Agilent E5070B/E5071B ENA Series RF Network Analyzers

Programmer's Guide

Seventh Edition

FIRMWARE REVISIONS

This manual applies directly to instruments that have the firmware revision A.06.50.
For additional information about firmware revisions, see Appendix A.

Agilent Technologies

Agilent Part No. E5070-90092

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Manual Printing History

The manual's printing date and part number indicate its current edition. The printing date changes when a new edition is printed. (Minor corrections and updates that are incorporated at reprint do not cause the date to change.) The manual part number changes when extensive technical changes are incorporated.

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Typeface Conventions

Bold	Boldface type is used when a term is defined. For example: **icons** are symbols.
Italic	Italic type is used for emphasis and for titles of manuals and other publications.
[Key]	Indicates the hardkey whose key label is Key.
[Key] - **Item**	Indicates a series of key operations in which you press the **[Key]** key, select (highlight) the item called **Item** on the displayed menu using the **[↓]** key and so on, and then press the **[Enter]** key.

Sample Program Disk

A sample program disk (Agilent part number: E5070-180x0) is furnished with this manual. The disk contains the sample programs used in this manual.

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E5070B/E5071B Documentation Map

The following manuals are available for the E5070B/E5071B.

- ***User's Guide*** **(Part Number: E5070-904x0, attached to optional ABA)**

  This manual describes most of the basic information necessary to use the E5070B/E5071B. It provides a function overview, detailed operation procedure for each function (from preparation for measurement to analysis of measurement results), measurement examples, specifications, and supplemental information. For programming guidance on performing automatic measurement with the E5070B/E5071B, please see the *Programming Manual*.

- ***Installation and Quick Start Guide*** **(Part Number: E5070-900x1, attached to optional ABA)**

  This manual describes installation after it is delivered and the basic operation procedures for applications and analysis. Refer to this manual when you use the E5070B/E5071B for the first time.

- ***Programmer's Guide*** **(Part Number: E5070-900x2, attached to optional ABA)**

  This manual provides programming information for performing automatic measurement with the E5070B/E5071B. It includes an outline of remote control, procedures for detecting measurement start (trigger) and end (sweep end), application programming examples, command reference, and related information.

- ***VBA Programmer's Guide*** **(Part Number: E5070-900x3, attached to optional ABA)**

  This manual describes programming information for performing automatic measurement with internal controller. It includes an outline of VBA programming, some sample programming examples, a COM object reference, and related information.

NOTE The number position shown by "x" in the part numbers above indicates the edition number. This convention is applied to each manual, CD-ROM (for manuals), and sample programs disk issued.

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Contents

1 Making Effective Use of This Manual

This chapter describes the contents of this guide.Using this chapter with the table of contents helps you to retrieve description of a subject you wish to understand as well as to obtain an overview of this guide.Also see the latter part of this chapter for brief description of usage of this guide, focusing on searching commands.

Contents of This Manual

This is a programming guide with Agilent E5070B/E5071B.

This guide describes programming method mainly aiming at learning how to write a program that remotely controls the E5070B/E5071B using SCPI commands, focusing on sample usage with the HTBasic.

Controlling the E5070B/E5071B using the built-in VBA is not covered by this guide; it is described in *VBA Programmer's Guide*. For using the E5070B/E5071B VBA, see *VBA Programmer's Guide*.

Description in this guide assumes that the reader has learned manual operation of the E5070B/E5071B.Thus, this guide does not describe each feature of the E5070B/E5071B in detail. For detailed information on each feature, see *User's Guide*.

The chapter-by-chapter contents of this manual are as follows.

Chapter 1, “Making Effective Use of This Manual.”

This chapter describes the contents of this guide.Using this chapter with the table of contents helps you to retrieve description of a subject you wish to understand as well as to obtain an overview of this guide.Also see the latter part of this chapter for brief description of usage of this guide, focusing on searching commands.

Chapter 2, “Overview of Remote Control.”

This chapter provides an overview of the remote control system and the SCPI commands.

Chapter 3, “Setting Up the Analyzer.”

This chapter describes how to configure measurement conditions and how to configure the way the instrument displays measurement results on the LCD.

Chapter 4, “Performing Calibration.”

This chapter explains how to obtain calibration coefficients and perform error correction as well as how to define the calibration kit required to obtain the calibration coefficients. It also shows how to perform power calibration.

Chapter 5, “Making a Measurement.”

This chapter explains how to trigger the instrument to start a new measurement cycle and how to detect the end of a measurement cycle.

Chapter 6, “Analyzing Data.”

This chapter describes how to use markers, analysis commands, and fixture simulator features.

Chapter 7, “Reading/Writing Measurement Data.”

This chapter provides an overview of the Agilent E5070B/E5071B's internal data processing flow and describes how to read and write measurement results (internal data array).

Chapter 8, “Limit Test.”

This chapter explains how to use the Limit Test feature to perform a limit test and determine the pass/fail status of the measured data.

Chapter 9, “Saving and Recalling (File Management).”

This chapter describes how to save and recall instrument status and measurement results onto/from the files. Here also covered is managing files.

Chapter 10, “Communication with External Instruments Using Handler I/O Port.”

This chapter provides necessary information for communicating with external instruments (for example, a handler in a production line) using the handler I/O port equipped with the Agilent E5070B/E5071B.

Chapter 11, “Working with Automatic Test Systems.”

This chapter describes useful features when the Agilent E5070B/E5071B is integrated with an automatic test system.

Chapter 12, “Controlling E5091A.”

This chapter explains how to control the E5091A.

Chapter 13, “Sample Application Programs.”

This chapter introduces several sample programs for basic measurement, measurement with a system using the handler I/O, and controlling the instrument over a LAN.

Chapter 14, “SCPI Command Reference.”

This chapter provides the SCPI command reference for the Agilent E5070B/E5071B. It describes the commands using their abbreviated format in alphabetical order. If you want to look up commands using their fully specified format, refer to the index for the desired SCPI command. If you want to look up commands by their function, refer to the SCPI command list ordered by function.

Appendix A, “Manual Changes.”

This appendix contains the information required to adapt this manual to earlier versions or configurations of the Agilent E5070B/E5071B than that indicated by the current printing date of this manual. The information in this manual applies directly to the E5070B/E5071B model that has the serial number prefix listed on the title page of this manual.

Appendix B, “Status Reporting System.”

This appendix describes the status reporting system of the Agilent E5070B/E5071B.

Appendix C, “Comparing Commands on the 8753ES and E5070B/E5071B.”

The following table presents a comparison of commands on the Agilent 8753ES and Agilent E5070B/E5071B, listed alphabetically by function.

How To Use This Manual

Chapters 3 to 9 provide task-based descriptions of SCPI commands that are useful for programming and explain how you can use them. These chapters contain explanations and sample program listings that you can use to develop your custom programs. For more information on individual commands, see Chapter 14, “SCPI Command Reference.”

Looking up SCPI commands

Chapter 14 “SCPI Command Reference” contains a complete reference of SCPI commands. You can look up a particular SCPI command in any of the following ways:

Lookup by Abbreviated Command Name

The command reference is organized alphabetically according to the abbreviated name used as the title for each command’s description.

Lookup by Full Command Name

You can use the index at the end of the manual to find full command names along with the page numbers where they appear.

Lookup by Command Function

Table 14-1 on page 794 provides a complete list of commands by function and indicates the page numbers where the commands appear in the command reference.

Lookup by Front panel key

Table 14-2 on page 814 provides a complete list of commands that correspond to the front panel key tree and indicates the page numbers where the commands appear in the command reference.

NOTE

Some SCPI commands supported by the E5070B/E5071B have optional syntax elements. In the command reference conventions, these elements are enclosed between square brackets ([]) or printed in lowercase letters. See “Syntax” on page 284 for more information.

Using sample programs

This manual comes with a sample program disk, which contains the source files of the sample programs used in the manual. The disk is DOS-formatted and the files are saved in ASCII format.

Loading a sample program

To load a sample program into the HTBasic interpreter, use the GET command. For example, you can load setup.bas, one of the sample programs, by the following procedure:

In the HTBasic screen, type the following command and press the Return key.

```
GET "setup.bas"
```

Looking up a sample program

To look up the description of a sample program, see the listings under “Sample program” in the index.

2 Overview of Remote Control

This chapter provides an overview of the remote control system and the SCPI commands.

Types of remote control system

Depending on the system controller and the interface, you can configure 4 types of remote control system as shown in the table below.

System controller	Interface	Overview
External controller (external computer such as PC and workstation)	GPIB (talker/listener mode)	System to control the E5070B/E5071B and other devices connected via GPIB from the external controller. For more information, refer to “GPIB remote control system” on page 31.
	LAN	System to control the E5070B/E5071B and other devices connected via LAN from the external controller. For more information, refer to “LAN remote control system” on page 33.
	USB	System to control the E5070B/E5071B and other devices connected via USB from the external controller. For more information, refer to “USB Remote Control System” on page 42.
E5070B/E5071B	——	System to control the E5070B/E5071B itself using built-in E5070B/E5071B VBA. For more information, refer to *VBA Programmers Guide*.
	GPIB (system controller mode)	System to control the E5070B/E5071B itself and external devices connected via GPIB using built-in E5070B/E5071B VBA. For more information, refer to *VBA Programmers Guide*.

GPIB remote control system

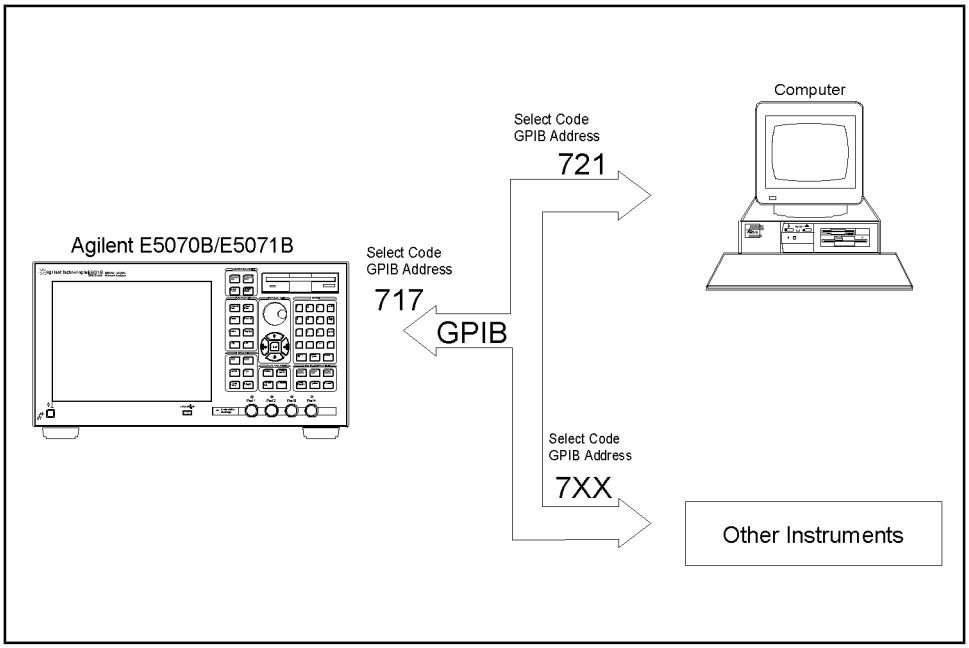
What is GPIB?

GPIB (General Purpose Interface Bus) is an interface standard for connecting computers and peripherals, which supports the following international standards: IEEE 488.1, IEC-625, IEEE 488.2, and JIS-C1901. The GPIB interface allows you to control the Agilent E5070B/E5071B from an external computer. The computer sends commands and instructions to the E5070B/E5071B and receives data sent from the E5070B/E5071B via GPIB.

System configuration

Use GPIB cables to connect between the E5070B/E5071B, the external controller (computer), and peripherals. Figure 2-1 shows the overview of the system configuration of the GPIB remote control system.

Figure 2-1 **Configuration of the GPIB remote control system**



e5070bpe013

NOTE While the E5070B/E5071B is turned off, the SRQ status of the E5070B/E5071B is active. To prevent an incorrect operation on the SRQ of the GPIB remote control system, disconnect the E5070B/E5071B from the system when the E5070B/E5071B is turned off.

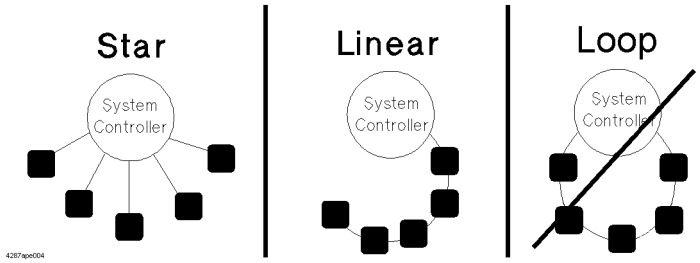
Required Equipment

1. E5070B/E5071B
2. External controller (computer)

   Use a personal computer or workstation equipped with the GPIB interface. You need to install software to control this instrument via GPIB into the external controller (for example, HTBasic and Agilent VEE) and set the GPIB mode to talker/listener mode (**[System]** - **Misc Setup** - **GPIB Setup** - **Talker/Listener Address**).
3. Other devices (other instruments and/or peripherals that serve your purpose)
4. GPIB cables for connecting the E5070B/E5071B, the external controller, and other devices

Scale of system you can construct

- You can connect up to 15 devices in a single GPIB system.
- The length of cables to connect between devices must be 4 m or less. The total length of connecting cables in a single GPIB system must be 2 m × the number of connected devices (including the controller) or less. You cannot construct the system in which the total cable length exceeds 20 m.
- The number of connectors connected to an individual device must be 4 or less. If you connect 5 or more connectors, excessive force is applied to the connector part, which may result in failure.
- You can choose the device connection topology from start, linear, and combined. Loop connection is not supported.



Device selector

The device selector is a unique value assigned to each device that is used by the controller to select the control target (to send/receive messages) among devices connected on the GPIB remote control system.

The device selector consists of a select code (usually, 7) and a GPIB address. For example, when the select code is 7 and the GPIB address is 17, the device selector is 717. The select code must be set for each system. The GPIB address must be set to a unique value for each device, which is used to identify devices on the same system. In the description and sample programs in this manual, it is assumed that the device selector is set to 717.

Setting the GPIB address of the E5070B/E5071B

[System] - GPIB Setup - Talker/Listener Address

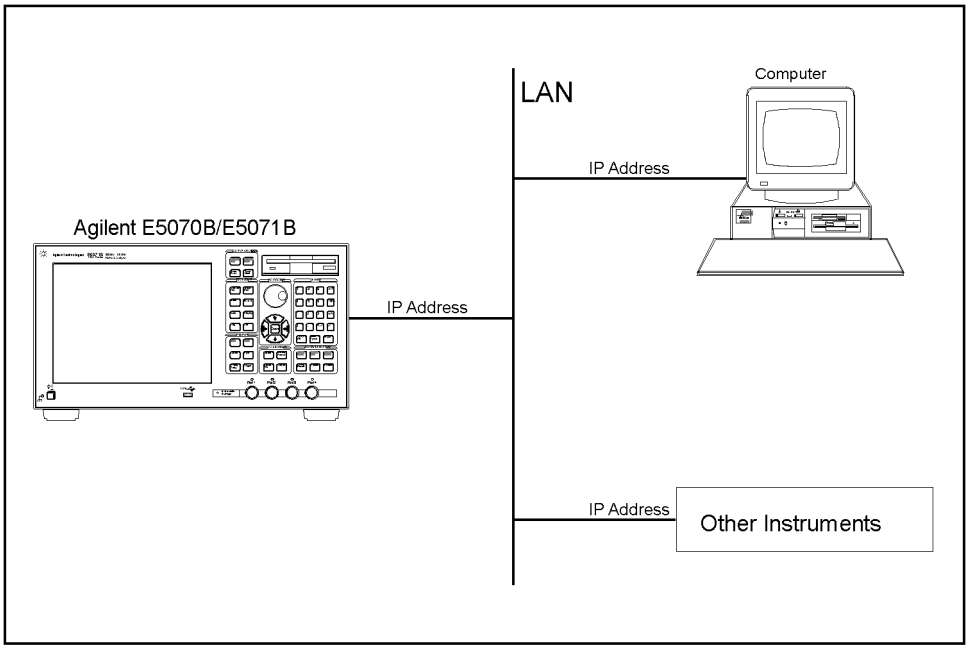
LAN remote control system

The LAN (Local Area Network) remote control system provides two methods: controlling the E5070B/E5071B using the SICL-LAN server and controlling the E5070B/E5071B using the telnet server.

System configuration

Use a LAN cable to connect between the E5070B/E5071B and the external controller (computer). Figure 2-2 shows the overview of the system configuration of the LAN remote control system.

Figure 2-2 **Configuration of the LAN remote control system**



e5070bpe015

Required Equipment

1. E5070B/E5071B
2. External controller (personal computer or workstation that can be connected to LAN and Agilent I/O Library is installed into)
3. Other devices (other instruments and/or peripherals that serve your purpose)
4. LAN cable for connecting the E5070B/E5071B with the external controller

Preparing the E5070B/E5071B

Before controlling the E5070B/E5071B via LAN, you need to configure the network function. For detailed information on the procedure, refer to *User's Guide*.

Control over SICL-LAN server

In the control system using the SICL-LAN server, communication between the external controller (client) and the E5070B/E5071B (server) is performed using the SICL-LAN protocol. Communication is performed using SICL (Standard Instrument Control Library). You can control the E5070B/E5071B by programming using SICL or VISA with the C language in the UNIX environment, or Visual C++, Visual Basic, or VEE in the Windows environment.

Preparing the E5070B/E5071B

To communicate with the external controller, follow these steps to turn on the SICL-LAN server of the E5070B/E5071B in advance.

Step 1. Turn on the SICL-LAN server of the E5070B/E5071B.

[System] - Misc Setup - Network Setup - SICL-LAN Server [ON]

Step 2. Set the GPIB address of the E5070B/E5071B for control with the SICL-LAN server. “XX” represents an address number.

[System] - Misc Setup - Network Setup - SICL-LAN Address [XX]

NOTE You need to restart the E5070B/E5071B firmware after changing the on/off setting or address setting of the SICL-LAN server.

Preparing the external controller

In order to establish communication to the E5070B/E5071B using the TCP/IP protocol, you need to set the I/O interface of the external controller in advance. This section shows the setting procedure when using the external controller in the Windows environment.

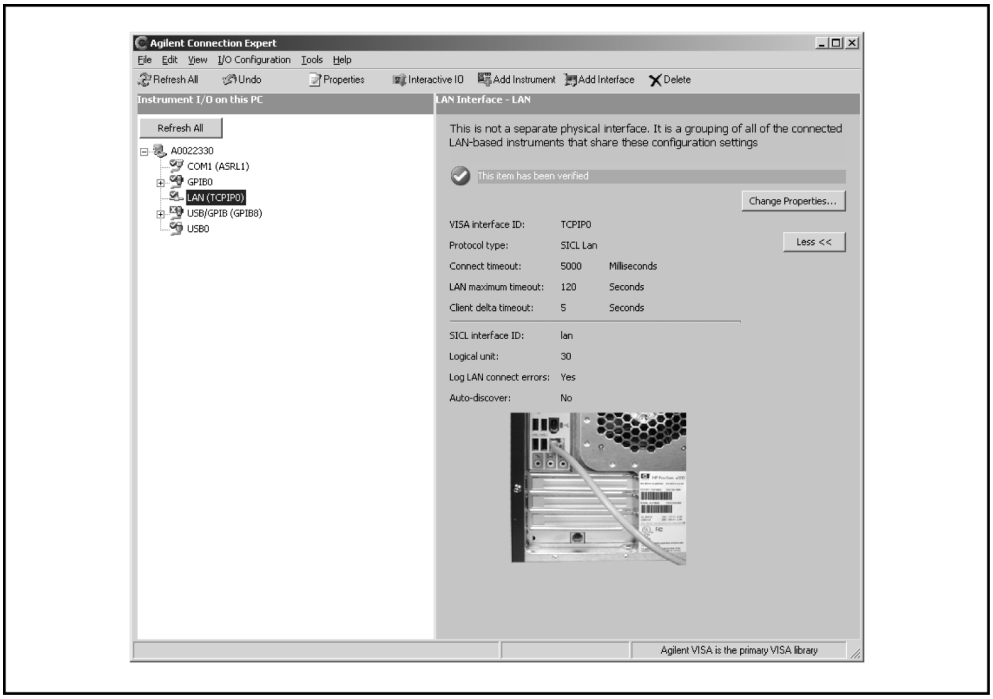
NOTE You must install the Agilent I/O Libraries in advance.

Use Agilent I/O Libraries M.01.01 or Agilent I/O Libraries Suite 14 or later.

For further information on the I/O Libraries, see the Agilent I/O Libraries Manual.

The Agilent I/O Libraries may not be available for certain external controllers or OS versions. For further details, refer to the Help guidance for the Agilent I/O Libraries.

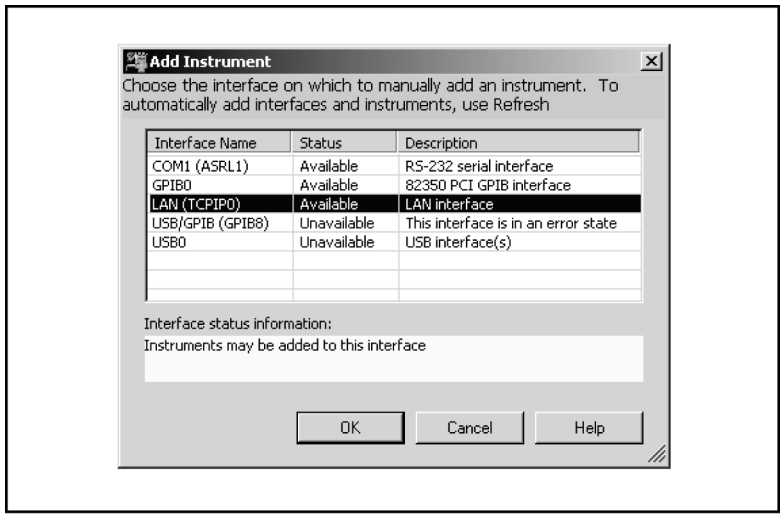
Step 1. From your PC's Start menu, click Program - Agilent I/O Libraries Suite - Agilent Connection Expert to open the Agilent Connection Expert setting screen.



e5070bpj7002

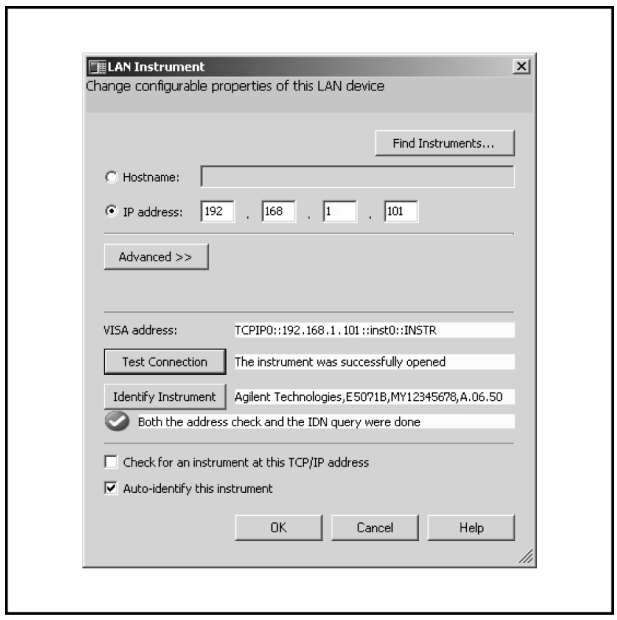
Step 2. In the Agilent Connection Expert setting screen, select **LAN(TCPIP0) in the Instrument I/O on this PC** frame, and then select **I/O Configuration - Add Instrument** on the menu**.**

Step 3. In the Add Instrument screen, press **OK** as LAN has been selected.



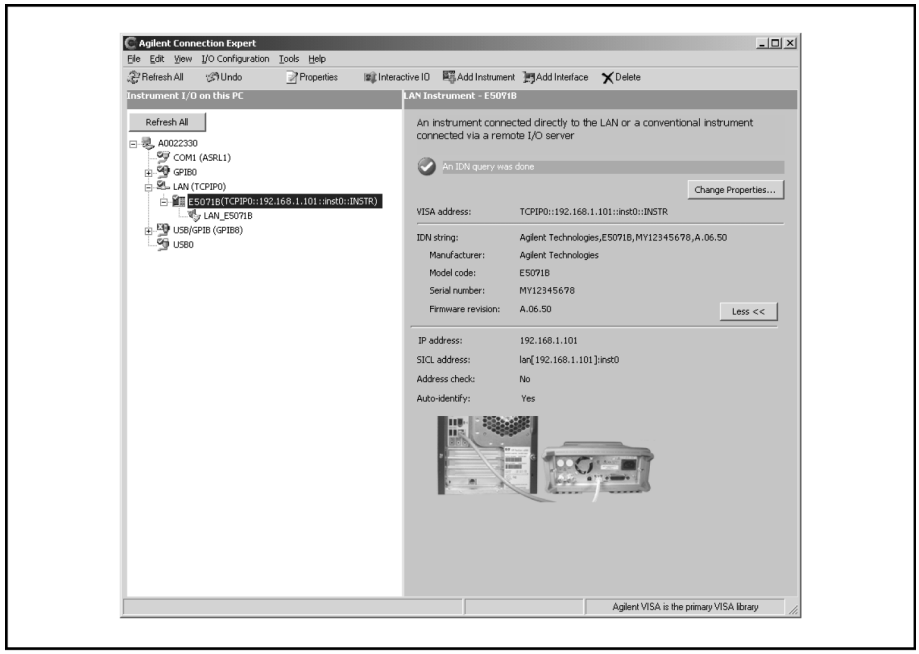
e5070bpj7003

Step 4. In the LAN Instrument Properties screen, set up the IP address of the E5070B/E5071B and click **OK**.You can change settings as necessary. For details, refer to the Agilent I/O Libraries Suite manual.



e5070bpj7004

Step 5. In the Agilent Connection Expert screen, check that the E5070B/E5071B has been added under **LAN(TCPIP0)** in the **Instrument I/O on this PC** frame.



e5070bpj7005

Control using C or Visual Basic

You can control the E5070B/E5071B by programming using SICL with the C language in the UNIX environment, or Visual C++ or Visual Basic in the Windows environment.

For more information on the control method, see a sample program using the VBA macro of Microsoft Excel described in “Control Using SICL-LAN Server” on page 265.

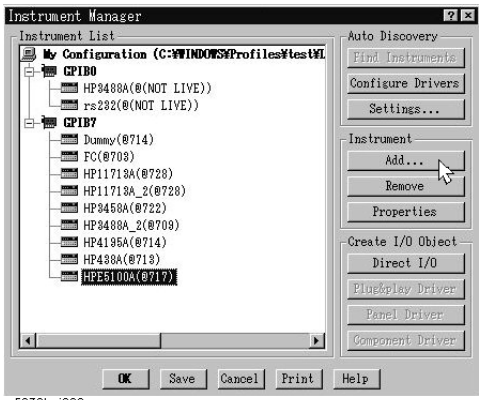
Control using Agilent VEE

Agilent VEE allows you to control the E5070B/E5071B via the I/O interface. The following example shows how to control the E5070B/E5071B that is set as follows: the address of the SICL-LAN server is 17 and the IP address is 192.168.0.1.

NOTE When using Agilent VEE for PC, use Agilent VEE Pro 6 for Windows or later.

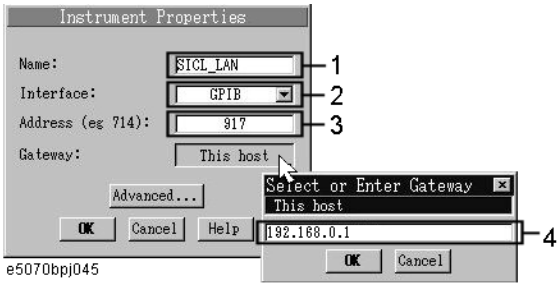
Step 1. On the Agilent EVE’s **I/O** menu, click **Instrument Manager...**.

Step 2. In the Instrument Manager setting screen, click **Add...**.



e5070bpj038

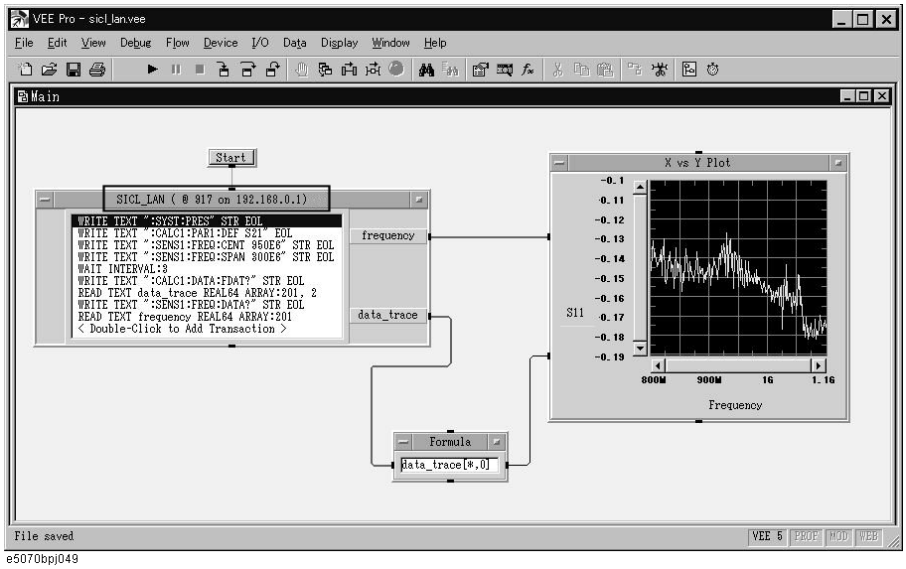
Step 3. The Instrument Properties setting screen appear. Make the settings as follows: Name (1 in the figure below): **SICL_LAN** (you can specify any name), Interface (2 in the figure below): **GPIB**, and Address (3 in the figure below): **917** (for the E5070B/E5071B, fixed to 9. 17 is the address of the SICL-LAN server). Then, click Gateway: **This host**. The Select or Enter Gateway setting screen appears. Enter the IP address or host name of the E5070B/E5071B (4 in the figure below).



e5070bpj045

Figure 2-3 shows an example of control using the I/O interface that has been set in the above procedure.

Figure 2-3 **Example of control using Agilent VEE**



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Control over telnet server

In the control system over telnet server, communications are performed through connection between the sockets provided by the processes of the external controller and the E5070B/E5071B to establish a network path between them.

A socket is an endpoint for network connection; port 23 and port 5025 are provided for the sockets for the E5070B/E5071B. Port 23 is provided for conversational control using telnet (user interface program for the TELNET protocol) and port 5025 for control from a program.

Preparing the E5070B/E5071B

To communicate with the external controller, follow these steps to turn on the telnet server of the E5070B/E5071B in advance.

[System] - Misc Setup - Network Setup - Telnet Server [ON]

Conversational control using telnet (using port 23)

You can use telnet to perform conversational control by sending SCPI commands to the E5070B/E5071B on a message-by-message basis. For telnet, the socket of port 23 is used for communications.

In this example, in order to show you the control procedure using telnet, you control the E5070B/E5071B (IP address: 192.168.0.1 and host name: e5070a) from the external controller in the Windows environment.

Step 1. Open the MS-DOS command prompt screen.

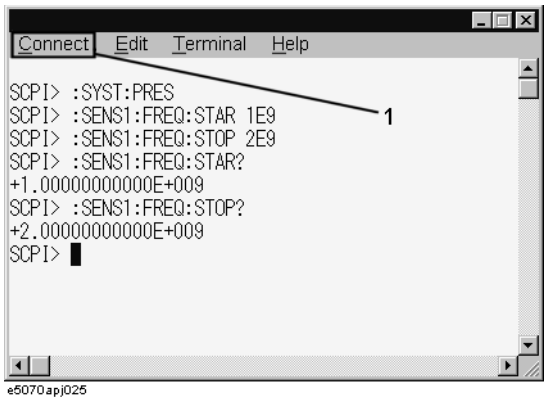
Step 2. At the MS-DOS prompt, type telnet 192.168.0.1 or telnet e5070a and press the return key.

Step 3. The telnet screen opens.

Step 4. Type a command and press the return key; it is sent to the E5070B/E5071B and executed. If you enter a command that queries some data, the query response is displayed below the line you have entered the command.

Figure 2-4 shows the screen after using the :SYST:PRES command on page 781 to reset, the :SENS{1-16}:FREQ:STAR command on page 643 and :SENS{1-16}:FREQ:STOP command on page 644 commands to set the sweep start value and stop value to 1 GHz and 2 GHz respectively, and checking the settings.

Figure 2-4 Example of control using telnet



Step 5. Select Disconnect from the Connect menu in the telnet screen (1 in Figure 2-4) to break the connection to the E5070B/E5071B and select Exit from the Edit menu to exit the telnet. (In other environment such as the UNIX environment, press] while holding down the control key. The telnet prompt appears. At the telnet prompt, type quit and press the return key. The connection to the E5070B/E5071B breaks and telnet finishes.)

Control from a program (using port 5025)

When controlling the E5070B/E5071B from a program on the external controller, use the socket of port 5025 for connection.

NOTE Some functions such as service requests that are available in the GPIB remote control system are not available in control over telnet server.

Control using C or Visual Basic

You can control the E5070B/E5071B by socket programming using the C language in the UNIX environment, or Visual C++ or Visual Basic in the Windows environment.

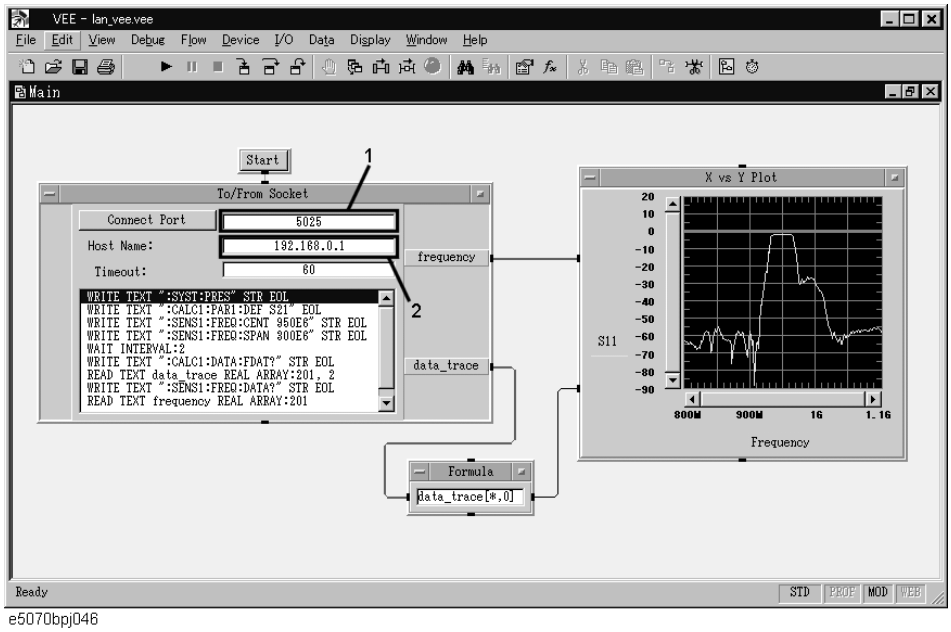
For socket programming, the library for network connection on the TCP/IP protocol is required. For the UNIX environment, BSD (Berkeley Software Distribution) Sockets API is available; for the Windows environment, WinSock (WinSock1.1 and WinSock2.0) created by porting BSD Sockets to Windows and expanding it is available.

For more information on the control method, see a sample program for control using WinSock described in “Controlling Using Telnet Server” on page 273.

Agilent Control using VEE

Agilent VEE allows you to control the E5070B/E5071B through the connection to the socket of port 5025 using To/From Socket. Figure 2-5 shows an example (when the IP address of the E5070B/E5071B is 192.168.0.1). Enter 5025 in the field to specify the port for connection (1 in Figure 2-5) and enter the IP address or host name of the E5070B/E5071B in the filed to specify the host name (2 in Figure 2-5).

Figure 2-5 Example of control using Agilent VEE



e5070bpj046

USB Remote Control System

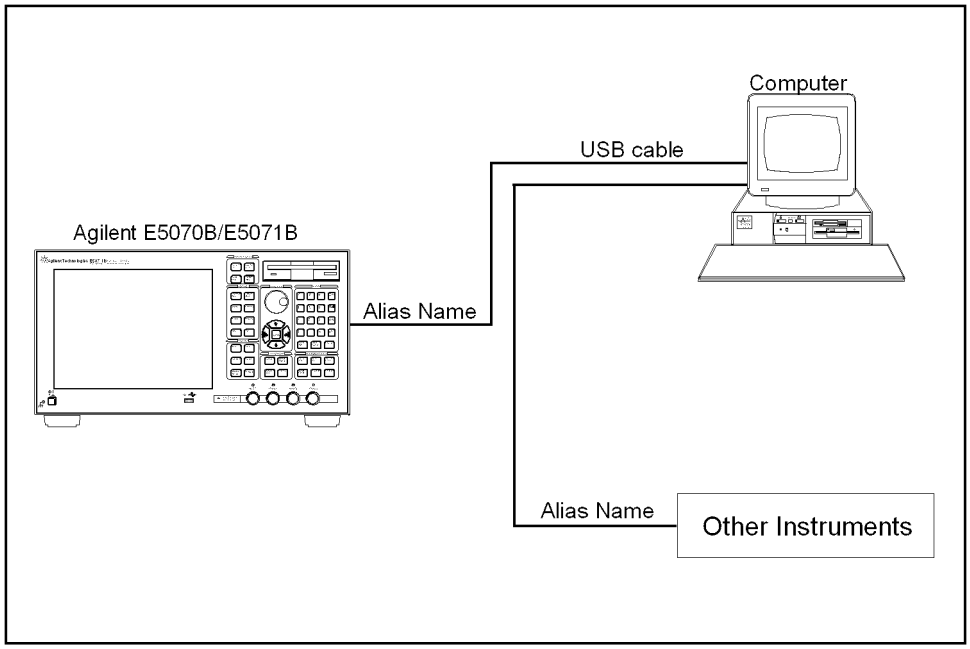
The USB (Universal Serial Bus) remote control system provides device control via USB that is equivalent to control via GRIP. Connection is made through an interface in compliance with USBTMC-USB488 and USB 2.0.

System configuration

The USB remote control system controls instruments that use the name “alias.” There is no such address for GPIB connections.

Use a LAN cable to connect the E5070B/E5071B to an external controller (personal computer). Figure 2-6 shows an overview of the system configuration for the USB remote control system.

Figure 2-6 **USB Remote Control System Configuration**



e5070bpe5008

Required Equipment

1. E5070B/E5071B (models with USB (USBTMC) interface port (type B)).
2. External controller (personal computer with installed Agilent I/O Libraries and USB host port (type A)).
3. Other USB compatible devices (instruments and/or peripherals for specific purposes).
4. USB cable connecting E5070B/E5071B and external controller (with type A/4-prong male or type B/4-prong male connectors depending on device used).

USB Port Types

There are two standard types of USB ports. The external controller (PC) must be connected

via the USB host port (type A), while the E5070B/E5071B and other USB compatible devices must be connected via the USB interface port (type B).

	Type A: USB host port
	Type B: USB (USBTMC) interface port

Preparing E5070B/E5071B

You do not have to configure any softkey or command of the E5070B/E5071B in order to control the E5070B/E5071B from an external controller. Simply connect a USB cable to the USB interface port.

Preparing External Controller

In order to establish communication with the E5070B/E5071B via USB, you must set up the I/O interface of the external controller in advance. The USB can identify devices automatically, so once you connect a USB cable to a target device, a dialog box will appear for USB device registration.

NOTE The E5070B/E5071B will be identified as new device if its serial number has been changed.

NOTE You must install the Agilent I/O Libraries in advance. Use Agilent I/O Libraries M.01.01 or Agilent I/O Libraries Suite 14 or later.

For further information on the I/O Libraries, see the Agilent I/O Libraries Manual.

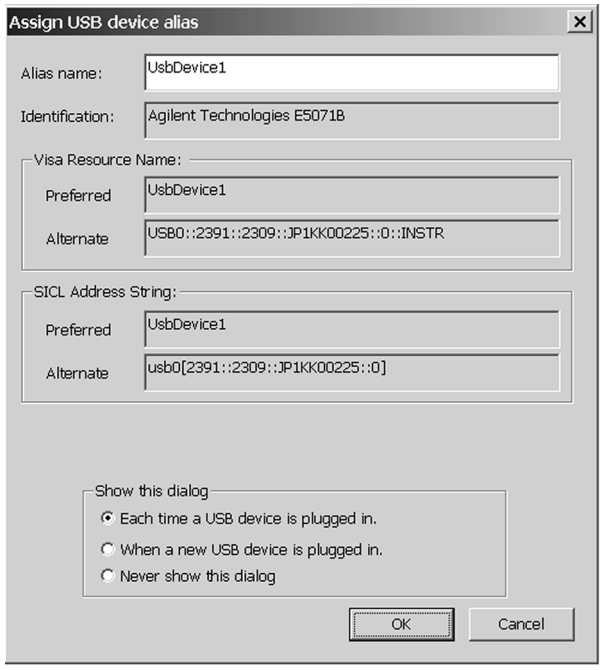
The Agilent I/O Libraries may not be available for certain external controllers or OS versions. For further details, refer to the Help guidance for the Agilent I/O Libraries.

1. Registering Alias When USB Cable Is Connected

When new device is connected via USB cable, the following dialog box will appear automatically.Follow the steps below to register alias, when you use the Agilent I/O Libraries Suite 14.

Step 1. In the Assign USB device alias dialog box, enter an alias and the click the **OK** button.

Figure 2-7 **Registering Alias**



e5070bpi5016

NOTE For alias, use the ASCII format less than 127 digits.Alias is upper/lower case insensitive.

If "Never show this dialog" is selected in the "Show this dialog" frame, the dialog box does not appear even if a new device is connected.

NOTE Once new device is identified, the "New Hardware Search Wizard" will start.Follow the instruction to implement the processing.

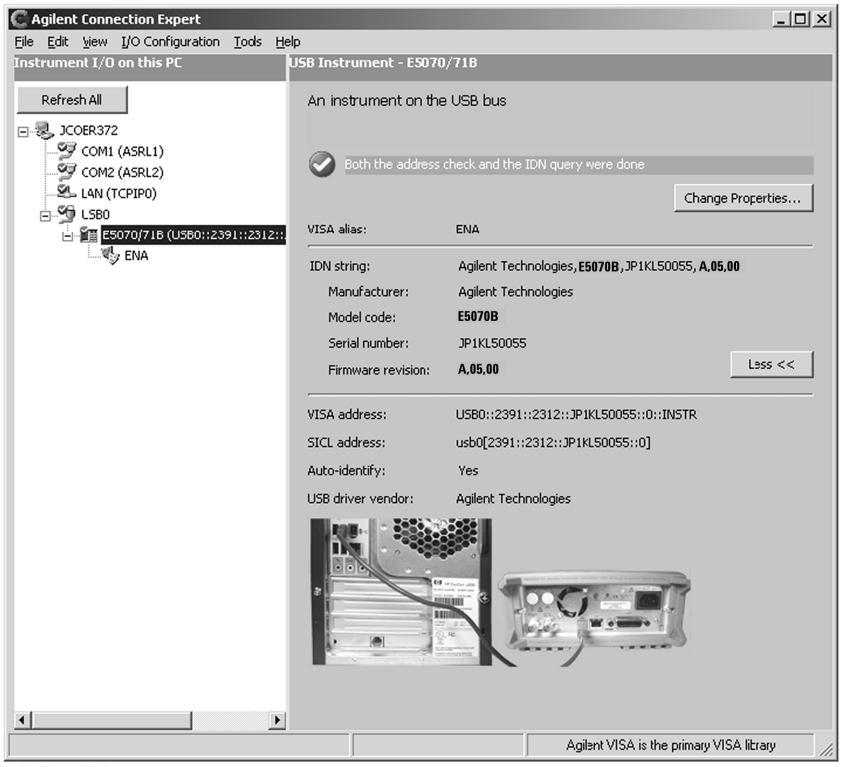
2. Changing Alias on Setting Screen

The following are steps using the Agilent I/O Libraries Suite 14.

Step 1. Step 1: From the Start menu of your PC, click Program - Agilent IO Libraries Suite -Agilent Connection Expert to open the Config setting screen.

Step 2. In the Config setting screen, select the alias names from **USB0** onward in the **Instrument I/O on this PC** frame, and then use the **Change Properties** from **I/O Configuration** on the menu bar.

Figure 2-8 **Changing Alias**



e5070bpj5005

Control using C or Visual Basic

You can control the E5070B/E5071B by programming using Visual C++ or Visual Basic in the Windows environment as well as SICL/VISA.For further information on controlling the E5070B/E5071B, see the manual of SICL or VISA.For Agilent I/O Libraries, use Agilent I/O Libraries M.01.01 or Agilent I/O Libraries Suite 14.

You may use alias in the programming using SICL/VISA.

The following example shows an OPEN command to control the E5070B/E5071B to which alias is given as ENA_USBIF.

SICL	id = iopen("ENA_USBIF")
VISA	viOpen(...,"ENA_USBIF",...)

NOTE For further details of the programming using SICL/VISA, see the SICL Users Guide or the VISA Users Guide.

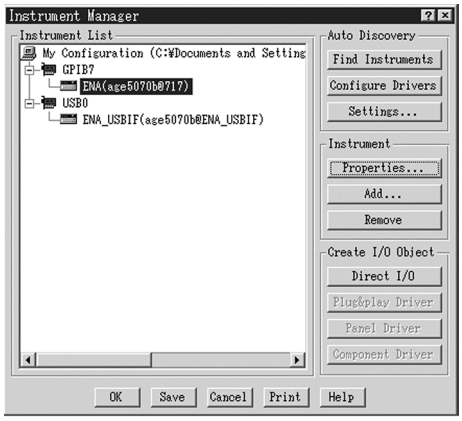
Control using Agilent VEE

Agilent VEE allows you to control the E5070B/E5071B via the direct I/O interface.The following example shows how to control the E5070B/E5071B to which alias is given as ENA_USBIF.

NOTE When using Agilent VEE for PC, use Agilent VEE Pro 7 for Windows or later version.

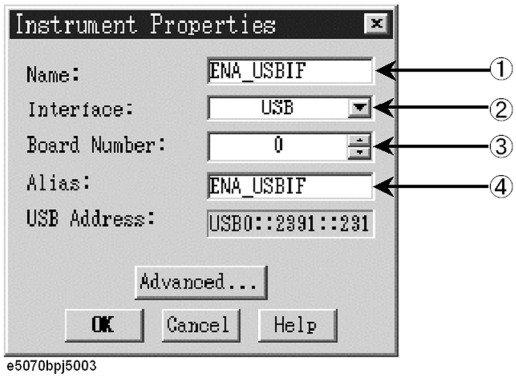
Step 1. On the Agilent VEE's **I/O** menu, click **Instrument Manager...**.

Step 2. In the Instrument Manager setting screen, click **Add...**.



e5070bpj5001

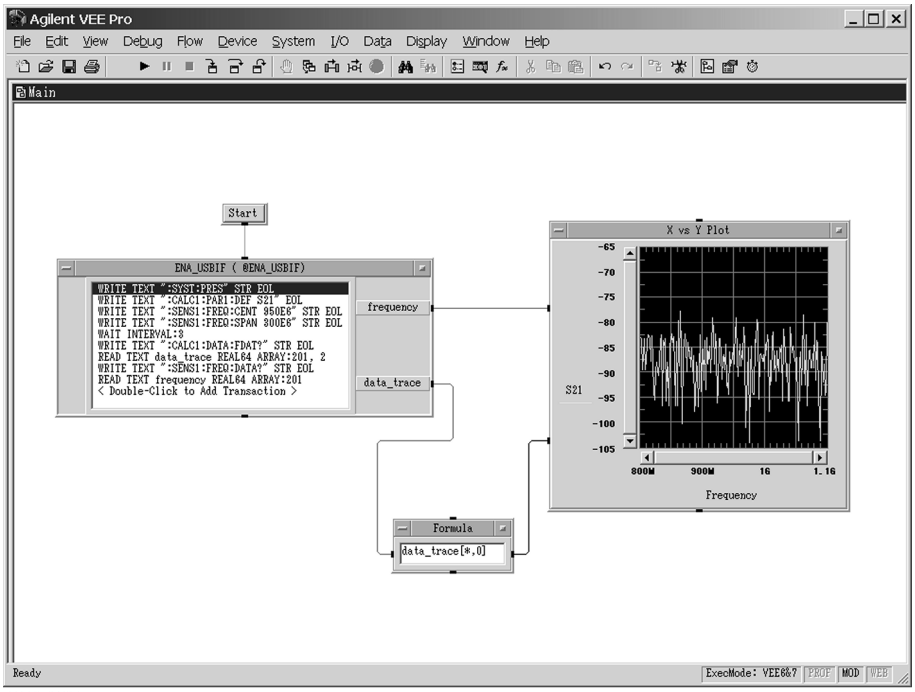
Step 3. The Instrument Properties dialog box appears.Specify Name: **ENA_USBIF**(1 shown below, any other name acceptable), Interface:**USB**(2 shown below), Board Number :**0**(3 shown below, USB port number), and Alias:**ENA_USBIF**(4 shown below which is registered in the IO Config setting screen), then click **OK**.



e5070bpj5003

Figure 2-9shows an example of control using the direct I/O interface that has been set in the above procedures.

Figure 2-9 **Sample Control Using Agilent VEE (USB)**



e5070bpj5017

Sending SCPI command messages

Types and structure of commands

The SCPI commands available for the E5070B/E5071B are classified into 2 groups as follows.

E5070B/E5071B commands

Commands specific to the E5070B/E5071B. They cover all measurement functions that the E5070B/E5071B has and some general-purpose functions. The commands in this group are arranged in a hierarchical structure called the command tree (see “Command tree” on page 830). Each command consists of character strings (mnemonics) indicating each hierarchical level and colon (:) separators between hierarchical levels.

IEEE common commands

Commands to cover general-purpose functions defined in IEEE488.2 that are available commonly to instruments that support this standard. The commands in this group have an asterisk (*) at the beginning. For the commands in this group, there is no hierarchical structure.

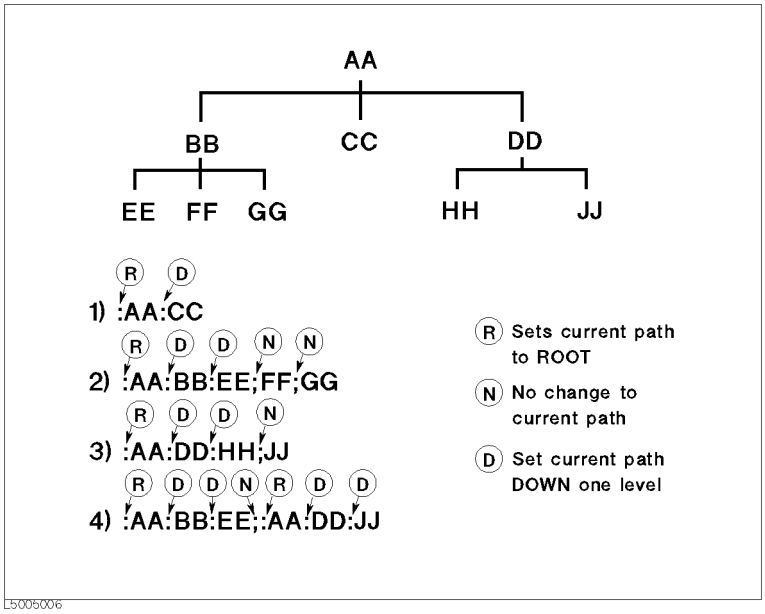
Concepts of the command tree

The commands at the top of the command tree are called “root command” or simply “root.” To access lower level commands in the tree, you need to specify a specific path like a directory path in the DOS file system. After power-on or reset, the current path is set to the root. Special characters in messages change the path setting as described below.

Message terminator	A message terminator such as the <new line> character sets the current path to the root.
Colon (:)	A colon between 2 command mnemonics lowers the level of the current path in the command tree. A colon used as the first character of a command specifies the command mnemonic that follows as the root-level command.
Semicolon (;)	A semicolon does not change the current path and separates 2 commands in the same message.

Figure 2-10 shows an example of how to use colons and semicolons to efficiently access commands in the command tree.

Figure 2-10 **Using colons and semicolons**



Grammar of messages

This section describes the grammar to send program messages via GPIB. Program messages are messages that the user sends to the instrument from the external controller to control the instrument. A program message consists of 1 or more commands and their necessary parameters.

Upper/lower case sensitivity

Upper/lower case insensitive.

Program message terminator

A program message must be terminated with one of the 3 program message terminators: <new line>, <^END>, or <new line><^END>. <^END> indicates that EOI on the GPIB interface becomes active at the instant when the immediately previous data byte is sent. For example, the OUTPUT command of HTBasic automatically sends the message terminator after the last data byte.

Parameters

A space (ASCII code: 32) is required between a command and its first parameter. When sending several parameters in a single command, separate each parameter with a comma (,).

Message including several commands

When sending 2 or more commands in a single message, separate each command with a semicolon (;). The following example shows how to send the ***CLS** command and the **:STAT:PRES** command in a single message using HTBasic.

```
OUTPUT 717;"*CLS;:STAT:PRES"
```

Remote mode

The E5070B/E5071B does not provide remote mode. Therefore, even if you send a GPIB command, it never enters into remote mode automatically. There is no local key to release remote mode.

If you need to prevent misoperation during remote control due to entry from the front panel or mouse, lock the input devices using the following commands.

- :SYST:KLOC:KBD command on page 779
- :SYST:KLOC:MOUS command on page 780

3 Setting Up the Analyzer

This chapter describes how to configure measurement conditions and how to configure the way the instrument displays measurement results on the LCD.

Selecting the Active Channel/Trace

You can configure the E5070B/E5071B by using various commands. Some commands require you to specify and work with a particular channel or trace, while other commands do not have this restriction.

Those commands that do not require you to specify a particular channel or trace apply to the currently active channels and traces. Before issuing such a command, therefore, you must make the appropriate channels and traces active.

To make a channel active, use the following command:

- :DISP:WIND{1-16}:ACT on page 464

NOTE Only the currently displayed channels can be active channels. Therefore, you must display the desired channels by using the :DISP:SPL command on page 460 before making them active.

To make a trace active, use the following command:

- :CALC{1-16}:PAR{1-16}:SEL on page 418

NOTE Only the currently displayed traces can be active traces. Therefore, you must display the desired traces by using the :CALC{1-16}:PAR:COUN command on page 415 before making them active.

Configuring Measurement Conditions

Setting the number of traces

When you set the number of traces, that setting determines the upper limit trace number; for example, if the setting is 3, traces 1 through 3 will be displayed. To set the number of traces, use the following command:

- :CALC{1-16}:PAR:COUN on page 415

NOTE Only the currently displayed traces can be active traces. Therefore, you must set the number of traces appropriately before making them active.

Selecting measurement parameters

To select the measurement parameter (S parameter) for each trace, use the following command:

- :CALC{1-16}:PAR{1-16}:DEF on page 416

When you use the Balance-Unbalance Conversion feature, you can select the mixed mode S parameter as well. For more information, refer to “Analysis Using the Fixture Simulator” on page 150.

Setting the sweep condition (Stimulus)

How you can set the sweep condition depends on the sweep type. You can choose between the following four sweep types:

- Linear sweep
- Log sweep
- Segment sweep
- Power sweep

To select one of the above sweep types, use the following command:

- :SENS{1-16}:SWE:TYPE on page 682

To select the sweep mode (stepped/fast stepped/swept/fast swept), use the following command:

- :SENS{1-16}:SWE:GEN on page 678

Turning On/Off stimulus signal output

To turn on/off the stimulus signal output, use the following commands. For example, if the power output is automatically turned off due to the power trip feature, remove the cause of the over-input and turn on the stimulus signal output by executing the following command. You cannot perform measurement until you turn on the stimulus signal output.

- :OUTP on page 521

Configuring linear sweep settings

To set the sweep range, use the following commands:

Start value	:SENS{1-16}:FREQ:STAR on page 643
Stop value	:SENS{1-16}:FREQ:STOP on page 644
Center value	:SENS{1-16}:FREQ:CENT on page 640
Span value	:SENS{1-16}:FREQ:SPAN on page 642

To set the number of measurement points, use the following command:

- :SENS{1-16}:SWE:POIN on page 679

To set the measurement time, use the following commands:

Measurement time	:SENS{1-16}:SWE:TIME on page 680
Turning on/off auto setting	:SENS{1-16}:SWE:TIME:AUTO on page 681

To set the sweep delay time, use the following command:

- :SENS{1-16}:SWE:DEL on page 677

To set the IF bandwidth, use the one of the following commands (both provide the same function):

- :SENS{1-16}:BAND on page 534
- :SENS{1-16}:BWID on page 535

Setting power level

When the instrument is equipped with the power range expansion function (Option 214, 314, or 414), you can select the power range by using the following command:

- :SOUR{1-16}:POW:ATT on page 690

To set the power level, use the following command:

- :SOUR{1-16}:POW on page 689

To select whether to output the same power level (the set value for port 1) or a different power level for each port, use the following command:

- :SOUR{1-16}:POW:PORT:COUP on page 694
- :SOUR{1-16}:POW:PORT{1-4} on page 695

To set the correction of power-level attenuation so that it's proportional to the frequency (power slope feature), use the following command:

- :SOUR{1-16}:POW:SLOP:STAT on page 703
- :SOUR{1-16}:POW:SLOP on page 702

NOTE If you turn on the power slope feature, the sweep mode is changed to the step mode.

Configuring segment sweep settings

When you opt to use segment sweep, you can set all items (in the segment sweep table) by using a single command:

- :SENS{1-16}:SEGM:DATA on page 674

Alternatively, you can configure the segment sweep settings based on the data contained in a CSV file by issuing the following command:

- :MMEM:LOAD:SEGM on page 498

Also, you can save the contents of the current segment sweep table to a file by issuing the following command:

- :MMEM:STOR:SEGM on page 512

For more information on how to save and load the segment sweep table, refer to "Saving and recalling the segment sweep table."

Configuring power sweep settings

To set the sweep range, use the following commands:

Start value	:SOUR{1-16}:POW:STAR on page 705
Stop value	:SOUR{1-16}:POW:STOP on page 706
Center value	:SOUR{1-16}:POW:CENT on page 693
Span value	:SOUR{1-16}:POW:SPAN on page 704

To set the fixed frequency (CW frequency), use the following command:

- :SENS{1-16}:FREQ on page 639

To set the number of points, the sweep time, the sweep delay time, and the IF bandwidth, use the same commands as for the linear/log sweep.

Configuring Averaging Settings

To configure the smoothing settings, use the following commands:

On/off	:SENS{1-16}:AVER on page 532
Averaging factor	:SENS{1-16}:AVER:COUN on page 533
Clear (Restart)	:SENS{1-16}:AVER:CLE on page 532

For averaging, normally, the instrument must be triggered according to the number of averaging; however, when the averaging trigger is turned on, sweeps for the number of averaging can be executed by a single trigger. For details on the averaging trigger, refer to "Averaging Trigger Function" on page 138 of Chapter 5, "Making a Measurement,"

Setting the System Z0

NOTE This function is available with the firmware version 3.01 or greater.

To set the system characteristic impedance (Z0), use the following command:

- :SENS:CORR:IMP on page 526

Configuring Display Settings

Setting the layout of windows and graphs

You can split the E5070B/E5071B's LCD screen into multiple windows that display channel-specific result information, and the window layout can be selected from a number of variations. In addition, you can place on screen a segment sweep table or echo window, which you can use to display messages from your custom program.

Selecting the window layout (Channel Display Mode)

One window displays the results for a single channel. You cannot have a single window display the results from more than one channel. This means that setting the window layout determines the number of channels displayed on screen.

To select one of the 19 different window layouts shown in Figure 3-1, use the following command:

- :DISP:SPL on page 460

Selecting the graph layout (Trace Display Mode)

You can place a number of trace graphs in each window by selecting one of the pre-defined graph layouts. The number of graphs differs depending on your selected graph layout. If the number of graphs is equal to or larger than the number of traces (set by the :CALC{1-16}:PAR:COUN command on page 415), each graph always displays one trace. On the other hand, if the number of graphs is smaller than the number of traces, some of the graphs display two or more traces. Graph 1 is populated with trace 1, graph 2 with trace 2, and so on. Traces whose numbers exceed the last graph's number will populate graph 1, graph 2, and so on.

To select one of the 19 different graph layouts shown in Figure 3-1, use the following command:

- :DISP:WIND{1-16}:SPL on page 469

Maximizing a window or a trace graph

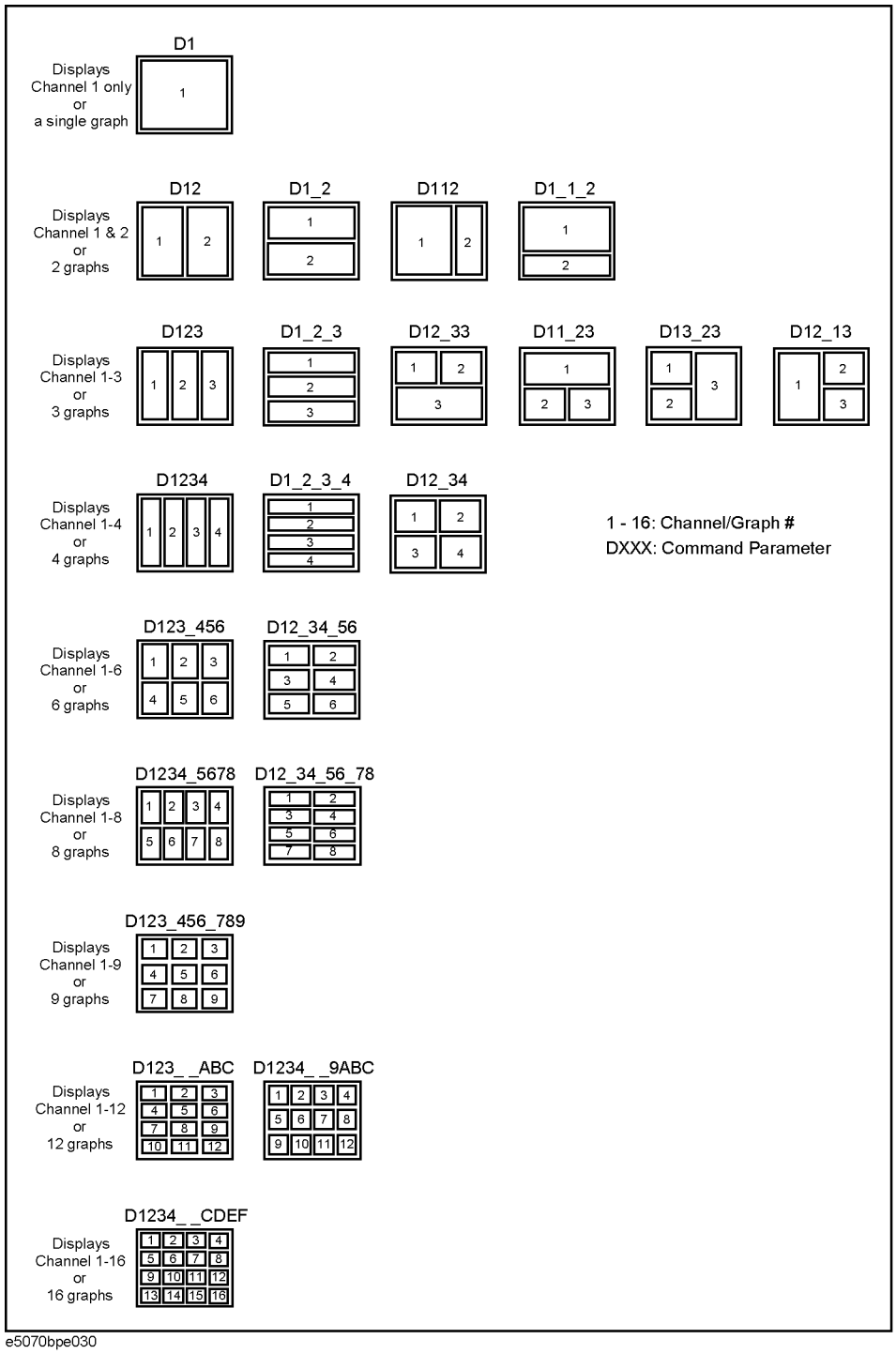
When you have multiple windows displayed, you can maximize the active channel window so that it covers the entire screen area. To maximize a window, use the following command:

- :DISP:MAX on page 459

Similarly, when you have multiple traces displayed, you can maximize the active trace so that it extends throughout the entire window. To maximize a trace, use the following command:

- :DISP:WIND{1-16}:MAX on page 468

Figure 3-1 **Window/graph layouts and command parameters**



e5070bpe030

Showing/hiding a table or echo window

You can display the following items at the bottom of the LCD screen:

- Segment sweep table
- Limit table
- Marker list table
- Echo window (a window that displays messages from a custom program)
- Loss compensation table
- Power sensor's calibration factor table

To show or hide each of the above items, use the following command:

- :DISP:TABL on page 462

You can have two or more of the above items displayed at a time. The screen displays only the selected item by using the following command:

- :DISP:TABL:TYPE on page 463

Showing/hiding softkey labels

You can show or hide the softkey labels placed alongside the right-hand edge of the LCD screen. To show or hide the softkey labels, use the following command:

- :DISP:SKEY on page 459

Configuring trace display settings

Selecting which traces to display

Each trace has two different representations: data and memory traces. You can show or hide the data and memory traces independently of each other. To show or hide the data or memory traces, use the following commands:

Data trace	:DISP:WIND{1-16}:TRAC{1-16}:STAT on page 475
Memory trace	:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:X on page 472

To copy the data trace to the memory trace, use the following command:

- :CALC{1-16}:MATH:MEM on page 410

Configuring cross-trace math operations

You can perform math operations between the data and memory traces and have the results displayed as the data trace. To perform cross-trace math operations, use the following command:

- :CALC{1-16}:MATH:FUNC on page 409

Configuring smoothing settings

To turn on/off smoothing, use the following command:

- :CALC{1-16}:SMO on page 427

The smoothing aperture is expressed as a percentage with respect to the sweep range. To set the smoothing aperture, use the following command:

- :CALC{1-16}:SMO:APER on page 428

Selecting the data format

You can select the following data formats:

❑ Rectangular display formats

- Log magnitude format
- Phase format
- Group delay format
- Linear magnitude format
- SWR format
- Real format
- Imaginary format
- Expanded phase format
- Positive phase format

❑ Imaginary format
❑ Expanded phase format

To select the measurement parameter data format, use the following command:

- :CALC{1-16}:FORM on page 318

Configuring the display scale

Depending on the measurement parameter data format, you can configure the display scale in one of the following two ways:

Rectangular display formats:

When you use one of rectangular display formats (Logarithmic magnitude/Phase/ Group delay/Linear magnitude/SWR/Real/Imaginary/Expanded phase/Positive phase), you can configure the display scale by setting the following four items:

Number of divisions	:DISP:WIND{1-16}:Y:DIV on page 480
Scale per division	:DISP:WIND{1-16}:TRAC{1-16}:Y:PDIV on page 476
Reference graticule line	:DISP:WIND{1-16}:TRAC{1-16}:Y:RPOS on page 478
Reference graticule line value	:DISP:WIND{1-16}:TRAC{1-16}:Y:RLEV on page 477

NOTE The number of divisions is a channel-wide setting (shared among all traces), while the remaining three settings are trace-specific.

You can show or hide graticule label (the label on the left-hand side of the graticule lines) by issuing the following command:

- :DISP:WIND{1-16}:LAB on page 467

Smith chart/Polar formats:

When you are using one of Smith chart/Polar formats, you can only set the full scale value (the outermost circle's value) using the following command:

- :DISP:WIND{1-16}:TRAC{1-16}:Y:PDIV on page 476

Auto Scale

You can use Auto Scale to automatically set the display scale. This feature works by automatically adjusting the reference division line value and the scale value per division when you are using one of the rectangular display formats or the full scale value when you are using one of Smith chart/Polar formats.

To perform Auto Scale, use the following command:

- :DISP:WIND{1-16}:TRAC{1-16}:Y:AUTO on page 475

Printing a message in the echo window

You can print a message in the echo window by issuing the following command:

- :DISP:ECHO on page 455

You can clear any message displayed in the echo window by issuing the following command:

- :DISP:ECHO:CLE on page 455

Turning On/Off display update

To turn on/off the update of the LCD screen, use the following command:

- :DISP:ENAB on page 456

Showing/hiding frequencies

To show or hide frequencies on the LCD screen, use the following command:

- :DISP:ANN:FREQ on page 448

Showing or hiding the title

To show or hide the title, use the following command:

- :DISP:WIND{1-16}:TITL on page 470

To define the title string that appears in the title display area, use the following command:

- :DISP:WIND{1-16}:TITL:DATA on page 471

Configuring date/time display

To show or hide the current date and time on the left-hand side of the instrument status bar, use the following command:

- :DISP:CLOC on page 449

To set the date and time, use the following command:

- :SYST:DATE on page 775
- :SYST:UPR on page 786

Turning On/Off the LCD backlight

To turn on/off the LCD backlight, use the following command (note that turning off the backlight makes the screen unreadable):

- :SYST:BACK on page 764

Setting display colors

Selecting display mode

You can select the one of two LCD display modes: normal display (black background) or inverted display (white background).

To select the display mode, use the following command:

- :DISP:IMAG on page 458

Setting display color for each item

To set the display colors, use the following commands:

Data trace	:DISP:COL{1-2}:TRAC{1-16}:DATA on page 453
Memory trace	:DISP:COL{1-2}:TRAC{1-16}:MEM on page 454
Graph	:DISP:COL{1-2}:GRAT{1-2} on page 451
Limit test	:DISP:COL{1-2}:LIM{1-2} on page 452
Background	:DISP:COL{1-2}:BACK on page 450

Resetting display colors to factory state

You can reset the display colors in normal display and inverted display to the preset factory state.

To reset the display colors, use the following command:

- :DISP:COL{1-2}:RES on page 452

Saving and Loading the Settings

You can save the settings for measurement conditions and screen display to a file along with other instrument settings, and these settings can later be loaded from the file.

Once you have saved the measurement condition and screen display settings to a file, you can later load them whenever necessary; therefore, you can quickly modify the settings loaded from a file to create new settings without having to issue many commands.

To save the current settings to a file, use the following command:

- :MMEM:STOR on page 500

To load the settings from a file, use the following command:

- :MMEM:LOAD on page 489

For more information on how to save and load the settings, refer to “Saving and recalling instrument status.”

Sample Program

Example 3-1 is a sample program that demonstrates how to configure measurement conditions. You can find the source file of this program, named setup.htb, on the sample program disk.

The sample program puts the instrument into the preset state, configures it as shown in Table 3-1, and saves the settings to a file named “Ex_3_1.sta”.

Table 3-1 Target settings in Example 3-1

Item			Setting
Window Layout			Channel 1 in the upper window (2/3 of the screen height) and channel 2 in the lower window (1/3 of the screen height)
Channel 1	Sweep type		Segment
	Sweep range		See Table 3-2.
	Number of measurement points		
	IF bandwidth		
	Power		
	Number of traces		4
	Graph Layout		Four graphs at upper left, upper right, lower left, and lower right.
	Trace 1	Measurement parameter	S11
		Data format	Smith chart (Lin)
		Full-scale value	2
	Trace 2	Measurement parameter	S21
		Data format	Log magnitude
		Reference division line number	9
		Reference division line value	2
		Scale per division	10 dBm
	Trace 3	Measurement parameter	S12
		Data format	Log magnitude
		Reference division line number	9
		Reference division line value	2
		Scale per division	10 dBm
	Trace 4	Measurement parameter	S22
		Data format	Smith chart (Lin)
		Full-scale value	2

Table 3-1 **Target settings in Example 3-1**

Item			Setting
Channel 2	Sweep type		Linear
	Sweep range	Center value	1.9 GHz
		Span value	500 MHz
	Number of measurement points		101
	IF bandwidth		70 kHz
	Power		0 dBm
	Number of traces		4
	Graph Layout		Two graphs at left and right
	Trace 1	Measurement parameter	S21
		Data format	Log magnitude
		Reference division line number	9
		Reference division line value	2
		Scale per division	10 dBm
	Trace 2	Measurement parameter	S22
		Data format	Smith chart (Lin)
		Full-scale value	2

Table 3-2 **Segment table for channel 1**

Segment Number	Start value	Stop value	Number of measurement points	IF bandwidth	Power
1	1.7 GHz	1.9 GHz	21	50 kHz	0 dBm
2	1.9 GHz	2 GHz	101	10 kHz	-10 dBm
3	2 GHz	2.2 GHz	21	50 kHz	0 dBm

The program is described in detail below:

Line 70	Assigns a GPIB address to the I/O pass.
Line 90	Stores the number of channel 1's sweep segments into the Segm variable.
Lines 100 to 150	These lines store the start and stop values for channel 1's segments 1 through 3 into the Star1(*) and Stop1(*) variables, respectively.
Lines 160 to 170	These lines store channel 2's center and span values into the Star2 and Stop2 variables, respectively.
Lines 180 to 210	These lines store the number of points for channel 1's segments 1 through 3 into the Nop1(*) variable and the number of measurement points for channel 2 into the Nop2 variable.
Lines 220 to 250	These lines store the IF bandwidth for channel 1's segments 1 through 3 into the If_bw1(*) variable and the IF bandwidth for channel 2 into the If_bw2 variable.
Lines 260 to 290	These lines store the power for channel 1's segments 1 through 3 into the Pow1(*) variable and the power for channel 2 into the Pow2 variable.
Lines 300 to 310	These lines store the number of channel 1's traces into the Num_of_tr1 variable and the number of channel 2's traces into the Num_of_tr2 variable.
Lines 320 to 330	These lines store channel 1's graph layout into the Allocate1$ variable and channel 2's graph layout into the Allocate2$ variable.
Lines 340 to 390	These lines store the measurement parameters for channel 1's traces 1 through 4 into the Para1$(*) variable and the measurement parameters for channel 2's traces 1 through 2 into the Para2$(*) variable.
Lines 400 to 450	These lines store the data formats for channel 1's traces 1 through 4 into the Fmt1$(*) variable and the data formats for channel 2's traces 1 through 2 into the Fmt2$(*) variable.
Lines 460 to 480	These lines store the reference division line numbers for channel 1's traces 2 through 3 into the Ref_pos1(*) variable and the reference division line numbers for channel 2's trace 1 into the Ref_pos2(*) variable.
Lines 490 to 510	These lines store the reference division line values for channel 1's traces 2 through 3 into the Ref_lev1(*) variable and the reference division line values for channel 2's trace 1 into the Ref_lev2(*) variable.
Lines 520 to 570	These lines store the data formats for channel 1's traces 1 through 4 into the Fmt1$(*) variable and the data formats for channel 2's traces 1 through 2 into the Fmt2$(*) variable.
Line 580	Stores the name of the file into the File$ variable.
Line 600	Puts the instrument into preset state.
Line 620	Places the window for channel 1 in the upper part of the LCD screen and the window for channel 2 in the lower part.
Lines 630 to 640	These lines turn on Continuous Activation mode for channels 1 and 2.

Line 680 Sets channel 1's sweep type to "segment".

Lines 690 to 730 These lines set up the segment table for channel 1.

Line 600: Sends the command that sets up the segment table along with the parameter header ("5,0,1,1,0,0" causes the IF bandwidth and power to be set on a segment-by-segment basis; Segm represents the number of segments).

Lines 700 to 730: Send the data for the start and stop values, number of points, IF bandwidth, and power (Star1, Stop1, Nop1, If_bw1, Pow1) on a segment-by-segment basis.

Lines 750 to 760 For channel 1, these lines set the number of traces to Num_of_tr1 and the graph layout to Allocate1$.

Lines 770 to 890 For channel 1, the program iterates the following loop while incrementing i from 1 to Num_of_tr1 for each trace.

Line 780: Sets the measurement parameter to Para1$(i).

Line 790: Makes trace(i) active.

Line 800: Sets the data format to Fmt1$(i).

Line 830: If the data format is Smith chart or polar, this line sets the full-scale value to Scale1(i).

Lines 850 to 870: If the data format is neither Smith chart nor polar, these lines set the reference division line number to Ref_pos1(i), the reference division line value to Ref_lev1(i), and the scale per division to Scale1(i).

Line 930 Sets channel 2's sweep type to "linear".

Lines 940 to 980 For channel 2, these lines set the center value to Cent2, the span value to Span2, the number of measurement points to Nop2, the IF bandwidth to If_bw2, and the power to Pow2.

Lines 1000 to 1010 For channel 2, these lines set the number of traces to Num_of_tr2 and the graph layout to Allocate2$.

Lines 1020 to 1140 For channel 2, the program iterates the following loop while incrementing i from 1 to Num_of_tr2 for each trace.

Line 1030: Sets the measurement parameter to Para2$(i).

Line 1040: Makes trace(i) active.

Line 1050: Sets the data format to Fmt2$(i).

Line 1080: If the data format is Smith chart or polar, this line sets the full-scale value to Scale2(i).

Lines 1100 to 1120: If the data format is neither Smith chart nor polar, these lines set the reference division line number to Ref_pos2(i), the reference division line value to Ref_lev2(i), and the scale per division to Scale2(i).

Line 1160 Saves the settings of the E5070B/E5071B under the file name File$.

Example 3-1 **Configuring measurement conditions (setup.htb)**

```
10     DIM Allocate1$[9],Allocate2$[9],File$[20]
20     DIM Para1$(1:4)[9],Para2$(1:2)[9],Fmt1$(1:4)[9],Fmt2$(1:2)[9]
30     REAL Star1(1:3),Stop1(1:3),Pow1(1:3),Cent2,Span2,Pow2
40     REAL Ref_rev1(1:4),Ref_rev2(1:2),Scale1(1:4),Scale2(1:2)
50     INTEGER Segm,Nop1(1:3),Nop2,Num_of_tr1,Num_of_tr2
60     INTEGER Ref_pos1(1:4),Ref_pos2(1:2),I
70     ASSIGN @Agte507x TO 717
80     !
90     Segm=3               ! Number of Segment Ch.1     : 3
100    Star1(1)=1.7E+9      ! Start Frequency Ch.1 Segm.1: 1.7 GHz
110    Star1(2)=1.9E+9      !                      Segm.2: 1.9 GHz
120    Star1(3)=2.E+9       !                      Segm.3: 2 GHz
130    Stop1(1)=1.9E+9      ! Stop Frequency  Ch.1 Segm.1: 1.9 GHz
140    Stop1(2)=2.E+9       !                      Segm.2: 2 GHz
150    Stop1(3)=2.2E+9      !                      Segm.3: 2.2 GHz
160    Cent2=1.9E+9         ! Center Frequency Ch.2      : 1.9 GHz
170    Span2=5.00E+8        ! Span             Ch.2      : 500 MHz
180    Nop1(1)=21           ! Number           Ch.1 Segm.1: 21
190    Nop1(2)=101          !   of Points           Segm.2: 101
200    Nop1(3)=21           !                       Segm.3: 21
210    Nop2=101             !                  Ch.2      : 101
220    If_bw1(1)=5.0E+4     ! IF Bandwidth     Ch.1 Segm.1: 50 kHz
230    If_bw1(2)=1.0E+4     !                       Segm.2: 10 kHz
240    If_bw1(3)=5.0E+4     !                       Segm.3: 50 kHz
250    If_bw2=7.0E+4        !                  Ch.2      : 70 kHz
260    Pow1(1)=0            ! Power            Ch.1 Segm.1: 0 dBm
270    Pow1(2)=-10          !                       Segm.2: -10 dBm
280    Pow1(3)=0            !                       Segm.3: 0 dBm
290    Pow2=0               !                  Ch.2      : 0 dBm
300    Num_of_tr1=4         ! Number           Ch.1      : 4
310    Num_of_tr2=2         !   of Traces      Ch.2      : 2
320    Allocate1$="D12_34"  ! Allocate Traces  Ch.1      : D12_34
330    Allocate2$="D12"     !                  Ch.2      : D12
340    Para1$(1)="S11"      ! Measurement      Ch.1 Trace1: S11
350    Para1$(2)="S21"      !   Parameter           Trace2: S21
360    Para1$(3)="S12"      !                       Trace3: S12
370    Para1$(4)="S22"      !                       Trace4: S22
380    Para2$(1)="S31"      !                  Ch.2 Trace1: S31
390    Para2$(2)="S33"      !                       Trace2: S33
400    Fmt1$(1)="SLIN"      ! Data Format     Ch.1 Trace1: Smith(Lin/Phase)
410    Fmt1$(2)="MLOG"      !                       Trace2: Log Mag
420    Fmt1$(3)="MLOG"      !                       Trace3: Log Mag
430    Fmt1$(4)="SLIN"      !                  Trace4: Smith(Lin/Phase)
440    Fmt2$(1)="MLOG"      !                  Ch.2 Trace1: Log Mag
450    Fmt2$(2)="SLIN"      !                  Trace2: Smith(Lin/Phase)
460    Ref_pos1(2)=9        ! Reference        Ch.1 Trace2: 9
470    Ref_pos1(3)=9        !   Position            Trace3: 9
480    Ref_pos2(1)=9        !                  Ch.2 Trace1: 9
490    Ref_lev1(2)=0        ! Reference Level  Ch.1 Trace2: 0 dBm
500    Ref_lev1(3)=0        !                       Trace3: 0 dBm
510    Ref_lev2(1)=0        !                  Ch.2 Trace1: 0 dBm
520    Scale1(1)=2          ! Scale            Ch.1 Trace1: 2
530    Scale1(2)=10         !                       Trace2: 10 dBm
540    Scale1(3)=10         !                       Trace3: 10 dBm
550    Scale1(4)=2          !                       Trace4: 2
560    Scale2(1)=10         !                  Ch.2 Trace1: 10 dBm
570    Scale2(2)=2          !                       Trace2: 2
580    File$="Ex_3_1.sta"   ! Save File Name             : Ex_3_1.sta
590    !
600    OUTPUT @Agte507x;":SYST:PRES"
610    !
620    OUTPUT @Agte507x;":DISP:SPL D1_1_2"
630    OUTPUT @Agte507x;":INIT1:CONT ON"
640    OUTPUT @Agte507x;":INIT2:CONT ON"
```

```
650     !
660     ! Channel 1
670     !
680     OUTPUT @Agte507x;":SENS1:SWE:TYPE SEGM"
690     OUTPUT @Agte507x;":SENS1:SEGM:DATA 5,0,1,1,0,0,";Segm;",";
700     FOR I=1 TO Segm-1
710       OUTPUT @Agte507x;Star1(I);",";Stop1(I);",";Nop1(I);",";If_bw1
(I);",";Pow1(I);",";
720     NEXT I
730     OUTPUT @Agte507x;Star1(Segm);",";Stop1(Segm);",";Nop1(Segm);","
;If_bw1(Segm);",";Pow(Segm)
740     !
750     OUTPUT @Agte507x;":CALC1:PAR:COUN ";Num_of_tr1
760     OUTPUT @Agte507x;":DISP:WIND1:SPL "&Allocate1$
770     FOR I=1 TO Num_of_tr1
780       OUTPUT @Agte507x;":CALC1:PAR"&VAL$(I)&":DEF "&Para1$(I)
790       OUTPUT @Agte507x;":CALC1:PAR"&VAL$(I)&":SEL"
800       OUTPUT @Agte507x;":CALC1:FORM "&Fmt1$(I)
810       SELECT Fmt1$(I)
820         CASE "SLIN","SLOG","SCOM","SMIT","SADM","PLIN","PLOG","POL"
830           OUTPUT @Agte507x;":DISP:WIND1:TRAC"&VAL$(I)&":Y:PDIV ";
Scale1(I)
840         CASE ELSE
850           OUTPUT @Agte507x;":DISP:WIND1:TRAC"&VAL$(I)&":Y:RPOS ";
Ref_pos1(I)
860           OUTPUT @Agte507x;":DISP:WIND1:TRAC"&VAL$(I)&":Y:RLEV ";
Ref_rev1(I)
870           OUTPUT @Agte507x;":DISP:WIND1:TRAC"&VAL$(I)&":Y:PDIV ";
Scale1(I)
880       END SELECT
890     NEXT I
900     !
910     ! Channel 2
920     !
930     OUTPUT @Agte507x;":SENS2:SWE:TYPE LIN"
940     OUTPUT @Agte507x;":SENS2:FREQ:CENT ";Cent2
950     OUTPUT @Agte507x;":SENS2:FREQ:SPAN ";Span2
960     OUTPUT @Agte507x;":SENS2:SWE:POIN ";Nop2
970     OUTPUT @Agte507x;":SENS2:BAND ";If_bw2
980     OUTPUT @Agte507x;":SOUR2:POW ";Pow2
990     !
1000    OUTPUT @Agte507x;":CALC2:PAR:COUN ";Num_of_tr2
1010    OUTPUT @Agte507x;":DISP:WIND2:SPL "&Allocate2$
1020    FOR I=1 TO Num_of_tr2
1030      OUTPUT @Agte507x;":CALC2:PAR"&VAL$(I)&":DEF "&Para2$(I)
1040      OUTPUT @Agte507x;":CALC2:PAR"&VAL$(I)&":SEL"
1050      OUTPUT @Agte507x;":CALC2:FORM "&Fmt2$(I)
1060      SELECT Fmt2$(I)
1070        CASE "SLIN","SLOG","SCOM","SMIT","SADM","PLIN","PLOG","POL"
1080          OUTPUT @Agte507x;":DISP:WIND2:TRAC"&VAL$(I)&":Y:PDIV ";
Scale2(I)
1090        CASE ELSE
1100          OUTPUT @Agte507x;":DISP:WIND2:TRAC"&VAL$(I)&":Y:RPOS ";
Ref_pos2(I)
1110          OUTPUT @Agte507x;":DISP:WIND2:TRAC"&VAL$(I)&":Y:RLEV ";
Ref_rev2(I)
1120          OUTPUT @Agte507x;":DISP:WIND2:TRAC"&VAL$(I)&":Y:PDIV ";
Scale2(I)
1130      END SELECT
1140    NEXT I
1150    !
1160    OUTPUT @Agte507x;":MMEM:STOR """&File$&""""
1170    END
```

4 Performing Calibration

This chapter explains how to obtain calibration coefficients and perform error correction as well as how to define the calibration kit required to obtain the calibration coefficients. It also shows how to perform power calibration.

Calibration

You need to execute calibration to eliminate error elements related to measurement, thus allowing you to perform accurate measurement.

Performing calibration (obtaining calibration coefficients)

Selecting a Calibration Kit

To select a calibration kit, use the following command:

- :SENS{1-16}:CORR:COLL:CKIT on page 548

Selecting a Calibration Type

The calibration coefficients are calculated based on the selected calibration type. Therefore, before you can calculate the calibration coefficients, you must select the appropriate calibration type by using one of the following commands.

Calibration type		Command
Response	OPEN	:SENS{1-16}:CORR:COLL:METH:OPEN on page 589
	SHORT	:SENS{1-16}:CORR:COLL:METH:SHOR on page 589
	THRU	:SENS{1-16}:CORR:COLL:METH:THRU on page 592
Enhanced Response		:SENS{1-16}:CORR:COLL:METH:ERES on page 588
1-Port		:SENS{1-16}:CORR:COLL:METH:SOLT1 on page 590
Full 2-Port		:SENS{1-16}:CORR:COLL:METH:SOLT2 on page 590
Full 3-Port		:SENS{1-16}:CORR:COLL:METH:SOLT3 on page 591
Full 4-Port		:SENS{1-16}:CORR:COLL:METH:SOLT4 on page 591
2-Port TRL		:SENS{1-16}:CORR:COLL:METH:TRL2 on page 593
3-Port TRL		:SENS{1-16}:CORR:COLL:METH:TRL3 on page 594
4-Port TRL		:SENS{1-16}:CORR:COLL:METH:TRL4 on page 595

NOTE

To calculate the calibration coefficients for the simplified full 3-port and simplified full 4-port calibrations, select the full 3-port and full-4 port commands, respectively. To calculate the calibration coefficient for the simplified 3-port TRL calibration and the simplified 4-port TRL calibration, select the 3-port TRL and the 4-port TRL commands, respectively.

To check the currently selected calibration type, use the following command:

- :SENS{1-16}:CORR:COLL:METH:TYPE? on page 596

Setting the trigger source for calibration

To set the trigger source for calibration, use the following command. By setting the trigger source for calibration to “System,” setting the trigger source for measurement to “External,” and turning on the point trigger function, it becomes possible to use “calibration for each measurement point using the external trigger.”

- :SENS{1-16}:CORR:TRIG:FREE on page 637

NOTE The trigger source for calibration does not function for the calibrations of E-Cal, power, receiver, and scalar mixer.

Measuring Calibration Data

To measure the calibration data, use one of the following commands:

Calibration data items	Command
OPEN	:SENS{1-16}:CORR:COLL:OPEN on page 597
SHORT	:SENS{1-16}:CORR:COLL:SHOR on page 599
LOAD	:SENS{1-16}:CORR:COLL:LOAD on page 587
THRU	:SENS{1-16}:CORR:COLL:THRU on page 602
Isolation	:SENS{1-16}:CORR:COLL:ISOL on page 586
TRL Thru	:SENS{1-16}:CORR:COLL:TRLT on page 605
TRL Reflection	:SENS{1-16}:CORR:COLL:TRLR on page 604
TRL Line/Match	:SENS{1-16}:CORR:COLL:TRLL on page 603

NOTE You cannot run more than one of the commands listed above at a time; if you issue another command before the currently running command completes successfully, the current command will be aborted. Therefore, when you write a program that issues multiple calibration commands in series, you should use the *OPC? command on page 288 or some other means to ensure that no command is executed before the preceding command completes itself.

As shown in Table 4-1, the data required to calculate the calibration coefficients differ depending on the selected calibration type.

Table 4-1 Calibration Types and Required Data

Calibration type (Selected ports are enclosed in parentheses)		Data				
		OPEN	SHORT	LOAD	THRU	Isolation
Response	OPEN (a)	a	Not required	[a]	Not required	Not required
	SHORT (a)	Not required	a	[a]	Not required	Not required
	THRU (a-b)	Not required	Not required	Not required	a-b	[a-b]
Enhanced Response (a-b)		b	b	b	a-b	[a-b]
1-Port (a)		a	a	a	Not required	Not required
Full 2-Port (a-b)		a, b	a, b	a, b	a-b, b-a	[a-b], [b-a]

Table 4-1 Calibration Types and Required Data

Calibration type (Selected ports are enclosed in parentheses)		Data				
		OPEN	SHORT	LOAD	THRU	Isolation
Full 3-Port (a-b-c)		a, b, c	a, b, c	a, b, c	a-b, b-a a-c, c-a b-c, c-b	[a-b], [b-a] [a-c], [c-a] [b-c], [c-b]
Simplified Full 3-Port						
	(1-2-3)	1, 2, 3	1, 2, 3	1, 2, 3	1-2, 2-1 1-3, 3-1 [2-3], [3-2]	[1-2], [2-1] [1-3], [3-1] [2-3], [3-2]
	(1-2-4)	1, 2, 4	1, 2, 4	1, 2, 4	1-2, 2-1 1-4, 4-1 [2-4], [4-2]	[1-2], [2-1] [1-4], [4-1] [2-4], [4-2]
	(1-3-4)	1, 3, 4	1, 3, 4	1, 3, 4	1-3, 3-1 [1-4], [4-1] 3-4, 4-3	[1-3], [3-1] [1-4], [4-1] [3-4], [4-3]
	(2-3-4)	2, 3, 4	2, 3, 4	2, 3, 4	2-3, 3-2 [2-4], [4-2] 3-4, 4-3	[2-3], [3-2] [2-4], [4-2] [3-4], [4-3]
Full 4-Port		1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1-2, 2-1 1-3, 3-1 1-4, 4-1 2-3, 3-2 2-4, 4-2 3-4, 4-3	[1-2], [2-1] [1-3], [3-1] [1-4], [4-1] [2-3], [3-2] [2-4], [4-2] [3-4], [4-3]
Simplified Full 4-Port		1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1-2, 2-1 1-3, 3-1 [1-4], [4-1] [2-3], [3-2] [2-4], [4-2] 3-4, 4-3	[1-2], [2-1] [1-3], [3-1] [1-4], [4-1] [2-3], [3-2] [2-4], [4-2] [3-4], [4-3]

In the data section in the table, the letter m (for example, 1, a) represents the measurement data at port m; m-n (for example, 1-2, a-b) represents the measurement data between response port m and stimulus port n. You can omit data enclosed in brackets.

Calculating Calibration Coefficients

To calculate the calibration coefficients, use one of the following commands:

Calibration type	Command
Response, 1/2/3/4 port	:SENS{1-16}:CORR:COLL:SAVE on page 599
Simplified full 3/4 port Simplified 3/4-port TRL	:SENS{1-16}:CORR:COLL:SIMP:SAVE on page 600

Before issuing the above commands, you must measure all required calibration data items according to your selected calibration type (see Table 4-1).Calculating the calibration coefficients clears all calibration data regardless of whether they are used for the calculation. The calibration type selection is also cleared, which results in a state where no calibration type is selected.

Simplified full 3-/4-port calibration

NOTE This function is available with firmware version 3.50 or greater. Note that you can execute this function from the front panel only for firmware version A.06.50 or greater.

The simplified full 3-/4-port calibration acquires the calibration coefficients while omitting a part of the thru measurement.

NOTE Notes on the simplified full 3-/4-port calibration

Compared to the normal full 3-/4-port calibration, the simplified full 3-/4-port calibration is more sensitive to the error that may arise when acquiring calibration data. This because the calibration coefficients are calculated without a part of the thru measurement data. Therefore, the following should be considered when measuring data for the simplified full 3-/4-port calibration.

❑ The standard used for measurement must match its definition value.

- Use a standard that provides good repeatability (stability).
- Do not omit the length of the thru when defining the standard.
- When using a user-created standard, verify the definition value.
- For the N connector, remember that it has two different types: male and female.

❑ Assure high reliability and repeatability for measurement.

- Reduce the difference in external environment (such as temperature difference) between the time when measuring calibration data and when measuring actual data.
- Set the power level of the stimulus signal sufficiently small so that compression does not occur.
- Narrow the IF bandwidth.
- Increase the averaging factor.
- Use a cable that has robust amplitude/phase characteristics against bending.
- Use high-precision connectors.

Simplified 3/4-port TRL calibration

NOTE This function is available with firmware version A.06.50 or greater.

The simplified 3/4-port TRL calibration calculates the calibration coefficient by skipping part of the thru/line measurement (or line/match measurement) that is necessary for normal 3/4-port TRL calibration.

NOTE You need to give consideration to the same conditions for the simplified 3/4-port TRL calibration as those for the simplified full 3/4-port calibration listed above.

Turning ON/OFF Error Correction

To turn ON/OFF error correction, use the following command:

- :SENS{1-16}:CORR:STAT on page 636

Also, once you have calculated the calibration coefficient using the **:SENS{1-16}:CORR:COLL:SAVE** or **:SENS{1-16}:CORR:COLL:SIMP:SAVE** command, error correction is automatically turned on.

Using ECal

An ECal (Electronic Calibration) module allows you to perform 1-/2-/3-/4-port calibration and response (THRU) calibration without having to replace the standard device.

ECal works by using the calibration kit data contained in the ECal module instead of the calibration kit data selected for the E5070B/E5071B. This means that you do not have to define or select a calibration kit when using ECal.

NOTE When two or more ECal modules are connected through the USB port, the system uses the calibration kit data of the first ECal module.

To perform ECal, use one of the following commands:

Calibration type	Command
1-Port Calibration	:SENS{1-16}:CORR:COLL:ECAL:SOLT1 on page 582
Full 2-Port Calibration	:SENS{1-16}:CORR:COLL:ECAL:SOLT2 on page 582
Full 3-Port Calibration	:SENS{1-16}:CORR:COLL:ECAL:SOLT3 on page 583
Full 4-Port Calibration	:SENS{1-16}:CORR:COLL:ECAL:SOLT4 on page 583
Enhanced Response Calibration	:SENS{1-16}:CORR:COLL:ECAL:ERES on page 580
Response Calibration (THRU)	:SENS{1-16}:CORR:COLL:ECAL:THRU on page 584

Simply issuing one of the above commands completes all of the tasks necessary for error correction, including measuring the calibration data, calculating the calibration coefficients, and running the error correction feature.

NOTE Once you have initiated ECal, you cannot cancel the operation.

No command entered following the initiation of ECal will be processed until ECal completes successfully. Accordingly, if you issue a command that queries some data, the system will not respond to the query until ECal is complete.

You can control whether to perform isolation measurement during ECal. To turn ON/OFF isolation measurement, use the following command:

- :SENS{1-16}:CORR:COLL:ECAL:ISOL on page 581

NOTE If the ECal module does not support isolation measurement, the system will not perform it.

To select the ECal characteristic for a user-characterized ECal, use the following command:

- :SENS{1-16}:CORR:COLL:ECAL:UCH on page 585

ECal Auto-detect Function

The ECal module can automatically detect which port of the ECal module is connected to the E5070B/E5071B test port. Turn off the auto-detect function to specify a port manually.

To turn OFF the auto-detect function, use the following command.

- :SENS:CORR:COLL:ECAL:ORI on page 524

To turn OFF the auto-detect function and set a port manually, use the following command.

- :SENS:CORR:COLL:ECAL:PATH on page 525

Checking the Applied Calibration Type

When you turn on error correction, you can check the calibration type actually applied to each trace. To check the calibration type, use the following command:

- :SENS{1-16}:CORR:TYPE{1-16}? on page 638

NOTE The above command reads out the same parameter (SOLT3) for both the full 3-port and simplified full 3-port calibrations, and thus they cannot be discriminated. For the same reason, the following calibrations cannot be discriminated: full 4-port and simplified full 4-port, 3-port TRL and simplified 3-port TRL, and 4-port TRL and simplified 4-port TRL.

Defining calibration kits

Selecting a Calibration Kit

To select a calibration kit, use the following command:

- :SENS{1-16}:CORR:COLL:CKIT on page 548

Setting the Calibration Kit Name

To set the name of a calibration kit, use the following command:

- :SENS{1-16}:CORR:COLL:CKIT:LAB on page 549

Standard definitions

Selecting a Standard Type

To select a standard type, use the following command:

- :SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE on page 574

Setting the Standard Name To set the standard name, use the following command:

- :SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:LAB on page 572

Setting the Standard Value To set the standard value, use one of the following commands:

Item	Command
C0	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C0 on page 560
C1	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C1 on page 561
C2	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C2 on page 562
C3	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C3 on page 563
L0	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L0 on page 568
L1	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L1 on page 569
L2	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L2 on page 570
L3	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L3 on page 571
Offset Delay	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:DEL on page 565
Offset Loss	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:LOSS on page 573
Offset Z0	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:Z0 on page 575
Arbitrary Impedance	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:ARB on page 559
Start Frequency	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMIN on page 567
Stop Frequency	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMAX on page 566
Media Type	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:CHAR on page 564

As shown in Table 4-2, you need to set different items depending on the standard type.

Table 4-2 Settings Specific to Each Standard Type

Standard Types	C0 to C3	L0 to L3	Offset Delay	Offset Loss	Offset Z0	Arbitrary Impedance	Min. Frequency	Max. Frequency	Connector Type
OPEN	√		√	√	√		√	√	√
SHORT		√	√	√	√		√	√	√
LOAD			√	√	√		√	√	√
THRU			√	√	√		√	√	√
Arbitrary Impedance			√	√	√	√	√	√	√

You need to set the items identified by √ marks in the table above.

Saving/Recalling the Definition File

To save the definition of the selected calibration kit to a file, use the following command.

- :MMEM:STOR:CKIT{1-20} on page 504

To recall the definition of the calibration kit from a file and set, use the following command.

- :MMEM:LOAD:CKIT{1-20} on page 493

Defining a Subclass of the Standard

To set the standard type that varies with the frequency range, use the following command to specify the subclass.

- :SENS{1-16}:CORR:COLL:SUBC on page 601

To select the subclass, use the following command.

- :SENS{1-16}:CORR:COLL:CKIT:ORD on page 550

To set the start frequency of a specified subclass, use the following command.

- :SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMIN on page 567

To set the stop frequency of a specified subclass, use the following command.

- :SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMAX on page 566

Defining a Standard Class Assignment

To select the standard to be applied to the OPEN measurement for each port, use the following command:

- :SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN on page 552

To select the standard to be applied to the SHORT measurement for each port, use the following command:

- :SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR on page 553

To select the standard to be applied to the LOAD measurement for each port, use the following command:

- :SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD on page 551

To select the standard to be applied to the THRU measurement between each pair of ports, use the following command:

- :SENS{1-16}:CORR:COLL:CKIT:ORD:THRU on page 554

To select the standard to be applied to the THRU measurement for the TRL calibration between each pair of ports, use the following command.

- :SENS{1-16}:CORR:COLL:CKIT:ORD:TRLT on page 557

To select the standard to be applied to the Reflection measurement for the TRL calibration between each pair of ports, use the following command.

- :SENS{1-16}:CORR:COLL:CKIT:ORD:TRLR on page 556

To select the standard to be applied to the Line/Match measurement for the TRL calibration between each pair of ports, use the following command.

- :SENS{1-16}:CORR:COLL:CKIT:ORD:TRLL on page 555

Setting the Standard Media Type

To select the media type of the standard to be used, use the following command.

- :SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:CHAR on page 564

Saving and loading calibration coefficients

You can save calibration coefficients to a file along with other instrument settings and then later load them from the file.

By default, the system does not save calibration coefficients when it saves instrument settings. Therefore, to save calibration coefficients, you must explicitly configure the system to save them by issuing the following command:

- on page 519

To save calibration coefficients to a file, use the following command:

- :MMEM:STOR on page 500

To load calibration coefficients from a file, use the following command:

- :MMEM:LOAD on page 489

For more information on how to save and load calibration coefficients, refer to “Saving and recalling instrument status.”

Reading/Writing Calibration Coefficient Only

The calibration coefficient alone can be read from and written to the E5070B/E5071B by using the following command:

- :SENS{1-16}:CORR:COEF on page 537

To write a positive calibration coefficient, use one of the following commands to declare the calibration type:

- :SENS{1-16}:CORR:COEF:METH:ERES on page 539
- :SENS{1-16}:CORR:COEF:METH:OPEN on page 540
- :SENS{1-16}:CORR:COEF:METH:SHOR on page 541
- :SENS{1-16}:CORR:COEF:METH:SOLT1 on page 542
- :SENS{1-16}:CORR:COEF:METH:SOLT2 on page 543
- :SENS{1-16}:CORR:COEF:METH:SOLT3 on page 544
- :SENS{1-16}:CORR:COEF:METH:SOLT4 on page 545
- :SENS{1-16}:CORR:COEF:METH:THRU on page 546

To validate the written calibration coefficient, use the following command:

- :SENS{1-16}:CORR:COEF:SAVE on page 547

About Calibration Types and Coefficients

The following table shows the required calibration coefficients for each calibration type.

Table 4-3 Calibration Type and Valid Calibration Coefficient

Calibration Type	Calibration Coefficient					
	ES	ER	ED	EL	ET	EX
Response calibration (OPEN)		*	*			
Response calibration (SHORT)		*	*			
Response calibration (THRU)					*	*
Enhanced response calibration	*	*	*		*	*
1-port calibration	*	*	*			
Full 2-port calibration	*	*	*	*	*	*
Full 3-port calibration	*	*	*	*	*	*
Full 4-port calibration	*	*	*	*	*	*
2-Port TRL calibration	*	*	*	*	*	
3-Port TRL calibration	*	*	*	*	*	
4-Port TRL calibration	*	*	*	*	*	

NOTE If either an invalid calibration coefficient is specified for the writing command or a nonexistent calibration coefficient is specified for its reading command, the following error will occur:

23, Specified error term does not exist

Procedures for Writing Calibration Coefficient

You must follow the steps below to write the calibration coefficient.

1. Declare the calibration type to write.

   Execute :SENS{1-16}:CORR:COEF:METH:xxxx command

2. Write any calibration coefficient.

   Execute **:SENS{1-16}:CORR:COEF**command as needed for the written calibration coefficients

3. Validate the calibration coefficients.

   Execute **:SENS{1-16}:CORR:COEF:SAVE** command

NOTE Do not execute any other command while writing the calibration coefficients.This may cause the system to function incorrectly.

If the fixture simulator is turned on, the calibration coefficient writing will not function correctly. Make sure to turn off the fixture simulator before execution.

Clearing calibration data and calibration coefficients

Clearing Calibration Data

You can use the following command to clear the measurement values of calibration data executed with :SENS{1-16}:CORR:OFFS:COLL:OPEN on page 627 command, etc. when the frequency offset function has been enabled.

- :SENS{1-16}:CORR:OFFS:COLL:CLE on page 621

By implementing the measurement of calibration data, the temporarily changed settings are recovered to the original state, including trace number and measurement parameters.

Clearing Calibration Coefficients

You can use the following command to clear the calibration coefficients used when the frequency offset function is enabled.

- :SENS{1-16}:CORR:OFFS:CLE on page 620

This command does not clear calibration coefficients related to normal calibration.

Power Calibration

The E5070B/E5071B lets you perform power calibration by using a power meter to output a more accurate power level.

Preparation for power calibration

Connecting Power Meter and Power Sensor

The E5070B/E5071B performs power calibration by controlling the power meter via GPIB. Therefore, you need to connect the E5070B/E5071B and the power meter by using the USB/GPIB interface. For details on this as well as information on available power meters and power sensors, refer to the *User's Guide*.

Setting GPIB Address of Power Meter

Use the following command to set the GPIB address of the power meter to the E5070B/E5071B.

- :SYST:COMM:GPIB:PMET:ADDR on page 767

Setting Power Sensor Calibration Factor Table

Before performing power calibration, set the reference calibration factor (the calibration factor at 50 MHz) and the calibration factor for each frequency depending on the power sensor you use.

NOTE Depending on the combination of power meter and power sensor that you use, the power sensor calibration factor table may be set automatically by the power meter. In this case, do not set the calibration factor table with the E5070B/E5071B. For details, refer to the *User's Guide*.

To set the reference calibration factor of the power sensor, use the following commands:

Channel A	:SOUR:POW:PORT:CORR:COLL:ASEN:RCF on page 685
Channel B	:SOUR:POW:PORT:CORR:COLL:BSEN:RCF on page 686

To set the calibration factor table of the power sensor for each frequency, use the following commands:

Channel A	:SOUR:POW:PORT:CORR:COLL:TABL:ASEN:DATA on page 687
Channel B	:SOUR:POW:PORT:CORR:COLL:TABL:BSEN:DATA on page 688

Alternatively, you can configure the power sensor calibration factor table based on the data contained in a CSV file by issuing the following commands:

Channel A	:MMEM:LOAD:ASCF on page 490
Channel B	:MMEM:LOAD:BSCF on page 491

Also, you can save the contents of the current power sensor calibration factor table to a file by issuing the following commands:

Channel A	:MMEM:STOR:ASCF on page 501
Channel B	:MMEM:STOR:BSCF on page 502

For more information on saving/recalling the power sensor calibration factor table, refer to “Saving/recalling Power Sensor Calibration Factor Table” on page 197.

Loss compensation

You can perform loss compensation by setting in advance the power loss due to the difference in connections (cables, adapters, etc.) between the when the power calibration data are measured and when the actual DUTs are measured.

Setting Loss Compensation Table

To set the loss compensation table for each frequency, use the following command:

- :SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS:DATA on page 700

Alternatively, you can configure the loss compensation table based on the data contained in a CSV file by issuing the following command:

- :MMEM:LOAD:PLOS{1-4} on page 495

Also, you can save the contents of the current loss compensation table to a file by issuing the following command:

- :MMEM:STOR:PLOS{1-4} on page 508

Turning ON/OFF Loss Compensation

To turn on or off the loss compensation, use the following command:

- :SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS on page 699

Measuring power calibration data

NOTE Before measuring power calibration data, you need to execute zero adjustment and calibration of the power sensor. For information on how to perform these procedures, refer to the operation manual of the power meter you are using.

When using the power sensor calibration factor table of the E5070B/E5071B, set the reference calibration factor of the power meter to 100% when calibrating the power sensor.

To set the number of power calibration data measurements at one measurement point (averaging factor), use the following command:

- :SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:AVER on page 697

To set a tolerance for power calibration, use the following command:

- :SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:NTOL on page 698

NOTE When a tolerance for power calibration is set, if the measured value does not fall within the tolerance, even after measurement is performed during power calibration the number of times specified by the averaging factor, an error message is displayed and the power calibration is aborted. In this case, the power correction is not turned on.

To measure the power calibration data, use the following command. When the measurement is complete, the power calibration is automatically turned on.

- :SOUR{1-16}:POW:PORT{1-4}:CORR:COLL on page 696

NOTE If you issue another command during the measurement of the power calibration data by the above command, the measurement may be aborted. Therefore, when you write a program that issues multiple calibration commands in series, you should use the *OPC? command on page 288 or some other means to ensure that no command is executed before the preceding command completes itself.

Turning ON/OFF power-level error correction

To turn on or off the power-level error correction, use the following command:

- :SOUR{1-16}:POW:PORT{1-4}:CORR on page 696

NOTE When the power calibration data measurement initiated with the **:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL** command is complete, the power calibration is automatically turned on.

Reading/writing power calibration data array

The power calibration data array contains data used to perform error correction for the power level at each measurement point (values obtained by subtracting the value actually measured with the power meter from the set power level value when measuring power calibration data at each measurement point).

The number of power calibration data arrays that are assigned to individual ports of individual channels can be up to 64 (16×4). To read/write one of the power calibration data arrays, use the following command:

- :SOUR{1-16}:POW:PORT{1-4}:CORR:DATA on page 701

Receiver Calibration

The E5070B/E5071B has a receiver calibration capability to calibrate the gain for each receiver in an absolute measurement.

Measurement of receiver calibration data and calculation of calibration coefficient

NOTE Before starting a measurement of receiver calibration data, you must connect a THRU between the source port at which power calibration was applied and the receiver port on which you want to implement receiver calibration.

Use the following command for the measurement of receiver calibration data and calculation of calibration coefficient. The value following REC signifies a receiver port number, and the value given as an argument is a source port number. Specifying the same port to both the receiver port and source port will cause an error.

- :SENS{1-16}:CORR:REC{1-4}:COLL:ACQ on page 634

Once the measurement is completed, calculation of the calibration coefficient takes place automatically, turning on receiver error correction automatically.

NOTE The power calibration information on both the receiver port and source port is used to calculate calibration coefficients. The accuracy of receiver calibration will increase if power calibration is implemented for both the receiver port and the source port before starting receiver calibration. For information on power calibration, refer to “Power Calibration” on page 87.

NOTE Verify the frequency of each port before starting a frequency offset sweep. Since this command does not change the frequency setting, you cannot expect a correct measurement result unless the frequency is the same for both the receiver port and the source port.

When using power calibration in combination with receiver calibration, you must implement it so that it sufficiently covers the frequencies of both ports or implement it twice, before and after the receiver calibration.

Turning ON/OFF receiver error correction

To turn on or off the receiver error correction, use the following command:

- :SENS{1-16}:CORR:REC{1-4} on page 633

NOTE Once the measurement of receiver calibration data is completed with the **:SENS{1-16}:CORR:REC{1-4}:COLL:ACQ** command, receiver error correction is automatically turned on.

Scalar-Mixer Calibration

The E5070B/E5071B's frequency offset function allows you to measure any device that has different input and output frequencies. To correct such measurements, you must determine the transmission frequency characteristics at different frequencies.

Scalar-mixer calibration is a method to calculate the transmission frequency characteristics at different frequencies by using a power meter.

Measurement of scalar-mixer calibration data

Setting Frequency Offset Function

You can use the following command to enable the frequency offset function before starting a measurement of scalar-mixer calibration data.

- :SENS{1-16}:OFFS on page 654

NOTE To use scalar-mixer calibration, the frequency offset function must be enabled.

Selecting Calibration Port and Type

You can use the following commands to set the port on which a measurement of scalar-mixer calibration data is implemented and the type of calibration.

- :SENS{1-16}:CORR:OFFS:COLL:METH:SMIX2 on page 625
- :SENS{1-16}:CORR:OFFS:COLL:METH:SOLT1 on page 626

"SMIX2" will set a scalar-mixer calibration for 2-port forward, reverse and both directions. "SOLT1" will set 1-port calibration.

NOTE The two ports specified by "SMIX2" must be different from each other.

The setting of forward, reverse and both directions is not dependent on the order of the two specified ports but determined by specifying an appropriate command for calibration data measurement, such as :SENS{1-16}:CORR:OFFS:COLL:OPEN on page 627.

Measuring the Calibration Data

You can use the following command to measure the scalar-mixer calibration data.

- :SENS{1-16}:CORR:OFFS:COLL:OPEN on page 627
- :SENS{1-16}:CORR:OFFS:COLL:SHOR on page 630
- :SENS{1-16}:CORR:OFFS:COLL:LOAD on page 624
- :SENS{1-16}:CORR:OFFS:COLL:THRU on page 631

Measuring Power

You can use the following command to measure power.

- :SENS{1-16}:CORR:OFFS:COLL:PMET on page 628

NOTE Power measurement is required for scalar-mixer calibration, but it is not required for 1-port calibration. The setting for power measurement is the same as for the normal power calibration. For information on power calibration, refer to "Power Calibration" on page 87.

Calculation of scalar-mixer calibration coefficient

If the needed measurement is completed for the calibration port and type you have selected, use the following command to start calculation of calibration coefficients.

- :SENS{1-16}:CORR:OFFS:COLL:SAVE on page 629

NOTE If the necessary measurement is not completed, an error will occur. Once the calculation of calibration coefficients is completed, the measurement values are cleared despite whether they were used and error correction is turned on automatically.

Turning ON/OFF scalar-mixer error correction

To turn on or off scalar-mixer error correction, use the following command. This command is commonly used for the normal calibration; scalar-mixer calibration data are enabled while the frequency offset is turned on, and the normal calibration data are enabled while it is turned off.

- :SENS{1-16}:CORR:STAT on page 636

NOTE Once the scalar-mixer calibration coefficient has been calculated, scalar-mixer correction is automatically turned on.

Implementing scalar-mixer calibration with ECal

An ECal (Electronic Calibration) module allows you to perform scalar-mixer calibration and 1-port calibration without needing to replace the standard device.

To perform ECal, use one of the following commands:

Calibration type	Command
1-Port Calibration	:SENS{1-16}:CORR:OFFS:COLL:ECAL:SOLT1 on page 623
Scalar-Mixer Calibration	:SENS{1-16}:CORR:OFFS:COLL:ECAL:SMIX2 on page 622

Simply issuing one of the above commands completes some of the tasks necessary for error correction, including measuring the calibration data, calculating the calibration coefficients, and running the error correction feature. To implement scalar-mixer calibration, you must measure the power in advance. For 1-port calibration, you do not need to do this.

NOTE

Once ECal has started, you cannot interrupt the operation.

Any command received after ECal has started will not be executed until ECal is completed. In other words, even if you issue a command with a Query, you cannot get the Query response until ECal is finished.

Partial overwrite

The E5070B/E5071B has the following calibration coefficients for full N-port calibration: Er, Es, Ed (reflection), Et (transmission), and Ex (isolation).The partial overwrite function is used to measure some of these calibration coefficients after completion of the initial calibration and then to overwrite them.

The conditions under which the calibration coefficients can be calculated by the partial overwrite are as follows:

- Calibration is completed once and valid (status other than C? or C!)
- One or more measurements for re-calculation are performed.

NOTE The isolation calibration coefficient, Ex, cannot be returned to the initial value, 0, once it is calculated.

If calculation of the calibration coefficients is attempted without the measurements required to execute the partial overwrite, an error message (20: Additional Standard Needed) is displayed.

Executing calculation of calibration coefficients using partial overwrite

To calculate the calibration coefficients using partial overwrite, use the following command:

- :SENS{1-16}:CORR:COLL:PART:SAVE on page 598

NOTE Before you can calculate the calibration coefficients with the partial overwrite, you must select the appropriate calibration type in the same way used for normal calibration. If calculation of the calibration coefficients is attempted without selecting the calibration type, an error message (28: Invalid Calibration Method) is displayed.

Sample Program

Calibration

Example 4-1 shows a sample program that demonstrates how to calibrate the instrument. You can find the source file of this program, named cal.htb, on the sample program disk.

The sample program performs calibration with the specified calibration type and saves the results to a file named “Ex_4_1.sta.”

The program is described in detail below:

Line 40	Assigns a GPIB address to the I/O pass.
Line 50	Stores the name of the file (Ex_4_1.sta) into the File$ variable.
Line 60	Stores the channel number (1) into the Ch$ variable.
Line 80	Calls a subprogram named Select_cal_kit to select the calibration kit.
Line 110	Allows the user to return to the entry start line and re-enter the data if an error (such as an invalid entry) occurs while selecting the calibration type number.
Lines 130 to 230	These lines display the list of supported calibration types and prompt the user to choose one of the items by typing in the appropriate number.
Line 240	Converts the entered value into an integer and stores it into the Cal_type variable.
Line 250	Returns to the entry start line if an invalid value is contained in Cal_type.
Lines 280 to 500	These lines call a subprogram named Select_port to select the appropriate port based on the value of Cal_type and then perform calibration.

Lines 300 to 310: If Cal_type = 1, the program calls a subprogram named Cal_resp to perform response calibration (OPEN) after selecting the port.

Lines 330 to 340: If Cal_type = 2, the program calls the subprogram Cal_resp to perform response calibration (SHORT) after selecting the port.

Lines 360 to 370: If Cal_type = 3, the program calls a subprogram named Cal_resp_thru to perform response calibration (THRU) after selecting the port.

Lines 390 to 400: If Cal_type = 4, the program calls a subprogram named Cal_solt to perform 1-port calibration after selecting the port.

Lines 420 to 430: If Cal_type = 5, the program calls the subprogram Cal_solt to perform full 2-port calibration after selecting the port.

Lines 450 to 460: If Cal_type = 6, the program calls the

subprogram Cal_solt to perform full 3-port calibration after selecting the port.

Lines 480 to 490: If Cal_type = 7, the program calls the subprogram Cal_solt to perform full 4-port calibration after selecting the port.

Lines 520 to 530 These lines configure the system to save calibration coefficients along with instrument settings and then save the instrument settings under the file name contained in the File$ variable.

The Select_cal_kit subprogram in lines 580 to 820, which selects the calibration kit, is described below.

Lines 630 to 670 These lines retrieve the names of all the calibration kits and store them into the Cal_kit_lbl$(*) variable.

Line 680 Allows the user to return to the entry start line and re-enter the data if an error (such as an invalid entry) occurs while entering the number that identifies the calibration kit.

Lines 700 to 760 These lines display the list of supported calibration kits and prompt the user to choose one of the items by typing in the appropriate number.

Line 770 Converts the entered value into an integer and stores it into the Cal_kit variable.

Line 780 Returns to the entry start line if an invalid value is contained in Cal_kit.

Line 810 Selects the calibration kit that matches the number contained in the Cal_kit variable.

The Select_port subprogram in lines 860 to 1090, which allows the user to select a port, is described below.

Lines 910 to 940 If the value of Num_of_ports is 4 (4-port), the subprogram determines the port numbers (1, 2, 3, 4) without prompting the user to enter port numbers and then stores the port numbers into the Port(*) variable.

Lines 960 to 1090 If the value of Num_of_ports is not 4, the subprogram prompts the user to select the number of ports indicated by Num_of_ports.

Line 970: Allows the user to return to the entry start line and re-enter the data if an error (such as an invalid entry) occurs while entering the port number.

Lines 990 to 1010: These lines print the index of the current port and prompt the user to enter the port number.

Lines 1020: Converts the entered value into an integer and stores it into the Port(*) variable.

Lines 1040 to 1060: These lines return to the entry start line if the port number is beyond the range of 1 to 4 or conflicts with an already selected number.

The Cal_resp subprogram in lines 1150 to 1260, which performs response calibration (OPEN/SHORT), is described below.

Line 1180 Displays the calibration type.

Line 1190 Configures the instrument to perform response calibration (Type$) on the port identified by the Port variable.

Lines 1200 to 1210 These lines prompt the user to connect a Type$ to port Port, and wait for a press of the [Enter] key after the connection.

Lines 1220 to 1240 These lines execute the calibration data measurement command identified by Type$ on port Port and wait until the measurement completes successfully.

Line 1250 Calculates the calibration coefficients and turns on error correction.

Line 1260 Displays a closing message.

The Cal_resp_thru subprogram in lines 1310 to 1430, which performs response calibration (THRU), is described below.

Line 1340 Displays the calibration type.

Line 1350 Configures the instrument to perform response calibration (THRU) on response port Port 1 and stimulus port Port 2.

Lines 1360 to 1370 These lines prompt the user to connect a THRU standard between the ports identified by Port 1 and Port 2 and wait for a press of the [Enter] key after the connection.

Lines 1380 to 1400 These lines execute the THRU calibration data measurement command on response port Port1 and stimulus port 2 and wait until the measurement completes successfully.

Line 1410 Calculates the calibration coefficients and turns on error correction.

Line 1420 Displays a closing message.

The Cal_solt subprogram in lines 1470 to 2000, which performs full n-port calibration, is described below.

Line 1510 Displays the calibration type.

Lines 1550 to 1590 These lines configure the instrument to perform full Num_of_ports port calibration on the ports identified by Port(1) through Port(Num_of_ports).

Lines 1630 to 1790 These lines make up a loop that iterates while incrementing i from 1 to Num_of_ports.

Lines 1640 to 1650: Prompt the user to connect an OPEN standard to port Port(i) and wait for a press of the [Enter] key after the connection.

Lines 1660 to 1680: Execute the OPEN calibration data measurement command on port Port(i) and wait until the measurement completes successfully.

Lines 1690 to 1700: Prompt the user to connect a SHORT standard to port Port(i) and wait for a press of the [Enter] key after the connection.

Lines 1710 to 1730: Execute the SHORT calibration data measurement command on port Port(i) and wait until the measurement completes successfully.

Lines 1740 to 1750: Prompt the user to connect a LOAD standard to port Port(i) and wait for a press of the [Enter] key after the connection.

Lines 1760 to 1780: Execute the LOAD calibration data measurement command on port Port(i) and wait until the measurement completes successfully.

Lines 1830 to 1940 These lines make up a loop that iterates while incrementing i from 1 to Num_of_ports-1 and j from i+1 to Num_of_ports.

Lines 1850 to 1860: Prompt the user to connect a THRU standard between port Port(i) and port Port(j) and wait for a press of the [Enter] key after the connection.

Lines 1660 to 1680: Execute the THRU calibration data measurement command on response port Port(i) and stimulus port Port(j) and wait until the measurement completes successfully.

Lines 1690 to 1700: Execute the THRU calibration data measurement command on response port Port(j) and stimulus port Port(i) and wait until the measurement completes successfully.

Line 1980 Calculates the calibration coefficients and turns on error correction.

Line 1990 Displays a closing message.

Example 4-1 **Calibration (cal.htb)**

```
10      DIM File$[20],Ch$[9],Inp_char$[9]
20      INTEGER Cal_kit,Cal_type,Port(1:4)
30      !
40      ASSIGN @Agte507x TO 717
50      File$="Ex_4_1.sta"
60      Ch$="1"
70      !
80      Select_cal_kit(@Agte507x,Ch$)
90      !
100     CLEAR SCREEN
110     ON ERROR GOTO Type_select
120 Type_select: !
130     PRINT "## Calibration Type Selection ##"
140     PRINT " 1: Response (Open)"
150     PRINT " 2: Response (Short)"
160     PRINT " 3: Response (Thru)"
170     PRINT " 4: Full 1 Port"
180     PRINT " 5: Full 2 Port"
190     PRINT " 6: Full 3 Port"
200     PRINT " 7: Full 4 Port"
210     PRINT ""
220     PRINT "Input 1 to 7"
230     INPUT "Input number? (1 to 7)",Inp_char$
240     Cal_type=IVAL(Inp_char$,10)
250     IF Cal_type<1 OR Cal_type>7 THEN Type_select
260     OFF ERROR
270     !
280     SELECT Cal_type
290       CASE 1
300         Select_port(1,Port(*))
310         Cal_resp(@Agte507x,Ch$,"OPEN",Port(1))
320       CASE 2
330         Select_port(1,Port(*))
340         Cal_resp(@Agte507x,Ch$,"SHOR",Port(1))
350       CASE 3
360         Select_port(2,Port(*))
370         Cal_resp_thru(@Agte507x,Ch$,Port(1),Port(2))
380       CASE 4
390         Select_port(1,Port(*))
400         Cal_solt(@Agte507x,Ch$,1,Port(*))
410       CASE 5
420         Select_port(2,Port(*))
430         Cal_solt(@Agte507x,Ch$,2,Port(*))
440       CASE 6
450         Select_port(3,Port(*))
460         Cal_solt(@Agte507x,Ch$,3,Port(*))
470       CASE 7
480         Select_port(4,Port(*))
490         Cal_solt(@Agte507x,Ch$,4,Port(*))
500     END SELECT
510     !
520     OUTPUT @Agte507x;":MMEM:STOR:STYP CST"
530     OUTPUT @Agte507x;":MMEM:STOR """&File$&""""
540     END
550     !============================================
560     ! Calibration Kit Selection Function
570     !============================================
580   SUB Select_cal_kit(@Agte507x,Ch$)
590     DIM Cal_kit_lbl$(1:10)[20],Inp_char$[9]
600     INTEGER Cal_kit,I
610     CLEAR SCREEN
```

```
620    !
630    FOR I=1 TO 10
640      OUTPUT @Agte507x;":SENS1:CORR:COLL:CKIT ";I
650      OUTPUT @Agte507x;":SENS1:CORR:COLL:CKIT:LAB?"
660      ENTER @Agte507x;Cal_kit_lbl$(I)
670    NEXT I
680    ON ERROR GOTO Kit_select
690 Kit_select: !
700    PRINT "## Calibration Kit Selection ##"
710    FOR I=1 TO 10
720      PRINT USING "X,2D,A,X,20A";I,":",Cal_kit_lbl$(I)
730    NEXT I
740    PRINT ""
750    PRINT "Input 1 to 10"
760    INPUT "Input number? (1 to 10)",Inp_char$
770    Cal_kit=IVAL(Inp_char$,10)
780    IF Cal_kit<1 OR Cal_kit>10 THEN Kit_select
790    OFF ERROR
800    !
810    OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:CKIT ";Cal_kit
820  SUBEND
830    !============================================
840    ! Port Selection Function
850    !============================================
860  SUB Select_port(INTEGER Num_of_ports,INTEGER Port(*))
870    DIM Inp_char$[9]
880    !
890    CLEAR SCREEN
900    IF Num_of_ports=4 THEN
910      Port(1)=1
920      Port(2)=2
930      Port(3)=3
940      Port(4)=4
950    ELSE
960      PRINT "## Test Ports Selection ##"
970      ON ERROR GOTO Port_select
980      FOR I=1 TO Num_of_ports
990        PRINT "Port("&VAL$(I)&"):";
1000 Port_select:!
1010       INPUT "Number?",Inp_char$
1020       Port(I)=IVAL(Inp_char$,10)
1030       IF Port(I)<1 OR Port(I)>4 THEN Port_select
1040       FOR J=1 TO I-1
1050         IF Port(I)=Port(J) THEN Port_select
1060       NEXT J
1070       PRINT Port(I)
1080     NEXT I
1090     OFF ERROR
1100   END IF
1110 SUBEND
1120   !============================================
1130   ! Response (Open/Short) Calibration Function
1140   !============================================
1150 SUB Cal_resp(@Agte507x,Ch$,Type$,INTEGER Port)
1160   DIM Buff$[9]
1170   !
1180   PRINT "## Response ("&Type$&") Calibration ##"
1190   OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:METH:"&Type$&" ";Port
1200   PRINT "Set "&Type$&" to Port "&VAL$(Port)&". Then push [Enter]
key."
1210   INPUT "",Buff$
1220   OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:"&Type$&" ";Port
1230   OUTPUT @Agte507x;"*OPC?"
1240   ENTER @Agte507x;Buff$
```

```
1250   OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:SAVE"
1260   PRINT "Done"
1270 SUBEND
1280   !=========================================
1290   ! Response (Thru) Calibration Function
1300   !=========================================
1310 SUB Cal_resp_thru(@Agte507x,Ch$,INTEGER Port1,Port2)
1320   DIM Buff$[9]
1330   !
1340   PRINT "## Response (Thru) Calibration ##"
1350   OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:METH:THRU ";Port1;",";
Port2
1360   PRINT "Set THRU between Port "&VAL$(Port1)&" and Port "&VAL$(Port2
)&". Then push [Enter] key."
1370   INPUT "",Buff$
1380   OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:THRU ";Port1;",";Port2
1390   OUTPUT @Agte507x;"*OPC?"
1400   ENTER @Agte507x;Buff$
1410   OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:SAVE"
1420   PRINT "Done"
1430 SUBEND
1440   !=========================================
1450   ! Full n Port Calibration Function
1460   !=========================================
1470 SUB Cal_solt(@Agte507x,Ch$,INTEGER Num_of_ports,INTEGER Port(*))
1480   DIM Buff$[9]
1490   INTEGER I,J
1500   !
1510   PRINT "## Full "&VAL$(Num_of_ports)&" Port Calibration ##"
1520   !
1530   ! Calibration Type Selection
1540   !
1550   OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:METH:SOLT"&VAL$(Num_of_
ports)&" ";
1560   FOR I=1 TO Num_of_ports-1
1570     OUTPUT @Agte507x;Port(I);",";
1580   NEXT I
1590   OUTPUT @Agte507x;Port(Num_of_ports)
1600   !
1610   ! Reflection Measurement
1620   !
1630   FOR I=1 TO Num_of_ports
1640     PRINT "Set OPEN  to Port "&VAL$(Port(I))&". Then push [Enter]
key."
1650     INPUT "",Buff$
1660     OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:OPEN ";Port(I)
1670     OUTPUT @Agte507x;"*OPC?"
1680     ENTER @Agte507x;Buff$
1690     PRINT "Set SHORT to Port "&VAL$(Port(I))&". Then push [Enter]
key."
1700     INPUT "",Buff$
1710     OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:SHOR ";Port(I)
1720     OUTPUT @Agte507x;"*OPC?"
1730     ENTER @Agte507x;Buff$
1740     PRINT "Set LOAD  to Port "&VAL$(Port(I))&". Then push [Enter]
key."
1750     INPUT "",Buff$
1760     OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:LOAD ";Port(I)
1770     OUTPUT @Agte507x;"*OPC?"
1780     ENTER @Agte507x;Buff$
1790   NEXT I
1800   !
1810   ! Transmission Measurement
1820   !
```

```
1830   FOR I=1 TO Num_of_ports-1
1840     FOR J=I+1 TO Num_of_ports
1850       PRINT "Set THRU between Port "&VAL$(Port(I))&" and Port "&
VAL$(Port(J))&". Then push [Enter] key."
1860       INPUT "",Buff$
1870       OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:THRU ";Port(I);","
;Port(J)
1880       OUTPUT @Agte507x;"*OPC?"
1890       ENTER @Agte507x;Buff$
1900       OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:THRU ";Port(J);","
;Port(I)
1910       OUTPUT @Agte507x;"*OPC?"
1920       ENTER @Agte507x;Buff$
1930     NEXT J
1940   NEXT I
1950   !
1960   ! Done
1970   !
1980   OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:SAVE"
1990   PRINT "Done"
2000 SUBEND
```

ECal

Example 4-2 shows a sample program that demonstrates how to use ECal. You can find the source file of this program, named ecal.htb, on the sample program disk.

The sample program performs 1-port or 2-port calibration using ECal and saves the results to a file named “Ex_4_2.sta.”

The program is described in detail below:

Line 40	Assigns a GPIB address to the I/O pass.
Line 50	Stores the name of the file (Ex_4_2.sta) into the File$ variable.
Line 60	Stores the channel number (1) into the Ch$ variable.
Line 90	Allows the user to return to the entry start line and re-enter the data if an error (such as an invalid entry) occurs while selecting the calibration type number.
Lines 110 to 160	These lines display the list of supported calibration types and prompt the user to choose one of the items by typing in the appropriate number.
Line 170	Converts the entered value into an integer and stores it into the Cal_type variable.
Line 180	Returns to the entry start line if an invalid value is contained in Cal_type.
Lines 230 to 240	These lines call a subprogram named Select_port to select the appropriate port based on the value of Cal_type and then perform ECal.
Lines 260 to 270	These lines configure the system to save calibration coefficients along with instrument settings and then save the instrument settings under the file name contained in the File$ variable.

For more information on the Select_port subprogram (lines 320 to lines 570), refer to the description in Example 4-1.

The Ecal subprogram in lines 610 to 1030, which performs ECal, is described below.

Line 650	Displays the calibration type.
Line 670	Clears the error queue.
Lines 700 to 720	If Num_of_ports = 1, the subprogram prompts the user to connect the E5070B/E5071B's port Port(1) with the ECal module and waits for a press of the [Enter] key after the connection.
Line 730	If Num_of_ports = 1, the subprogram executes the ECal command that performs 1-port calibration on port Port(1).
Lines 750 to 780	If Num_of_ports = 2, the subprogram prompts the user to connect the E5070B/E5071B's ports Port(1) and Port(2) with the ECal module and waits for a press of the [Enter] key after the connection.
Line 790	If Num_of_ports = 2, the subprogram executes the ECal command that performs full 2-port calibration on ports Port(1) and Port(2).
Lines 810 to 850	If Num_of_ports = 3, the subprogram prompts the user to connect the E5070B/E5071B's ports Port(1), Port(2) and Port(3) with the ECal module and waits for a press of the [Enter] key after the connection.
Line 860	If Num_of_ports = 3, the subprogram executes the ECal command that performs full 3-port calibration on ports Port(1), Port(2) and Port(3).
Lines 880 to 900	If Num_of_ports = 4, the subprogram prompts the user to connect the E5070B/E5071B's ports 1, 2, 3 and 4 with the ECal module and waits for a press of the [Enter] key after the connection.
Line 910	If Num_of_ports = 4, the subprogram executes the ECal command that performs full 4-port calibration.
Lines 940 to 950	These lines retrieve the error number and error message from the error queue and then store them into the variables Err_no and Err_msg$, respectively.

NOTE

Unlike calibration data measurement commands such as **:SENS{1-16}:CORR:COLL:OPEN**, the ECal command cannot be combined with the ***OPC?** command to make the program wait until the measurement completes successfully. However, since the system accepts no command during ECal, you can suspend the program until ECal is complete by following the ECal command with a command that queries some data. The sample program executes **:SYST:ERR?** in order to wait for the completion of ECal and check for any error.

Lines 970 to 990	If Err_no returns a non-zero value (an error value), the program displays the corresponding error message.
Line 1010	If Err_no returns 0 (no error), the program displays a closing message.

Example 4-2 **ECal (ecal.htb)**

```
10      DIM File$[20],Ch$[9],Inp_char$[9]
20      INTEGER Cal_kit,Cal_type,Port(1:4)
30      !
40      ASSIGN @Agte507x TO 717
50      File$="Ex_4_2.sta"
60      Ch$="1"
70      !
80      CLEAR SCREEN
90      ON ERROR GOTO Type_select
100 Type_select: !
110     PRINT "## Calibration Type Selection ##"
120     PRINT " 1: Full 1 Port"
130     PRINT " 2: Full 2 Port"
140     PRINT " 3: Full 3 Port"
150     PRINT " 4: Full 4 Port"
160     PRINT ""
170     PRINT "Input 1 to 4"
180     INPUT "Input number? (1 to 4)",Inp_char$
190     Cal_type=IVAL(Inp_char$,10)
200     IF Cal_type<1 OR Cal_type>4 THEN Type_select
210     OFF ERROR
220     !
230     Select_port(Cal_type,Port(*))
240     Ecal(@Agte507x,Ch$,Cal_type,Port(*))
250     !
260     OUTPUT @Agte507x;":MMEM:STOR:STYP CST"
270     OUTPUT @Agte507x;":MMEM:STOR """&File$&""""
280     END
290     !=========================================
300     ! Port Selection Function
310     !=========================================
320   SUB Select_port(INTEGER Num_of_ports,INTEGER Port(*))
330     DIM Inp_char$[9]
340     !
350     CLEAR SCREEN
360     IF Num_of_ports=4 THEN
370       Port(1)=1
380       Port(2)=2
390       Port(3)=3
400       Port(4)=4
410     ELSE
420       PRINT "## Test Ports Selection ##"
430       ON ERROR GOTO Port_select
440       FOR I=1 TO Num_of_ports
450         PRINT "Port("&VAL$(I)&"):";
460 Port_select: !
470         INPUT "Number?",Inp_char$
480         Port(I)=IVAL(Inp_char$,10)
490         IF Port(I)<1 OR Port(I)>4 THEN Port_select
500         FOR J=1 TO I-1
510           IF Port(I)=Port(J) THEN Port_select
520         NEXT J
530         PRINT Port(I)
540       NEXT I
550       OFF ERROR
560     END IF
570   SUBEND
580     !=========================================
590     ! Electronic Calibration Function
600     !=========================================
610   SUB Ecal(@Agte507x,Ch$,INTEGER Num_of_ports,INTEGER Port(*))
```

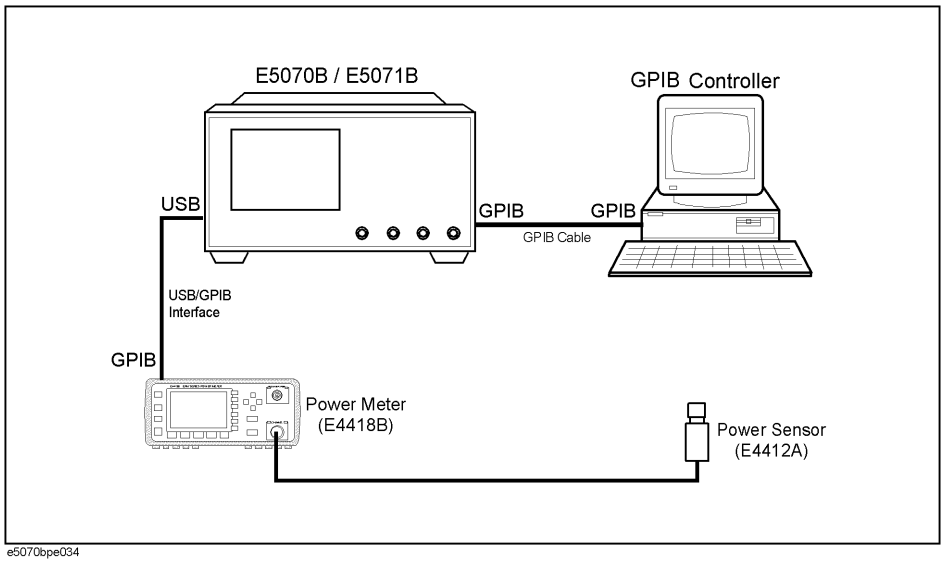
```
620     DIM Buff$[9],Err_msg$[100]
630     INTEGER Err_no,Port1
640     !
650     PRINT "## Full "&VAL$(Num_of_ports)&" Port ECal ##"
660     !
670     OUTPUT @Agte507x;"*CLS"
680     SELECT Num_of_ports
690       CASE 1
700         PRINT "Connect Port "&VAL$(Port(1))&" to ECal Module."
710         PRINT "Then push [Enter] key."
720         INPUT "",Buff$
730         OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:ECAL:SOLT1 ";Port(1)
740       CASE 2
750         PRINT "Connect Port "&VAL$(Port(1));
760         PRINT " and Port "&VAL$(Port(2))&" to ECal Module."
770         PRINT "Then push [Enter] key."
780         INPUT "",Buff$
790        OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:ECAL:SOLT2 ";Port(1);
",";Port(2)
800       CASE 3
810         PRINT "Connect Port "&VAL$(Port(1));
820         PRINT ", Port "&VAL$(Port(2));
830         PRINT " and Port "&VAL$(Port(3))&" to ECal Module."
840         PRINT "Then push [Enter] key."
850         INPUT "",Buff$
860        OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:ECAL:SOLT3 ";Port(1);
",";Port(2);",";Port(3)
870       CASE 4
880         PRINT "Connect Port 1, Port 2, Port 3 and Port 4 to to ECal Mod
ule."
890         PRINT "Then push [Enter] key."
900         INPUT "",Buff$
910         OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:ECAL:SOLT4 1,2,3,4"
920     END SELECT
930     PRINT "Executing ..."
940     OUTPUT @Agte507x;":SYST:ERR?"
950     ENTER @Agte507x;Err_no,Err_msg$
960     IF Err_no<>0 THEN
970       PRINT "Error occurred!!"
980       PRINT "  No:";Err_no,"Description: "&Err_msg$
990       PRINT "ECAL INTERRUPT!!"
1000    ELSE
1010      PRINT "Done"
1020    END IF
1030 SUBEND
```

Power Calibration

Example 4-3 shows a sample program that demonstrates how to perform power calibration. You can find the source file of this program, named pow_cal.htb, on the sample program disk.

This program, as shown in Figure 4-1, is run by making connections between the E5070B/E5071B and the power meter (E4418B) through the USB/GPIB interface and between the E5070B/E5071B and the external controller through the GPIB cable. Then the program executes the power calibration of the E5070B/E5071B by using the power sensor (E4412A). The obtained power calibration data array is saved into a file.

Figure 4-1 **Connecting E5070B/E5071B, power meter, and external controller**



The program is described in detail below:

Line 70	Assigns a GPIB address to the I/O path.
Lines 90 to 140	Set the sweep type (power sweep), the number of points (41), the power range (-20 to +12 dBm), the sweep start value (-20 dBm), the sweep stop value (-10 dBm), and the fixed frequency (1 GHz) to the Swp_type, Nop, Pow_rang, Start_p, Stop_p, and Cw_freq variables, respectively.
Lines 150 to 160	Set the number of power calibration data measurements for each measurement point (4) and the limit value of the power calibration data array (10 dBm) into the Num_avg and Limit variables, respectively.
Line 200	Returns the E5070B/E5071B to the preset state.
Line 240	Sets the power meter's GPIB address (13) in the E5070B/E5071B.
Lines 280 to 330	For channel 1, set the sweep type to the Swp_type variable, the number of points to the Nop variable, the power range to the Pow_rang variable, the sweep start value to the Start_p variable, the sweep stop value to the Stop_p variable, and the fixed frequency to the Cw_freq variable.

Lines 350 to 420 Display a message asking whether to execute the zero adjustment and calibration of the power sensor connected to channel A of the power meter. When the **[Y]** key and the **[Enter]** key are pressed, the subprogram prompts for the zero adjustment and calibration of the power sensor using the power meter and waits for a pressing of the **[Enter]** key after that operation.

NOTE Because a GPIB connection is not available between the power meter and the external controller, you need to execute the zero adjustment and calibration of the power sensor manually.

Lines 480 to 510 These lines clear the error queue and then prompt you to connect the power sensor to port 1 of the E5070B/E5071B and wait for a pressing of the **[Enter]** key after the connection.

Lines 550 to 580 For port 1 of channel 1, these lines set the number of power calibration data measurements for each measurement point to the Num_avg variable and then start the measurement of the power calibration data and wait for the completion of the measurement.

Lines 620 to 630 These lines read out an error that has occurred in the E5070B/E5071B during the measurement of the power calibration data and set this error in the Err_no and Err_mes$ variables.

Lines 650 to 780 If no error has occurred, these lines use the value of the Nop variable (the number of points) to set the range of the array variable for reading out the power calibration data array again and read out the power calibration data array. In addition, the subprogram uses the FNLim function program to check whether the read out power calibration data array exceeds the specified limit value. If the limit value is exceeded, the return value of the FNLim function program, -1, is returned. Then, a message is displayed asking whether to perform the power calibration again. Pressing the **[Y]** key and then the **[Enter]** key returns to the start of the power calibration data measurement. If another key is pressed, the program is terminated. For information on the FNLim function program (Lines 1190 to 1360), see the description later.

Lines 800 to 880 If an error occurs, these lines display an error message and a message asking whether to execute the power calibration again. Pressing the **[Y]** key and then the **[Enter]** key returns to the start of the power calibration data measurement. If another key is pressed, the program is terminated.

Lines 920 to 1060 These lines write the read out power calibration data array into a file named “CORR_DATA.” Then, a message is displayed confirming that saving into a file has successfully completed.

The FNLim program in lines 1190 to 1360 is described below.

Lines 1230 to 1320 If the absolute value of the read out power calibration data array exceeds the specified limit value, these lines turn off the power calibration function and return the value of -1. Otherwise, the subprogram returns the value of 0.

Example 4-3 **Power calibration (pow_cal.htb)**

```
10    DIM Swp_type$[11],Inp_char$[9],Buff$[9],Err_mes$[50],File$[20]
20    DIM Corr_data(1:1601)
30    REAL Start_p,Stop_p,Cw_freq,Limit
40    INTEGER Nop,Pow_rang,Num_avg,Err_no,Verifier,Data_size,I
50    CLEAR SCREEN
60    !
70    ASSIGN @Agte507x TO 717
80    !
90    Swp_type$="POW"         !Sweep type               : POWER
100   Nop=41                  !Number of points         : 41
110   Pow_rang=0              !Power Range              :-20 to +12 dBm
120   Start_p=-2.0E+1         !Start Power              :-20 dBm
130   Stop_p=-1.0E+1          !Stop Power               :-10 dBm
140   Cw_freq=1.0E+9          !CW frequency             : 1 GHz
150   Num_avg=4               !Number of averaging      : 4
160   Limit=10                !limit for corrected data : 10 dBm
170   !
180   ! Presetting the analyzer
190   !
200   OUTPUT @Agte507x;":SYST:PRES"
210   !
220   ! Setting GPIB address of the power meter to E5070B/E5071B
230   !
240   OUTPUT @Agte507x;":SYST:COMM:GPIB:PMET:ADDR 13"
250   !
260   ! Setting measurement conditions
270   !
280   OUTPUT @Agte507x;":SENS1:SWE:TYPE "&Swp_type$
290   OUTPUT @Agte507x;":SENS1:SWE:POIN ";Nop
300   OUTPUT @Agte507x;":SOUR1:POW:ATT ";Pow_rang
310   OUTPUT @Agte507x;":SOUR1:POW:STAR ";Start_p
320   OUTPUT @Agte507x;":SOUR1:POW:STOP ";Stop_p
330   OUTPUT @Agte507x;":SENS1:FREQ ";Cw_freq
340   !
350   PRINT "Do you perform zeroing and calibrating the power sensor?"
360   PRINT
370   INPUT "[Y/N]",Inp_char$
380   IF UPC$(Inp_char$)="Y" THEN
390     PRINT "Zero and calibrate the power sensor by using the power
meter, then press [Enter] key."
400     PRINT
410     INPUT "",Inp_char$
420   END IF
430   !
440 Meas_start:  !
450   !
460   ! Connecting the power sensor to the port 1 in the E5070/71B
470   !
480   OUTPUT @Agte507x;"*CLS"
490   PRINT "Set the power sensor connected to the port 1 in the
E5070/71B, then press [Enter] key."
500   PRINT
510   INPUT "",Inp_char$
520   !
530   ! Performing power calibration measurement
540   !
550   OUTPUT @Agte507x;":SOUR1:POW:PORT1:CORR:COLL:AVER ";Num_avg
560   OUTPUT @Agte507x;":SOUR1:POW:PORT1:CORR:COLL ASEN"
570   OUTPUT @Agte507x;"*OPC?"
580   ENTER @Agte507x;Buff$
590   !
```

```
600   ! Error hnadling at power meter measurement
610   !
620   OUTPUT @Agte507x;":SYST:ERR?"
630   ENTER @Agte507x;Err_no,Err_mes$
640   !
650   IF Err_no=0 THEN
660     REDIM Corr_data(1:Nop)
670     OUTPUT @Agte507x;":FORM:DATA ASC"
680     OUTPUT @Agte507x;":SOUR1:POW:PORT1:CORR:DATA?"
690     ENTER @Agte507x;Corr_data(*)
700     Verifier=FNLim(@Agte507x,Nop,Limit,Corr_data(*))
710       IF Verifier=-1 THEN
720       PRINT "Do you perform the power meter calibration measurement
again?"
730       PRINT
740       INPUT "[Y/N]",Inp_char$
750         IF UPC$(Inp_char$)="Y" THEN GOTO Meas_start
760         IF UPC$(Inp_char$)<>"Y" THEN GOTO Prog_stop
770       END IF
780     PRINT "Power meter calibration measurement is complete."
790     PRINT
800   ELSE
810     PRINT "Error: "&Err_mes$
820     PRINT
830     PRINT "Do you perform the power meter calibration measurement
again?"
840     PRINT
850     INPUT "[Y/N]",Inp_char$
860       IF UPC$(Inp_char$)="Y" THEN GOTO Meas_start
870       IF UPC$(Inp_char$)<>"Y" THEN GOTO Prog_stop
880   END IF
890   !
900   ! Installing the corrected data to a file
910   !
920   File$="CORR_DATA"
930   Data_size=Nop*8
940   ON ERROR GOTO Skip_purge
950   PURGE File$
960 Skip_purge:   OFF ERROR
970   PRINT "The file installing power correction data: "&File$
980   PRINT
990   CREATE File$,Data_size
1000  ASSIGN @File TO File$;FORMAT ON
1010  FOR I=1 TO Nop
1020    OUTPUT @File USING "3D,3X,MD.4DE";I,Corr_data(I)
1030  NEXT I
1040  ASSIGN @File TO *
1050  !
1060  PRINT "Installing the corrected data to the file is DONE."
1070  !
1080  GOTO Prog_end
1090  !
1100 Prog_stop: !
1110  PRINT "Program Interruption"
1120  !
1130 Prog_end: !
1140  !
1150  END
1160  !
1170  ! Limit Test Function for the Corrected Data
1180  !
1190  DEF FNLim(@Agte507x,INTEGER Nop,REAL Limit,REAL Corr_data(*))
1200    INTEGER I
1210    !
```

```
1220    FOR I=1 TO Nop
1230      IF ABS(Corr_data(I))>Limit THEN
1240        OUTPUT @Agte507x;"SOUR1:POW:PORT1:CORR OFF"
1250        PRINT "The corrected data is out of limit!"
1260        PRINT
1270        RETURN -1
1280        GOTO Fn_exit
1290      END IF
1300    NEXT I
1310    !
1320    RETURN 0
1330    !
1340 Fn_exit:   !
1350    !
1360  FNEND
```

Reading/Writing Error Coefficient

Example 4-4 shows a sample program to read/write the error coefficient. You can find the source file of this program, named ErrTerm.htb, in the sample program disk.

This program will set measurement conditions and perform full 2-port calibration, preset the E5070B/E5071B with the read error coefficient to be written, and then again read the error coefficient.

NOTE The error coefficient read from the E5070B/E5071B will be displayed in a graph.

The program is described in detail below:

Line 2100 - 2120: Clears PC screen and initializes the graphics.

Line 2150: Assigns the address (717) of the E5070B/E5071B to the Agte507x variable.

Line 2170: Assigns the channel number (1) to the Ch$ variable.

Line 2220: Configures for the timeout (15 seconds) and interrupt service for the timeout while communicating with the E5070B/E5071B.

Line 2220: Configures for the timeout (15 seconds) and interrupt service for the timeout while communicating with the E5070B/E5071B.

Line 2250 - 2260: Assigns in Port(*) the port number to be used.

Line 2290: Configures the segment table using the subprogram Set_sgm_tbl.

Line 2320: Selects the calibration kit using the subprogram Select_cal_kit.

Line 2350: Executes full 2-port calibration using the subprogram Cal_solt.

Line 2380: Acquires the total number of measurement points of all segments in the segment sweep table using the subprogram Get_nop.

Line 2400 - 2420: Defines the stock variables for the error coefficient as needed for NOP.

Line 2440: Reads the error coefficient for ES with a value 1 for the response port and 1 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2450: Reads the error coefficient for ES with a value 2 for the response port and 2 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2460: Reads the error coefficient for ER with a value 1 for the response port and 1 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2470: Reads the error coefficient for ER with a value 2 for the response port and 2 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2480: Reads the error coefficient for ED with a value 1 for the response port and 1 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2490: Reads the error coefficient for ED with a value 2 for the response port and 2 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2510: Reads the error coefficient for EL with a value 1 for the response port and 2 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2520: Reads the error coefficient for EL with a value 2 for the response port and 1 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2530: Reads the error coefficient for ET with a value 1 for the response port and 2 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2540: Reads the error coefficient for ET with a value 2 for the response port and 1 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2560 - 2580: Clears the PC screen.

Displays the request message to preset the E5070B/E5071B. Waits for the PC's [Enter] key to be pressed after the E5070B/E5071B is preset.

Line 2600: Configures the segment table.

Line: 2620: Sets the calibration coefficient with the type specified and full 2-port calibration between two ports.

Line 2640: Writes the stored data of line 2440 as the error coefficient for ES, with the response port 1 and the stimulus port 1.

Line 2650: Writes the stored data of line 2450 as the error coefficient for ES, with the response port 2 and the stimulus port 2.

Line 2660: Writes the stored data of line 2460 as the error coefficient for ER, with the response port 1 and the stimulus port 1.

Line 2670: Writes the stored data of line 2470 as the error coefficient for ER, with the response port 2 and the stimulus port 2.

Line 2680: Writes the stored data of line 2480 as the error coefficient for ED, with the response port 1 and the stimulus port 1.

Line 2690: Writes the stored data of line 2490 as the error coefficient for ED, with the response port 2 and the stimulus port 2.

Line 2710: Writes the stored data of line 2510 as the error coefficient for EL, with the response port 1 and the stimulus port 2.

Line 2720: Writes the stored data of line 2520 as the error coefficient for EL, with the response port 2 and the stimulus port 1.

Line 2730: Writes the stored data of line 2530 as the error coefficient for ET, with the response port 1 and the stimulus port 2.

Line 2740: Writes the stored data of line 2540 as the error coefficient for ET, with the response port 2 and the stimulus port 1.

Line 2760: Validates the written error coefficient.

Line 2780: Reads the error coefficient for ES with a value 1 for the response port and 1 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2790: Reads the error coefficient for ES with a value 2 for the response port and 2 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2800: Reads the error coefficient for ER with a value 1 for the response port and 1 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2810: Reads the error coefficient for ER with a value 2 for the response port and 2 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2820: Reads the error coefficient for ED with a value 1 for the response port and 1 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2830: Reads the error coefficient for ED with a value 2 for the response port and 2 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2850: Reads the error coefficient for EL with a value 1 for the response port and 2 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2860: Reads the error coefficient for EL with a value 2 for the response port and 1 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2870: Reads the error coefficient for ET with a value 1 for the response port and 2 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2880: Reads the error coefficient for ET with a value 2 for the response port and 1 for the stimulus port.

Stores the read error coefficient into the stock variable.

Line 2900 - 2920: Executes processing after the program has ended successfully. Clears the GPIB address to the I/O pass.

Displays a program closing message (Done ....)

Line 2950 - 2990: Executes processing after the E5070B/E5071B has encountered a timeout.

Clears the interrupt setting for the timeout.

Clears the GPIB address to the I/O pass.

Displays a message indicating a time out has occurred for the E5070B/E5071B (ENA Timeout ....)

The following is a description of the Set_sgm_tbl subprogram in lines 3020 to 3390 used to configure the segment table.

Line 3100: Assigns the number of channel 1's sweep segments into the Segm variable.

Line 3110 - 3140: Assigns the start and stop values for channel 1's segments 1 through 2 into the Start1(*) and Stop1(*) variables, respectively.

Line 3150 - 3160: Assigns the number of points in channel 1's segments 1 through 2 into the Nop1(*)variables, respectively.

Line 3170 - 3180: Assigns the IF bandwidths in channel 1's segments 1 through 2 into the if_bw1(*) variable, respectively.

Line 3190 - 3200: Assigns the powers in channel 1's segments 1 through 2 into the Pow1(*) variable, respectively.

Line 3220 - 3240: Presets the E5070B/E5071B. Wait 5 seconds for the E5070B/E5071B to complete the preset.

Line 3280: Sets channel 1's sweep type to segment.

Line 3290 - 3330: Sets the segment table for channel 1.

Line 3290: Sends the command that sets up the segment table along with the parameter header ("5, 0, 1, 1, 0, 0" causing the IF bandwidth and power to be set on a segment-by-segment basis, with Segm representing the number of segments).

Line 3300: Sends the data for the start and stop values, number of points, IF bandwidth, and power (Star1, Stop1, Nop1, If_bw1, Pow1) on a segment-by-segment basis.

The following is a description of the Select_cal_kit subprogram in lines 3020 to 3390 to select a calibration kit.

Line 3540:	Assigns the number of registered valid calibration kits.
Line 3560 - 3600:	Retrieve the names of all the calibration kits and assigns them into the Cal_kit_lbl$(*) variable.
Line 3610:	Configures to generate a beep to allow for reentry when an error occurred by entering an invalid value for the calibration kit numbers.
Line 3630 - 3700:	Displays a list for the calibration kits.
Line 3730 - 3740:	Prompts to enter the number of the list.
Line 3750:	Converts the entered value into an integer and stores it into the Cal_kit variable.
Line 3760:	Repeats entering the numbers of the list so that the value of Cal_kit may become appropriate.
Line 3810 - 3830:	Changes the display color into green for the selected calibration kit in order to prompt to verify the calibration kit.
Line 3850:	Repeats verifying the numbers of the list and the calibration kits so that the value of Wk$ become "Y."
Line 3860 - 3890:	Turns the display color for the selected calibration kit back into white.
Line 3930:	Selects the calibration kit that matches the number contained in the Cal_kit variable.

The following is a description of the Cal_solt subprogram in lines 3960 to 4560 to perform full n-port calibration.

Line 4070: Displays the calibration type.

Line 4110 - 4150: Configures the instrument to perform full Num_of_ports port calibration on the ports identified by Port(1) through Port(Num_of_ports).

Line 4190 - 4350: Makes up a loop that iterates while incrementing i from 1 to Num_of_ports.

Line 4200 - 4210: Prompts the user to connect an OPEN standard to port Port(i) and waits for a press of the Enter key after the connection.

Line 4220 - 4240: Executes the OPEN calibration data measurement command on port Port(i) and waits until the measurement completes successfully.

Line 4250 - 4210: Prompts the user to connect a SHORT standard to port Port(i) and waits for a press of the Enter key after the connection.

Line 4270 - 4240: Executes the SHORT calibration data measurement command on port Port(i) and waits until the measurement completes successfully.

Line 4300 - 4310: Prompts the user to connect a LOAD standard to port Port(i) and waits for a press of the Enter key after the connection.

Line 4320 - 4340: Executes the LOAD calibration data measurement command on port Port(i) and waits until the measurement completes successfully.

Line 4390 - 4500: Makes up a loop that iterates while incrementing i from 1 to Num_of_ports-1 and j from i+1 to Num_of_ports.

Line 4410 - 4420: Prompts the user to connect a THRU standard between the ports identified by Port(i) and Port(j) and waits for a press of the Enter key after the connection.

Line 4430 - 4450: Executes the THRU calibration data measurement command on response port Port(i) and stimulus port Port(j) and waits until the measurement completes successfully.

Line 4460 - 4480: Executes the THRU calibration data measurement command on response port Port(j) and stimulus port Port(i) and waits until the measurement completes successfully.

Line 4540: Calculates the calibration coefficients and turns on error correction.

Line 4550: Displays a program-closing message.

The following is a description of the Get_nop subprogram in lines 4580 to 4620 to acquire the total number of measurement points of all segments in the segment sweep table.

Line 4600 - 4610: Acquires the total number of measurement points of all segments in the segment sweep table.

The following is a description of the Exec_error_term subprogram in lines 4630 to 4970.

Line 4690: Defines the data area for "real" and "image" as needed for NOP.

Line 4730 - 4760: Assigns the stocked data into the writing variable.

Line 4780: Writes the data in the error coefficient items for the specified response port and stimulus port.

Line 4810 - 4840: Initializes the retrieving variable for the error coefficient with -999.

Line 4860 - 4870: Retrieves the data from the error coefficient items for the specified response port and stimulus port.

Line 4890: Graphs the retrieved error coefficients.

Line 4910 - 4760: Assigns the retrieved error coefficients into the stocking variable.

The following is a description of the Data_plot subprogram in lines 4990 to 5950.

Line 5080 - 5090: Specifies the waveform color.

Pen (1): Yellow (Real)

Pen (2): Green (Imaginary)

Line 5120 - 5130: Acquires the minimum and maximum values from all data.

Line 5150 -5180: Executes the processing when both the minimum and maximum values are zero.

Line 5200 -5230: Executes the processing when the minimum and maximum values are the same.

Line 5260 -5280: Displays the graph area.

Line 5300 - 5460: Displays the legend.

Line 5480 - 5560: Displays the header.

Line 5580 - 5670: Displays the minimum and maximum values for the y-axis.

Line 5690 - 5760: Displays the minimum and maximum values for the x-axis.

Line 5780 -5900: Displays the waveform in the graph area.

Line 5820 - 5840: Plots the Real value in yellow.

Line 5870 - 5890: Plots the Imaginary value in green.

Example 4-4 **Reading/Writing Error Coefficient (ErrTerm.htb)**

```
2000 Main:!
2010  INTEGER Agte507x,Ii,Nop
2020  INTEGER Respons,Stimulas
2030  INTEGER Port(1:2)
2040  REAL Stok(12,1:5000)
2050  REAL Stok2(12,1:5000)
2060  REAL Stok3(12,1:5000)
2070  DIM Ch$[10],Wk$[128]
2080  !
2090  ! PC's Monitor Clear
2100  CLEAR SCREEN
2110  GINIT
2130  !
2140  ! Set ENA++'s Addr
2150  Agte507x=717
2160  !
2170  Ch$="1"
2180  !
2190  ! Set ENA++'s I/O Path
2200  ASSIGN @Agte507x TO Agte507x
2210  !
2220  ON TIMEOUT SC(@Agte507x),15 RECOVER Tout
2230  !
2240  ! Set Start Port and End Port
2250  Port(1)=1
2260  Port(2)=2
2270  !
2280  ! Setup Segment Table
2290  CALL Set_sgm_tbl(@Agte507x)
2300  !
2310  ! Select Cal Kit
2320  CALL Select_cal_kit(@Agte507x,Ch$)
2330  !
2340  ! Execute Full-2Port Calibration
2350  CALL Cal_solt(@Agte507x,Ch$,2,Port(*))
2360  !
2370  ! Get All Segment's Points
2380  CALL Get_nop(@Agte507x,Nop,Ch$)
2390  !
2400  REDIM Stok(12,1:Nop*2)
2410  REDIM Stok2(12,1:Nop*2)
2420  REDIM Stok3(12,1:Nop*2)
2430  !
2440  CALL Exec_error_term(@Agte507x,"READ","ES",Ch$,1,Nop,1,1,Stok(*))
2450  CALL Exec_error_term(@Agte507x,"READ","ES",Ch$,2,Nop,2,2,Stok(*))
2460  CALL Exec_error_term(@Agte507x,"READ","ER",Ch$,3,Nop,1,1,Stok(*))
2470  CALL Exec_error_term(@Agte507x,"READ","ER",Ch$,4,Nop,2,2,Stok(*))
2480  CALL Exec_error_term(@Agte507x,"READ","ED",Ch$,5,Nop,1,1,Stok(*))
2490  CALL Exec_error_term(@Agte507x,"READ","ED",Ch$,6,Nop,2,2,Stok(*))
2500  !
2510  CALL Exec_error_term(@Agte507x,"READ","EL",Ch$,7,Nop,1,2,Stok(*))
2520  CALL Exec_error_term(@Agte507x,"READ","EL",Ch$,8,Nop,2,1,Stok(*))
2530  CALL Exec_error_term(@Agte507x,"READ","ET",Ch$,9,Nop,1,2,Stok(*))
2540  CALL Exec_error_term(@Agte507x,"READ","ET",Ch$,10,Nop,2,1,Stok(*))
2550  !
2560  CLEAR SCREEN
2570  PRINT "Push [Preset] - OK of ENA. Then push [Enter] key."
2580  INPUT "",Wk$
2590  !
2600  CALL Set_sgm_tbl(@Agte507x)
2610  !
```

```
2620  OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COEF:METH:SOLT2
";Port(1);",";Port(2)
2630  !
2640  CALL Exec_error_term(@Agte507x,"WRITE","ES",Ch$,1,Nop,1,1,Stok(*))
2650  CALL Exec_error_term(@Agte507x,"WRITE","ES",Ch$,2,Nop,2,2,Stok(*))
2660  CALL Exec_error_term(@Agte507x,"WRITE","ER",Ch$,3,Nop,1,1,Stok(*))
2670  CALL Exec_error_term(@Agte507x,"WRITE","ER",Ch$,4,Nop,2,2,Stok(*))
2680  CALL Exec_error_term(@Agte507x,"WRITE","ED",Ch$,5,Nop,1,1,Stok(*))
2690  CALL Exec_error_term(@Agte507x,"WRITE","ED",Ch$,6,Nop,2,2,Stok(*))
2700  !
2710  CALL Exec_error_term(@Agte507x,"WRITE","EL",Ch$,7,Nop,1,2,Stok(*))
2720  CALL Exec_error_term(@Agte507x,"WRITE","EL",Ch$,8,Nop,2,1,Stok(*))
2730  CALL Exec_error_term(@Agte507x,"WRITE","ET",Ch$,9,Nop,1,2,Stok(*))
2740  CALL
Exec_error_term(@Agte507x,"WRITE","ET",Ch$,10,Nop,2,1,Stok(*))
2750  !
2760  OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COEF:SAVE"
2770  !
2780  CALL Exec_error_term(@Agte507x,"READ","ES",Ch$,1,Nop,1,1,Stok2(*))
2790  CALL Exec_error_term(@Agte507x,"READ","ES",Ch$,2,Nop,2,2,Stok2(*))
2800  CALL Exec_error_term(@Agte507x,"READ","ER",Ch$,3,Nop,1,1,Stok2(*))
2810  CALL Exec_error_term(@Agte507x,"READ","ER",Ch$,4,Nop,2,2,Stok2(*))
2820  CALL Exec_error_term(@Agte507x,"READ","ED",Ch$,5,Nop,1,1,Stok2(*))
2830  CALL Exec_error_term(@Agte507x,"READ","ED",Ch$,6,Nop,2,2,Stok2(*))
2840  !
2850  CALL Exec_error_term(@Agte507x,"READ","EL",Ch$,7,Nop,1,2,Stok2(*))
2860  CALL Exec_error_term(@Agte507x,"READ","EL",Ch$,8,Nop,2,1,Stok2(*))
2870  CALL Exec_error_term(@Agte507x,"READ","ET",Ch$,9,Nop,1,2,Stok2(*))
2880  CALL
Exec_error_term(@Agte507x,"READ","ET",Ch$,10,Nop,2,1,Stok2(*))
2890  !
2900  ASSIGN @Agte507x TO *
2910  !
2920  DISP CHR$(139)&" Done ..."&CHR$(136)
2930  STOP
2940  !
2950 Tout: OFF TIMEOUT SC(@Agte507x)
2960  !
2970  ASSIGN @Agte507x TO *
2980  !
2990  PRINT CHR$(137)&"   ENA Timeout ..."&CHR$(136)
3000  END
3010!
3020 Set_sgm_tbl: SUB Set_sgm_tbl(@Agte507x)
3030    REAL Star1(1:2),Stop1(1:2),Pow1(1:2)
3040    INTEGER Segm,Nop1(1:2),Num_of_tr1
3050    INTEGER I
3060    !
3070    CLEAR SCREEN
3080    DISP CHR$(138)&" Wait ..."&CHR$(136)
3090    !
3100    Segm=2              ! Number of Segment Ch.1       : 2
3110    Star1(1)=3.E+6      ! Start Frequency   Ch.1 Segm.1:  3.0 MHz
3120    Star1(2)=5.0E+7     !                        Segm.2: 50.0 MHz
3130    Stop1(1)=1.0E+7     ! Stop Frequency    Ch.1 Segm.1: 10.0 MHz
3140    Stop1(2)=8.E+9      !                        Segm.2:  8.0 GHz
3150    Nop1(1)=2           ! Number            Ch.1 Segm.1: 2
3160    Nop1(2)=170         !   of Points            Segm.2: 170
3170    If_bw1(1)=7.0E+4    ! IF Bandwidth      Ch.1 Segm.1: 70 kHz
3180    If_bw1(2)=7.0E+4    !                        Segm.2: 70 kHz
3190    Pow1(1)=0           ! Power             Ch.1 Segm.1: 0 dBm
3200    Pow1(2)=0           !                        Segm.2: 0 dBm
3210    !
3220    OUTPUT @Agte507x;":SYST:PRES"
```

```
3230    !
3240    WAIT 5
3250    !
3260    ! Channel 1
3270    !
3280    OUTPUT @Agte507x;":SENS1:SWE:TYPE SEGM"
3290    OUTPUT @Agte507x;":SENS1:SEGM:DATA 5,0,1,1,0,0,";Segm;",";
3300    FOR I=1 TO Segm-1
3310      OUTPUT
@Agte507x;Star1(I);",";Stop1(I);",";Nop1(I);",";If_bw1(I);",";Pow1(I);",
";
3320    NEXT I
3330    OUTPUT
@Agte507x;Star1(Segm);",";Stop1(Segm);",";Nop1(Segm);",";If_bw1(Segm);",
";Pow1(Segm)
3340   !
3350    OUTPUT @Agte507x;":CALC1:PAR:COUN ";Num_of_tr1
3360    FOR I=1 TO Num_of_tr1
3370      OUTPUT @Agte507x;":CALC1:PAR"&VAL$(I)&":SEL"
3380    NEXT I
3390  SUBEND
3400!
3410 Select_cal_kit: SUB Select_cal_kit(@Agte507x,Ch$)
3420    !=============================================
3430    ! Calibration Kit Selection Function
3440    !=============================================
3450    !
3460    DIM Cal_kit_lbl$(1:10)[20],Inp_char$[9]
3470    DIM Msg$[80],Wk$[10]
3480    INTEGER Cal_kit,I,Noc
3490    !
3500    ! PC's Monitor Clear
3510    CLEAR SCREEN
3520    !
3530    ! Number of Cal Kid
3540    Noc=10
3550    !
3560    FOR I=1 TO Noc
3570      OUTPUT @Agte507x;":SENS1:CORR:COLL:CKIT ";I
3580      OUTPUT @Agte507x;":SENS1:CORR:COLL:CKIT:LAB?"
3590      ENTER @Agte507x;Cal_kit_lbl$(I)
3600    NEXT I
3610    ON ERROR GOTO Kit_select
3620    !
3630    PRINT "## Calibration Kit Selection ##"
3640    FOR I=1 TO Noc
3650      PRINT USING "X,2D,A,X,20A";I,":",Cal_kit_lbl$(I)
3660    NEXT I
3670    PRINT ""
3680    PRINT "Input 1 to "&VAL$(Noc)
3690    !
3700    Msg$="Input number? (1 to "&VAL$(Noc)&") "
3710    LOOP
3720      LOOP
3730        DISP Msg$;
3740        INPUT Inp_char$
3750        Cal_kit=IVAL(Inp_char$,10)
3760      EXIT IF 1<=Cal_kit AND Cal_kit<=Noc
3770 Kit_select:!
3780        BEEP
3790      END LOOP
3800      !
3810      Wk$=""
3820      PRINT TABXY(1,Cal_kit+1);
```

```
3830      PRINT USING
"X,B,2D,A,X,20A,B";139,Cal_kit,":",Cal_kit_lbl$(Cal_kit),136
3840      INPUT "Sure ? [Y/N]",Wk$
3850    EXIT IF (UPC$(Wk$)="Y")
3860      PRINT TABXY(1,Cal_kit+1);
3870      PRINT USING "X,2D,A,X,20A";Cal_kit,":",Cal_kit_lbl$(Cal_kit)
3880      BEEP
3890      BEEP
3900    END LOOP
3910    OFF ERROR
3920    !
3930    OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:CKIT ";Cal_kit
3940  SUBEND
3950!
3960 Cal_solt: SUB Cal_solt(@Agte507x,Ch$,INTEGER Num_of_ports,INTEGER
Port(*))
3970    !============================================
3980    ! Full n Port Calibration Function
3990    !============================================
4000    !
4010    DIM Buff$[9]
4020    INTEGER I,J
4030    !
4040    ! PC's Monitor Clear
4050    CLEAR SCREEN
4060    !
4070    PRINT "## Full "&VAL$(Num_of_ports)&" Port Calibration ##"
4080    !
4090    ! Calibration Type Selection
4100    !
4110    OUTPUT
@Agte507x;":SENS"&Ch$&":CORR:COLL:METH:SOLT"&VAL$(Num_of_ports)&" ";
4120    FOR I=1 TO Num_of_ports-1
4130      OUTPUT @Agte507x;Port(I);",";
4140    NEXT I
4150    OUTPUT @Agte507x;Port(Num_of_ports)
4160    !
4170    ! Reflection Measurement
4180    !
4190    FOR I=1 TO Num_of_ports
4200      PRINT "Set OPEN  to Port "&VAL$(Port(I))&". Then push [Enter]
key."
4210      INPUT "",Buff$
4220      OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:OPEN ";Port(I)
4230      OUTPUT @Agte507x;"*OPC?"
4240      ENTER @Agte507x;Buff$
4250      PRINT "Set SHORT to Port "&VAL$(Port(I))&". Then push [Enter]
key."
4260      INPUT "",Buff$
4270      OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:SHOR ";Port(I)
4280      OUTPUT @Agte507x;"*OPC?"
4290      ENTER @Agte507x;Buff$
4300      PRINT "Set LOAD  to Port "&VAL$(Port(I))&". Then push [Enter]
key."
4310      INPUT "",Buff$
4320      OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:LOAD ";Port(I)
4330      OUTPUT @Agte507x;"*OPC?"
4340      ENTER @Agte507x;Buff$
4350    NEXT I
4360   !
4370   ! Transmission Measurement
4380   !
4390    FOR I=1 TO Num_of_ports-1
4400      FOR J=I+1 TO Num_of_ports
```

```
4410        PRINT "Set THRU between Port "&VAL$(Port(I))&" and Port
"&VAL$(Port(J))&". Then push [Enter] key."
4420        INPUT "",Buff$
4430        OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:THRU
";Port(I);",";Port(J)
4440        OUTPUT @Agte507x;"*OPC?"
4450        ENTER @Agte507x;Buff$
4460        OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:THRU
";Port(J);",";Port(I)
4470        OUTPUT @Agte507x;"*OPC?"
4480        ENTER @Agte507x;Buff$
4490      NEXT J
4500    NEXT I
4510    !
4520    ! Done
4530    !
4540    OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:SAVE"
4550    PRINT "Done"
4560  SUBEND
4570!
4580 Get_nop: SUB Get_nop(@Agte507x,INTEGER Nop,Ch$)
4590    ! Get All Segment's Points
4600    OUTPUT @Agte507x;":SENS"&Ch$&":SEGM:SWE:POIN?"
4610    ENTER @Agte507x;Nop
4620  SUBEND
4630 Exec_error_term: SUB Exec_error_term(@Agte507x,Rw$,Id$,Ch$,INTEGER
Idx,Nop,Respons,Stimulas,REAL Stok(*))
4640    INTEGER Ii
4650    REAL Error_term_data(1:5000)
4660    !
4670    DISP CHR$(138)&" Wait ..."&CHR$(136)
4680    !
4690    REDIM Error_term_data(1:Nop*2)
4700    !
4710    SELECT Rw$
4720    CASE "WRITE"
4730      FOR Ii=1 TO Nop
4740        Error_term_data(2*Ii-1)=Stok(Idx,2*Ii-1)
4750        Error_term_data(2*Ii)=Stok(Idx,2*Ii)
4760      NEXT Ii
4770      !
4780      OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COEF
"&Id$&",";Respons;",";Stimulas;",";Error_term_data(*)
4790      !
4800    CASE "READ"
4810      FOR Ii=1 TO Nop
4820        Error_term_data(2*Ii-1)=-999
4830        Error_term_data(2*Ii)=-999
4840      NEXT Ii
4850      !
4860      OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COEF?
"&Id$&",";Respons;",";Stimulas
4870      ENTER @Agte507x;Error_term_data(*)
4880      !
4890      CALL Data_plot(Id$,Respons,Stimulas,Nop,Error_term_data(*))
4900      !
4910      FOR Ii=1 TO Nop
4920        Stok(Idx,2*Ii-1)=Error_term_data(2*Ii-1)
4930        Stok(Idx,2*Ii)=Error_term_data(2*Ii)
4940      NEXT Ii
4950      !
4960    END SELECT
4970  SUBEND
4980!
```

```
4990 Data_plot: SUB Data_plot(Error_term$,INTEGER
Respons,Stimulas,Nop,REAL Error_term_data(*))
5000    INTEGER Ii,Pen(1:2)
5010    REAL Y_minmax(1:2)
5020    DIM Wk$[20]
5030    !
5040    CLEAR SCREEN
5050    GINIT
5060    GCLEAR
5070    !
5080    Pen(1)=3
5090    Pen(2)=4
5100    !
5110    ! Get Min Value and Max Value from all data
5120    Y_minmax(1)=MIN(Error_term_data(*))
5130    Y_minmax(2)=MAX(Error_term_data(*))
5150    !
5160    IF (Y_minmax(1)=Y_minmax(2)) AND (Y_minmax(1)=0) THEN
5170      Y_minmax(1)=1
5180      Y_minmax(2)=-1
5190    ELSE
5200      IF (Y_minmax(1)=Y_minmax(2)) THEN
5210        Y_minmax(1)=Y_minmax(1)*.5
5220        Y_minmax(2)=Y_minmax(2)*1.5
5230      END IF
5240    END IF
5250    !
5260    VIEWPORT 25*RATIO,80*RATIO,40,90
5270    WINDOW 1,Nop,Y_minmax(1),Y_minmax(2)
5280    FRAME
5290    !
5300    VIEWPORT 80*RATIO,100*RATIO,40,90
5310    WINDOW 0,2,0,2
5320    PEN Pen(1)
5330    CSIZE 2.5
5340    LORG 2
5350    MOVE .2,1.5
5360    DRAW .4,1.5
5370    MOVE .5,1.5
5380    PEN 1
5390    LABEL ":Real Value"
5400    !
5410    PEN Pen(2)
5420    MOVE .2,1
5430    DRAW .4,1
5440    MOVE .5,1
5450    PEN 1
5460    LABEL ":Image Value"
5470    !
5480    VIEWPORT 25*RATIO,80*RATIO,90,100
5490    WINDOW 0,2,0,2
5500    CSIZE 3
5510    LORG 5
5520    MOVE 1,1.2
5530    LABEL "Error Term:"&Error_term$
5540    !
5550    MOVE 1,.5
5560    LABEL "Respons Port:"&VAL$(Respons)&"  Stimulas
Port:"&VAL$(Stimulas)
5570    !
5580    VIEWPORT 0,25*RATIO,40,90
5590    WINDOW 0,2,0,2
5600    CLIP -10,10,-10,10
5610    LORG 8
```

```
5620    CSIZE 3
5630    !
5640    MOVE 1.9,0
5650    LABEL VAL$(Y_minmax(1))
5660    MOVE 1.9,2
5670    LABEL VAL$(Y_minmax(2))
5680    !
5690    VIEWPORT 25*RATIO,80*RATIO,30,40
5700    WINDOW 0,2,0,2
5710    CLIP -10,10,-10,10
5720    LORG 5
5730    MOVE 0,1.5
5740    LABEL VAL$(1)
5750    MOVE 2,1.5
5760    LABEL VAL$(Nop)
5770    !
5780    VIEWPORT 25*RATIO,80*RATIO,40,90
5790    WINDOW 1,Nop,Y_minmax(1),Y_minmax(2)
5800    FOR Ii=2 TO Nop
5820      PEN Pen(1)
5830      MOVE Ii-1,Error_term_data(2*(Ii-1)-1)
5840      DRAW Ii,Error_term_data(2*Ii-1)
5860      !
5870      PEN Pen(2)
5880      MOVE Ii-1,Error_term_data(2*(Ii-1))
5890      DRAW Ii,Error_term_data(2*Ii)
5900    NEXT Ii
5910    !
5920    PEN 1
5930    BEEP
5940    INPUT "Cont:push [Enter] key",Wk$
5950  SUBEND
5960!
```

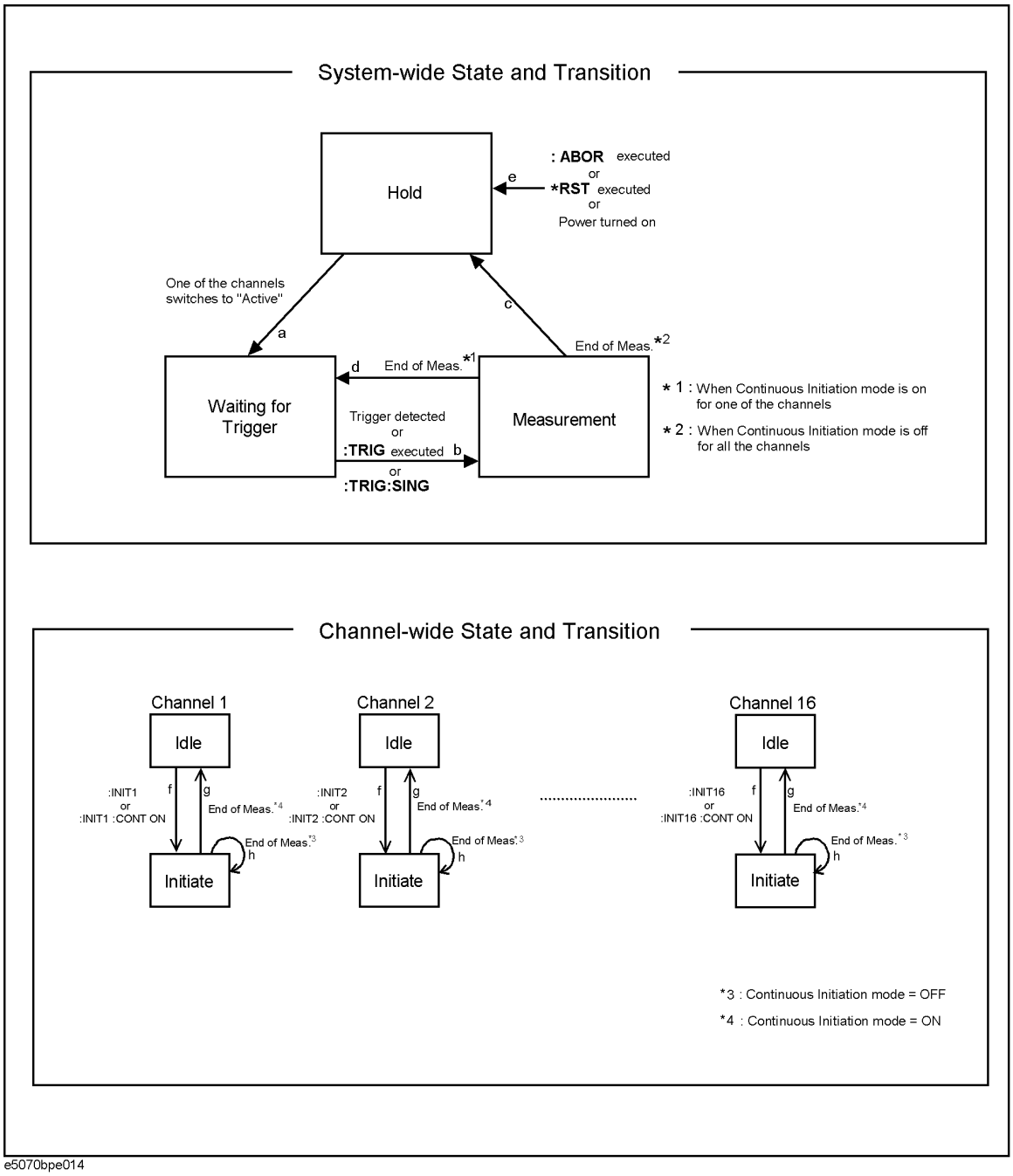
5 Making a Measurement

This chapter explains how to trigger the instrument to start a new measurement cycle and how to detect the end of a measurement cycle.

Trigger System

The trigger system is responsible for such tasks as detecting the start of a measurement cycle (triggering) and enabling/disabling measurement on each channel. As shown in Figure 5-1, the trigger system has two types of states: system-wide and channel-wide. The system-wide state can be “Hold”, “Waiting for Trigger”, or “Measurement”, while the channel-wide state can be “Idle” or “Initiate”.

Figure 5-1 Trigger system



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The following subsections describe each state and explains how the trigger system switches among the states.

System-wide states and transitions

"Hold" State

The trigger system switches to "Hold" state when one of the following commands has been executed (arrow "e" in Figure 5-1). Also, turning on the power to the instrument puts the trigger system into "Hold" state. When the power is turned on, however, continuous initiation mode is on for channel 1 and the trigger source is set to "Internal"; accordingly, the trigger system immediately switches to "Waiting for Trigger" state and subsequently repeats transitions between "Measurement" and "Waiting for Trigger" states.

- :ABOR on page 292
- *RST on page 289

When the trigger system is in "Hold" state and one of the channels switches to "Initiate" state (arrow "f" in Figure 5-1), the trigger system switches to "Waiting for Trigger" state (arrow "a" in Figure 5-1).

"Waiting for Trigger" State

When the trigger system is in "Waiting for Trigger" state and either the instrument is triggered (i.e., a trigger is detected) or one of the following commands is executed, the trigger system switches to "Measurement" state (arrow "B" in Figure 5-1).

- :TRIG on page 787
- :TRIG:SING on page 792

As shown in the table below, the instrument is triggered differently depending on which trigger source is specified. To specify the trigger source, use the :TRIG:SOUR command on page 793.

Trigger Source	How instrument is triggered
Internal trigger	The instrument is automatically triggered within itself.
External trigger	The instrument is triggered when a trigger signal is input through the Ext Trig terminal or the handler interface.
Bus trigger	The instrument is triggered when the *TRG command on page 291 is issued.
Manual trigger	The instrument is triggered when you press **[Trigger]** - **Trigger** on the front panel.

“Measurement” State

In “Measurement” state, the instrument waits for the elapse of the sweep delay time (set by the :SENS{1-16}:SWE:DEL command on page 677) and then starts a measurement cycle; this process is performed sequentially on each of those channels that were in “Initiate” state immediately before the transition to this state, in ascending order of channel number.

When the instrument has finished measuring all of the active channels, the trigger system behaves in one of the following ways depending on the setting of the continuous initiation mode.

If continuous initiation mode is off for all channels:

The trigger system switches to “Hold” state (arrow “c” in Figure 5-1).

If continuous initiation mode is on for one of the channels:

The trigger system switches to “Waiting for Trigger” state (arrow “d” in Figure 5-1).

Channel-wide states and transitions

“Idle” State

A channel switches to “Initiate” state when one of the following commands has been executed (arrow “f” in Figure 5-1).

- :INIT{1-16} on page 484
- :INIT{1-16}:CONT on page 485 (“ON” specified)

“Initiate” State

A channel in this state is measured just before the entire system switches to “Measurement” state.

When the instrument has finished measuring a channel, the channel behaves in one of the following ways depending on the setting of the continuous initiation mode (set by the :INIT{1-16}:CONT command on page 485).

If continuous initiation mode is off:	The channel switches to “Idle” state (arrow “g” in Figure 5-1).
If continuous initiation mode is on:	The channel remains in “Initiate” state (arrow “h” in Figure 5-1).

Starting a Measurement Cycle (triggering the instrument)

Configuring the instrument to automatically perform continuous measurement

Step 1. Use the :INIT{1-16}:CONT command on page 485 to turn on continuous initiation mode for the channels you want to measure and turn the mode off for any other channel.

Step 2. Issue the :TRIG:SOUR command on page 793 to set the trigger source to Internal trigger.

Starting Measurement on Demand

Step 1. Use the **:INIT{1-16}:CONT** command to turn on continuous initiation mode for the channels you want to measure and turn the mode off for any other channel.

Step 2. Issue the **:TRIG:SOUR** command to set the trigger source to "Bus Trigger".

Step 3. Trigger the instrument whenever you want to perform measurement. An external controller can trigger the instrument by using one of the following three commands:

Command	Can *OPC? command on page 288 be used to wait for end of sweep?	Applicable trigger source
*TRG on page 291	No	Bus trigger only
:TRIG on page 787		External trigger Bus trigger Manual trigger
:TRIG:SING on page 792	Yes	

Step 4. Repeat step 3 to start the next measurement cycle.

Waiting for the End of Measurement

Using the status register

The status of the E5070B/E5071B can be detected through the status registers. This section explains how to detect the end of measurement by using the status registers. For a complete description of the status report mechanism, including the specifications of each bit, see Appendix B, “Status Reporting System.”

Measurement status is reported by the operation status condition register (see Table B-3 on page 880). An SRQ (service request) is useful when creating a program that uses the information reported by this register to detect the end of measurement.

To detect the end of measurement via an SRQ, use one of the following commands:

- *SRE on page 290
- :STAT:OPER:ENAB on page 708
- :STAT:OPER:PTR on page 710
- :STAT:OPER:NTR on page 709

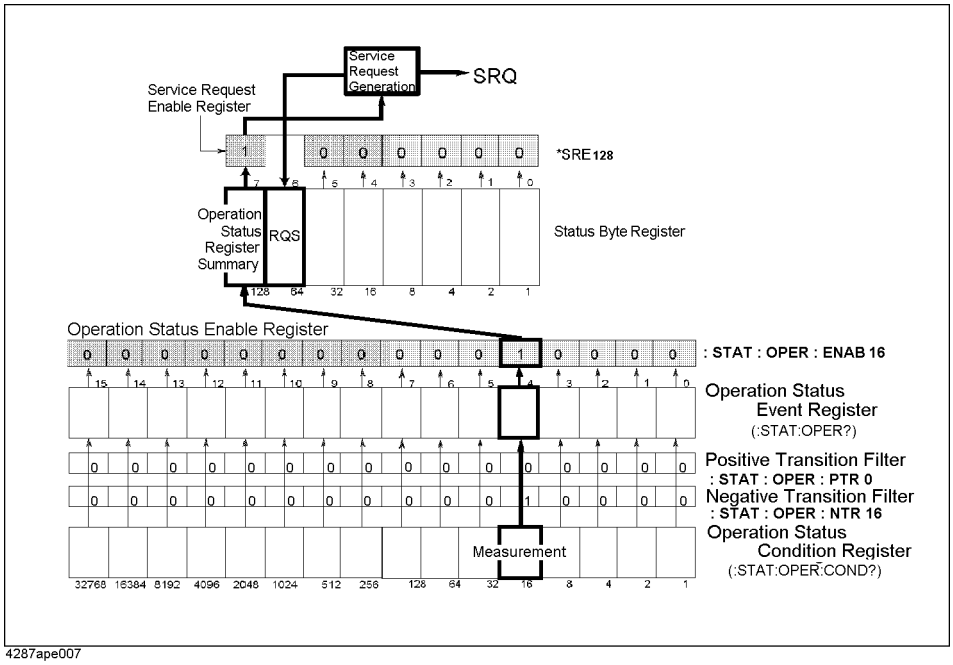
Follow these steps to utilize an SRQ:

Step 1. Configure the E5070B/E5071B so that it generates an SRQ when the operation status condition register’s bit 4 (a bit that is set to 1 during measurement) is changed from 1 to 0.

Step 2. Trigger the instrument to start a measurement cycle.

Step 3. When an SRQ is generated, the program interrupts the measurement cycle.

Figure 5-2 SRQ generation sequence (at end of measurement)



Sample Program

Example 5-2 is a sample program that demonstrates how to use an SRQ to detect the end of measurement. You can find the source file of this program, named srq_meas.htb, on the sample program disk.

NOTE This sample program correctly runs when the maximum number of channels/traces is set to 9 channels/9 traces.

The sample program sets up the trigger system, configures the instrument to properly generate an SRQ, and then triggers the instrument. When the instrument has generated an SRQ that indicates the end of measurement, the program exits after printing a measurement completion message.

The program is described in detail below:

Line 40	Assigns a GPIB address to the I/O pass.
Lines 60 to 140	These lines store the settings of continuous initiation mode for each channel (on for channels 1 and 2; off for channels 3 through 9) into the array variable Cont_mode$(*).
Lines 160 to 180	These lines turn on or off continuous initiation mode for each channel depending on the value of Cont_mode$(*).
Line 190	Sets the trigger source to “Bus Trigger”.
Lines 210 to 220	These lines configure the instrument so that operation status event register’s bit 4 is set to 1 only when the operation status condition register’s bit 4 is changed from 1 to 0 (negative transition).
Lines 230 to 240	These lines enable the operation status event register’s bit 4 and status byte register’s bit 7.
Lines 250 to 270	These lines clear the status byte register and operation status event register.
Lines 290 to 300	These lines set the branch target for an SRQ interrupt to enable SRQ interruptions.
Lines 310 to 320	These lines trigger the instrument and wait until the measurement cycle finishes.
Line 350	Displays a measurement completion message.

Example 5-1 **Using an SRQ to detect the end of measurement (srq_meas.htb)**

```
10      DIM Cont_mode$(1:9)[9],Buff$[9]
20      INTEGER I
30      !
40      ASSIGN @Agte507x TO 717
50      !
60      Cont_mode$(1)="ON"
70      Cont_mode$(2)="ON"
80      Cont_mode$(3)="OFF"
90      Cont_mode$(4)="OFF"
100     Cont_mode$(5)="OFF"
110     Cont_mode$(6)="OFF"
120     Cont_mode$(7)="OFF"
130     Cont_mode$(8)="OFF"
140     Cont_mode$(9)="OFF"
150     !
160     FOR I=1 TO 9
170       OUTPUT @Agte507x;":INIT"&VAL$(I)&":CONT "&Cont_mode$(I)
180     NEXT I
190     OUTPUT @Agte507x;":TRIG:SOUR BUS"
200     !
210     OUTPUT @Agte507x;":STAT:OPER:PTR 0"
220     OUTPUT @Agte507x;":STAT:OPER:NTR 16"
230     OUTPUT @Agte507x;":STAT:OPER:ENAB 16"
240     OUTPUT @Agte507x;"*SRE 128"
250     OUTPUT @Agte507x;"*CLS"
260     OUTPUT @Agte507x;"*OPC?"
270     ENTER @Agte507x;Buff$
280     !
290     ON INTR 7 GOTO Meas_end
300     ENABLE INTR 7;2
310     OUTPUT @Agte507x;"*TRG"
320     PRINT "Waiting..."
330 Meas_wait:  GOTO Meas_wait
340 Meas_end:  OFF INTR 7
350     PRINT "Measurement Complete"
360     END
```

Using the :TRIG:SING Command

When you trigger the instrument by issuing the :TRIG:SING command on page 792, you can use the ***OPC?** command to wait until the measurement cycle is completed.

Sample Program

Example 5-2 is a sample program that demonstrates how to use the **:TRIG:SING** command to wait until the measurement cycle is completed. You can find the source file of this program, named trg_sing.htb, on the sample program disk.

NOTE

This sample program correctly runs when the maximum number of channels/traces is set to 9 channels/9 traces.

The sample program uses the **:TRIG:SING** command to start a sweep (measurement) cycle, uses the ***OPC?** command to wait until the measurement cycle is completed, then prints a message and exits.

The program is described in detail below:

Line 40	Assigns a GPIB address to the I/O pass.
Lines 60 to 140	These lines store the settings of continuous initiation mode for each channel (on for channels 1 and 2; off for channels 3 through 9) into the array variable Cont_mode$(*).
Lines 160 to 180	These lines turn on or off continuous initiation mode for each channel depending on the value of Cont_mode$(*).
Line 190	Sets the trigger source to “Bus Trigger”.
Line 210	Triggers the instrument to start a sweep cycle.
Lines 220 to 230	These lines execute the ***OPC?** command and wait until the command returns 1 (i.e., the measurement cycle is completed).
Line 250	Displays a measurement completion message.

Example 5-2 **Using the :TRIG:SING command to wait until the end of measurement (trg_sing.htb)**

```
10      DIM Cont_mode$(1:9)[9],Buff$[9]
20      INTEGER I
30      !
40      ASSIGN @Agte507x TO 717
50      !
60      Cont_mode$(1)="ON"
70      Cont_mode$(2)="ON"
80      Cont_mode$(3)="OFF"
90      Cont_mode$(4)="OFF"
100     Cont_mode$(5)="OFF"
110     Cont_mode$(6)="OFF"
120     Cont_mode$(7)="OFF"
130     Cont_mode$(8)="OFF"
140     Cont_mode$(9)="OFF"
150     !
160     FOR I=1 TO 9
170       OUTPUT @Agte507x;":INIT"&VAL$(I)&":CONT "&Cont_mode$(I)
180     NEXT I
190     OUTPUT @Agte507x;":TRIG:SOUR BUS"
200     !
210     OUTPUT @Agte507x;":TRIG:SING"
220     OUTPUT @Agte507x;"*OPC?"
230     ENTER @Agte507x;Buff$
240     !
250     PRINT "Measurement complete"
260     END
```

Using wait time

Before creating your program, actually measure the time between the start and end of the measurement cycle. Then code your program so that the controller waits for the actually measured time by using the appropriate command (for example, the WAIT command for HTBasic). This is a straightforward method, but care must be taken: an incorrect wait time could result in an unexpected error.

Point Trigger Function

Point trigger

Point trigger is a method used to measure a single point each time the instrument is triggered.You can perform this type of measurement by turning ON/OFF the point trigger function.

Switching over modes

You can use the following command to toggle between the point trigger's ON/OFF status.

- :TRIG:POIN on page 791

NOTE If the trigger source is internal, the point trigger function does not work if it is specified to ON.

Low-latency external trigger

When the trigger source is an external trigger and the point trigger function is on, the low-latency external trigger function is available.The low-latency external trigger function is used to set the external trigger delay time each time a trigger for a measurement point is given.

The setting of the low-latency external trigger function is valid for all channels.

Setting the low-latency external trigger

To toggle ON/OFF the low-latency external trigger function, use the following command:

- :TRIG:EXT:LLAT on page 790

NOTE If the trigger source is not an external trigger, the low-latency external trigger function does not work if it is specified to ON, nor does it work when the point trigger function is off.

To set the external trigger delay time, use the following command:

- :TRIG:EXT:DEL on page 789

Averaging Trigger Function

Averaging trigger

The averaging trigger function is used to execute the number of sweeps specified as the averaging factor with a single trigger when the sweep averaging function is used. When a trigger is given, the sweep count is cleared, the sweep is executed the number of times specified by the averaging count, and then the instrument goes into Hold status.

The setting of the averaging trigger function is valid for all channels. Note that you can set the sweep averaging function for each channel.

Toggling the mode

To toggle ON/OFF the averaging trigger function, use the following command:

- :TRIG:AVER on page 788

NOTE

When the point trigger function is on, its setting has priority and the setting of the averaging trigger is ignored. More specifically, the required number of triggers is: number of measurement points in a single sweep x averaging factor.

When the averaging function is off for the active channel, the averaging trigger function does not work for the channel. When a trigger is given, the sweep is executed only once, and then the instrument goes into Hold status.

6 Analyzing Data

This chapter describes how to use markers, analysis commands, and fixture simulator features.

Retrieving Measurement Results at Specified Points

Markers allow you to retrieve measurement results at specified points. You can use up to eight markers for each trace, and you can move them to any point on the trace. In addition to the regular markers, you can use a reference marker.

Showing/hiding markers

To show or hide markers, including the reference marker, use the following command:

- :CALC{1-16}:MARK{1-10} on page 394

NOTE You can move markers or retrieve the data at a marker even when the markers are hidden.

NOTE The display of the reference marker is turned on or off when you turn On or Off Reference Marker mode.

Turning On or Off reference marker mode

Turning on Reference Marker mode provides relative marker values with respect to the reference marker (by subtracting the value at the reference marker from the value at a particular marker).

To turn On or Off Reference Marker mode, use the following command:

- :CALC{1-16}:MARK:REF on page 393

Setting (changing) and retrieving stimulus value at marker positions

To set (or change along the frequency axis) the stimulus value at a particular marker or the reference maker or to retrieve the current stimulus value, use the following command:

- :CALC{1-16}:MARK{1-10}:X on page 407

When Reference Marker mode is on, the stimulus value at a regular marker is a relative stimulus value obtained by subtracting the stimulus value at the reference marker from the actual stimulus value at that particular marker.

Retrieving measurement results at marker positions

To retrieve the measurement results (response values) at a particular marker or the reference marker, use the following command:

- :CALC{1-16}:MARK{1-10}:Y? on page 408

When Reference Marker mode is on, the response value at a regular marker is a relative value obtained by subtracting the response value at the reference marker from the actual response value at that particular marker.

Searching for Positions That Match Specified Criteria

You can search for a position that matches specified criteria by using the Marker Search feature or analysis commands.

Using marker search

NOTE Marker Search is available whether the markers are shown or hidden.

Setting the Search Range

You can use either the entire sweep range or a user-defined range for the marker search range by using the following command:

- :CALC{1-16}:MARK:FUNC:DOM on page 389

When you opt to use a user-defined range, use the following commands to set the range:

Start value (lower limit value)	:CALC{1-16}:MARK:FUNC:DOM:STAR on page 391
Stop value (upper limit value)	:CALC{1-16}:MARK:FUNC:DOM:STOP on page 392

You can also select whether to specify the marker search range independently for each trace by using the following command.

- :CALC{1-16}:MARK:FUNC:DOM:COUP on page 390

Selecting a Search Type

Marker Search allows you to choose from the following eight search types:

- ❑ Maximum value
- ❑ Minimum value
- ❑ Peak (3 types)
  - Maximum peak (for a positive peak), minimum peak (for a negative peak)
  - Peak nearest to the marker position on its left-hand side
  - Peak nearest to the marker position on its right-hand side
- ❑ Target (3 types)
  - Peak nearest to the marker position
  - Target nearest to the marker position on its left-hand side
  - Target nearest to the marker position on its right-hand side

To select a search type, use the following command:

- :CALC{1-16}:MARK{1-10}:FUNC:TYPE on page 405

Defining a Peak

You can define a peak by specifying the lower limit for the peak excursion value and polarity (positive or negative peak). The peak excursion value is the difference between the positive peak and the minimum value on either side of it (or between the negative peak and the maximum value on either side of it). For more information on the peak excursion value, see *User's Guide*.

To define a peak, use the following commands:

Lower limit for the peak excursion value	:CALC{1-16}:MARK{1-10}:FUNC:PEXC on page 400
Polarity	:CALC{1-16}:MARK{1-10}:FUNC:PPOL on page 401

Defining a Target

You can define a target by specifying the target value (response value) and transitional direction (positive or negative value change).

To define a target, use the following commands:

Target value	:CALC{1-16}:MARK{1-10}:FUNC:TARG on page 402
Transitional direction	:CALC{1-16}:MARK{1-10}:FUNC:TTR on page 404

Performing Marker Search

To perform Marker Search, use the following command:

- :CALC{1-16}:MARK{1-10}:FUNC:EXEC on page 399

To turn On or Off the Search Tracking feature, which performs Marker Search every time the trace is updated, use the following command:

- :CALC{1-16}:MARK{1-10}:FUNC:TRAC on page 403

Retrieving Search Results

Performing Marker Search moves the marker to the points that matches the search criteria, so you can obtain the search results by retrieving the marker value. For information on how to retrieve marker values, refer to "Setting (changing) and retrieving stimulus value at marker positions" on page 140 and "Retrieving measurement results at marker positions" on page 140.

Using the Analysis Commands

You can use the analysis Commands to perform search and analysis.

Setting the Search (Analysis) Range

You can use either the entire sweep range or a user-defined range as the search (analysis) range by using the following command:

- :CALC{1-16}:FUNC:DOM on page 367

When you opt to use a user-defined range, use the following commands to set the range:

Start value (lower limit value)	:CALC{1-16}:FUNC:DOM:STAR on page 369
Stop value (upper limit value)	:CALC{1-16}:FUNC:DOM:STOP on page 370

You can also select whether to specify the marker search (analysis) range independently for each trace by using the following command:

- :CALC{1-16}:FUNC:DOM:COUP on page 368

Selecting the Search (Analysis) Type

The analysis commands allows you to choose from the following five search types:

- ❑ Maximum value
- ❑ Minimum value
- ❑ Maximum peak (for a positive peak), minimum peak (for a negative peak)
- ❑ All peaks
- ❑ All targets

In addition, you can choose from the following three analysis types:

- ❑ Difference between the maximum and minimum values
- ❑ Standard deviation
- ❑ Average

To select the search (analysis) type, use the following command:

- :CALC{1-16}:FUNC:TYPE on page 376

Defining a Peak

You can define a peak by specifying the lower limit for the peak excursion value and polarity (positive or negative peak). The peak excursion value is the difference between the positive peak and the minimum value on either side of it (or between the negative peak and the maximum value on either side of it). For more information on the peak excursion value, see *User's Guide*.

To define a peak, use the following commands:

Lower limit for the peak excursion value	:CALC{1-16}:FUNC:PEXC on page 371
Polarity	:CALC{1-16}:FUNC:PPOL on page 373

Defining a Target

You can define a target by specifying the target value (response value) and transitional direction (positive or negative value change).

To define a target, use the following commands:

Target value	:CALC{1-16}:FUNC:TARG on page 374
Transitional direction	:CALC{1-16}:FUNC:TTR on page 375

Performing Search (Analysis)

To perform search (analysis), use the following command:

- :CALC{1-16}:FUNC:EXEC on page 370

Retrieving Search (Analysis) Results

To retrieve search (analysis) results, use the following command:

- :CALC{1-16}:FUNC:DATA? on page 366

The number of data items contained in search (analysis) results differ depending on the search (analysis) type and the number of points found by the search operation. To retrieve the number of data items, use the following command:

- :CALC{1-16}:FUNC:POIN? on page 372

Sample Program

Example 6-2 is a sample program that demonstrates how to search for peaks using the Marker Search feature and analysis commands. You can find the source file of this program, named search.htb, on the sample program disk.

This program works in two steps: first, it uses Marker Search to search for the maximum positive peak and displays the results; second, it uses analysis commands to search for all positive peaks and displays the results.

The program is described in detail below:

Line 50	Assigns a GPIB address to the I/O pass.
Line 60	Stores a peak excursion value of 0.5 into the Excursion variable.
Lines 80 to 120	These lines configure the system to generate an SRQ when it cannot perform Bandwidth Search due to an error.
Lines 130 to 140	These lines set the branch target for an SRQ interrupt to enable SRQ interruptions.
Line 180	Sets the active trace to trace 1.
Line 190	Sets the search type for marker 1 to Peak.
Lines 200 to 210	These lines set the Excursion variable to the peak excursion value for the peak search of marker 1 and set the polarity to Positive Peak.
Line 220	Performs Peak Search and moves marker 1 to the maximum positive peak.
Lines 230 to 240	These lines retrieve the frequency at marker 1.
Lines 250 to 260	These lines retrieve the response value at marker 1.
Lines 270 to 290	These lines display the results of searching for the maximum positive peak.
Line 330	Sets the analysis range to the entire sweep range.
Line 340	Sets the search type of the analysis command to All Peaks.
Lines 350 to 360	These lines set the Excursion variable to the peak excursion value for the analysis command's peak search and set the polarity to Positive Peak.
Line 370	Searches for all peaks.
Lines 380 to 390	These lines retrieve the number of data pairs contained in the search results and store that number into the Point variable.
Line 400	Resizes the Result array based on the value of the Point variable.
Lines 380 to 390	These lines retrieve the response values and frequencies for all peaks.
Lines 430 to 470	These lines display the results of searching for all peaks.
Lines 490 to 530	These lines define an error handler that retrieves and displays the number and message of an error that has occurred.

Example 6-1 **Peak Search (search.htb)**

```
10      DIM Buff$[9],Img$[50],Err_msg$[100]
20      REAL Excursion,Freq,Resp,Result(1:100,1:2)
30      INTEGER Poin,Err_no
40      !
50      ASSIGN @Agte507x TO 717
60      Excursion=.5
70      !
80      OUTPUT @Agte507x;"*ESE 60"
90      OUTPUT @Agte507x;"*SRE 32"
100     OUTPUT @Agte507x;"*CLS"
110     OUTPUT @Agte507x;"*OPC?"
120     ENTER @Agte507x;Buff$
130     ON INTR 7 GOTO Err
140     ENABLE INTR 7;2
150     !
160     PRINT "Maximum Peak Search using Marker 1"
170     !
180     OUTPUT @Agte507x;":CALC1:PAR1:SEL"
190     OUTPUT @Agte507x;":CALC1:MARK1:FUNC:TYPE PEAK"
200     OUTPUT @Agte507x;":CALC1:MARK1:FUNC:PEXC ";Excursion
210     OUTPUT @Agte507x;":CALC1:MARK1:FUNC:PPOL POS"
220     OUTPUT @Agte507x;":CALC1:MARK1:FUNC:EXEC"
230     OUTPUT @Agte507x;":CALC1:MARK1:X?"
240     ENTER @Agte507x;Freq
250     OUTPUT @Agte507x;":CALC1:MARK1:Y?"
260     ENTER @Agte507x;Resp
270     Img$="8A,MD.4DE,2X,MD.6DE"
280     PRINT "         Frequency      Response"
290     PRINT USING Img$;"Peak:   ",Freq,Resp
300     !
310     PRINT "All Peaks Search using Command"
320     !
330     OUTPUT @Agte507x;":CALC1:FUNC:DOM OFF"
340     OUTPUT @Agte507x;":CALC1:FUNC:TYPE APE"
350     OUTPUT @Agte507x;":CALC1:FUNC:PEXC ";Excursion
360     OUTPUT @Agte507x;":CALC1:FUNC:PPOL POS"
370     OUTPUT @Agte507x;":CALC1:FUNC:EXEC"
380     OUTPUT @Agte507x;":CALC1:FUNC:POIN?"
390     ENTER @Agte507x;Poin
400     REDIM Result(1:Poin,1:2)
410     OUTPUT @Agte507x;":CALC1:FUNC:DATA?"
420     ENTER @Agte507x;Result(*)
430     Img$="4A,2D,2A,MD.4DE,2X,MD.6DE"
440     PRINT "         Frequency      Response"
450     FOR I=1 TO Poin
460       PRINT USING Img$;"Peak",I,": ",Result(I,2),Result(I,1)
470     NEXT I
480     GOTO No_err
490 Err: OFF INTR 7
500     OUTPUT @Agte507x;";:SYST:ERR?"
510     ENTER @Agte507x;Err_no,Err_msg$
520     PRINT "Error occurred!!"
530     PRINT "  No:";Err_no,"Description: "&Err_msg$
540 No_err: OFF INTR 7
550     END
```

Bandwidth Search

The E5070B/E5071B has a feature called Bandwidth Search. This feature searches for the cutoff points on both right- and left-hand sides of the marker position on the trace.

- Bandwidth ($BW = high - low$)
- Center frequency ($cent = \frac{high + low}{2}$)
- Q value ($Q = \frac{cent}{BW}$)
- Loss (response value at the marker position)

Where $high$ is the right-hand cutoff point frequency; low is the left-hand cutoff point frequency.

Setting the bandwidth definition value

Bandwidth Search finds a point whose response value is different, by the amount defined as the bandwidth definition value, from the response value at the marker position, and identifies that point as the cutoff point.

To set the bandwidth definition value, use the following command:

- :CALC{1-16}:MARK{1-10}:BWID:THR on page 397

Retrieving bandwidth search results

Once you have moved the marker to the appropriate position using Marker Search or some other feature, you can retrieve the results of Bandwidth Search by using the following command:

- :CALC{1-16}:MARK{1-10}:BWID:DATA? on page 396

Also, you can use the following command to control whether to display the results of Bandwidth Search on the LCD:

- :CALC{1-16}:MARK:BWID on page 387

NOTE You can retrieve the results of Bandwidth Search even after you have turned off the display of markers or the results of Bandwidth Search.

Sample Program

Example 6-2 shows a sample program that demonstrates how to perform Bandwidth Search. You can find the source file of this program, named bandwid.htb, on the sample program disk.

The sample program moves the marker to the maximum value position and then retrieves and displays the results of Bandwidth Search.

The program is described in detail below:

Line 50 Assigns a GPIB address to the I/O pass.

Line 60 Stores a bandwidth definition value of 3 into the Threshold variable.

Lines 80 to 120	These lines configure the system to generate an SRQ when it cannot perform Bandwidth Search due to an error.
Lines 130 to 140	These lines set the branch target for an SRQ interrupt to enable SRQ interruptions.
Line 160	Sets the search type for marker 1 to Peak.
Lines 170 to 180	These lines use the Marker Search feature to move the marker to the maximum value position.
Line 190	Sets the bandwidth definition value to Threshold.
Lines 200	Sends the command to retrieve the results of Bandwidth Search.
Lines 210	Waits 0.5 seconds to prevent retrieval before an SRQ is generated if an error occurs on Bandwidth Search.
Lines 220	Retrieves the results of Bandwidth Search.
Lines 240 to 280	These lines display the results of Bandwidth Search.
Lines 310 to 350	These lines define an error handler that retrieves and displays the number and message of an error that has occurred.

Example 6-2 **Bandwidth Search (bandwid.htb)**

```
10     DIM Buff$[9],Err_msg$[100]
20     REAL Threshold,Bwid,Cent,Q,Loss
30     INTEGER Err_no
40     !
50     ASSIGN @Agte507x TO 717
60     Threshold=-3
70     !
80     OUTPUT @Agte507x;"*ESE 60"
90     OUTPUT @Agte507x;"*SRE 32"
100    OUTPUT @Agte507x;"*CLS"
110    OUTPUT @Agte507x;"*OPC?"
120    ENTER @Agte507x;Buff$
130    ON INTR 7 GOTO Err
140    ENABLE INTR 7;2
150    !
160    OUTPUT @Agte507x;":CALC1:PAR1:SEL"
170    OUTPUT @Agte507x;":CALC1:MARK1:FUNC:TYPE MAX"
180    OUTPUT @Agte507x;":CALC1:MARK1:FUNC:EXEC"
190    OUTPUT @Agte507x;":CALC1:MARK1:BWID:THR ";Threshold
200    OUTPUT @Agte507x;":CALC1:MARK1:BWID:DATA?"
210    WAIT .5
220    ENTER @Agte507x;Bwid,Cent,Q,Loss
230    !
240    PRINT "## Bandwidth Search ##"
250    PRINT "Bandwidth       : ",Bwid
260    PRINT "Center Frequency: ",Cent
270    PRINT "Q               : ",Q
280    PRINT "Loss            : ",Loss
290    !
300    GOTO No_err
310 Err: OFF INTR 7
320    OUTPUT @Agte507x;";:SYST:ERR?"
330    ENTER @Agte507x;Err_no,Err_msg$
340    PRINT "Error occurred!!"
350    PRINT "  No:";Err_no,"Description: "&Err_msg$
360 No_err: OFF INTR 7
370    END
```

Statistical Analysis

The E5070B/E5071B provides a mechanism that analyzes trace statistics. You can analyze the following statistics:

- ❑ Average
- ❑ Standard deviation
- ❑ Difference between the maximum and minimum values

To retrieve the results of statistical analysis, use the following command:

- :CALC{1-16}:MST:DATA? on page 413

Also, you can use the following command to control whether to display the results of statistical analysis on the LCD:

- :CALC{1-16}:MST on page 412

NOTE You can retrieve the results of statistical analysis even after you have turned off the display showing these results.

Alternatively, you can use the analysis commands to analyze the trace statistics. When you use the analysis commands, you can analyze the trace data in a specific range as well as the trace data throughout the entire sweep range. For information on how to use the analysis commands, refer to “Using the Analysis Commands” on page 143.

Analysis Using the Fixture Simulator

The Fixture Simulator provides the following functions:

- ❏ Matching Circuit Embedding
- ❏ Port Impedance Conversion
- ❏ Network De-embedding
- ❏ 4-Port Network Embedding/De-embedding
- ❏ Balance-Unbalance Conversion (only 3-port/4-port models)
- ❏ Differential Matching Circuit Embedding (only 3-port/4-port models)
- ❏ Differential Port Impedance Conversion (only 3-port/4-port models)

Before you can use any of the features listed above, you must turn on the desired feature individually and issue the following command to turn on the Fixture Simulator:

- :CALC{1-16}:FSIM:STAT on page 365

Matching Circuit Embedding

The Matching Circuit feature simulates the characteristics that the DUT would exhibit when connected to a matching circuit.

On/Off

To turn on or off the Matching Circuit, use the following command:

- :CALC{1-16}:FSIM:SEND:PMC:STAT on page 360

You can only turn on or off Matching Circuit for all the ports, not for each port individually. However, any port whose circuit type is set to “None” behaves as if this feature were permanently off.

Configuring the Matching Circuit Settings

To select a circuit type, use the following command:

- :CALC{1-16}:FSIM:SEND:PMC:PORT{1-4} on page 354

To set the circuit constant, use the following commands:

Circuit constant	Command
C	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:C on page 355
G	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:G on page 356
L	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:L on page 357
R	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:R on page 358

When you want to use a user file to define the circuit type, specify the file by using the following command:

- :CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:USER:FIL on page 359

Port Impedance Conversion

The Port Impedance Conversion feature converts the measurement results with a port impedance of 50 Ω to the characteristics of a different port impedance.

On/Off

To turn on or off Port Impedance Conversion, use the following command:

- :CALC{1-16}:FSIM:SEND:ZCON:STAT on page 364

You can only turn on or off Port Impedance Conversion for all of the ports, not for each port individually. However, any port with ZO set to 50 Ω behaves as if this feature were permanently off.

Setting the Z0 Value

To set the target port impedance, use the following command:

- :CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:Z0 on page 363
- :CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:REAL on page 362
- :CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:IMAG on page 361

Network De-embedding

The Network De-embedding feature eliminates any network that can cause error between the calibration level and the DUT.

On/Off

To turn on or off Network De-embedding, use the following command:

- :CALC{1-16}:FSIM:SEND:DEEM:STAT on page 353

You can only turn on or off Network De-embedding for all of the ports, not for each port individually. However, any port whose Network De-embedding type is set to “None” behaves as if this feature were permanently off.

Selecting a Type

To select a Network De-embedding type, use the following command:

- :CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4} on page 351

Specifying the File

To specify the file that defines the criteria for Network De-embedding, use the following command:

- :CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4}:USER:FIL on page 352

4-Port Network Embedding/De-embedding

The 4-port Network Embedding/De-embedding feature is provided to embed or de-embed a network (defined in a 4-port touchstone file) between the calibration surface and the DUT.

On/Off

To turn on or off the 4-port network embedding/de-embedding feature, use the following command:

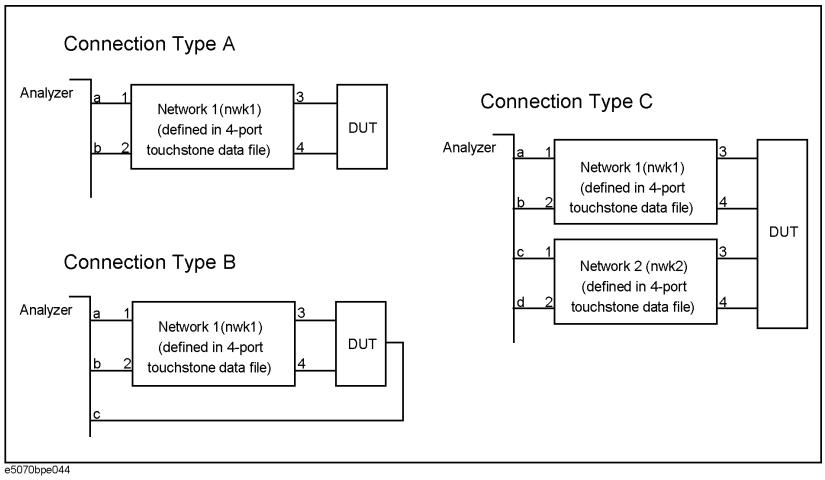
- :CALC{1-16}:FSIM:EMB:STAT on page 346

Setting Topology (connection method between analyzer and DUT)

To select a connection type, use the following command:

- :CALC{1-16}:FSIM:EMB:TYPE on page 350

Figure 6-1 **Connection type**



To assign the ports (ports a through d in Figure 6-1), use the appropriate command that matches your selected connection type, as identified in the following table:

Connection type	Command
A	:CALC{1-16}:FSIM:EMB:TOP:A:PORT on page 347
B	:CALC{1-16}:FSIM:EMB:TOP:B:PORT on page 348
C	:CALC{1-16}:FSIM:EMB:TOP:C:PORT on page 349

Selecting Processing Type (embedding/de-embedding)

To select a network processing type, use the following command:

- :CALC{1-16}:FSIM:EMB:NETW{1-2}:TYPE on page 345

Specifying File

To select a file that defines the criteria for network embedding/de-embedding, use the following command:

- :CALC{1-16}:FSIM:EMB:NETW{1-2}:FIL on page 344

Balance-Unbalance Conversion

The Balance-Unbalance Conversion feature converts the measurement results obtained in an unbalanced state to the characteristics of a balanced state. You can select mixed mode S parameter, balance and CMRR as the measurement parameter when you turn on Balance-Unbalance Conversion.

On/Off

You can turn on or off Balance-Unbalance Conversion for each trace individually. To turn on or off Balance-Unbalance Conversion, use the following command:

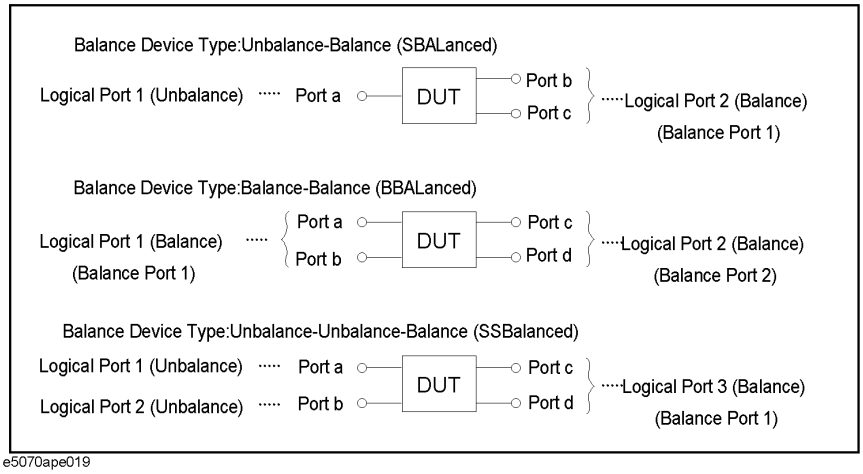
- :CALC{1-16}:FSIM:BAL:PAR{1-16}:STAT on page 339

Setting the Topology

To select a balance device type, use the following command:

- :CALC{1-16}:FSIM:BAL:DEV on page 324

Figure 6-2 Balance device type



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To assign the ports (ports a through d in Figure 6-2), use the command that matches your selected device type, as identified in the following table:

Device type	Command
Unbalance-balance (SBALanced)	:CALC{1-16}:FSIM:BAL:TOP:SBAL on page 342
Balance-balance (BBALanced)	:CALC{1-16}:FSIM:BAL:TOP:BBAL on page 340
Unbalance-unbalance-balance (SSBalanced)	:CALC{1-16}:FSIM:BAL:TOP:SSB on page 343

Selecting the Measurement Parameter

To select the measurement parameter, use the command that matches your selected device type, as identified in the following table:

Device type	Command
Unbalance-balance	:CALC{1-16}:FSIM:BAL:PAR{1-16}:SBAL on page 337

Device type	Command
Balance-balance	:CALC{1-16}:FSIM:BAL:PAR{1-16}:BBAL on page 336
Unbalance-unbalance-balance	:CALC{1-16}:FSIM:BAL:PAR{1-16}:SSB on page 338

Differential Matching Circuit Embedding

The Differential Matching Circuit Embedding feature simulates the characteristics the DUT would exhibit if a balance-unbalance converted differential port were connected to a matching circuit after being subjected to balance-unbalance conversion.

On/Off

To turn on or off Differential Matching Circuit Embedding, use the following command:

- :CALC{1-16}:FSIM:BAL:DMC:STAT on page 331

You can only turn on or off Differential Matching Circuit Embedding for all of the ports, not for each balance port individually. However, any balance port whose circuit type is set to “None” behaves as if this feature were permanently off.

Configuring the Matching Circuit Settings

To select a circuit type, use the following command:

- :CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2} on page 325

To set the circuit constant, use the following commands:

Circuit constant	Command
C	:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:C on page 326
G	:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:G on page 327
L	:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:L on page 328
R	:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:R on page 329

When you want to use a user file to define the circuit type, specify the file using the following command:

- :CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:USER:FIL on page 330

Differential Port Impedance Conversion

The Differential Port Impedance Conversion feature converts the measurement results for a balance-unbalance converted differential port to the characteristics of a different port impedance.

On/Off

To turn on or off Differential Port Impedance Conversion, use the following command:

- :CALC{1-16}:FSIM:BAL:DZC:STAT on page 335

You can only turn on or off Differential Port Impedance Conversion for all of the balance ports, not for each port individually.

Setting the Z0 Value

To set the target differential port impedance, use the following command:

- :CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:Z0 on page 334
- :CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:REAL on page 333
- :CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:IMAG on page 332

Sample Program

Example 6-2 shows a sample program that demonstrates how to use the Fixture Simulator. You can find the source file of this program, named fixture.htb, on the sample program disk.

The program configures the Balance-Unbalance Conversion, Differential Matching Circuit Embedding, Port Impedance Conversion, and Differential Port Impedance Conversion features so that the instrument can correctly deal with an unbalance-balance (3-port) DUT.

The program is described in detail below:

Line 50	Assigns a GPIB address to the I/O pass.
Lines 70 to 100	These lines store the balance device type (unbalance-balance), port assignments (logical port 1 = port 1, logical port 2 = port 2 and port 3), and measurement parameter (Sds21) into the variables Dev_type$, Port(*), and Para$, respectively.
Lines 120 to 150	These lines store the balance matching circuit constants (C:1 pF, G:2 mS, L:30 nH, R:4 mΩ) into the variables Dmc_c, Dmc_g, Dmc_l, and Dmc_r, respectively.
Lines 160 to 170	These lines store the port impedance (100 Ω) and the differential port impedance (210 Ω) into the variables Z0_se and Z0_diff, respectively.
Lines 210 to 230	These lines set the balance device type to Dev_type$, the port assignment to Port(*), and the measurement parameter of port 1 (Sds21) to Para$.
Line 240	Turns on Balance-Unbalance Conversion.
Line 280	Specifies the type of differential matching circuit to be a circuit composed of an L and a shunt C.
Lines 290 to 320	These lines set the differential matching circuit constants (C, G, L, R) to Dmc_c, Dmc_g, Dmc_l, and Dmc_r, respectively.
Line 330	Turns on Differential Matching Circuit Embedding.
Lines 370 to 380	Sets the port impedance of port 2 and port 3 to Z0_se.
Line 390	Turns on Port Impedance Conversion.
Line 430	Sets the differential port impedance of balance port 1 to Z0_diff.
Line 440	Turns on Differential Port Impedance Conversion.
Line 480	Turns on the Fixture Simulator.

Example 6-3 **Fixture Simulator (fixture.htb)**

```
10      DIM Dev_type$[9],Para$[9]
20      REAL Dmc_c,Dmc_g,Dmc_l,Dmc_r,Z0_se,Z0_diff
30      INTEGER Port(1:3)
40      !
50      ASSIGN @Agte507x TO 717
60      !
70      Dev_type$="SBAL"        ! Device Type     : SE-Bal
80      Port(1)=1               ! Port1(SE)       : 1
90      Port(2)=2               ! Port2(Bal)      : 2,3
100     Port(3)=3               !
110     Para$="SDS21"           ! Meas. Parameter : Sds21
120     Dmc_c=1.E-12            ! Diff.          C: 1 pF
130     Dmc_g=2.E-3             !   Matching     G: 2 mS
140     Dmc_l=3.E-8             !     Circuit    L: 30 nH
150     Dmc_r=4.E-3             !                R: 4 mohm
160     Z0_se=100               ! Z Conversion  Z0: 100 ohm
170     Z0_diff=210             ! Diff. Z Conv. Z0: 210 ohm
180     !
190     ! Balance-Unbalance Conversion Setting
200     !
210     OUTPUT @Agte507x;":CALC1:FSIM:BAL:DEV "&Dev_type$
220     OUTPUT @Agte507x;":CALC1:FSIM:BAL:TOP:"&Dev_type$&" ";Port(*)
230     OUTPUT @Agte507x;":CALC1:FSIM:BAL:PAR1:"&Dev_type$&" "&Para$
240     OUTPUT @Agte507x;":CALC1:FSIM:BAL:PAR1:STAT ON"
250     !
260     ! Diff. Matching Circuit Setting
270     !
280     OUTPUT @Agte507x;":CALC1:FSIM:BAL:DMC:BPOR1 PLPC"
290     OUTPUT @Agte507x;":CALC1:FSIM:BAL:DMC:BPOR1:PAR:C ";Dmc_c
300     OUTPUT @Agte507x;":CALC1:FSIM:BAL:DMC:BPOR1:PAR:G ";Dmc_g
310     OUTPUT @Agte507x;":CALC1:FSIM:BAL:DMC:BPOR1:PAR:L ";Dmc_l
320     OUTPUT @Agte507x;":CALC1:FSIM:BAL:DMC:BPOR1:PAR:R ";Dmc_r
330     OUTPUT @Agte507x;":CALC1:FSIM:BAL:DMC:STAT ON"
340     !
350     ! Z Conversion Setting
360     !
370     OUTPUT @Agte507x;":CALC1:FSIM:SEND:ZCON:PORT2:Z0 ";Z0_se
380     OUTPUT @Agte507x;":CALC1:FSIM:SEND:ZCON:PORT3:Z0 ";Z0_se
390     OUTPUT @Agte507x;":CALC1:FSIM:SEND:ZCON:STAT ON"
400     !
410     ! Diff. Z Conversion Setting
420     !
430     OUTPUT @Agte507x;":CALC1:FSIM:BAL:DZC:BPOR1:Z0 ";Z0_diff
440     OUTPUT @Agte507x;":CALC1:FSIM:BAL:DZC:STAT ON"
450     !
460     ! Fixture Simulator On/Off
470     !
480     OUTPUT @Agte507x;":CALC1:FSIM:STAT ON"
490     !
500     END
```

Analysis in Time Domain (time domain function)

The time domain function provides the following functions:

- ❑ Transforming measurement data to data in the time domain (Transformation Function)
- ❑ Deleting unnecessary measurement data in the time domain (Gating Function)

Transforming measurement data to data in time domain

By using the Transformation Function, you can convert the results measured in the frequency domain to data in the time domain and analyze it.

On/Off

To turn on or off the transformation function, use the following command:

- :CALC{1-16}:TRAN:TIME:STAT on page 435

Selecting Transformation Type

To select the transformation type (band pass/low pass), use the following command:

- :CALC{1-16}:TRAN:TIME on page 429

To select the stimulus type (impulse/step) when the transformation type is low pass, use the following command:

- :CALC{1-16}:TRAN:TIME:STIM on page 437

When the transformation type is low pass, you need to execute the following command because each measurement point must be a multiple of the start frequency.

- :CALC{1-16}:TRAN:TIME:LPFR on page 433

Setting Window Shape

To set the window shape, use one of the following items.

Item	Command
β	:CALC{1-16}:TRAN:TIME:KBES on page 432
Impulse width	:CALC{1-16}:TRAN:TIME:IMP:WIDT on page 431
Rise time of step signal	:CALC{1-16}:TRAN:TIME:STEP:RTIM on page 436

The above three items are dependent on each other. When the value of one of them is changed, the values of the other two are automatically changed to corresponding values.

Unlike manual operation, you cannot set the window shape by selecting the window type (maximum/normal/minimum). However, you can set the same shape as each window type by setting β as follows:

	Maximum	Normal	Minimum
Value of β.	13	6	0

Setting Display Range

To set the display range after time domain transformation, use the following commands:

Start value	:CALC{1-16}:TRAN:TIME:STAR on page 434
Stop value	:CALC{1-16}:TRAN:TIME:STOP on page 438
Center value	:CALC{1-16}:TRAN:TIME:CENT on page 430
Span value	:CALC{1-16}:TRAN:TIME:SPAN on page 433

Deleting unnecessary measurement data in the time domain

You can use the Gating Function to delete unnecessary time domain data.

On/Off

To turn on or off the gating function, use the following command:

- :CALC{1-16}:FILT:TIME:STAT on page 316

Selecting Gate Type

To select the gate type, use the following command:

- :CALC{1-16}:FILT:TIME on page 311

Setting Gate Shape

To select the gate shape, use the following command:

- :CALC{1-16}:FILT:TIME:SHAP on page 313

Setting Gate Range

To set the gate range, use the following commands:

Start value	:CALC{1-16}:FILT:TIME:STAR on page 315
Stop value	:CALC{1-16}:FILT:TIME:STOP on page 317
Center value	:CALC{1-16}:FILT:TIME:CENT on page 312
Span value	:CALC{1-16}:FILT:TIME:SPAN on page 314

Sample Program

Example 6-2 shows a sample program that demonstrates how to use the transformation function of the time domain function. You can find the source file of this program, named time_dom.htb, on the sample program disk.

The sample program executes calibration (ECal), performs measurement once, converts the results to data in the time domain, and displays this data.

The program is described in detail below:

Line 50	Assigns a GPIB address to the I/O path.
Lines 70 to 90	These lines set the sweep stop frequency (3 GHz), the number of points (201), and the measurement parameter (S11) to the Stop_freq, Nop, and Para$ variables, respectively.
Lines 110 to 150	These lines set the transformation type (low pass), the stimulus type (impulse), the β value of the window (13), the start value of the display range (0 s), and the stop value of the display range (10 ns) into the Tran_type$, Stim_type$, Win_beta, Star_time, and Stop_time variables, respectively.
Lines 170 to 190	After preset, These lines set the sweep stop frequency to Stop_freq and the number of points to Nop.
Line 210	Sets a measurement point that is appropriate when the transformation type is low pass.
Lines 230 to 240	These lines set the measurement parameter to Para$ and the trigger source to BUS.
Lines 280 to 320	These lines use the ECal module to execute 1-port calibration on port 1.
Lines 360 to 410	These lines perform measurement once after the DUT is connected.
Lines 430 to 450	These lines execute auto scale and suspend progress to the next process (transformation to data in the time domain) until any key is pressed.
Lines 490 to 530	These lines set the transformation type to Tran_type$, the stimulus type to Stim_type$, the β value of the window to Win_beta, the start value of the display range to Star_time, and the stop value of the display range to Stop_time.
Line 540	Turns on the transformation function of the time domain function.
Lines 560 to 580	These lines set the data format to the real format and execute auto scale.

Example 6-4 **Time Domain Transformation (time_dom.htb)**

```
10      DIM Para$[9],Tran_type$[9],Stim_type$[9],Buff$[9],Inp_ch
ar$[9]
20      REAL Stop_freq,Win_beta,Star_time,Stop_time
30      INTEGER Nop
40      !
50      ASSIGN @Agte507x TO 717
60      !
70      Stop_freq=3.E+9       ! Stop Frequency  : 3 GHz
```

```
80     Nop=201                ! Nop              : 201
90     Para$="S11"            ! Meas. Parameter  : S11
100    !
110    Tran_type$="LPAS"      ! Transform Type   : Lowpass
120    Stim_type$="IMP"       ! Stimulus Type    : Impulse
130    Win_beta=13            ! Window Beta      : 13 (Maximum Type)
140    Star_time=0            ! Start time       : 0 s
150    Stop_time=1.E-8        ! Stop time        : 10 ns
160    !
170    OUTPUT @Agte507x;":SYST:PRES"
180    OUTPUT @Agte507x;":SENS1:FREQ:STOP ";Stop_freq
190    OUTPUT @Agte507x;":SENS1:SWE:POIN ";Nop
200    !
210    OUTPUT @Agte507x;":CALC1:TRAN:TIME:LPFR"
220    !
230    OUTPUT @Agte507x;":CALC1:PAR1:DEF "&Para$
240    OUTPUT @Agte507x;":TRIG:SOUR BUS"
250    !
260    ! 1 Port Full Calibration (ECal)
270    !
280    PRINT "Connect Port 1 to ECal Module. Then push [Enter] key."
290    INPUT "",Buff$
300    OUTPUT @Agte507x;":SENS1:CORR:COLL:ECAL:SOLT1 1"
310    OUTPUT @Agte507x;":SYST:ERR?"
320    ENTER @Agte507x;Buff$
330    !
340    ! Measurement
350    !
360    PRINT "Set DUT. Then Push [Enter] key."
370    INPUT "",Inp_char$
380    !
390    OUTPUT @Agte507x;":TRIG:SING"
400    OUTPUT @Agte507x;"*OPC?"
410    ENTER @Agte507x;Buff$
420    !
430    OUTPUT @Agte507x;":DISP:WIND1:TRAC1:Y:AUTO"
440    PRINT "Push [Enter] key. -> [Time Domain Transform]"
450    INPUT "",Inp_char$
460    !
470    ! Time Domain Transform
480    !
490    OUTPUT @Agte507x;":CALC1:TRAN:TIME "&Tran_type$
500    OUTPUT @Agte507x;":CALC1:TRAN:TIME:STIM "&Stim_type$
510    OUTPUT @Agte507x;":CALC1:TRAN:TIME:KBES ";Win_beta
520    OUTPUT @Agte507x;":CALC1:TRAN:TIME:STAR ";Star_time
530    OUTPUT @Agte507x;":CALC1:TRAN:TIME:STOP ";Stop_time
540    OUTPUT @Agte507x;":CALC1:TRAN:TIME:STAT ON"
550    !
560    OUTPUT @Agte507x;":CALC1:PAR1:SEL"
570    OUTPUT @Agte507x;":CALC1:FORM REAL"
580    OUTPUT @Agte507x;":DISP:WIND1:TRAC1:Y:AUTO"
590    END
```

Analyzing impedance

By turning on the parameter conversion function, you can convert the measurement result of the S parameter to the following parameters.

- ❏ Equivalent impedance in reflection measurement
- ❏ Equivalent impedance in transmission measurement
- ❏ Equivalent admittance in reflection measurement
- ❏ Equivalent admittance in transmission measurement
- ❏ Inverse of S-parameter (1/S)

To turn On/Off the parameter conversion function, use the following command:

- :CALC{1-16}:CONV on page 301

To select the parameter to which you want to convert the measurement result, use the following command:

- :CALC{1-16}:CONV:FUNC on page 302

7 Reading/Writing Measurement Data

This chapter provides an overview of the Agilent E5070B/E5071B's internal data processing flow and describes how to read and write measurement results (internal data array).

Data Transfer Format

When you transfer data using the one of the following commands, you can choose among ASCII transfer format, IEEE 64-bit floating point binary transfer format and IEEE 32-bit floating point binary transfer format.

NOTE The instrument always uses the ASCII transfer format when you transfer data without using any of the following commands.

- :CALC{1-16}:BLIM:REP? on page 300
- :CALC{1-16}:DATA:FDAT on page 307
- :CALC{1-16}:DATA:FMEM on page 308
- :CALC{1-16}:DATA:SDAT on page 309
- :CALC{1-16}:DATA:SMEM on page 310
- :CALC{1-16}:FUNC:DATA? on page 366
- :CALC{1-16}:LIM:DATA on page 378
- :CALC{1-16}:LIM:REP? on page 384
- :CALC{1-16}:LIM:REP:ALL? on page 385
- :CALC{1-16}:RLIM:DATA on page 421
- :CALC{1-16}:RLIM:REP? on page 426
- :SENS{1-16}:FREQ:DATA? on page 641
- :SENS{1-16}:SEGM:DATA on page 674
- :SOUR:POW:PORT:CORR:COLL:TABL:ASEN:DATA on page 687
- :SOUR:POW:PORT:CORR:COLL:TABL:BSEN:DATA on page 688
- :SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS on page 699
- :SOUR{1-16}:POW:PORT{1-4}:CORR:DATA on page 701

To set the data transfer format, use the following command:

- :FORM:DATA on page 482

NOTE Executing the :SYST:PRES command on page 781 or *RST command on page 289 does not affect the current setting of the data transfer format.

ASCII Transfer Format

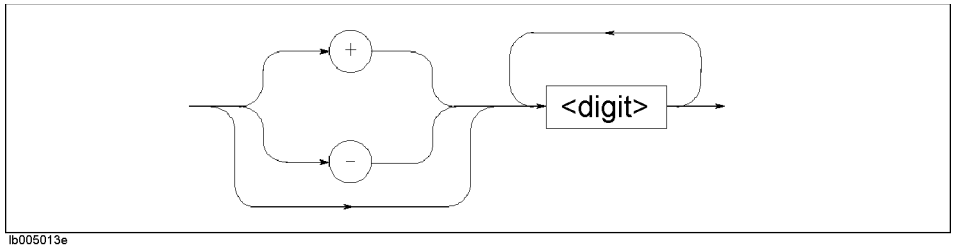
When you select the ASCII transfer format as the data transfer format, numbers are transferred as ASCII bytes, each of which corresponds to one of the formats shown below. Note that numbers are separated from one another with a comma (,) in accordance with the IEEE 488.2 specification.

NOTE Numeric data strings vary in length. Keep this in mind when you extract some data from retrieved numeric data strings in your program.

- Integer format

  Figure 7-1 shows this format. Numbers are expressed as integers. For example, 201 is expressed as “+201” or “201.”

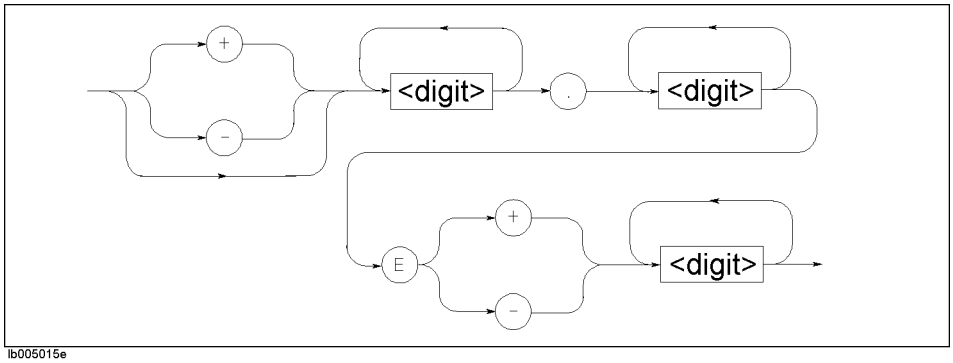
Figure 7-1 Integer format



- Floating-point number format

  Figure 7-2 shows this format. Numbers are expressed with floating points. For example, 1000 is expressed as “+201” or “201.”

Figure 7-2 Floating-point number format



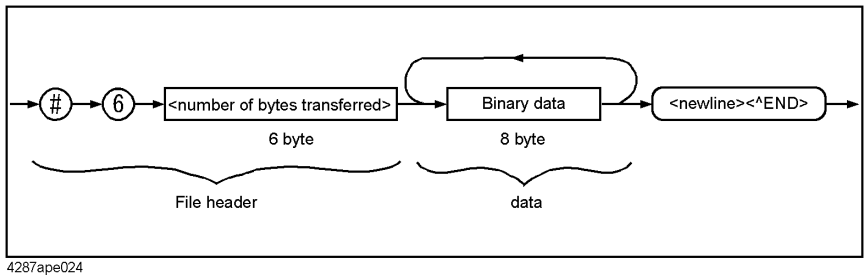
Binary Transfer Format

You can select the binary transfer format from the IEEE 64-bit floating point format or the IEEE 32-bit floating point format depending on the controller you use.

IEEE 64-bit floating point format

When you select the IEEE 64-bit floating point binary transfer format as the data transfer format, numbers are transferred in the format shown in Figure 7-3.

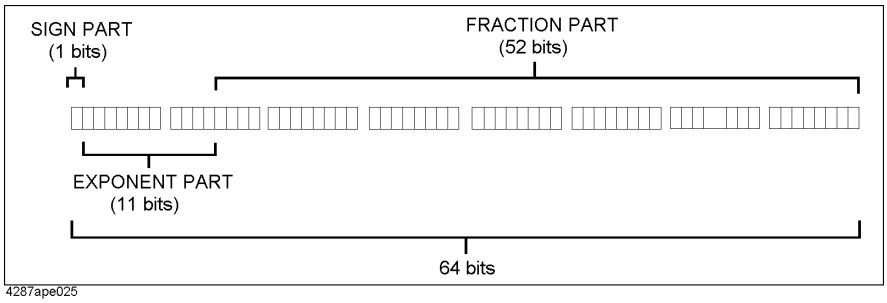
Figure 7-3 **Binary transfer format**



This data transfer format uses a header that consists of a sharp character (#), a number of 6 (which indicates the byte size of the <number of bytes transferred> part), and the <number of bytes transferred> part in this order. The header is followed by the binary data (each number consists of 8 bytes and the total is the byte size indicated by <number of bytes transferred>) and the message terminator <new line>^END.

The binary data is expressed in the IEEE 754 64-bit floating-point number format shown in Figure 7-4.

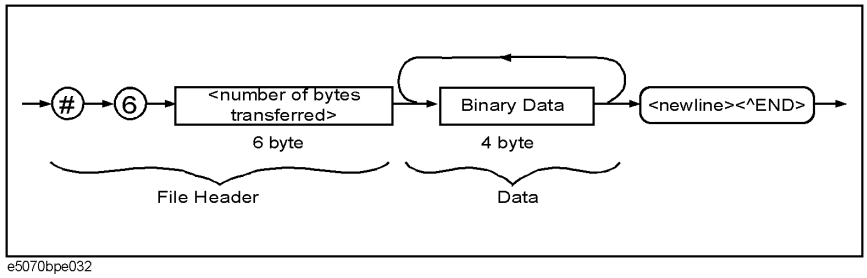
Figure 7-4 **64-bit floating point format**



IEEE 32-bit floating point format

When you select the IEEE 32-bit floating point binary transfer format as the data transfer format, numbers are transferred in the format shown in Figure 7-5.

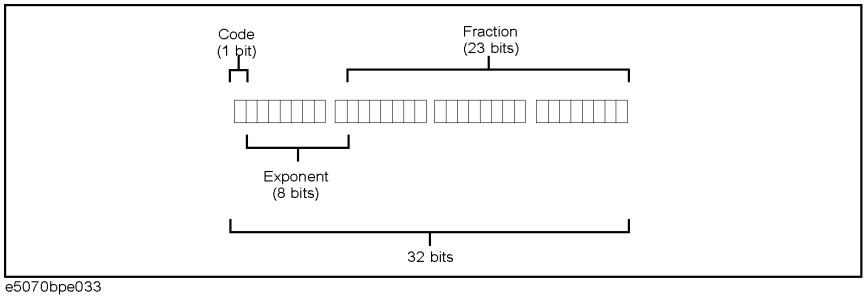
Figure 7-5 **IEEE 32-bit floating point binary transfer format**



This data transfer format uses a header that consists of a sharp character (#), a number of 6 (which indicates the byte size of the <number of bytes transferred> part), and the <number of bytes transferred> part in this order. The header is followed by the binary data (each number consists of 4 bytes and the total is the byte size indicated by <number of bytes transferred>) and the message terminator <new line>^END.

The binary data is expressed in the IEEE 754 32-bit floating-point number format shown in Figure 7-6.

Figure 7-6 **32-bit floating point data**



Byte order

When you opt to perform binary transfer, you can configure the instrument to transfer the bytes of the data in one of the following two byte orders:

NORMal	Transfer begins with the byte that contains the MSB (most significant bit); that is, the leftmost byte in Figure 7-4 and Figure 7-6.
SWAPped	Transfer begins with the byte that contains the LSB (least significant bit); that is, the rightmost byte in Figure 7-4 and Figure 7-6.

To set the byte order, use the following command:

- :FORM:BORD on page 481

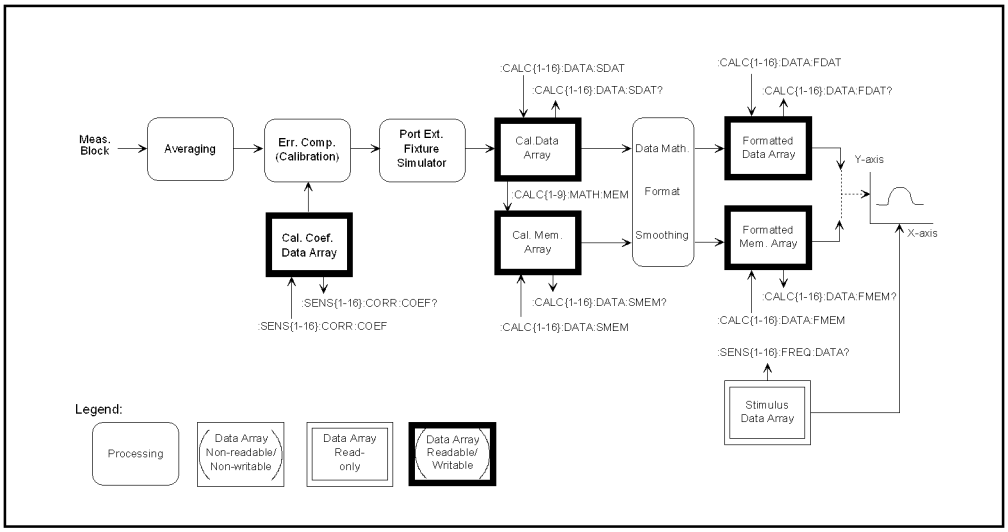
NOTE Executing the :SYST:PRES command on page 781 or *RST command on page 289 does not affect the current setting of the byte order.

Internal data processing

Data flow

Figure 7-7 provides an overview of the E5070B/E5071B's internal data processing flow. For more information on the data processing flow, refer to "*User's Guide*."

Figure 7-7 E5070B/E5071B's data processing flow



e5070bpe5018

Internal data arrays

Corrected data arrays

A corrected data array contains the corrected data obtained by performing error correction, port extension compensation (calibration), Fixture Simulator operations on the raw measured data of S parameter specified for each trace of each channel. Each data element is stored as a complex number (Re/Im).

The instrument retains 81 corrected data arrays at maximum, each of which is associated with one of the 9 traces contained in one of the 9 channels 9×9 = 81). To read/write one of the corrected data arrays, use the following command:

- :CALC{1-16}:DATA:SDAT on page 309

Corrected memory arrays

When the :CALC{1-16}:MATH:MEM command on page 410 command is executed on a particular corrected data array, its copy is stored into the corrected memory array corresponding to that corrected data array.

The instrument retains 81 corrected memory arrays at maximum, each of which is associated with one of the 9 traces contained in one of the 9 channels 9×9 = 81). To read/write one of the corrected data arrays, use the following command:

- :CALC{1-16}:DATA:SMEM on page 310

Formatted data array

A formatted data array contains the formatted data (values to be displayed) obtained by performing data math operations, measurement parameter conversion, and smoothing on a particular corrected data array. Regardless of the data format, it contains two data elements per measurement point as shown in the following table:

Table 7-1 Data elements and data formats

Data format*1	Data element (primary value)	Data element (secondary value)
log magnitude	log magnitude	Always 0
Phase	Phase	Always 0
Group delay	Group delay	Always 0
Smith chart (Lin)	Liner magnitude	Phase
Smith chart (Log)	log magnitude	Phase
Smith chart (Re/Im)	Real part of a complex number	Imaginary part of a complex number
Smith chart (R+jX)	Resistance	Reactance
Smith chart (G+jB)	Conductance	Susceptance
Polar (Lin)	Liner magnitude	Phase
Polar (Log)	log magnitude	Phase
Polar (Re/Im)	Real part of a complex number	Imaginary part of a complex number
Liner magnitude	Liner magnitude	Always 0
SWR	SWR	Always 0
Real number	Real part of a complex number	Always 0
Imaginary number	Imaginary part of a complex number	Always 0
Expanded phase	Expanded phase	Always 0

*1. To set this, use the :CALC{1-16}:FORM command on page 318 command.

The instrument retains 81 formatted data arrays at maximum, each of which is associated with one of the 9 traces contained in one of the 9 channels 9×9 = 81). To read/write one of the formatted data arrays, use the following command:

- :CALC{1-16}:DATA:FDAT on page 307

Formatted memory arrays

A formatted memory array contains the formatted data (values to be displayed) obtained by performing data math operations, measurement parameter conversion, and smoothing on a particular corrected memory array.

The instrument retains 81 formatted memory arrays at maximum, each of which is associated with one of the 9 traces contained in one of the 9 channels 9×9 = 81). To read/write one of the formatted memory arrays, use the following command:

- :CALC{1-16}:DATA:FMEM on page 308

Stimulus data arrays

A stimulus data array contains the stimulus values for all measurement points.

The instrument retains 16 stimulus data arrays at maximum, each of which is associated with one of the 16 channels. Stimulus data arrays are read-only. To retrieve one of the stimulus data arrays, use the following command:

- :SENS{1-16}:FREQ:DATA? on page 641

Calibration Coefficient Data Arrays

A calibration coefficient data array contains the calibration coefficients calculated based on the results of measurement performed with standard devices.

The instrument retains 16 calibration coefficient data arrays at maximum, each of which is associated with each channel. Commands are available for reading or writing calibration coefficient data arrays.To read or write, first use the following command:

- :SENS{1-16}:CORR:COEF on page 537

NOTE If any calibration coefficient is stored, the stored calibration coefficient data array will be retrieved. Once a calibration coefficient data array has been written, execute the command to validate it(**:SENS{1-16}:CORR:COEF:SAVE**).

Retrieving Measurement Results

"Internal data arrays" on page 168 allow you to retrieve all measurement results throughout a particular trace. Alternatively, markers allow you to retrieve measurement results at your specified points. For information on how to retrieve marker values, refer to "Retrieving measurement results at marker positions" on page 140.

Retrieving Internal Data Arrays

You can chose between the ASCII and binary data transfer formats when you retrieve internal data arrays. For more information, refer to "Data Transfer Format" on page 164.

Example 7-1 and Example 7-2 show sample programs that demonstrate how to retrieve formatted data arrays. The sample program in Example 7-1 uses the ASCII transfer format while the sample in Example 7-2 uses the binary transfer format. You can find the source files of these programs, named read_asc.htb and read_bin.htb, on the sample program disk.

Each of the sample programs holds the sweep on channel 1, then retrieves and displays the stimulus array for channel 1 and the formatted data array for trace 1.

The program in Example 7-1 is described in detail below:

Line 50	Assigns a GPIB address to the I/O pass.
Lines 70 to 90	These lines set channel 1's active trace to trace 1 and hold the sweep.
Lines 100 to 110	These lines retrieve the number of points in channel 1 and stores that number into the Nop variable.
Line 120	Resizes the Fdata and Freq arrays based on the value of the Nop variable (the number of points).
Line 160	Sets the data transfer format to ASCII.
Lines 180 to 190	These lines retrieve the formatted data array for the active trace (trace 1) in channel 1, and store the data into the Fdata array.
Lines 200 to 210	These lines retrieve the stimulus array for channel 1 and stores the data into the Freq variable.
Lines 250 to 260	These lines retrieve the data format for the active trace (trace 1) in channel 1, and store it into the Fmt$ array.
Lines 270 to 400	The lines display each point along with one measured value and a frequency if the Fmt$ is "MLOG", "PHAS", "GDEL", "MLIN", "SWR", "REAL", "IMAG", or "UPH"; or along with two measured values and a frequency if Fmt$ returns any other string.

Example 7-1 **Using the ASCII Transfer Format to Retrieve Internal Data Arrays (read_asc.htb)**

```
10     REAL Fdata(1:1601,1:2),Freq(1:1601)
20     DIM Img$[30]
30     INTEGER Nop,I
40     !
50     ASSIGN @Agte507x TO 717
60     !
70     OUTPUT @Agte507x;":CALC1:PAR1:SEL"
80     OUTPUT @Agte507x;":INIT1:CONT OFF"
90     OUTPUT @Agte507x;":ABOR"
100    OUTPUT @Agte507x;":SENS1:SWE:POIN?"
110    ENTER @Agte507x;Nop
120    REDIM Fdata(1:Nop,1:2),Freq(1:Nop)
130    !
140    ! Reading out in ASCII transfer format
150    !
160    OUTPUT @Agte507x;":FORM:DATA ASC"
170    !
180    OUTPUT @Agte507x;":CALC1:DATA:FDAT?"
190    ENTER @Agte507x;Fdata(*)
200    OUTPUT @Agte507x;":SENS1:FREQ:DATA?"
210    ENTER @Agte507x;Freq(*)
220    !
230    ! Displaying
240    !
250    OUTPUT @Agte507x;":CALC1:FORM?"
260    ENTER @Agte507x;Fmt$
270    SELECT Fmt$
280      CASE "MLOG","PHAS","GDEL","MLIN","SWR","REAL","IMAG","UPH"
290        Img$="MD.4DE,2X,MD.6DE"
300        PRINT " Frequency      Data"
310        FOR I=1 TO Nop
320          PRINT USING Img$;Freq(I),Fdata(I,1)
330        NEXT I
340      CASE ELSE
350        Img$="MD.4DE,2X,MD.6DE,2X,MD.6DE"
360        PRINT " Frequency      Data1          Data2"
370        FOR I=1 TO Nop
380          PRINT USING Img$;Freq(I),Fdata(I,1),Fdata(I,2)
390        NEXT I
400    END SELECT
410    !
420    END
```

The program in Example 7-2 is described in detail below:

Lines 50 to 60	Assigns a GPIB address to the I/O pass.
Lines 80 to 100	These lines set channel 1's active trace to trace 1 and hold the sweep.
Lines 110 to 120	These lines retrieve the number of points in channel 1 and store that number into the Nop variable.
Line 130	Resizes the Fdata and Freq arrays based on the value of the Nop variable (the number of points).
Line 170	Sets the data transfer format to binary.
Lines 190 to 200	These lines retrieve the data header.
Line 210	Retrieves the formatted data array for the active trace (trace 1) in channel 1, and stores the data into the Fdata array.

NOTE Because binary data must be read without being formatted, the program uses an I/O path (@Binary) that is configured to support the retrieval of unformatted data. This applies to line 250 as well.

Line 220	Reads the message terminator at the end of the data.
Lines 230 to 240	These lines retrieve the data header.
Line 250	Retrieves the stimulus array for channel 1 and stores the data into the Freq variable.
Line 260	Reads the message terminator at the end of the data.
Lines 300 to 310	These lines retrieve the data format for the active trace (trace 1) in channel 1, and store it into the Fmt$ array.
Lines 320 to 450	The lines display each point along with one measured value and a frequency if the Fmt$ is “MLOG”, “PHAS”, “GDEL”, “MLIN”, “SWR”, “REAL”, “IMAG”, or “UPH”; or along with two measured values and a frequency if Fmt$ returns any other string.

Example 7-2 **Using the Binary Transfer Format to Retrieve Internal Data Arrays (read_bin.htb)**

```
10     REAL Fdata(1:1601,1:2),Freq(1:1601)
20     DIM Buff$[9],Img$[30]
30     INTEGER Nop,I
40     !
50     ASSIGN @Agte507x TO 717
60     ASSIGN @Binary TO 717;FORMAT OFF
70     !
80     OUTPUT @Agte507x;":CALC1:PAR1:SEL"
90     OUTPUT @Agte507x;":INIT1:CONT OFF"
100    OUTPUT @Agte507x;":ABOR"
110    OUTPUT @Agte507x;":SENS1:SWE:POIN?"
120    ENTER @Agte507x;Nop
130    REDIM Fdata(1:Nop,1:2),Freq(1:Nop)
140    !
150    ! Reading out in binary transfer format
160    !
170    OUTPUT @Agte507x;":FORM:DATA REAL"
180    !
190    OUTPUT @Agte507x;":CALC1:DATA:FDAT?"
200    ENTER @Agte507x USING "#,8A";Buff$
210    ENTER @Binary;Fdata(*)
220    ENTER @Agte507x USING "#,1A";Buff$
230    OUTPUT @Agte507x;":SENS1:FREQ:DATA?"
240    ENTER @Agte507x USING "#,8A";Buff$
250    ENTER @Binary;Freq(*)
260    ENTER @Agte507x USING "#,1A";Buff$
270    !
280    ! Displaying
290    !
300    OUTPUT @Agte507x;":CALC1:FORM?"
310    ENTER @Agte507x;Fmt$
320    SELECT Fmt$
330      CASE "MLOG","PHAS","GDEL","MLIN","SWR","REAL","IMAG","UPH"
340        Img$="MD.4DE,2X,MD.6DE"
350        PRINT " Frequency      Data"
360        FOR I=1 TO Nop
370          PRINT USING Img$;Freq(I),Fdata(I,1)
380        NEXT I
390      CASE ELSE
400        Img$="MD.4DE,2X,MD.6DE,2X,MD.6DE"
410        PRINT " Frequency      Data1          Data2"
420        FOR I=1 TO Nop
430          PRINT USING Img$;Freq(I),Fdata(I,1),Fdata(I,2)
440        NEXT I
450    END SELECT
460    !
470    END
```

Entering Data into a Trace

You can change the data/memory trace on the LCD by writing the new data into the “Formatted data array” on page 169/“Formatted memory arrays” on page 170.

When you write data into formatted data/memory array, you can choose either the ASCII or binary transfer format (see “Data Transfer Format” on page 164).

Example 7-3 and Example 7-4 show sample programs that demonstrate how to write data into formatted data arrays. The sample program in Example 7-3 uses the ASCII transfer format while the sample in Example 7-4 uses the binary transfer format. You can find the source files of these programs, named write_a.htb and write_b.htb, on the sample program disk.

Each of the sample programs holds the sweep on channel 1, retrieves the data from a specified file (a file saved measurement data using the :MMEM:STOR:FDAT command on page 505 command), and populates trace 1 for channel 1 with the retrieved data.

The program in Example 7-3 is described in detail below:

Line 50	Assigns a GPIB address to the I/O pass.
Line 70	Passes control to a subprogram named Inp_file_name, which lets the user input a file name, and then stores the returned file name into the File$ variable. For more information on the Inp_file_name subprogram, refer to the description in Example 7-4.
Lines 90 to 110	These lines set channel 1's active trace to trace 1 and hold the sweep.
Lines 130 to 140	These lines retrieve the number of points in channel 1 and stores that number into the Nop variable.
Line 150	Resizes the Fdata array based on the value of the Nop variable (the number of points).
Line 170	This line points to the statement block to be executed if an error occurs in retrieving data from the file (for example, if no file matches File$).
Lines 180 to 260	These lines retrieve the formatted data from the file identified by File$, and store the data into the Fdata array.
Line 280	Sets the data transfer format to ASCII.
Line 300	Writes Fdata into the formatted data array for the active trace (trace 1) in channel 1.
Lines 340 to 380	This statement block is executed if an error occurs in retrieving data from the file.

Example 7-3 **Using the ASCII Transfer Format to Write Formatted Data Arrays (write_a.htb)**

```
10     REAL Freq,Fdata(1:1601,1:2)
20     DIM File$[300]
30     INTEGER Nop
40     !
50     ASSIGN @Agte507x TO 717
60     !
70     CALL Inp_file_name(File$)
80     !
90     OUTPUT @Agte507x;":CALC1:PAR1:SEL"
100    OUTPUT @Agte507x;":INIT1:CONT OFF"
110    OUTPUT @Agte507x;":ABOR"
120    !
130    OUTPUT @Agte507x;":SENS1:SWE:POIN?"
140    ENTER @Agte507x;Nop
150    REDIM Fdata(1:Nop,1:2)
160    !
170    ON ERROR GOTO File_error
180    ASSIGN @File TO File$
190    ENTER @File USING "K";Buff$
200    ENTER @File USING "K";Buff$
210    ENTER @File USING "K";Buff$
220    FOR I=1 TO Nop
230      ENTER @File USING "19D,2X,19D,2X,19D";Freq,Fdata(I,1),Fdata
(I,2)
240    NEXT I
250    ASSIGN @File TO *
260    OFF ERROR
270    !
280    OUTPUT @Agte507x;":FORM:DATA ASC"
290    !
300    OUTPUT @Agte507x;":CALC1:DATA:FDAT ";Fdata(*)
310    !
320    GOTO Prog_end
330    !
340 File_error: OFF ERROR
350    PRINT "############ ERROR ############"
360    PRINT File$&" is NOT exist."
370    PRINT "              or"
380    PRINT File$&" has UNSUITABLE data."
390    !
400 Prog_end: END
410    !===========================================
420    ! File Name Input Function
430    !===========================================
440  SUB Inp_file_name(Inp_name$)
450    DIM Inp_char$[9]
460    ON ERROR GOTO Inp_start
470 Inp_start: !
480    PRINT "Input File Name!"
490    INPUT "Name?",Inp_name$
500    PRINT "Input Name: "&Inp_name$
510    INPUT "OK? [Y/N]",Inp_char$
520    IF UPC$(Inp_char$)<>"Y" THEN Inp_start
530    OFF ERROR
540  SUBEND
```

The program in Example 7-4 is described in detail below:

Lines 50 to 60	Assigns a GPIB address to the I/O pass.
Line 70	Passes control to a subprogram named Inp_file_name, which lets the user input a file name, and then stores the returned file name into the File$ variable.
Lines 90 to 110	These lines set channel 1's active trace to trace 1 and hold the sweep.
Lines 130 to 140	These lines retrieve the number of points in channel 1 and stores that number into the Nop variable.
Line 150	Resizes the Fdata array based on the value of the Nop variable (the number of points).
Line 170	This line points to the statement block to be executed if an error occurs in retrieving data from the file (for example, if no file matches File$).
Lines 180 to 260	These lines retrieve the formatted data from the file identified by File$, and store the data into the Fdata array.
Line 280	Sets the data transfer format to binary.
Line 290	Creates the data header and stores it into the Header$ variable.
Line 300	Sends the command that writes data into the formatted data array for the active trace (trace 1) in channel 1, following it with the data header (Header$).
Line 310	Sends the data itself (Fdata), following it with a message terminator.

NOTE Because binary data must be written without being formatted, the program uses an I/O path (@Binary) that is configured to support writing unformatted data.

Lines 340 to 380	This statement block is executed if an error occurs in retrieving data from the file.

The Inp_file_name subprogram in lines 440 to 540, which is used to enter a save filename, is described below.

Line 460	Allows the user to return to the entry start line and re-enter the data if an error (such as an invalid entry) occurs while entering the target file name.
Lines 480 to 490	These lines prompt the user to enter the target file name. The program does not continue till the user actually enters the file name.
Lines 500 to 510	These lines display the entered file name and waits for a confirmation entry (y/n key).
Line 520	Returns to the entry start line if the key the user pressed in line 870 is not the y key.

Example 7-4 **Using the Binary Transfer Format to Write Formatted Data Arrays (write_b.htb)**

```
10     REAL Freq,Fdata(1:1601,1:2)
20     DIM File$[300],Header$[10]
30     INTEGER Nop
40     !
50     ASSIGN @Agte507x TO 717
60     ASSIGN @Binary TO 717;FORMAT OFF
70     CALL Inp_file_name(File$)
80     !
90     OUTPUT @Agte507x;":CALC1:PAR1:SEL"
100    OUTPUT @Agte507x;":INIT1:CONT OFF"
110    OUTPUT @Agte507x;":ABOR"
120    !
130    OUTPUT @Agte507x;":SENS1:SWE:POIN?"
140    ENTER @Agte507x;Nop
150    REDIM Fdata(1:Nop,1:2)
160    !
170    ON ERROR GOTO File_error
180    ASSIGN @File TO File$
190    ENTER @File USING "K";Buff$
200    ENTER @File USING "K";Buff$
210    ENTER @File USING "K";Buff$
220    FOR I=1 TO Nop
230      ENTER @File USING "19D,2X,19D,2X,19D";Freq,Fdata(I,1),Fdata
(I,2)
240    NEXT I
250    ASSIGN @File TO *
260    OFF ERROR
270    !
280    OUTPUT @Agte507x;":FORM:DATA REAL"
290    Header$="#6"&IVAL$(8*2*Nop,10)
300    OUTPUT @Agte507x;":CALC1:DATA:FDAT ";Header$;
310    OUTPUT @Binary;Fdata(*),END
320    GOTO Prog_end
330    !
340 File_error: OFF ERROR
350    PRINT "############ ERROR ############"
360    PRINT File$&" is NOT exist."
370    PRINT "             or"
380    PRINT File$&" has UNSUITABLE data."
390    !
400 Prog_end: END
410    !===========================================
420    ! File Name Input Function
430    !===========================================
440  SUB Inp_file_name(Inp_name$)
450    DIM Inp_char$[9]
460    ON ERROR GOTO Inp_start
470 Inp_start: !
480    PRINT "Input File Name!"
490    INPUT "Name?",Inp_name$
500    PRINT "Input Name: "&Inp_name$
510    INPUT "OK? [Y/N]",Inp_char$
520    IF UPC$(Inp_char$)<>"Y" THEN Inp_start
530    OFF ERROR
540  SUBEND
```

8 Limit Test

This chapter explains how to use the Limit Test feature to perform a limit test and determine the pass/fail status of the measured data.

Performing a Limit Test

Configuring limit lines

The Limit Test feature of the E5070B/E5071B allows you to create up to 100 upper/lower limit lines on each trace and then determine the pass/fail status of the measured data.

When you manually configure limit lines, you must add each segment (limit line) to the limit table and define various conditions that apply to the specific segment. On the other hand, when you use an external controller to configure limit lines, you can use the following command to define all of the segment conditions (all limit lines) in the active table trace at once.

- :CALC{1-16}:LIM:DATA on page 378

Alternatively, you can configure limit lines based on the data contained in a CSV file by issuing the following command:

- :MMEM:LOAD:LIM on page 494

Also, you can save the contents of the current limit table to a file by issuing the following command:

- :MMEM:STOR:LIM on page 507

Showing/hiding limit lines

To turn ON or OFF limit lines, use the following command:

- :CALC{1-16}:LIM:DISP on page 379

Even when limit lines are hidden, the system performs a limit test if the Limit Test feature is on.

Turning ON or OFF the Limit Test Feature

To turn ON or OFF the Limit Test feature, use the following command:

- :CALC{1-16}:LIM on page 377

Showing/hiding “Fail”

To turn ON or OFF the “Fail” indicator that is displayed at the center of the window when the test result for the channel is “fail,” use the following command:

- :DISP:FSIG on page 457

Obtaining Test Results

You can obtain test results by issuing a result retrieval command or through the status register. For detailed information on the status register, see Appendix B, “Status Reporting System.”

Test results at each measurement point

Using commands that retrieve test results

You can obtain the test results at each measurement point by retrieving the stimulus value at failed measurement points. To retrieve failed measurement points, use the following command:

Stimulus value	:CALC{1-16}:LIM:REP? on page 384
Number of measurement points	:CALC{1-16}:LIM:REP:POIN? on page 386

Using the status register

You cannot use the status register to obtain the test results at each measurement point.

Test results for each trace

Using commands that retrieve test results

You can retrieve the test result for each trace (i.e., the trace-wide result that combines the results for all measurement points in a particular trace) by issuing the following command:

- :CALC{1-16}:LIM:FAIL? on page 380

Using the status register

The condition register and event register under the questionable limit channel {1-16} status register provide 14 bits that correspond to traces 1 to 14 and contain the test results (0: Pass, 1: Fail) for the respective traces; for example, you can obtain the test result for trace 1 from bit 1 and that for trace 14 from bit 14. The condition register and event register under the questionable limit channel {1-16} extra status register provide two bits that correspond to traces 15 to 16 and contain the test results (0: Pass, 1: Fail) for the respective traces; for example, you can obtain the test result for trace 15 from bit 1 and that for trace 16 from bit 2.

Every bit of the condition register is set to 0 when a measurement cycle is started. Upon completion of measurement, those bits that correspond to failed traces are set to 1.

If the corresponding bit of the positive transition filter is set to 1 (preset value), each bit of the event register is set to 1 when the corresponding bit of the condition register changes from 0 to 1 (indicating that the corresponding trace failed the test).

To retrieve the registers, use the following commands:

Questionable limit channel {1-16} status register	
Condition register	:STAT:QUES:LIM:CHAN{1-16}:COND? on page 730
Event register	:STAT:QUES:LIM:CHAN{1-16}? on page 730
Questionable limit channel {1-16} extra status register	
Condition register	:STAT:QUES:LIM:CHAN{1-16}:ECH:COND? on page 732
Event register	:STAT:QUES:LIM:CHAN{1-16}:ECH? on page 732

Test results for each channel

Using commands that retrieve test results

No command is available that allows you to directly retrieve the test result for each channel (i.e., the channel-wide result that combines the results for all traces in a particular channel).

Using the status register

The questionable limit status event register provides 14 bits that correspond to channels 1 to 14 and contain the test results (0: Pass, 1: Fail) for the respective channels; for example, you can obtain the test result for channel 1 from bit 1 and that for channel 14 from bit 14. The questionable limit extra status event register provides nine bits that correspond to channels 1 to 2 and contain the test results (0: Pass, 1: Fail) for the respective channels; for example, you can obtain the test result for channel 14 from bit 1 and that for channel 15 from bit 2.

Every bit of the condition register is set to 0 after the event registers are cleared by the *CLS command on page 286. Upon completion of measurement, if the channel-wide test result that combines the results for all traces[*1] in a channel is “fail,” the corresponding bit of the condition register is set to 1.

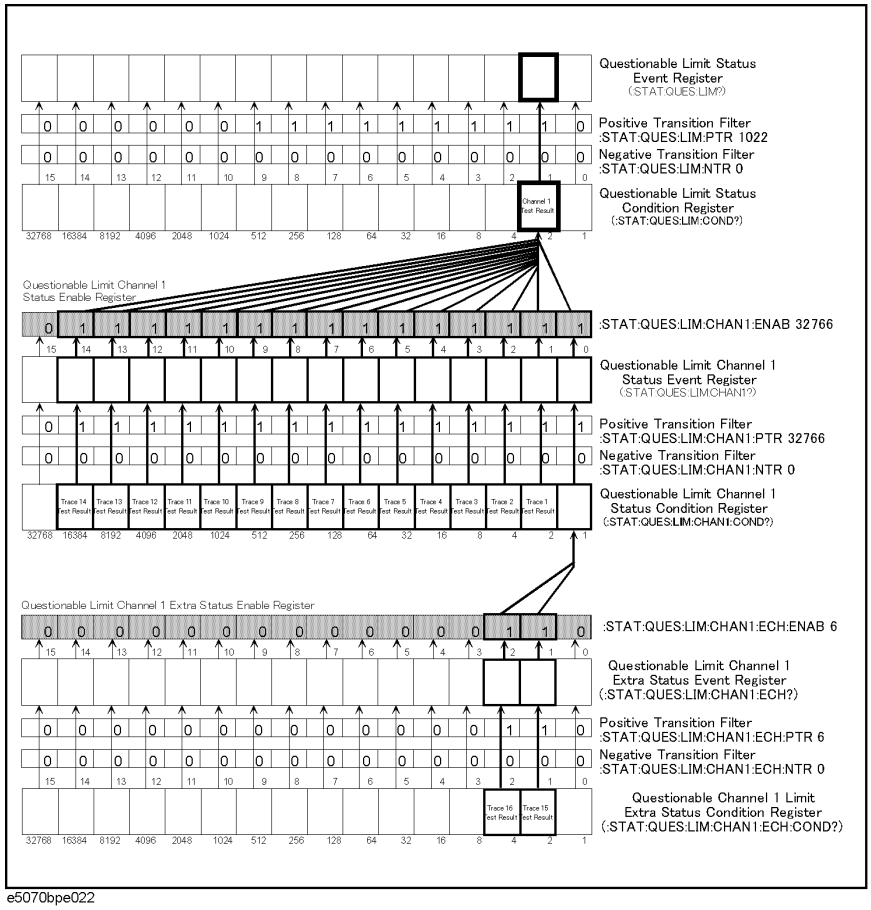
If the corresponding bit of the positive transition filter is set to 1 (preset value), every bit of the event register is set to 1 when the corresponding bit of the condition register changes from 0 to 1.

To retrieve the registers, use the following commands:

Questionable limit status register	
Condition register	:STAT:QUES:LIM:COND? on page 739
Event register	:STAT:QUES:LIM? on page 730
Questionable limit extra status register	
Condition register	:STAT:QUES:LIM:ELIM:COND? on page 740
Event register	:STAT:QUES:LIM:ELIM? on page 739

*1. This is when the registers are set as preset values. You can configure the enable registers and transition filters under the questionable limit channel {1-16} status register and the questionable limit channel {1-16} extra status register so that the condition register’s bits reflect the result that combines the results for a limited set of traces rather than for all the traces.

Figure 8-1 **Obtaining test results for a channel (channel 1 in this example) using the status register**



e5070bpe022

Overall test results

Using commands that retrieve test results

No command is available that allows you to directly retrieve the overall test results that combine the test results for all channels.

Using the status register

The condition register and event register under the questionable status event register each provides bit 10, from which you can obtain the overall test result (0: Pass, 1: Fail).

The condition register's bit 10 is set to 0 after the event registers are cleared by the *CLS command on page 286. Upon completion of measurement, this bit is set to 1 if the overall test result that combines the results for all channels*1 is “fail.”

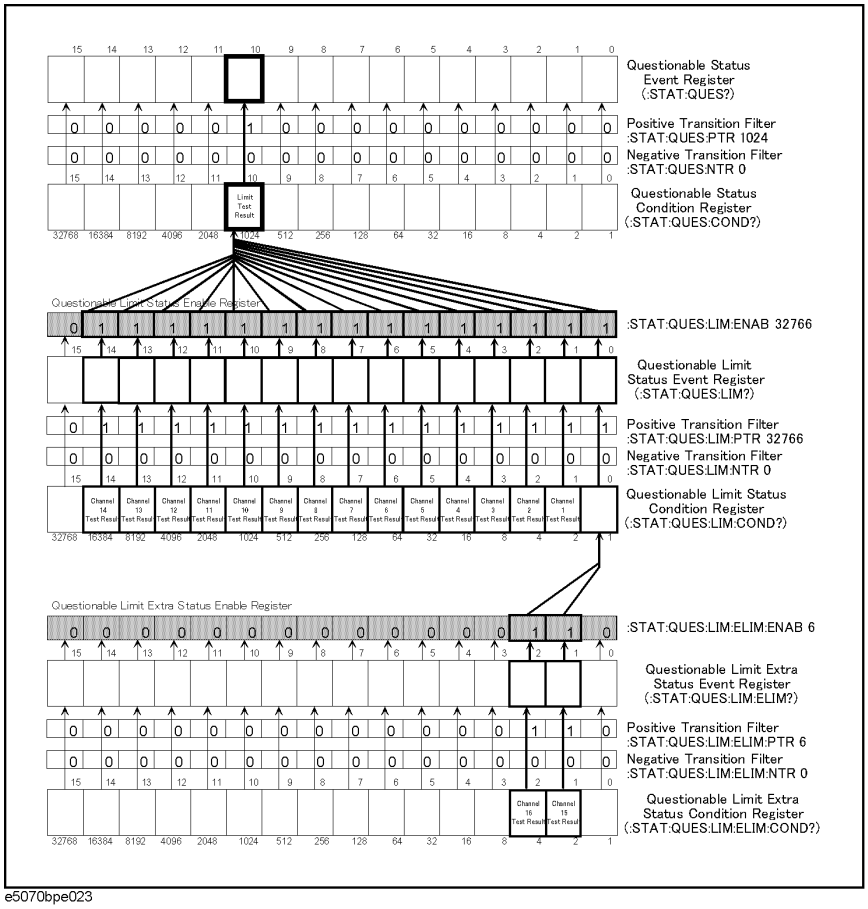
If the positive transition filter’s bit 10 is set to 1 (preset value), the event register's bit 10 is set to 1 when the condition register’s bit 10 changes from 0 to 1.

To retrieve the condition register and event register under the questionable status register, use the following commands:

Condition register	:STAT:QUES:COND? on page 728
Event register	:STAT:QUES? on page 711

*1. This is when the registers are set as preset values. You can configure the enable registers and transition filters under the questionable limit status register and the questionable limit extra status register so that the condition register's bit 10 reflects the result that combines the results for a limited set of channels rather than for all of the channels.

Figure 8-2 **Obtaining overall test results using the status register**



e5070bpe023

Sample Program

Example 8-1 shows a sample program that demonstrates how to perform limit tests. You can find the source file of this program, named lim_test.htb, on the sample program disk.

The sample program creates a limit table as shown in Table 8-1 and Table 8-2, turns on the Limit Test feature, performs one cycle of measurement, and then displays the test results.

Table 8-1 Limit table for trace 1

No.	Type	Begin Stimulus	End Stimulus	Begin Response	End Response
1	MAX	847.5 MHz	905.0 MHz	-55.0 dBm	-55.0 dBm
2	MIN	935.0 MHz	960.0 MHz	-3.5 dBm	-3.5 dBm
3	MAX	935.0 MHz	960.0 MHz	0 dBm	0 dBm
4	MAX	980.0 MHz	1047.5 MHz	-25.0 dBm	-25.0 dBm

Table 8-2 Limit table for trace 2

No.	Type	Begin Stimulus	End Stimulus	Begin Response	End Response
1	MAX	847.5 MHz	925.0 MHz	0 dBm	0 dBm
2	MIN	935.0 MHz	960.0 MHz	-9.5 dBm	-9.5 dBm
3	MAX	970.0 MHz	1047.5 MHz	0 dBm	0 dBm

The program is described in detail below:

Line 50 — Assigns a GPIB address to the I/O pass.

Lines 70 to 120 — These lines store the sweep center value, sweep span value, trace 1 measurement parameter, trace 2 measurement parameter, trace 1 data format, and trace 2 data format into the variables Cent, Span, Param1$, Param2$, Fmt1$, and Fmt2$, respectively.

Line 150 — Stores the number of segments in trace 1 limit table into the Num_of_seg1 variable.

Lines 160 to 390 — These lines store the settings in trace 1 limit table into the Lim1(*) variable.

Line 410 — Stores the number of segments in trace 2 limit table into the Num_of_seg2 variable.

Lines 420 to 590 — These lines store the settings in trace 2 limit table into the Lim2(*) variable.

Lines 610 to 620 — These lines configure the sweep range for channel 1's sweep range using the center and span values contained in the Cent and Span values.

Lines 630 to 660 — These lines configure channel 1 so that it contains 2 traces, displays graphs in two windows tiled horizontally (i.e., with the screen split into upper and lower halves), uses a bus trigger source, and works in continuous activation mode.

Line 700 Sets channel 1's active trace to trace 1.

Lines 720 to 730 These lines store trace 1's measurement parameter and data format into the variables Param1$ and Fmt1$, respectively.

Lines 750 to 810 These lines set up the limit table for trace 1.

Line 750: Sends the command that sets up a limit table along with the Num_of_seg1 variable that contains the number of segments.

Lines 770 to 790: Sends five data items (type, start point stimulus value, end point stimulus value, start point response value, and end point response value) for each segment.

Lines 820 to 830 These lines turn on the display of limit lines and the Limit Test feature for trace 1.

Line 870 Sets channel 1's active trace to trace 2.

Lines 890 to 900 These lines set trace 2's measurement parameter and data format to Param2$ and Fmt2$, respectively.

Lines 920 to 980 These lines set up the limit table for trace 2.

Lines 990 to 1000 These lines turn on the display of limit lines and the Limit Test feature for trace 2.

Lines 1040 to 1060 These lines set, under the questionable limit channel 1 status register, the enable register and positive transition filter to 6 (0000000000000110 in binary notation) while setting the negative transition filter to 0 so that the questionable limit status condition register's bit 1 is set to 1 when the test result that combines the results for trace 1 and trace 2 is "fail."

NOTE The sample program provides an example of explicitly configuring the register bits so that they reflect the test results that only cover trace 1 and trace 2. However, because the results for traces 3 to 9 will never be "fail" as long as the Limit Test feature is disabled for those traces, the register bits would reflect the test result that is limited to traces 1 and 2, even if the default setting is not changed.

Lines 1070 to 1080 These lines set transition filters so that the questionable limit status event register's bit 1 is set to 1 when the questionable limit status condition register's bit 1 changes from 0 to 1.

Line 1090 Clears the questionable limit status event register and questionable limit channel 1 status event register.

Lines 1110 to 1130 These lines trigger the instrument and wait until the sweep cycle is completed.

Lines 1170 to 1190 These lines retrieve the value of the questionable limit status event register and store the setting of bit 1 of the value into Ch1_judge.

Lines 1200 to 1230 These lines retrieve the value of the questionable limit channel 1 status event register and store the settings of bit 1 and bit 2 of the value into Tr1_judge and Tr2_judge, respectively.

Line 1280 Displays a message indicating that the DUT has passed the limit test if the test result for channel 1 is "Pass" (i.e., if Ch1_judge returns 0).

Lines 1300 to 1660 These lines are executed if the test result for channel 1 is "Fail" (i.e., if

Ch1_judge returns 1).

Line 1300: Notifies the user that the limit test result is “Fail”.

Line 1320: Displays a message indicating that trace 1 has passed the limit test if the test result for trace 1 is “Pass” (i.e., if Tr1_judge returns 0).

Lines 1340 to 1470: These lines are executed if the test result for trace 1 is “Fail” (i.e., if Tr1_judge returns 1). The lines notify the user that the test result for trace 1 is “Fail” and then retrieve and display the frequencies at the failed measurement points on trace 1.

Line 1340: Notifies the user that the limit test result for trace 1 is “Pass.”

Line 1380: Sets channel 1’s active trace to trace 2.

Lines 1390 to 1410: These lines retrieve the number of failed measurement points on trace 1 and, based on that number, resize the array that contains retrieved frequencies.

Lines 1420 to 1470: These lines retrieve and display the frequencies at the failed measurement points on trace 1.

Line 1500: Displays a message indicating that trace 2 has passed the limit test if the test result for trace 2 is “Pass” (i.e., if Tr2_judge returns 0).

Lines 1520 to 1650: If the test result for trace 2 is “Fail” (i.e., if Tr2_judge returns 1), these lines notify the user that trace 2 has failed to pass the limit test and then retrieve and display the frequencies at the failed measurement points on trace 2.

Example 8-1 **Limit Test (lim_test.htb)**

```
10      DIM Param1$[9],Param2$[9],Fmt1$[9],Fmt2$[9],Buff$[9]
20      REAL Cent,Span,Lim1(1:4,1:5),Lim2(1:3,1:5),Fail_data(1:1601)
30      INTEGER Num_of_seg1,Num_of_seg2,Segment,Column,Fail_point
40      !
50      ASSIGN @Agte507x TO 717
60      !
70      Cent=9.475E+8
80      Span=2.00E+8
90      Param1$="S21"
100     Param2$="S11"
110     Fmt1$="MLOG"
120     Fmt2$="MLOG"
130     !
140     ! == Trace 1 Limit Line ==
150     Num_of_seg1=4           ! Number of segments: 4
160     ! -- Segment 1 --
170     Lim1(1,1)=1             ! Type            : Maximum
180     Lim1(1,2)=8.475E+8      ! Frequency Start: 847.5 MHz
190     Lim1(1,3)=9.050E+8      !           Stop : 905.0 MHz
200     Lim1(1,4)=-55           ! Response  Start: -55 dBm
210     Lim1(1,5)=-55           !           Stop : -55 dBm
220     ! -- Segment 2 --
230     Lim1(2,1)=2             ! Type            : Minimum
240     Lim1(2,2)=9.350E+8      ! Frequency Start: 935.0 MHz
250     Lim1(2,3)=9.600E+8      !           Stop : 960.0 MHz
260     Lim1(2,4)=-3.5          ! Response  Start: -3.5 dBm
270     Lim1(2,5)=-3.5          !           Stop : -3.5 dBm
280     ! -- Segment 3 --
290     Lim1(3,1)=1             ! Type            : Maximum
300     Lim1(3,2)=9.350E+8      ! Frequency Start: 935.0 MHz
310     Lim1(3,3)=9.600E+8      !           Stop : 960.0 MHz
320     Lim1(3,4)=0             ! Response  Start: 0 dBm
330     Lim1(3,5)=0             !           Stop : 0 dBm
340     ! -- Segment 4 --
350     Lim1(4,1)=1             ! Type            : Maximum
360     Lim1(4,2)=9.800E+8      ! Frequency Start: 980.0 MHz
370     Lim1(4,3)=1.0475E+9     !           Stop : 1047.5 MHz
380     Lim1(4,4)=-25           ! Response  Start: -25 dBm
390     Lim1(4,5)=-25           !           Stop : -25 dBm
400     ! == Trace 2 Limit Line ==
410     Num_of_seg2=3           ! Number of segments: 3
420     ! -- Segment 1 --
430     Lim2(1,1)=1             ! Type            : Maximum
440     Lim2(1,2)=8.475E+8      ! Frequency Start: 847.5 MHz
450     Lim2(1,3)=9.250E+8      !           Stop : 925.0 MHz
460     Lim2(1,4)=0             ! Response  Start: 0 dBm
470     Lim2(1,5)=0             !           Stop : 0 dBm
480     ! -- Segment 2 --
490     Lim2(2,1)=1             ! Type            : Maximum
500     Lim2(2,2)=9.350E+8      ! Frequency Start: 935.0 MHz
510     Lim2(2,3)=9.600E+8      !           Stop : 960.0 MHz
520     Lim2(2,4)=-9.5          ! Response  Start: -9.5 dBm
530     Lim2(2,5)=-9.5          !           Stop : -9.5 dBm
540     ! -- Segment 3 --
550     Lim2(3,1)=1             ! Type            : Maximum
```

```
560    Lim2(3,2)=9.700E+8     ! Frequency Start: 970.0 MHz
570    Lim2(3,3)=1.0475E+9    !           Stop : 1047.5 MHz
580    Lim2(3,4)=0            ! Response  Start: 0 dBm
590    Lim2(3,5)=0            !           Stop : 0 dBm
600    !
610    OUTPUT @Agte507x;":SENS1:FREQ:CENT ";Cent
620    OUTPUT @Agte507x;":SENS1:FREQ:SPAN ";Span
630    OUTPUT @Agte507x;":CALC1:PAR1:COUN 2"
640    OUTPUT @Agte507x;":DISP:WIND1:SPL D1_2"
650    OUTPUT @Agte507x;":TRIG:SOUR BUS"
660    OUTPUT @Agte507x;":INIT1:CONT ON"
670    !
680    ! Trace 1
690    !
700    OUTPUT @Agte507x;":CALC1:PAR1:SEL"
710    !
720    OUTPUT @Agte507x;":CALC1:PAR1:DEF "&Param1$
730    OUTPUT @Agte507x;":CALC1:FORM "&Fmt1$
740    !
750    OUTPUT @Agte507x;":CALC1:LIM:DATA ";Num_of_seg1;
760    FOR Segment=1 TO Num_of_seg1
770      FOR Column=1 TO 5
780        OUTPUT @Agte507x;",";Lim1(Segment,Column);
790      NEXT Column
800    NEXT Segment
810    OUTPUT @Agte507x;""
820    OUTPUT @Agte507x;":CALC1:LIM:DISP ON"
830    OUTPUT @Agte507x;":CALC1:LIM ON"
840    !
850    ! Trace 2
860    !
870    OUTPUT @Agte507x;":CALC1:PAR2:SEL"
880    !
890    OUTPUT @Agte507x;":CALC1:PAR2:DEF "&Param2$
900    OUTPUT @Agte507x;":CALC1:FORM "&Fmt2$
910    !
920    OUTPUT @Agte507x;":CALC1:LIM:DATA ";Num_of_seg2;
930    FOR Segment=1 TO Num_of_seg2
940      FOR Column=1 TO 5
950        OUTPUT @Agte507x;",";Lim2(Segment,Column);
960      NEXT Column
970    NEXT Segment
980    OUTPUT @Agte507x;""
990    OUTPUT @Agte507x;":CALC1:LIM:DISP ON"
1000   OUTPUT @Agte507x;":CALC1:LIM ON"
1010   !
1020   ! Setting status registers
1030   !
1040   OUTPUT @Agte507x;":STAT:QUES:LIM:CHAN1:ENAB 6"
1050   OUTPUT @Agte507x;":STAT:QUES:LIM:CHAN1:PTR 6"
1060   OUTPUT @Agte507x;":STAT:QUES:LIM:CHAN1:NTR 0"
1070   OUTPUT @Agte507x;":STAT:QUES:LIM:PTR 2"
1080   OUTPUT @Agte507x;":STAT:QUES:LIM:NTR 0"
1090   OUTPUT @Agte507x;"*CLS"
1100   !
1110   OUTPUT @Agte507x;":TRIG:SING"
1120   OUTPUT @Agte507x;"*OPC?"
1130   ENTER @Agte507x;Buff$
```

```
1140   !
1150   ! Checking test results
1160   !
1170   OUTPUT @Agte507x;":STAT:QUES:LIM?"
1180   ENTER @Agte507x;Reg_val
1190   Ch1_judge=BIT(Reg_val,1)
1200   OUTPUT @Agte507x;":STAT:QUES:LIM:CHAN1?"
1210   ENTER @Agte507x;Reg_val
1220   Tr1_judge=BIT(Reg_val,1)
1230   Tr2_judge=BIT(Reg_val,2)
1240   !
1250   ! Displaying test results
1260   !
1270   IF Ch1_judge=0 THEN
1280     PRINT "## PASS! ##"
1290   ELSE
1300     PRINT "## FAIL! ##"
1310     IF Tr1_judge=0 THEN
1320       PRINT " Trace1(S21): PASS"
1330     ELSE
1340       PRINT " Trace1(S21): FAIL"
1350       !
1360       ! Reading and displaying frequency at failed points
1370       !
1380       OUTPUT @Agte507x;":CALC1:PAR1:SEL"
1390       OUTPUT @Agte507x;":CALC1:LIM:REP:POIN?"
1400       ENTER @Agte507x;Fail_point
1410       REDIM Fail_data(1:Fail_point)
1420       OUTPUT @Agte507x;":CALC1:LIM:REP?"
1430       ENTER @Agte507x;Fail_data(*)
1440       PRINT "  Frequency:"
1450       FOR I=1 TO Fail_point
1460         PRINT USING "3X,MD.4DE";Fail_data(I)
1470       NEXT I
1480     END IF
1490     IF Tr2_judge=0 THEN
1500       PRINT " Trace2(S11): PASS"
1510     ELSE
1520       PRINT " Trace2(S11): FAIL"
1530       !
1540       ! Reading and displaying frequency at failed points
1550       !
1560       OUTPUT @Agte507x;":CALC1:PAR2:SEL"
1570       OUTPUT @Agte507x;":CALC1:LIM:REP:POIN?"
1580       ENTER @Agte507x;Fail_point
1590       REDIM Fail_data(1:Fail_point)
1600       OUTPUT @Agte507x;":CALC1:LIM:REP?"
1610       ENTER @Agte507x;Fail_data(*)
1620       PRINT "  Frequency:"
1630       FOR I=1 TO Fail_point
1640         PRINT USING "3X,MD.4DE";Fail_data(I)
1650       NEXT I
1660     END IF
1670   END IF
1680   END
```

9 Saving and Recalling (File Management)

This chapter describes how to save and recall instrument status and measurement results onto/from the files. Here also covered is managing files.

Saving and Recalling File

Specifying file

When running a command for saving, recalling, and managing files, use a filename with extension to specify a particular file. Specify “A:” in the beginning of the file name, when specifying a file on the flexible disk. Also, when specifying a file name with directory, use “/” (slash) or “\” (backslash) as a delimiter.

Saving and recalling instrument status

You can save the instrument state using one of the following 2 methods:

- ❏ Saving the entire instrument state into a file
- ❏ Saving the state for each channel into registers A to D (volatile memory)

Selecting content to be saved

When saving the instrument status into a file or register, the content to be saved can be selected among the following 4 options:

- ❏ Instrument status only (see *Users Guide* for setting items to be saved)
- ❏ Instrument status and calibration coefficient array.
- ❏ Instrument status, corrected data/memory array (measurement data)
- ❏ Instrument status, calibration coefficient array, and corrected data/memory array (measurement data)

To select a content to be saved, use the following command:

- on page 519

Selecting Content to be Saved

To select whether to save the setting of all channels/traces or that of the displayed channels/traces, use the following command:

- :MMEM:STOR:SALL on page 511

Saving and recalling entire instrument status

To save the entire instrument status into a file, use the following command:

- :MMEM:STOR on page 500

Recalling a file saved with the above command can reproduce the status when it was saved. To recall the settings from a file, use the following command:

- :MMEM:LOAD on page 489

Auto recall

The file saved with the name autorec.sta or A:autorec.sta will be automatically recalled the E5070B/E5071B is powered ON.

Saving the state for each channel into a register

For the active channel, when you want to save the instrument state specific to that channel into only one of the registers A to D, use the following command:

- :MMEM:STOR:CHAN on page 503

Recalling an instrument state saved in a register can reproduce it as the state of the active channel. To recall a register, use the following command:

- :MMEM:LOAD:CHAN on page 492

NOTE It is possible to recall a file from a different channel where it was saved.

The contents in the registers are lost when you turn OFF the power. You can delete (clear) the contents of all registers using the following command.

- :MMEM:STOR:CHAN:CLE on page 503

Saving measurement data

Measurement data (in a formatted data array) can be saved to a file in CSV (Comma Separated Value) format.

To save measurement data in a file, use the following command:

- :MMEM:STOR:FDAT on page 505

Executing the above command will save the measurement data of the active trace. Note that the data saved using the above command cannot be recalled from the E5070B/E5071B.

Saving measurement data in touchstone format

Measurement data for the active channel can be saved to a file in touchstone format.

To determine a file type in touchstone file format and specify a port, use one of the following commands according to the number of ports used:

- :MMEM:STOR:SNP:TYPE:S1P on page 515
- :MMEM:STOR:SNP:TYPE:S2P on page 516
- :MMEM:STOR:SNP:TYPE:S3P on page 517
- :MMEM:STOR:SNP:TYPE:S4P on page 518

To set a data type for files saved in touchstone format, use the following command:

- :MMEM:STOR:SNP:FORM on page 514

To save measurement data in touchstone format, use the following command:

- :MMEM:STOR:SNP on page 513

NOTE Only trace data of frequency sweep can be saved in touchstone format files.Trace data of frequency offset measurement and power sweep measurement cannot be saved.

Saving the images on the LCD screen

Images displayed on the LCD screen can be saved to a file in the bitmap (.bmp) or portable network graphics (.png) format.

To save the screen image to a file, use the following command:

- :MMEM:STOR:IMAG on page 506

Executing the above command will save the screen image when the command is invoked.

NOTE Note that this gives different screen image results from those obtained by pressing the **[Capture]** key on the front panel.

Saving and recalling the segment sweep table

Segment sweep table can be saved in the file with CSV (Comma Separated Value) format.

To save segment sweep table on a file, use the following command:

- :MMEM:STOR:SEGM on page 512

Executing the above command will save the segment sweep table for the active channel.

Recalling the file saved using the above command can reproduce the segment sweep table on the active channel.

To recall the settings from a file, use the following command:

- :MMEM:LOAD:SEGM on page 498

NOTE It is possible to recall a file from a different channel where it was saved. Note that recalling operation is not guaranteed for the file that might have been modified with editor.

Saving and recalling the limit table

Limit table can be saved in the file with CSV (Comma Separated Value) format. To save limit table on a file, use the following command:

- :MMEM:STOR:LIM on page 507

Executing the above command will save the limit table for the active trace of the active channel.

Recalling the file saved using the above command can reproduce the limit table on the active trace of the active channel. To recall the settings from a file, use the following command:

- :MMEM:LOAD:LIM on page 494

NOTE It is possible to recall a file from a different channel or trace where it was saved. Note that recalling operation is not guaranteed for the file that might have been modified with editor.

Saving/recalling Power Sensor Calibration Factor Table

The power sensor calibration table can be saved in the file with CSV (Comma Separated Value) format. To save the power sensor calibration factor table that is set specifically to the E5070B/E5071B into a file, use the following commands:

- :MMEM:STOR:ASCF on page 501
- :MMEM:STOR:BSCF on page 502

Recalling a file saved with the above command can reproduce the power sensor calibration factor table when it was saved. To recall the settings from a file, use the following command:

- :MMEM:LOAD:ASCF on page 490
- :MMEM:LOAD:BSCF on page 491

NOTE Recalling operation is not guaranteed for the file that might have been modified with editor.

Saving/recalling Loss Compensation Table

The loss compensation table can be saved in the file with CSV (Comma Separated Value) format.To save the loss compensation table that is set for each port into a file, use the following command:

- :MMEM:STOR:PLOS{1-4} on page 508

Executing the above command will save the loss compensation table for the active channel.

Recalling the file saved using the above command can reproduce the loss compensation table on the active channel. To recall the settings from a file, use the following command:

- :MMEM:LOAD:PLOS{1-4} on page 495

NOTE It is possible to recall a file from a different channel or port where it was saved. Note that recalling operation is not guaranteed for the file that might have been modified with editor.

Saving/loading (importing) the VBA program

Saving

Only the VBA project file can be saved using command.

To save the VBA project that is opened on the VBA editor on the file, use the following command.

- :MMEM:STOR:PROG on page 509

Loading (importing)

To load the VBA project to the VBA editor, or to import the module/form file, use the following command.

- :MMEM:LOAD:PROG on page 496

Executing above command will load/import the file according to its extension as follows:

Extension	File type
vba	VBA Project
bas	Standard module
frm	User Forms
cls	Class Modules

Sample program

Example 9-1 shows a sample program that demonstrates how to save a file.You can find the source file of this program, named file_sav.bas, on the sample program disk.

This program saves selected content on a file with a specified name.

The program is described in detail below:

Line 40	Assigns a GPIB address to the I/O pass.
Line 60	Allows the user to return to the entry start line and re-enter the data if an error (such as an invalid entry) occurs while entering the number that identifies the content to be saved.
Lines 80 to 180	These lines display the list of options for content to be saved, and prompt the user to choose one of the items by typing in the appropriate number.
Line 190	Converts the entered value into an integer and stores it into the Content variable.
Line 200	Returns to the entry start line if an invalid value is contained in Content.
Line 230	Passes control to a subprogram named Inp_file_name, which lets the user input a file name for saving, and then stores the returned file name into the File$ variable.
Lines 270 to 280	If Content is equal to 1, these lines set the content to be saved as the instrument status to “instrument status only”, and store the state with the file name which is combined the File$ variable with the extension “.sta”.
Lines 300 to 310	If Content is equal to 2, these lines set the content to be saved as the instrument status to “instrument status and calibration coefficient”, and store the state with the file name which is combined the File$ variable with the extension “.sta”.
Lines 330 to 340	If Content is equal to 3, these lines set the content to be saved as the instrument status to “instrument status and measurement data”, and store the state with the file name which is combined the File$ variable with the extension “.sta”.
Lines 360 to 370	If Content is equal to 4, these lines set the content to be saved as the instrument status to “instrument status, calibration coefficient, and measurement data”, and store the state with the file name which is combined the File$ variable with the extension “.sta”.
Line 390	If Content is equal to 5, and store the state with the file name which is combined the File$ variable with the extension “.csv”.
Line 410	If Content is equal to 6, and store the image data of the LCD screen with the file name which is combined the File$ variable with the extension “.bmp”.

The Inp_file_name subprogram in lines 480 to 590, which is used to enter a save filename, is described below.

Line 500	Allows the user to return to the entry start line and re-enter the data if an error (such as an invalid entry) occurs while entering the target file name.
Lines 520 to 540	These lines prompt the user to enter the target file name. The program does not continue till the user actually enters the file name.
Lines 550 to 560	These lines display the entered file name and waits for a confirmation entry (y/n key).
Line 570	Returns to the entry start line if the key the user pressed in line 560 is not the y key.

Example 9-1 **Saving file (file_sav.htb)**

```
10      DIM File$[300],Inp_char$[30]
20      INTEGER Content
30      CLEAR SCREEN
40      ASSIGN @Agte507x TO 717
50      !
60      ON ERROR GOTO Content_select
70 Content_select:  !
80      PRINT "## Save Content Selection ##"
90      PRINT "Select Content"
100     PRINT " 1: State (State only)"
110     PRINT " 2: State (State & Cal)"
120     PRINT " 3: State (State & Trace)"
130     PRINT " 4: State (State & Cal & Trace)"
140     PRINT " 5: Trace Data (CSV)"
150     PRINT " 6: Screen"
160     PRINT ""
170     PRINT "Input 1 to 6"
180     INPUT "Number?",Inp_char$
190     Content=IVAL(Inp_char$,10)
200     IF Content<1 OR Content>6 THEN Content_select
210     OFF ERROR
220     !
230     CALL Inp_file_name(File$)
240     !
250     SELECT Content
260       CASE 1
270         OUTPUT @Agte507x;":MMEM:STOR:STYP STAT"
280         OUTPUT @Agte507x;":MMEM:STOR """&File$&".sta"""
290       CASE 2
300         OUTPUT @Agte507x;":MMEM:STOR:STYP CST"
310         OUTPUT @Agte507x;":MMEM:STOR """&File$&".sta"""
320       CASE 3
330         OUTPUT @Agte507x;":MMEM:STOR:STYP DST"
340         OUTPUT @Agte507x;":MMEM:STOR """&File$&".sta"""
350       CASE 4
360         OUTPUT @Agte507x;":MMEM:STOR:STYP CDST"
370         OUTPUT @Agte507x;":MMEM:STOR """&File$&".sta"""
380       CASE 5
390         OUTPUT @Agte507x;":MMEM:STOR:FDAT """&File$&".csv"""
400       CASE 6
```

```
410         OUTPUT @Agte507x;":MMEM:STOR:IMAG """&File$&".bmp"""
420     END SELECT
430     !
440     END
450     !=========================================
460     ! File Name Input Function
470     !=========================================
480   SUB Inp_file_name(Inp_name$)
490     DIM Inp_char$[9]
500     ON ERROR GOTO Inp_start
510 Inp_start: !
520     PRINT "## File Name Input ##"
530     PRINT "Input Save File Name (without Extension)"
540     INPUT "Name?",Inp_name$
550     PRINT "Input Name: "&Inp_name$
560     INPUT "OK? [Y/N]",Inp_char$
570     IF UPC$(Inp_char$)<>"Y" THEN Inp_start
580     OFF ERROR
590   SUBEND
```

Managing Files

Creating directory (folder)

To create a directory (folder), use the following command:

- :MMEM:MDIR on page 499

Deleting file (directory)

To delete a file or a directory, use the following command:

- :MMEM:DEL on page 488

Copying file

To copy a file, use the following command:

- :MMEM:COPY on page 487

Transferring files

File transfer from the external controller to the E5070B/E5071B can be possible by reading data from a file on the controller and then writing them to the file on the E5070B/E5071B.

- :MMEM:TRAN on page 520

Also, file transfer from the E5070B/E5071B to the external controller can be possible by reading data from a file on the E5070B/E5071B using the commands as query and then writing them to the file on the controller.

Retrieving data from storage

To retrieve information for the storage that is built in the E5070B/E5071B (usage, property of file located in a specified directory), use the following command;

- :MMEM:CAT? on page 486

Sample program

Example 9-1 shows a sample program for transferring files between the external controller and the E5070B/E5071B. You can find the source file of this program, named file_xfr.bas, on the sample program disk.

This program reads out data from a specified file on the external controller (or the E5070B/E5071B), then write them to a specified file on the E5070B/E5071B(or the external controller).

The program is described in detail below:

Line 40	Assigns a GPIB address to the I/O pass.
Lines 60 to 130	These line allow the user to return to the entry start line and re-enter the data if an error (such as an invalid entry) occurs while entering the number that indicates the transfer direction. Then, these line display the list of transfer directions and prompt the user to input a selected number.
Lines 80 to 130	These lines display the list of transfer directions, and prompt the user to choose one of the items by typing in the appropriate number.
Lines 140 to 150	Converts the entered value into an integer and stores it into the Direction variable. Returns to the entry start line if an invalid value is contained in Direction.
Lines 180 to 210	These lines obtain the name of the source file for copying from the user input, store it into the Src_file$ variable, and display the value of Src_file$.
Lines 180 to 210	These lines obtain the name of the source file for copying from the user input, store it into the Src_file$ variable, and display the value of Src_file$.
Lines 230 to 270	If Direction is equal to 2 (from the external controller to the E5070B/E5071B), these lines obtain the size of the source file for copying, store it into the Src_size_char$, and display the value of Src_size_char$.
Lines 290 to 320	These lines obtain the name of the destination file for copying from the user input, store it into the Dst_file$ variable, and display the value of Dst_file$.
Line 350	If Direction is equal to 1 (from the E5070B/E5071B to the external controller), these lines use the subprogram Copy_to_contr to transfer (copy) a file with the name Src_file$ on the E5070B/E5071B to a file with the name Dst_file$ on the external controller.
Line 370	If Direction is equal to 2, these lines use the subprogram Copy_to_e507x to transfer (copy) a file with the name Src_file$ on the external controller to a file with the name Dst_file$ on the E5070B/E5071B.

Copy_to_contr, a subprogram for transferring files from the E5070B/E5071B to the external controller that appears in lines 440 to 1000, is described below.

Lines 490 to 520	If any file with the name File$ already exists, these lines delete the file and newly create a file with the name File$.
Line 530	Assigns a destination file for copying to the I/O pass.

Line 540 This line stores a maximum number of transferred data (in bytes) per one transfer, that is 24 KByte to meet the size limitation of string arrays in the HTBasic, into Max_bsize variable.

Lines 560 to 600 These lines configure the system to generate an SRQ when it cannot find a source file for copying due to an error.

Lines 620 to 630 These lines set the branch target for an SRQ interrupt to enable SRQ interrupts.

Lines 640 to 650 These lines display a message showing that the transfer has started, and execute commands for reading data from a file on the E5070B/E5071B.

Lines 670 to 680 These lines read the header symbol (#) in a block data, read number of digits (characters) indicating the size of data in bytes, then store it into Digit$ variable.

Line 690 This line creates a format for reading characters in Digit$.

Line 700 This line reads the data size in byte and stores it into Src_size_char$ variable.

Line 720 This line converts Src_size_char$ to a real number and stores it into Src_size variable.

Lines 730 to 870 These lines repeat the procedures below until Src_size reaches 0.

Lines 740 to 780: If Src_size is greater than Max_bsize, these lines assign the value of the Max_bsize to Block_size variable (transferred data in bytes). If Src_size is equal or less than Max_bsize, assign the value of Src_size to Block_size.

Line 800 This line defines Dat$ string variable with the size as large as Block_size and reserves memory area.

Line 810 This line creates a format for reading characters as many as Block_size characters.

Line 820 This line reads data from the file on the E5070B/E5071B, then stores them into Dat$.

Line 830 This line writes the contents of Dat$ to the file on the external controller.

Lines 840 to 860 These lines free the memory area for Dat$ and subtract Block_size from Src_size.

Lines 890 to 900 These lines display a message showing the completion of transfer, then read a message terminator at the end of the data.

Lines 940 to 980 These lines define an error handler that retrieves and displays the number and message of an error that has occurred.

Copy_to_e507x, a subprogram for transferring files from the external controller to the E5070B/E5071B that appears in lines 1040 to 1540, is described below.

Lines 1090 to 1110 Assigns a destination file for copying to the I/O pass.

Line 1120 This line stores a maximum number of transferred data (in bytes) per one transfer, that is 24 KByte, into Max_bsize variable.

Lines 1140 to 1160 Clears the error queue.

Line 1180 Displays a measurement start message.

Lines 1190 to 1200 These lines create the header part indicating that data will be sent as many as Src_size_char$ bytes, then send the header part of the command and its parameters for writing the data to the file on the E5070B/E5071B.

Line 1220 This line converts Src_size_char$ to a real number and stores it into Src_size variable.

Lines 1230 to 1370 These lines repeat the procedures below until Src_size reaches 0.

Lines 1240 to 1280: If Src_size is greater than Max_bsize, these lines assign the value of the Max_bsiize to Block_size variable (transferred data in bytes). If Src_size is equal or less than Max_bsize, assign the value of Src_size to Block_size.

Line 1300 This line defines Dat$ string variable with the size as large as Block_size and reserves memory area.

Line 1310 This line creates a format for reading characters as many as Block_size characters.

Line 1320 This line reads data from the file on the external controller, then stores them into Dat$.

Line 1330 This line writes the contents of Dat$ to the file on the E5070B/E5071B.

Lines 1340 to 1360 These lines free the memory area for Dat$ and subtract Block_size from Src_size.

Line 1390 This line sends a message terminator at the end of data.

Lines 1420 to 1430 These lines retrieve the error number and error message from the error queue, and then store them into the variables Err_no and Err_msg$, respectively.

Lines 1440 to 1490 If Err_no is equal to 0 (no error occurred), these lines display the message indicating completion of transfer, and if Err_no is not equal to 0 (an error occurred), display Err_no along with Err_msg$.

Lines 1510 to 1520 These lines handle the case with no source file for copying is found.

Example 9-2 **File transfer (file_xfr.htb)**

```
10     DIM Src_file$[50],Dst_file$[50],Src_size_char$[50],Inp_char$[30]
20     INTEGER Direction
30     ASSIGN @Agte507x TO 717
40     !
50     CLEAR SCREEN
60     ON ERROR GOTO Direct_select
70 Direct_select:  !
80     PRINT "####  File Transfer ####"
90     PRINT " 1: E507x -> Controller"
100    PRINT " 2: Controller -> E507x"
110    PRINT ""
120    PRINT "Input 1 or 2"
130    INPUT "Number?",Inp_char$
140    Direction=IVAL(Inp_char$,10)
150    IF Direction<1 OR Direction>2 THEN Direct_select
160    OFF ERROR
170    !
180    PRINT ""
190    PRINT " Input source file name.        ";
200    INPUT "Name?",Src_file$
210    PRINT ": "&Src_file$
220    !
230    IF Direction=2 THEN
240      PRINT " Input source file size.        ";
250      INPUT "Size[Byte]?",Src_size_char$
260      PRINT ": "&Src_size_char$&"[Byte]"
270    END IF
280    !
290    PRINT " Input destination file name.   ";
300    INPUT "Name?",Dst_file$
310    PRINT ": "&Dst_file$
320    PRINT ""
330    !
340    IF Direction=1 THEN
350      Copy_to_contr(@Agte507x,Src_file$,Dst_file$)
360    ELSE
370      Copy_to_e507x(@Agte507x,Src_file$,Src_size_char$,Dst_file$)
380    END IF
390    !
400    END
410    !============================================
420    ! File Transfer Function (E507x -> Controller)
430    !============================================
440  SUB Copy_to_contr(@Agte507x,Src_file$,Dst_file$)
450    DIM Img$[32],Src_size_char$[10],Buff$[9],Err_msg$[100]
460    INTEGER Max_bsize,Block_size,Err_no
470    REAL Src_size
480    !
490    ON ERROR GOTO Skip_purge
500    PURGE Dst_file$
510 Skip_purge: OFF ERROR
520    CREATE Dst_file$,1
530    ASSIGN @Dst_file TO Dst_file$
540    Max_bsize=24576   ! 24KByte
550    !
560    OUTPUT @Agte507x;"*ESE 60"
570    OUTPUT @Agte507x;"*SRE 32"
580    OUTPUT @Agte507x;"*CLS"
590    OUTPUT @Agte507x;"*OPC?"
600    ENTER @Agte507x;Buff$
610    !
```

```
620    ON INTR 7 GOTO Err
630    ENABLE INTR 7;2
640   PRINT "Now Copying: "&Src_file$&"(@E507x) -> "&Dst_file$&"(@Contro
ller)"
650    OUTPUT @Agte507x;":MMEM:TRAN? """&Src_file$&""""
660    WAIT .1
670    ENTER @Agte507x USING "#,A";Buff$
680    ENTER @Agte507x USING "#,A";Digit$
690    Img$="#,"&Digit$&"A"
700    ENTER @Agte507x USING Img$;Src_size_char$
710    !
720    Src_size=VAL(Src_size_char$)
730    WHILE Src_size>0
740      IF Src_size>Max_bsize THEN
750        Block_size=Max_bsize
760      ELSE
770        Block_size=Src_size
780      END IF
790      !
800      ALLOCATE Dat$[Block_size]
810      Img$="#,"&VAL$(Block_size)&"A"
820      ENTER @Agte507x USING Img$;Dat$
830      OUTPUT @Dst_file USING Img$;Dat$
840      DEALLOCATE Dat$
850      !
860      Src_size=Src_size-Block_size
870    END WHILE
880    !
890    PRINT "Done"
900    ENTER @Agte507x USING "#,A";Buff$
910    ASSIGN @Dst_file TO *
920    !
930    GOTO Skip_error
940 Err: OFF INTR 7
950    OUTPUT @Agte507x;";:SYST:ERR?"
960    ENTER @Agte507x;Err_no,Err_msg$
970    PRINT "Error occurred!!"
980    PRINT "  No:";Err_no,"Description: "&Err_msg$
990 Skip_error: OFF INTR 7
1000 SUBEND
1010   !============================================
1020   ! File Transfer Function (Controller -> E507x)
1030   !============================================
1040 SUB Copy_to_e507x(@Agte507x,Src_file$,Src_size_char$,Dst_file$)
1050   DIM Img$[32],Header$[10],Buff$[9],Err_msg$[100]
1060   INTEGER Max_bsize,Block_size,Err_no
1070   REAL Src_size
1080   !
1090   ON ERROR GOTO File_error
1100   ASSIGN @Src_file TO Src_file$
1110   OFF ERROR
1120   Max_bsize=24576   ! 24KByte
1130   !
1140   OUTPUT @Agte507x;"*CLS"
1150   OUTPUT @Agte507x;"*OPC?"
1160   ENTER @Agte507x;Buff$
1170   !
1180   PRINT "Now Copying: "&Src_file$&"(@Controller) -> "&Dst_file$&"(@
E507x)"
1190   Header$="#"&VAL$(LEN(Src_size_char$))&Src_size_char$
1200   OUTPUT @Agte507x;":MMEM:TRAN """&Dst_file$&""","&Header$;
1210   !
1220   Src_size=VAL(Src_size_char$)
1230   WHILE Src_size>0
```

```
1240     IF Src_size>Max_bsize THEN
1250       Block_size=Max_bsize
1260     ELSE
1270       Block_size=Src_size
1280     END IF
1290     !
1300     ALLOCATE Dat$[Block_size]
1310     Img$="#,"&VAL$(Block_size)&"A"
1320     ENTER @Src_file USING Img$;Dat$
1330     OUTPUT @Agte507x USING Img$;Dat$
1340     DEALLOCATE Dat$
1350     !
1360     Src_size=Src_size-Block_size
1370   END WHILE
1380   !
1390   OUTPUT @Agte507x;"",END
1400   ASSIGN @Src_file TO *
1410   !
1420   OUTPUT @Agte507x;";:SYST:ERR?"
1430   ENTER @Agte507x;Err_no,Err_msg$
1440   IF Err_no=0 THEN
1450     PRINT "Done"
1460   ELSE
1470     PRINT "Error occurred!!"
1480     PRINT "  No:";Err_no,"Description: "&Err_msg$
1490   END IF
1500   GOTO Skip_error
1510 File_error:OFF ERROR
1520   PRINT "File name NOT found!"
1530 Skip_error:!
1540 SUBEND
```

10 Communication with External Instruments Using Handler I/O Port

This chapter provides necessary information for communicating with external instruments (for example, a handler in a production line) using the handler I/O port equipped with the Agilent E5070B/E5071B.

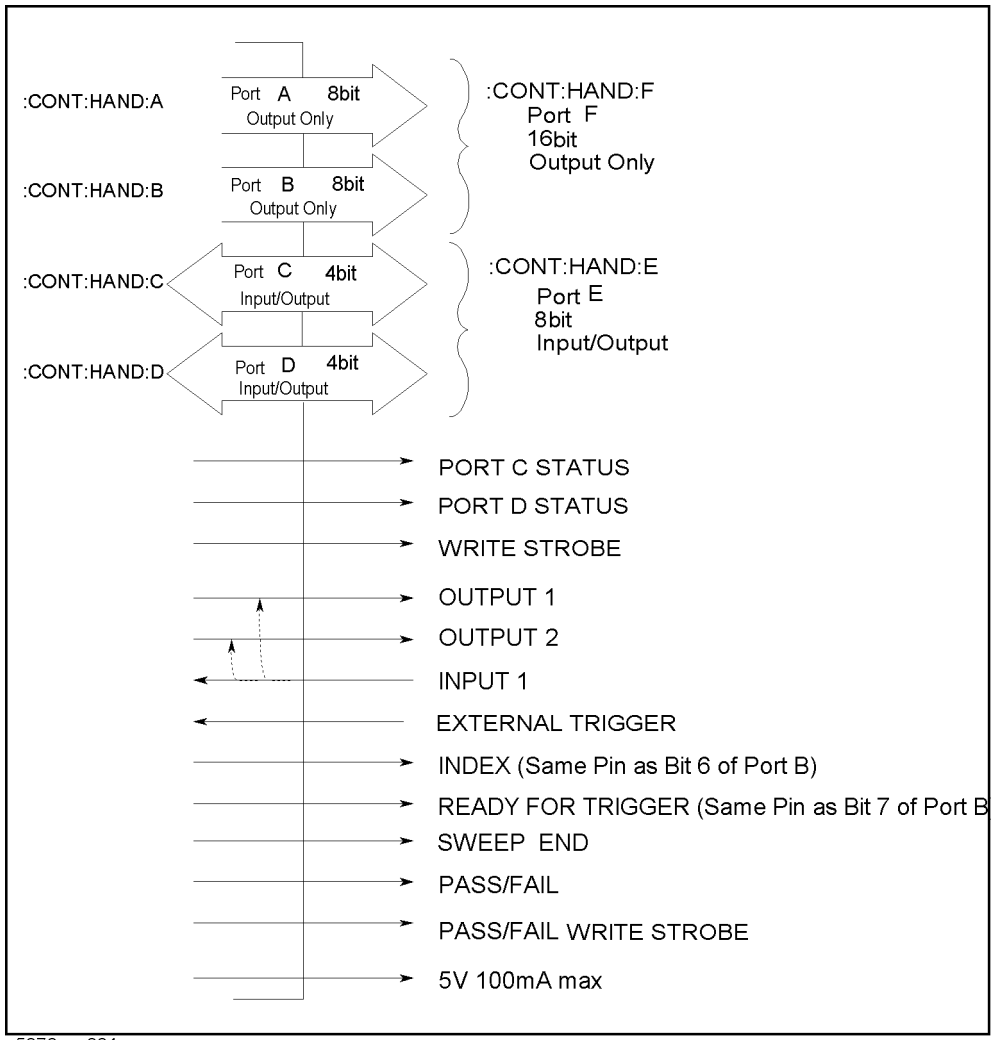
Handler I/O Port Overview

The E5070B/E5071B handler I/O port provides four independent parallel ports for data I/O associated with several control signal lines and the power line. All signals operate in TTL logic.

The data I/O ports are configured with 2 pairs of 8 bit output port and 2 pairs of 4 bit bi-directional port. Also those ports can cooperate to provide a maximum 16-bit-width output port or a maximum 8-bit-width input port.

The I/O signals operate on the negative logic basis, which can be altered. The control signal lines consist of various control output data, including completion of measurement or control signal for handshaking. Figure 10-1 outlines the I/O ports and control signal lines.

Figure 10-1 **Handler I/O port overview**

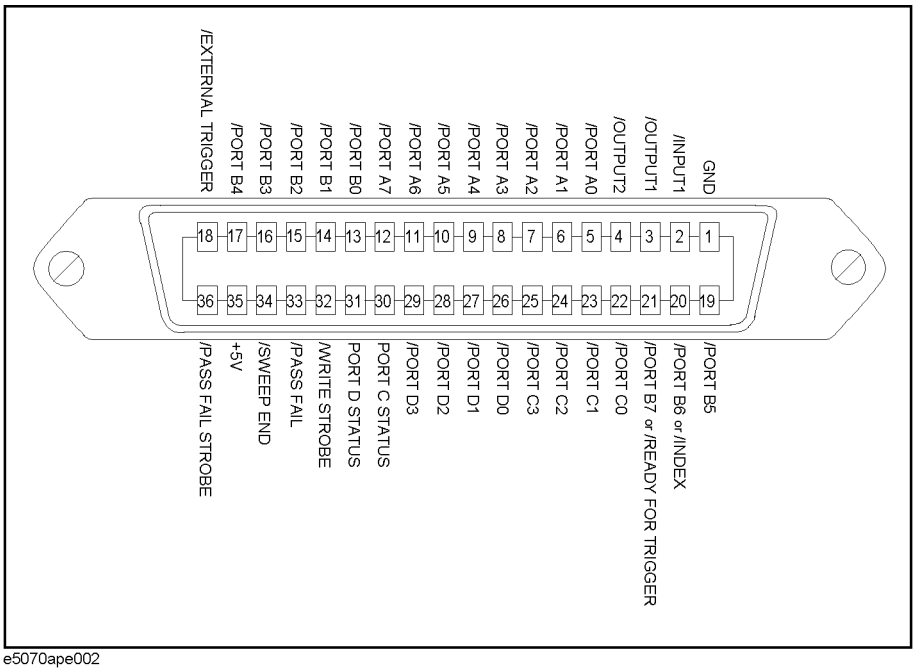


e5070ape001

I/O Signal Pin Layout and Description

Figure 10-2 illustrates the layout of the I/O signal pins on the handler interface connector while Table 10-1 on page 212 briefly describes those signals.

Figure 10-2 **Handler interface connector pin layout**



e5070ape002

NOTE A slash (/) symbol preceding signal names means that they are negative logic (active low).

Table 10-1 Description of the handler interface I/O signals

Pin number	Signal name	Input/Output	Description
1	GND	——	Ground.
2	/INPUT1	Input	When this port receives a negative pulse, /OUTPUT1 and /OUTPUT2 are changed to the Low level.
3	/OUTPUT1	Output	Changes to the Low level when /INPUT1 receives a negative pulse.A command can be available for altering the Low/High level logic.
4	/OUTPUT2	Output	Changes to the Low level when /INPUT1 receives a negative pulse.A command can be available for altering the Low/High level logic.
5	/PORT A0	Output	Bit 0 of port A (8 bit parallel output port)
6	/PORT A1	Output	Bit 1 of port A.
7	/PORT A2	Output	Bit 2 of port A.
8	/PORT A3	Output	Bit 3 of port A.
9	/PORT A4	Output	Bit 4 of port A.
10	/PORT A5	Output	Bit 5 of port A.
11	/PORT A6	Output	Bit 6 of port A.
12	/PORT A7	Output	Bit 7 of port A.
13	/PORT B0	Output	Bit 0 of port B (8 bit parallel output port)
14	/PORT B1	Output	Bit 1 of port B.
15	/PORT B2	Output	Bit 2 of port B.
16	/PORT B3	Output	Bit 3 of port B.
17	/PORT B4	Output	Bit 4 of port B.
18	/EXTERNAL TRIGGER	Input	An external trigger signal. When the trigger source is set to the “External,” this port generates a trigger in respond to the trailing edge of a negative pulse.
19	/PORT B5	Output	Bit 5 of port B.
20[*1]	/PORT B6	Output	Bit 6 of port B.
	/INDEX		Indicates that analog measurement is complete.The /INDEX signal changes to the Low level when analog measurement (all sweeps of all channels) is complete. When the handler receives the signal, it assumes that it is ready to connect the next DUT. However, no measurement data are available until data calculation is completed. When the point trigger function is on, it goes to the High level before staring measurement of the first measurement point and returns to the Low level after completing measurement of all measurement points.

Table 10-1 Description of the handler interface I/O signals

Pin number	Signal name	Input/Output	Description
21[*2]	/PORT B7	Output	Bit 7 of port B.
	/READY FOR TRIGGER		Indicates that the instrument is ready for triggering.This signal is changed to the Low level when the instrument is ready for receiving a trigger signal. With the point trigger function on, it goes to the Low level when the instrument is ready to accept the trigger signal for the first point and goes to the High level when the trigger signal for the first point is received. When measurement of all measurement points is completed and the instrument is ready to receive the trigger signal for the first point of the next sweep, this signal goes to the Low level again.
22	/PORT C0	Input/Output	Bit 0 of port C (4 bit parallel I/O port)
23	/PORT C1	Input/Output	Bit 1 of port C.
24	/PORT C2	Input/Output	Bit 2 of port C.
25	/PORT C3	Input/Output	Bit 3 of port C.
26	/PORT D0	Input/Output	Bit 0 of port D (4 bit parallel I/O port)
27	/PORT D1	Input/Output	Bit 1 of port D.
28	/PORT D2	Input/Output	Bit 2 of port D.
29	/PORT D3	Input/Output	Bit 3 of port D.
30	PORT C STATUS	Output	Port C status signal.This signal is changed to the High level when the port C is configured to output port. It is changed to the Low level when the port is configured to input port.
31	PORT D STATUS	Output	Port D status signal.This signal is changed to the High level when the port D is configured to output port. It is changed to the Low level when the port is configured to input port.
32	/WRITE STROBE	Output	A output port write strobe signal.When data is present (that is, output level changes) on any of the output ports, this signal provides a negative pulse.
33	/PASS FAIL	Output	Each limit test's results[*3] signal. This signal changes to the High level when limit test, bandwidth test, or ripple test results return FAIL. It changes to the Low level when all limit test results return PASS.
34	/SWEEP END	Output	A sweep completion signal.When measurement (all sweeps of all channels) and data calculation are completed, this signal provides this signal provides a negative pulse.
35	+5V	Output	Provides +5V DC power supply for external instruments.

Table 10-1 Description of the handler interface I/O signals

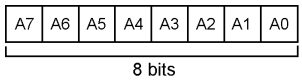
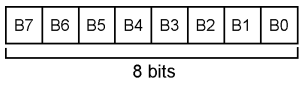
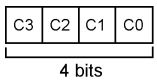
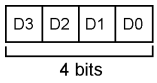
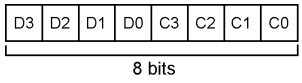
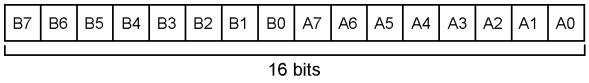
Pin number	Signal name	Input/Output	Description
36	/PASS FAIL STROBE	Output	Each limit test's results write a strobe signal. When limit test result is present on /PASS FAIL, this signal provides a negative pulse.

*1. This signal provides various functions depending upon the setting of :CONT:HAND:IND:STAT command on page 446.
*2. This signal provides various functions depending upon the setting of :CONT:HAND:RTR:STAT command on page 447.
*3. The overall test result that combine the test results for all traces in all channels.

Inputting/Outputting Data

The E5070B/E5071B handler I/O port provides the ports for data I/O shown in Table 10-2.

Table 10-2 I/O port

Port Name	Usage	Data Structure
Port A	Output	
Port B	Output	
Port C	Input/Output	
Port D	Input/Output	
Port E	Input/Output	
Port F	Output	

Specifying signal direction of port

Signal direction (input/output) can be changed for the ports C, D, and D as shown in Table 10-2. Thus, before the ports are used, the directions should be determined according to their usage.

To specify the signal direction for the ports C and D, use the following command.Direction for the port E depends on the setting for the ports C and D.

Port Name	Command
Port C	:CONT:HAND:C:MODE on page 441
Port D	:CONT:HAND:D:MODE on page 443

Reading data input to port

When the ports C, D, or E is configured to input ports, binary data represented with High(0)/Low(1) of each bit of the port will be read as decimal data.

To retrieve the data, use the following command as query:

Port Name	Command
Port C	:CONT:HAND:C on page 440
Port D	:CONT:HAND:D on page 442
Port E	:CONT:HAND:E on page 444

Data output to port

To the ports A through F (the ports C, D, and E should be configured to output ports), binary data (decimal data when output data is specified with a command) represented with High(0)/Low(1) of each bit of the port can be output.

To output data, use the following command.

Port Name	Command
Port A	:CONT:HAND:A on page 439
Port B	:CONT:HAND:B on page 439
Port C	:CONT:HAND:C on page 440
Port D	:CONT:HAND:D on page 442
Port E	:CONT:HAND:E on page 444
Port F	:CONT:HAND:F on page 445

NOTE

The bit 6 of the data outputted by **:CONT:HAND:B** command (the bit 14 of the data outputted by **:CONT:HAND:F** command) is ignored when outputting the /INDEX signal is turned on.

The bit 7 of the data outputted by **:CONT:HAND:B** command (the bit 15 of the data outputted by **:CONT:HAND:F** command) is ignored when outputting the /READY FOR TRIGGER signal is turned on.

Preset states at power-on

The handler I/O port is set at power-on as follows (not affected at reset).

Port A	High (All Bits)
Port B	High (All Bits)
Port C	Input
Port D	Input
PORT C STATUS	Low
PORT D STATUS	Low
/OUTPUT1	High
/OUTPUT2	High
/SWEEP END	High
/PASS FAIL	High

Timing Chart

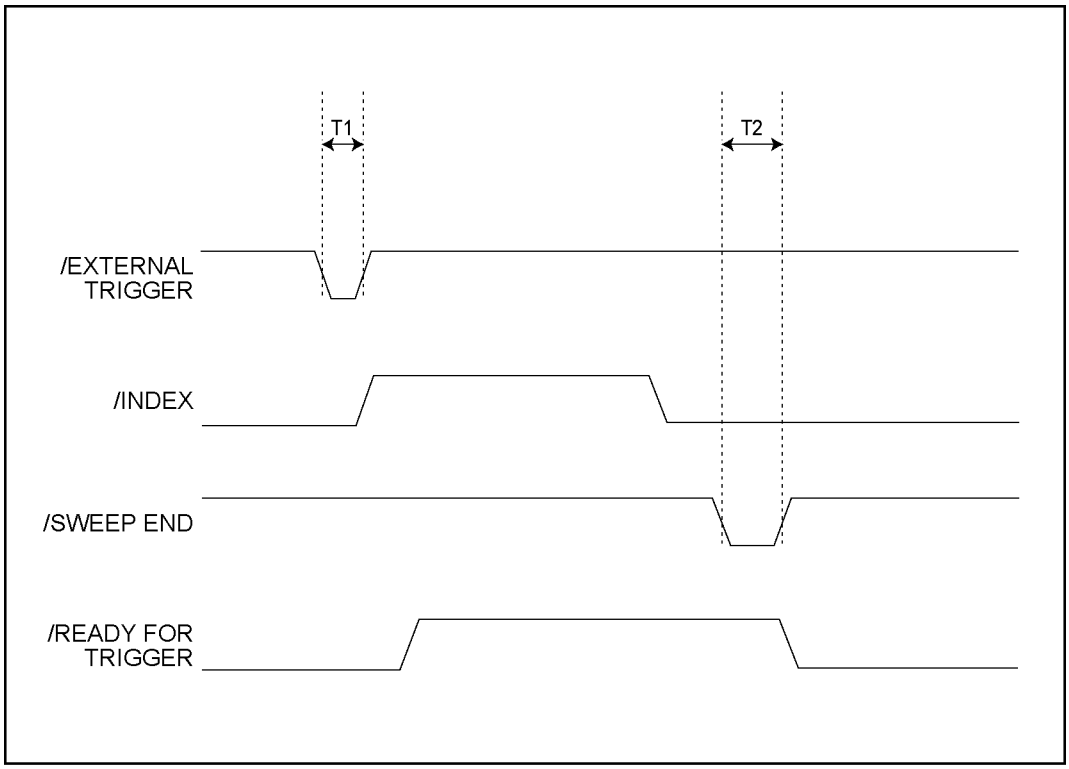
Figure 10-3 shows the timing chart for each timing signal output, from the start of measurement (pulse input to /EXTERNAL TRIGGER) until the end of measurement when the point trigger function is off.

Table 10-3 Values of T1 through T2 in Figure 10-3 (typical)

		Minimum value	Typical Value	Maximum value
T1	Pulse width of /EXTERNAL TRIGGER	1 µs*1	—	—
T2	Pulse width of /SWEEP END	10 µs	12 µs	—

*1. When a trigger signal is input from the handler I/O port.

Figure 10-3 Timing chart of /EXTERNAL TRIGGER, /INDEX, /SWEEP END, and /READY FOR TRIGGER (when point trigger function is off)



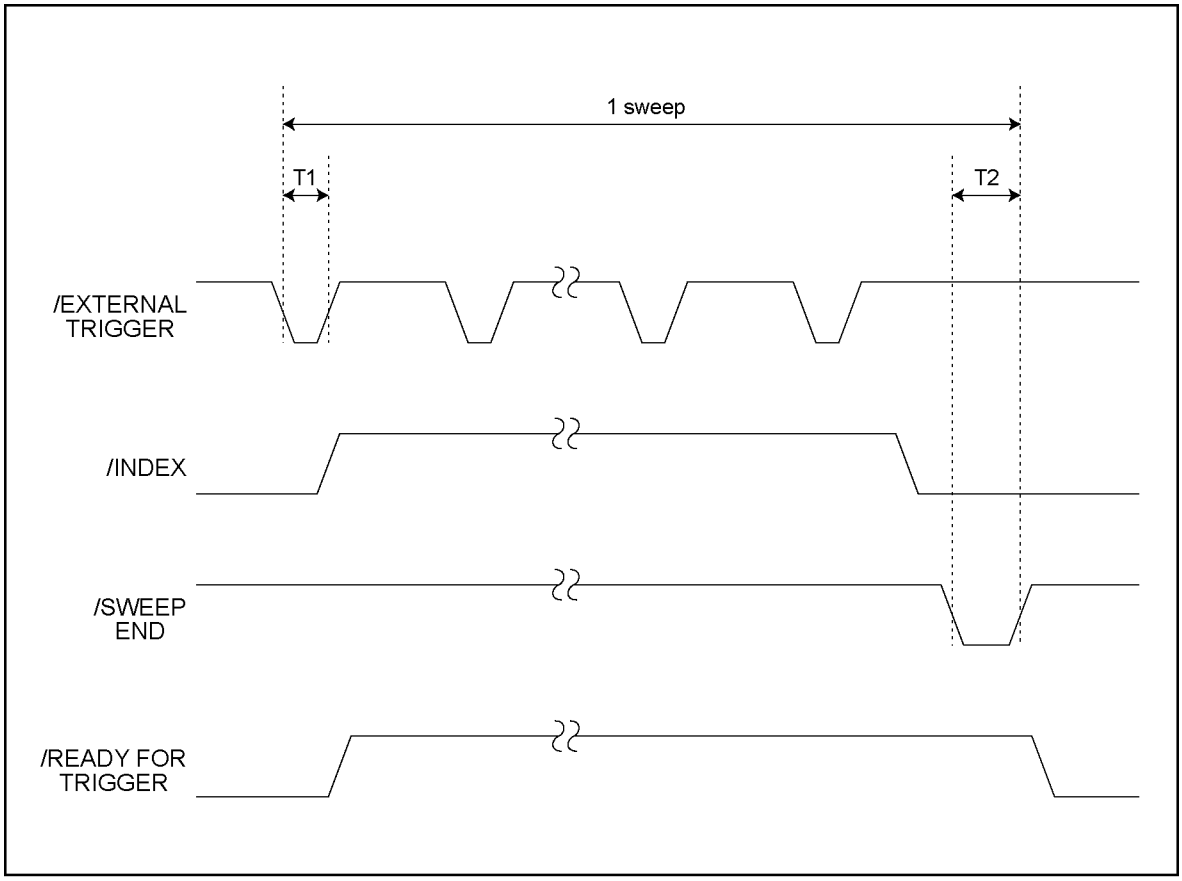
e5070apj009

/INDEX and /READY FOR TRIGGER signals can be outputted by using the following commands.

/INDEX	:CONT:HAND:C:MODE on page 441
/READY FOR TRIGGER	:CONT:HAND:D:MODE on page 443

Figure 10-4 shows the timing chart of the timing signal outputs, from the start of measurement (pulse input to /EXTERNAL TRIGGER) to the end of measurement, when the point trigger function is on and the low-latency external trigger mode is on.

Figure 10-4 Timing chart of /EXTERNAL TRIGGER, /INDEX, /SWEEP END, and /READY FOR TRIGGER (when point trigger function is on and low-latency external trigger mode is on)



e5070bpj7001

NOTE

When both the point trigger function and the low-latency external trigger mode are on, the /EXTERNAL TRIGGER signal must be inputted for each measurement point during a single sweep. The /INDEX signal goes to the High level before staring measurement of the first measurement point and returns to the Low level after the completing measurement of all measurement points.The /READY FOR TRIGGER signal goes to the Low level when the instrument is ready to accept the trigger signal for the first point and then goes to the High level when the trigger signal for the first point is received. When measurement of all measurement points is completed and the instrument is ready to receive the trigger signal for the first point of the next sweep, this signal goes to the Low level again.

When the point trigger function is on and the low-latency external trigger mode is off, the /READY FOR TRIGGER signal goes High each time a trigger signal is received and goes Low when measurement of each measurement point is completed and the instrument is ready to accept a trigger for the next measurement point.

The times of T1 and T2 are the same as those when the point trigger function is off. For

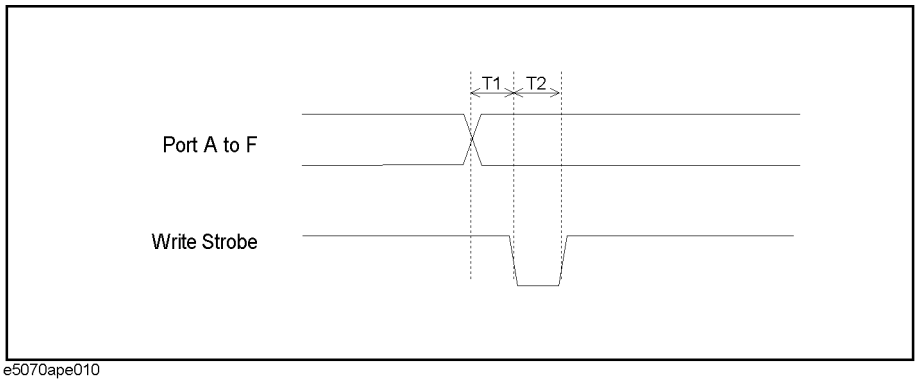
more information, see Table 10-3 on page 218.

Figure 10-5 shows the timing chart for data output and write strobe signal output to ports A through F.

Table 10-4 Values of T1 through T2 in Figure 10-5 (typical)

T1	Response time of write strobe signal	1 µs
T2	Pulse width of write strobe signal	1 µs

Figure 10-5 Timing chart of data output and write strobe signal



e5070ape010

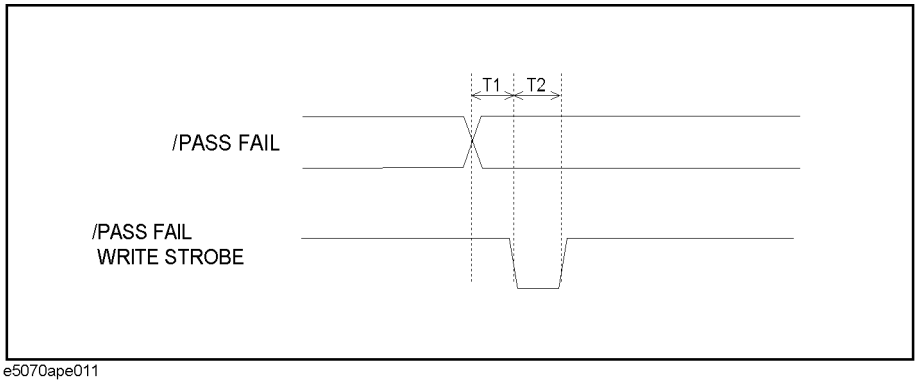
Figure 10-6 shows the timing chart of limit test result output (/PASS FAIL signal output) and /PASS FAIL write strobe signal output.

The timing chart of the limit test result contains a ripple test and a bandwidth test.

Table 10-5 Values of T1 through T2 in Figure 10-6 (typical)

T1	Response time of /PASS FAIL write strobe	1 µs
T2	Pulse width of /PASS FAIL write strobe	1 µs

Figure 10-6 Timing chart of limit test result output and write strobe signal



e5070ape011

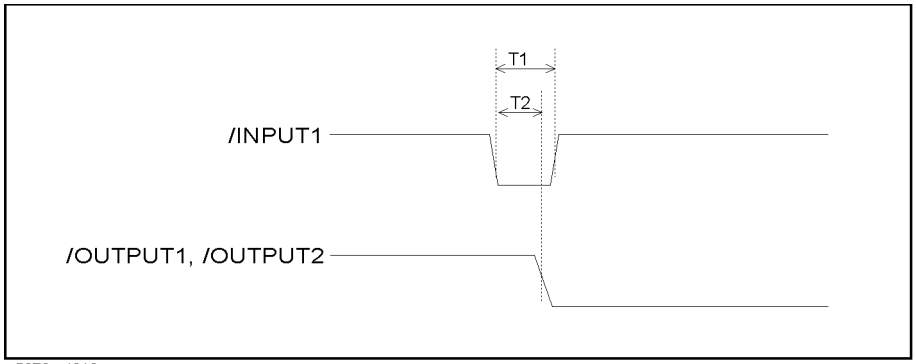
NOTE When the average trigger function is activated, the fail and write strobe signals are outputted at the time that the average test result shows “failed” on a certain channel.

Figure 10-7 shows the timing chart of a pulse input to INPUT1, /OUTPUT1 signal output, and /OUTPUT2 signal output.

Table 10-6 Values of T1 through T2 in Figure 10-7 (typical)

		Minimum value	Maximum value
T1	Pulse width of /INPUT1	1 µs	—
T2	Response time of /OUTPUT1, /OUTPUT2	0.4 µs	0.6 µs

Figure 10-7 Timing chart of /INPUT1 and /OUTPUT1, /OUTPUT2



e5070apj012

Electrical Characteristics

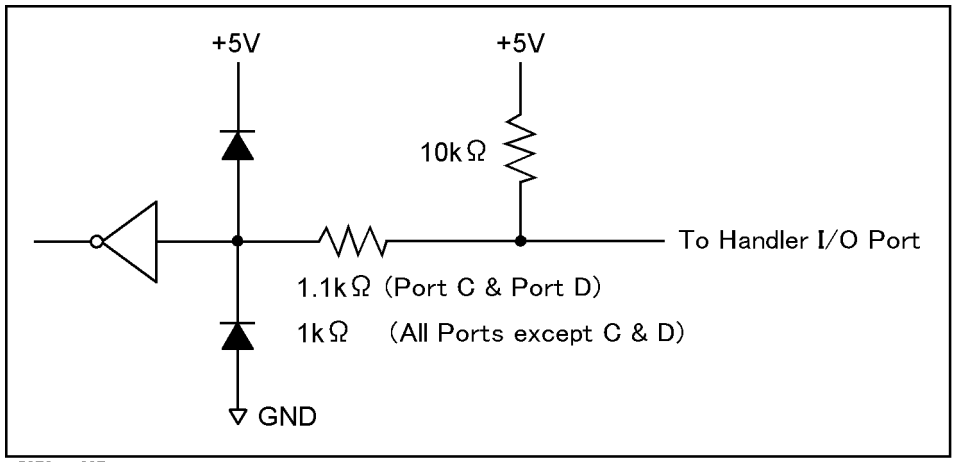
Input signal

All input signals are TTL compatible. Table 10-7 shows the electrical characteristics of input signals. Figure 10-8 shows the circuit diagram of input signals.

Table 10-7 Electrical characteristics of input signals (typical)

Maximum rate input voltage		-0.5 V to 5.5 V
Input voltage	High level	2.0 V to 5.0 V
	Low level	0 V to 0.5 V

Figure 10-8 Circuit diagram or input signals



e5070ape027

Output signal

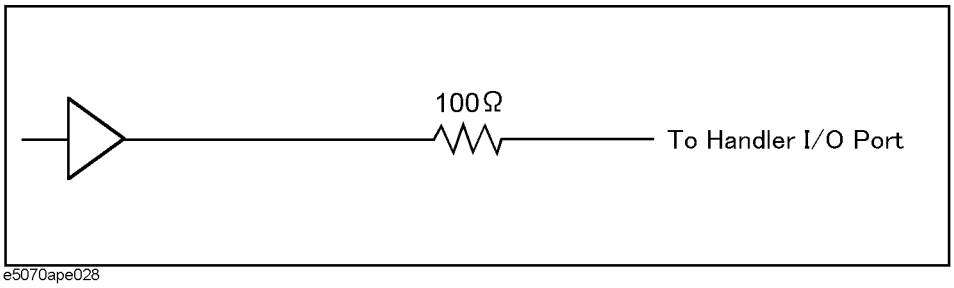
All output signals are TTL compatible. Table 10-8 shows the electrical characteristics of output signals. Figure 10-9 shows the circuit diagram of output signals.

Table 10-8 Electrical characteristics of output signals (typical)

Maximum rate output current		-10 mA to 10 mA
Output current	High level	-5 mA
	Low level	3 mA
Output voltage	High level	2.0 V to 3.3 V (when output current is from -5 mA to 0 mA) 3.20 V (when output current is -1 mA) 2.75 V (when output current is -5 mA)
	Low level	0 V to 0.8 V (when output current is from 0 mA to 3 mA) 0.25 V*1 (when output current is 1 mA) 0.55 V (when output current is 3 mA)

*1. Notice that, in case of C0 to C3 (port C) and D0 to D3 (port D), output voltage is 0.30 V.

Figure 10-9 Circuit diagram of output signals



e5070ape028

Power supply (+5 V)

Table 10-9 shows electrical characteristics of +5 V power supply for external instruments.

Table 10-9 Electrical characteristics of +5 V power supply (typical)

Output voltage	4.5 V to 5.5 V
Maximum output current	100 mA

Sample Program

Example 10-1 provides a sample program that communicates with an external instrument through the handler I/O port.You can find the source file of this program, named hander.htb, on the sample program disk.

This program outputs 5 (sets bit 2 and bit 0 to Low, and the other bits to High) to the port A of the handler I/O port, then waits until the bit 3 of the port C is set to Low.

The program is described in detail below:

Line 40	Assigns a GPIB address to the I/O pass.
Lines 60 to 70	These lines store the output data on the port A (binary) and bit location (bit 3) into Out_data_bin$ and Flag_bit variables, respectively.
Line 90	This line configures the port C to input port.
Lines 100 to 110	These lines enable /INDEX and /READY FOR TRIGGER signals.
Lines 130 to 140	These lines convert Out_data_bin$ to a decimal value and set it to the port A.
Lines 160 to 200	These lines repeat reading data from the port C until Flag_bit becomes TRUE.

Example 10-1 **Communicating with external instruments (handler.htb)**

```
10      INTEGER Out_data,In_data,Bit_stat
20      DIM Out_data_bin$[9]
30      !
40      ASSIGN @Agte507x TO 717
50      !
60      Out_data_bin$="00000101"
70      Flag_bit=3
80      !
90      OUTPUT @Agte507x;":CONT:HAND:C:MODE INP"
100     OUTPUT @Agte507x;":CONT:HAND:IND:STAT ON"
110     OUTPUT @Agte507x;":CONT:HAND:RTR:STAT ON"
120     !
130     Out_data=IVAL(Out_data_bin$,2)
140     OUTPUT @Agte507x;":CONT:HAND:A ";Out_data
150     !
160     REPEAT
170       OUTPUT @Agte507x;":CONT:HAND:C?"
180       ENTER @Agte507x;In_data
190       Bit_stat=BIT(In_data,Flag_bit)
200     UNTIL Bit_stat=1
210     END
```

11 Working with Automatic Test Systems

This chapter describes useful features when the Agilent E5070B/E5071B is integrated with an automatic test system.

Preventing Erroneous Key Operation on the Front Panel (key lock feature)

When no operation is required from the front panel controls, the mouse, or the keyboard, disabling these input devices can prevent any erroneous operation that might be caused by accidentally touching the devices.

To turn on or off Key Locking, use the following commands:

Locking the front panel controls and the keyboard	:SYST:KLOC:KBD on page 779
Locking the mouse and the touch screen	:SYST:KLOC:MOUS on page 780

Improving Command Processing Speed

SCPI commands should be processed quickly to improve throughput when such commands are frequently executed (for example, reading out traces for each measurement).

With the E5070B/E5071B, the processing time for SCPI commands can be improved by decreasing the refresh rate of the LCD display.

Measurement results (trace) do not need to be updated

When the measurement trace does not need to be updated, turn off the updating of the LCD display. This improves the processing speed of SCPI commands and eliminates the time used for updating the screen.

To turn off the updating of the LCD display, use the following command:

- :DISP:ENAB command on page 456

Measurement results (trace) need to be updated

When the measurement trace needs to be updated, the processing speed of SCPI commands can still be improved by controlling the update timing of the LCD display:

Step 1. Execute all SCPI commands that are required before measurement, including commands setting conditions.

Step 2. Turn OFF the update of the LCD display.

Step 3. Perform the measurement.

Step 4. Execute the commands for reading out measurement result or analyzing the result. Note that reading out the result in binary format will accelerate data transfer.

Step 5. Execute the following command to update the LCD display once.

- :DISP:UPD command on page 464

Step 6. Return to Step 3.

Sample program

Example 11-2 shows a sample program where the command processing time is improved by controlling the update timing of the LCD display.You can find the source file of this program, named cont_upd.htb, on the sample program disk.

NOTE This sample program correctly runs when the maximum number of channels/traces is set to 9 channels/9 traces.

This program sets the necessary measurement conditions and then turns off the updating of the LCD display. Next, it performs measurement, reads out the result, and updates the screen once.This program repeats this measurement procedure ten times.

The program is described in detail below:

Lines 50 to 60	Assigns a GPIB address to the I/O pass.
Lines 80 to 110	These lines set the sweep type to linear sweep, the sweep center value to 950 MHz, the sweep span value to 100 MHz, and the number of measurement points to 201.
Lines 120 to 160	These lines set the trigger source to bus trigger, turn on Continuous Activation mode for channel 1, and turn the mode off for channels 2 through 9.
Lines 180 to 190	These lines display the window for channel 1 only and arrange two graphs tiled horizontally.
Lines 210 to 270	These lines set the number of traces for channel 1 to 2, the measurement parameter and its data format for trace 1 to S21 and Log Mag, respectively, and those for trace 2 to S11 and Log Mag, respectively.
Line 290	This line turns Off the updating of the LCD screen.
Line 300	This line sets the data transfer format to binary.
Lines 320 to 540	These lines repeat the following procedure ten times.

1. Lines 340 to 360: These lines trigger the instrument and wait until the measurement cycle finishes.
2. Lines 400 to 440: Reads out the formatted data array of trace 1 in channel 1.
3. Lines 460 to 500: Reads out the formatted data array of trace 2 in channel 1.
4. Line 540: This line updates the LCD screen once.

Example 11-1 **Controlling the update timing of LCD display (cont_upd.htb)**

```
10     REAL Trace1(1:201,1:2),Trace2(1:201,1:2)
20     DIM Buff$[9],Img$[30]
30     INTEGER Nop,I
40     !
50     ASSIGN @Agte507x TO 717
60     ASSIGN @Binary TO 717;FORMAT OFF
70     !
80     OUTPUT @Agte507x;":SENS1:SWE:TYPE LIN"
90     OUTPUT @Agte507x;":SENS1:FREQ:CENT 950E6"
100    OUTPUT @Agte507x;":SENS1:FREQ:SPAN 100E6"
110    OUTPUT @Agte507x;":SENS1:SWE:POIN 201"
120    OUTPUT @Agte507x;":TRIG:SOUR BUS"
130    OUTPUT @Agte507x;":INIT1:CONT ON"
140    FOR I=2 TO 9
150      OUTPUT @Agte507x;":INIT"&VAL$(I)&":CONT OFF"
160    NEXT I
170    !
180    OUTPUT @Agte507x;":DISP:SPL D1"
190    OUTPUT @Agte507x;":DISP:WIND1:SPL D1_2"
200    !
210    OUTPUT @Agte507x;":CALC1:PAR:COUN 2"
220    OUTPUT @Agte507x;":CALC1:PAR1:DEF S21"
230    OUTPUT @Agte507x;":CALC1:PAR1:SEL"
240    OUTPUT @Agte507x;":CALC1:FORM MLOG"
250    OUTPUT @Agte507x;":CALC1:PAR2:DEF S11"
260    OUTPUT @Agte507x;":CALC1:PAR2:SEL"
270    OUTPUT @Agte507x;":CALC1:FORM MLOG"
280    !
290    OUTPUT @Agte507x;":DISP:ENAB OFF"
300    OUTPUT @Agte507x;":FORM:DATA REAL"
310    !
320    FOR I=1 TO 10
330      OUTPUT @Agte507x;":TRIG:SING"
340      OUTPUT @Agte507x;"*OPC?"
350      ENTER @Agte507x;Buff$
360      !
370      ! Read Trace Data
380      !
390      OUTPUT @Agte507x;":CALC1:PAR1:SEL"
400      OUTPUT @Agte507x;":CALC1:DATA:FDAT?"
410      ENTER @Agte507x USING "#,8A";Buff$
420      ENTER @Binary;Trace1(*)
430      ENTER @Agte507x USING "#,1A";Buff$
440      !
450      OUTPUT @Agte507x;":CALC1:PAR2:SEL"
460      OUTPUT @Agte507x;":CALC1:DATA:FDAT?"
470      ENTER @Agte507x USING "#,8A";Buff$
480      ENTER @Binary;Trace2(*)
490      ENTER @Agte507x USING "#,1A";Buff$
500      !
510      ! Update Display
520      !
530      OUTPUT @Agte507x;":DISP:UPD"
540    NEXT I
550    END
```

Detecting Occurrence of an Error

Using the status reporting system

The status of the E5070B/E5071B can be detected through the status registers. This section describes how to detect the end of measurement by using the status registers. For a complete description of the status report mechanism, including the specifications of each bit, see Appendix B, “Status Reporting System.”

The occurrence of an error will be present in the standard event status register. An SRQ (service request) is useful when you create a program that uses the information reported by this register to detect the occurrence of an error.

To detect the end of sweep via an SRQ, use one of the following commands:

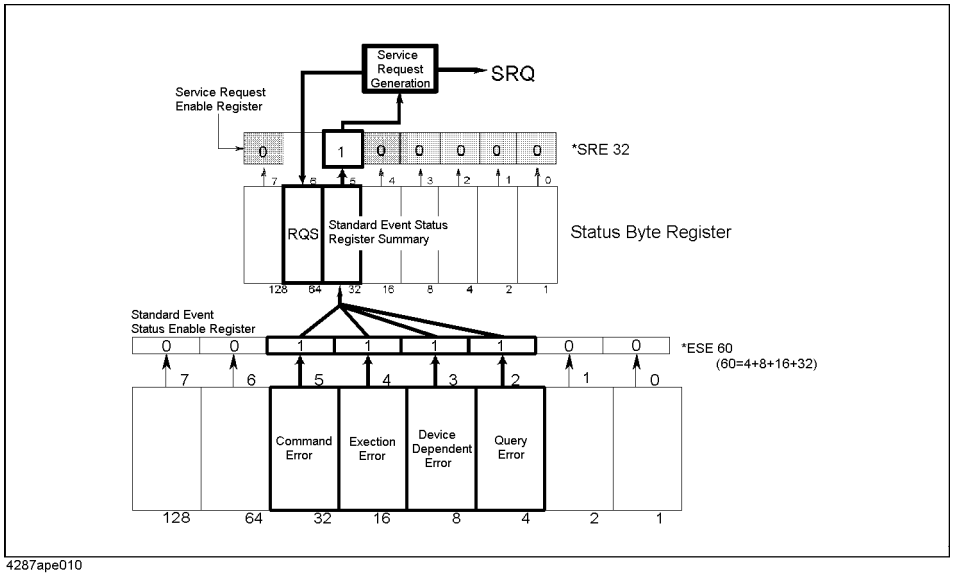
- *SRE on page 290
- *ESE on page 287

Follow these steps:

Step 1. Set the E5070B/E5071B so that it generates an SRQ when any of the error occurrence bits is set to 1 in the standard event status register.

Step 2. When an SRQ is generated, the program interrupts the measurement cycle.

Figure 11-1 SRQ generation sequence (when an error occurs)



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Using the error queue

An error queue holds the number for the error and the error message. Reading the error queue allows the user to verify the error that has occurred. To retrieve the content of an error queue, use the following command:

- :SYST:ERR? on page 776

The error queue can be used in the following ways:

1. It is used as a branch for error handling. When an error queue is retrieved, it returns 0 as the error number and “No error” as the error message if no error is detected. This can be used for detecting of an error and for branching the flow of a program. This is also useful when you wish to handle a specific error(s). Note that this method will not allow the user to perform any processing during the occurrence of an error.
2. When an error is detected using SRQ, the error queue is used to examine the error. Refer to the example in Example 11-2.

Sample program

Example 11-2 is a sample program that demonstrates how to use an SRQ to detect the occurrence of an error. You can find the source file of this program, named srq_err.htb, on the sample program disk.

This program sets SRQs and then intentionally sends an invalid parameter to generate an error to be handled by this program. In the error handling part, this program examines the error, displays the error number and error message, and then displays the message indicating the suspension of the program.

Line 40	Assigns a GPIB address to the I/O pass.
Lines 60 to 70	These lines enable bits 2, 3, 4 and 5 in the standard event status register and set bit 5 to 1 in the service request enable register.
Lines 80 to 100	These lines clear the status byte register, the standard event status register, and the error queue.
Lines 120 to 130	These lines set the branch target for an SRQ interrupt to enable SRQ interruptions.
Lines 140 to 260	These lines set the measurement parameters and their data formats for traces 1 and 2. An invalid parameter is given to the data format setting for trace 2, causing an error.
Lines 280 to 330	These lines define an error handler in the following way. Lines 290 to 300: These lines retrieve the error number and error messages for the error from the error queue. Lines 310 to 330 These lines display the message indicating the occurrence of the error, the error number, the error message, and the message showing that the program is suspended.
Line 350	Displays a closing message.Note that this message will not display unless this program is re-executed after setting a corrected parameter to the data format setting for trace 2.

Example 11-2 **Error detection using an SRQ (srq_err.bas)**

```
10     DIM Buff$[9],Err_mes$[50]
20     INTEGER Err_no
30     !
40     ASSIGN @Agte507x TO 717
50     !
60     OUTPUT @Agte507x;"*ESE 60"
70     OUTPUT @Agte507x;"*SRE 32"
80     OUTPUT @Agte507x;"*CLS"
90     OUTPUT @Agte507x;"*OPC?"
100    ENTER @Agte507x;Buff$
110    !
120    ON INTR 7 GOTO Err_proc
130    ENABLE INTR 7;2
140    OUTPUT @Agte507x;":CALC1:PAR:COUN 2"
150    PRINT "Trace 1 Meas.Para: S21"
160    PRINT "Trace 1 Format   : Log Mag"
170    OUTPUT @Agte507x;":CALC1:PAR1:DEF S21"
180    OUTPUT @Agte507x;":CALC1:PAR1:SEL"
190    OUTPUT @Agte507x;":CALC1:FORM MLOG"
200    PRINT "Trace 2 Meas.Para: S11"
210    PRINT "Trace 2 Format   : Log Mag"
220    OUTPUT @Agte507x;":CALC1:PAR2:DEF S11"
230    OUTPUT @Agte507x;":CALC1:PAR2:SEL"
240    OUTPUT @Agte507x;":CALC1:FORM LOG"
250    OUTPUT @Agte507x;"*OPC?"
260    ENTER @Agte507x;Buff$
270    GOTO Skip_err_proc
280 Err_proc: OFF INTR 7
290    OUTPUT @Agte507x;";:SYST:ERR?"
300    ENTER @Agte507x;Err_no,Err_mes$
310    PRINT "Error occurred!!"
320    PRINT "  No:";Err_no,"Description: "&Err_mes$
330    PRINT "PROGRAM INTERRUPT!!"
340    GOTO Prog_end
350 Skip_err_proc: PRINT "PROGRAM DONE."
360 Prog_end: END
```

12 Controlling E5091A

This chapter explains how to control the E5091A.

Controlling E5091A

Selecting Test Set

The E5091A test set provides test set 1 and test set 2. To select the test set, use the following command:

- :SENS:MULT{1-2}:NAME on page 530

The following models are available for the test set.

E5091A_009	Option 009
E5091A_013	Option 016 (13-port measurement)
E5091A_016	Option 016 (16-port measurement)

Checking the name of available test set

To check the name of the available test set of the E5091A, use the following command:

- :SENS:MULT:CAT? on page 527

Turning control ON/OFF

To turn ON/OFF the control of the E5091A, use the following command:

- :SENS:MULT{1-2}:STAT on page 531

If you turn OFF the control of the E5091A, it does not affect the operation of the E5070B/E5071B, even if it is connected. You can control test set 1 and test set 2 separately.

Selecting ports assigned to Port 1 to Port n

Selecting the connection ports

You can select the ports assigned to Port 1 to Port n for each channel. To select the ports, use the following commands:

- :SENS{1-16}:MULT{1-2}:PORT{1-20} on page 646

NOTE The connection between the assigned ports and Port 1 to Port 4 inside the E5091A is not changed when one of the above commands is executed but it is changed immediately before a sweep for each channel.

Turning ON/OFF state display of connection ports (properties display)

You can display the state of the ports assigned to Port 1 to Port n (E5091 properties) in the lower right part in the window for each channel. To turn ON/OFF the properties display, use the following command:

- :SENS:MULT{1-2}:DISP on page 528

Checking number of ports

To check the number of the E5091A's connected ports, use the following command:

- :SENS:MULT{1-2}:COUN? on page 528

Checking the available port name.

To check the name of the E5091A's connected ports, use the following command:

- :SENS{1-16}:MULT{1-2}:PORT{1-20}:CAT? on page 648

Checking number of input ports.

To check the number of the E5091A's input ports, use the following command:

- :SENS:MULT{1-2}:INC? on page 529

Setting control line

You can set the HIGH/LOW state of each line of the control line for each channel. To set the HIGH/LOW of each line, use the following command:

- :SENS{1-16}:MULT{1-2}:TSET9:OUTP on page 649

NOTE The HIGH/LOW state of each line of the E5091A is not changed when the above command is executed but it is changed immediately before a sweep for each channel.

Sample program

Example 12-1 shows a sample program that demonstrates how to control the E5091A. You can find the source file of this program, named e5091ctr.htb, on the sample program disk.

This program assigns Port 1 of the E5091A to A, Port 2 to T2, Port 3 to R2+, and Port 4 to R2- and sets Line 1 and Line 3 of the control line to HIGH.

The program is described in detail below:

Line 70	Assigns a GPIB address to the I/O path.
Line 90	Assigns the name of the test set, E5091A-009 (Option009) to the variables Model$.
Lines 110 to 140	Sets the port assigned to Port 1 (A), the port assigned to Port 2 (T2), the port assigned to Port 3 (R2+), and the port assigned to Port 4 (R2-) to the Port1$, Port2$, Port3$, and Port4$ variables.
Lines 160 to 230	Sets the states of Line 1 to Line 8 of the control line (1 and 3: HIGH, 4 to 8: LOW) to Line1$ through Line8$ variables, respectively.
Lines 250	Specifies the test set name.
Lines 270 to 300	Sets the port assigned to Port 1 to Port1$, the port assigned to Port 2 to Port2$, the port assigned to Port 3 to Port3$, and the port assigned to Port 4 to Port4$.
Lines 270 to 290	Creates a decimal setting value from Line1$ to Line8$ and uses it to set the control line.
Line 360	Turns ON the E5091A property display.
Line 370	Turns ON the control of the E5091A.

Example 12-1 **Controlling E5091A (e5091ctr_2.htb)**

```
10      DIM Port1$[3],Port2$[3],Port3$[3],Port4$[3],Data_bin$[9]
20      DIM Line1$[3],Line2$[3],Line3$[3],Line4$[3]
30      DIM Line5$[3],Line6$[3],Line7$[3],Line8$[3]
40      DIM Model$[8]
50      INTEGER Data_dec
60      !
70      ASSIGN @Agte507x TO 717
80      !
90      Model$="E5091_9"     ! Model:E5091A-009
100     !
110     Port1$="A"           ! Port1: A
120     Port2$="T2"          ! Port2: T2
130     Port3$="R2"          ! Port3: R2+
140     Port4$="R2"          ! Port4: R2-
150     !
160     Line1$="1"           ! Line1: HIGH
170     Line2$="0"           ! Line2: Low
180     Line3$="1"           ! Line3: HIGH
190     Line4$="0"           ! Line4: Low
200     Line5$="0"           ! Line5: Low
210     Line6$="0"           ! Line6: Low
220     Line7$="0"           ! Line7: Low
230     Line8$="0"           ! Line8: Low
240     !
250     OUTPUT @Agte507x;":SENS1:MULT1:NAME "&Model$
260     !
270     OUTPUT @Agte507x;":SENS1:MULT1:PORT1 "&Port1$
280     OUTPUT @Agte507x;":SENS1:MULT1:PORT2 "&Port2$
290     OUTPUT @Agte507x;":SENS1:MULT1:PORT3 "&Port3$
300     OUTPUT @Agte507x;":SENS1:MULT1:PORT4 "&Port4$
310     !
320
Data_bin$=Line8$&Line7$&Line6$&Line5$&Line4$&Line3$&Line2$&Line1$
330     Data_dec=IVAL(Data_bin$,2)
340     OUTPUT @Agte507x;":SENS1:MULT1:OUTP ";Data_dec
350     !
360     OUTPUT @Agte507x;":SENS:MULT1:DISP ON"
370     OUTPUT @Agte507x;":SENS:MULT1:STAT ON"
380     !
390     END
```

13 Sample Application Programs

This chapter introduces several sample programs for basic measurement, measurement with a system using the handler I/O, and controlling the instrument over a LAN.

Basic Measurement (measuring a band pass filter)

Example 13-1 is a sample program that measures a band pass filter.You can find the source file of this program, named meas_bpf.htb, on the sample program disk.

The sample program performs full 2-port calibration using the 85032F calibration kit, measures a band-pass filter (center frequency: 947.5 MHz), and calculates and displays its bandwidth, insertion loss, and so on. This measurement is the same as “Measuring a band pass filter” in *Installation and Quick Start Guide* of the E5070B/E5071B. Therefore, for information on the flow of the measurement, the connection of the standard, and so on, refer to the description in *Installation and Quick Start Guide*.

When started, the program displays the message “Set OPEN to Port 1. Then push [Enter] key.” Connect the OPEN standard to port 1 and press **[Enter]** to measure the OPEN calibration data. Likewise, connect the SHORT and the LOAD standards and measure their calibration data.

Next, the program displays the message “Set OPEN to Port 2. Then push [Enter] key.” Connect the OPEN standard to port 2 and press **[Enter]** to measure the OPEN calibration data. Likewise, connect the SHORT and the LOAD standards and measure their calibration data.

Then, the program displays the message “Set THRU between Port 1 and Port 2. Then push [Enter] key.” Connect the THRU standard between ports 1 and 2 and press **[Enter]** to measure the THRU calibration data.

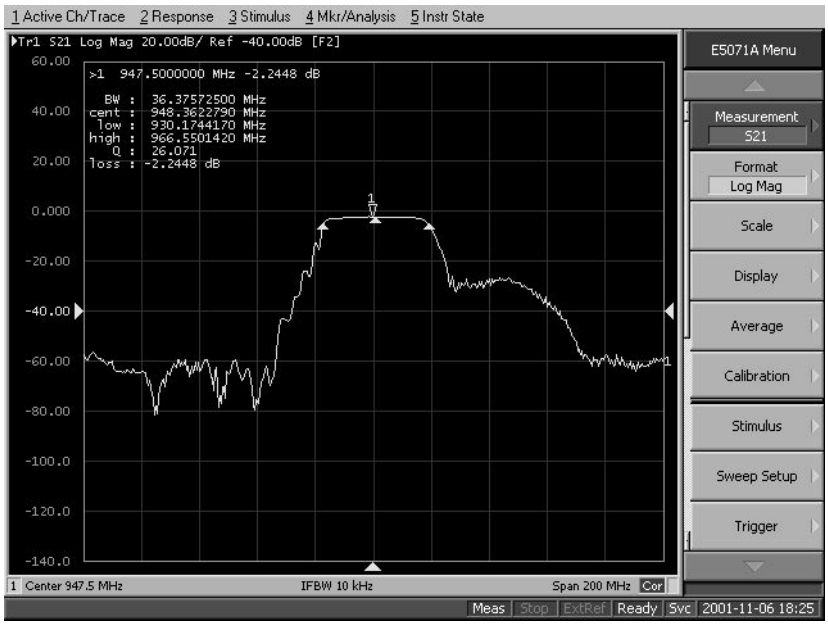
When the calibration is finished, the program displays the message “Set DUT. Then Push [Enter] key.” Connect the DUT and press **[Enter]**. This initiates the measurement and display the result as shown in Figure 13-1.

Figure 13-2 shows a sample display of the LCD screen after the program exits execution.

Figure 13-1 **Sample execution result of the program in Example 13-1**

```
## Measurement Result ##
   BW:     3.63757249908E+7
 cent:     9.4836227902E+8
  low:     9.30174417035E+8
 high:     9.66550142015E+8
    Q:     26.0712980976
 loss:    -2.2447956671
```

Figure 13-2 **Sample screen display after program in Example 13-1 exits execution**



The program is described in detail below:

Line 50	Assigns a GPIB address to the I/O pass.
Lines 70 to 110	Stores the sweep center value (947.5 MHz), the sweep span value (200 MHz), the number of measurement points (401), the IF bandwidth (10 kHz), and the power level (-10 dBm) into the variables Center, Span, Nop, If_Bw, and Pow, respectively.
Lines 120 to 160	Stores the number of traces (1), the measurement parameter (S21), the data format (log Mag), the calibration kit number (4: 85032F), and the save file name (State08.sta) into the variables Num_of_tr, Para$, Fmt$, CalKit, and File$, respectively.
Line 200	Puts the instrument into the preset state.
Lines 220 to 260	These lines assign the sweep center value for channel 1 to Center, sweep span value to Span, number of measurement points to Nop, IF bandwidth to If_bw, and power level to Pow, respectively.
Lines 280 to 310	These lines assign the number of traces for channel 1 to Num_of_tr, measurement parameters to Para$, and data format to Fmt$, respectively.
Line 350	Stores the calibration kit number for channel 1 to the CalKit variable.
Lines 360 to 380	These lines specify ports 1 and 2 to be used and call the sub-program Cal_solt to perform full 2-port calibration for channel 1. For more information on the Cal_solt sub-program, refer to the description in Example 4-1 on page 100.
Lines 420 to 430	Saves the settings of the E5070B/E5071B and the calibration coefficients under the file name File$.
Lines 480 to 490	These lines set the trigger source to the bus trigger and turn on the continuous initiation mode for channel 1.

Lines 510 to 520	These lines prompt the user to connect the DUT and wait for **[Enter]** to be pressed after the DUT is connected.
Lines 540 to 560	These lines trigger the instrument and wait until the measurement cycle finishes.
Line 580	This line executes auto scale for trace 1 of channel 1.
Lines 620 to 650	These lines turn on the display of marker 1, move the marker to the position where the stimulus value is equal to Center, read out the response value at the marker, and assign the value to the Resp variable.
Lines 670 to 710	These lines configure the system to generate an SRQ when it cannot perform Bandwidth Search due to an error.
Lines 730 to 740	These lines set the branch target for an SRQ interrupt to enable SRQ interruptions.
Lines 750 to 790	Sets the bandwidth definition value to -3 dB and the bandwidth search result display to on, reads out the bandwidth search results (bandwidth, center frequency, Q value, and insertion loss), and stores them into the variables Bwid, Cent, Q, and Loss, respectively.
Lines 830 to 900	These lines define an error handler that retrieves the error number and error messages for the error and then assign 0 to Bwid, Cent and Q, Resp (response value at marker 1) to Loss.
Lines 930 to 940	These lines calculate the two (higher and lower) cutoff frequencies from the values in the Bw and Cent variables and stores them into the Cut_l and Cut_h variables.
Lines 980 to 1040	These lines display the measurement results (values of Bwid, Cent, Q, Loss, Cut_l, and Cut_h).
Lines 1060 to 1070	These lines prompt the user to decide whether to perform another measurement. When **[y]** is pressed followed by the **[Enter]** key, the program will return to the part where the DUT is connected and continue measurement.

Example 13-1 **Measurement of band pass filter (meas_bpf.htb)**

```
10     DIM Para$[9],Fmt$[9],File$[20],Buff$[9],Inp_char$[9],Err_msg$[20]
20     REAL Center,Span,If_bw,Pow,Resp,Bwid,Cent,Q,Loss,Cut_l,Cut_h
30     INTEGER Nop,Num_of_tr,Cal_kit,Port(1:4),Err_no
40     !
50     ASSIGN @Agte507x TO 717
60     !
70     Center=9.475E+8      ! Center Freq.      : 947.5 MHz
80     Span=2.00E+8         ! Span              : 200 MHz
90     Nop=401              ! Number of Points  : 401
100    If_bw=1.0E+4         ! IF Bandwidth      : 10 kHz
110    Pow=-10              ! Power Level       : -10 dBm
120    Num_of_tr=1          ! Number of Traces  : 1
130    Para$="S21"          ! Meas. Parameter   : S21
140    Fmt$="MLOG"          ! Data Format       : Log Mag
150    Cal_kit=4            ! Calibration Kit   : 85032F
160    File$="State08.sta" ! Save File Name    : State08.sta
170    !
180    ! Mesurement Condition
190    !
200    OUTPUT @Agte507x;":SYST:PRES"
210    !
220    OUTPUT @Agte507x;":SENS1:FREQ:CENT ";Center
230    OUTPUT @Agte507x;":SENS1:FREQ:SPAN ";Span
240    OUTPUT @Agte507x;":SENS1:SWE:POIN ";Nop
250    OUTPUT @Agte507x;":SENS1:BAND ";If_bw
260    OUTPUT @Agte507x;":SOUR1:POW ";Pow
270    !
280    OUTPUT @Agte507x;":CALC1:PAR:COUN ";Num_of_tr
290    OUTPUT @Agte507x;":CALC1:PAR1:DEF "&Para$
300    OUTPUT @Agte507x;":CALC1:PAR1:SEL"
310    OUTPUT @Agte507x;":CALC1:FORM "&Fmt$
320    !
330    ! Full 2 Port Calibration (@ Port 1 & Port 2)
340    !
350    OUTPUT @Agte507x;":SENS1:CORR:COLL:CKIT ";Cal_kit
360    Port(1)=1
370    Port(2)=2
380    Cal_solt(@Agte507x,"1",2,Port(*))
390    !
400    ! Save State & Cal
410    !
420    OUTPUT @Agte507x;":MMEM:STOR:STYP CST"
430    OUTPUT @Agte507x;":MMEM:STOR """&File$&""""
440    !
450    ! Measurement
460    !
470    CLEAR SCREEN
480    OUTPUT @Agte507x;":TRIG:SOUR BUS"
490    OUTPUT @Agte507x;":INIT1:CONT ON"
500 Meas_start:!
510    PRINT "Set DUT, then Push [Enter] key"
520    INPUT "",Inp_char$
530    !
540    OUTPUT @Agte507x;":TRIG:SING"
550    OUTPUT @Agte507x;"*OPC?"
560    ENTER @Agte507x;Buff$
570    !
580    OUTPUT @Agte507x;":DISP:WIND1:TRAC1:Y:AUTO"
590    !
600    ! Analysis
610    !
```

```
620     OUTPUT @Agte507x;":CALC1:MARK1 ON"
630     OUTPUT @Agte507x;":CALC1:MARK1:X ";Center
640     OUTPUT @Agte507x;":CALC1:MARK1:Y?"
650     ENTER @Agte507x;Resp
660     !
670     OUTPUT @Agte507x;"*ESE 60"
680     OUTPUT @Agte507x;"*SRE 32"
690     OUTPUT @Agte507x;"*CLS"
700     OUTPUT @Agte507x;"*OPC?"
710     ENTER @Agte507x;Buff$
720     !
730     ON INTR 7 GOTO Bw_err
740     ENABLE INTR 7;2
750     OUTPUT @Agte507x;":CALC1:MARK1:BWID:THR -3"
760     OUTPUT @Agte507x;":CALC1:MARK1:BWID ON"
770     OUTPUT @Agte507x;":CALC1:MARK1:BWID:DATA?"
780     WAIT .5
790     ENTER @Agte507x;Bwid,Cent,Q,Loss
800     GOTO Skip_bw_err
810     !
820 Bw_err: OFF INTR 7
830     OUTPUT @Agte507x;";:SYST:ERR?"
840     ENTER @Agte507x;Err_no,Err_msg$
850     PRINT "Error occurred!!"
860     PRINT "  No:";Err_no,"Description: "&Err_msg$
870     Bwid=0
880     Cent=0
890     Q=0
900     Loss=Resp
910     !
920 Skip_bw_err: OFF INTR 7
930     Cut_l=Cent-(Bwid/2)
940     Cut_h=Cent+(Bwid/2)
950     !
960     ! Display
970     !
980     PRINT "## Measurement Result ##"
990     PRINT "   BW:",Bwid
1000    PRINT " cent:",Cent
1010    PRINT "  low:",Cut_l
1020    PRINT " high:",Cut_h
1030    PRINT "    Q:",Q
1040    PRINT " loss:",Loss
1050    !
1060    INPUT "Once more? [Y]es/[N]o",Inp_char$
1070    IF UPC$(Inp_char$)="Y" OR UPC$(Inp_char$)="YES" THEN Meas_start
1080    !
1090    END
1100    !===========================================
1110    ! Full n Port Calibration Function
1120    !===========================================
1130 SUB Cal_solt(@Agte507x,Ch$,INTEGER Num_of_ports,INTEGER Port(*))
1140    DIM Buff$[9]
1150    INTEGER I,J
1160    !
1170    PRINT "## Full "&VAL$(Num_of_ports)&" Port Calibration ##"
1180    !
1190    ! Calibration Type Selection
1200    !
1210    OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:METH:SOLT"&VAL$(Num_of_
ports)&" ";
1220    FOR I=1 TO Num_of_ports-1
1230      OUTPUT @Agte507x;Port(I);",";
1240    NEXT I
```

```
1250   OUTPUT @Agte507x;Port(Num_of_ports)
1260   !
1270   ! Reflection Measurement
1280   !
1290   FOR I=1 TO Num_of_ports
1300     PRINT "Set OPEN  to Port "&VAL$(Port(I))&". Then push [Enter]
key."
1310     INPUT "",Buff$
1320     OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:OPEN ";Port(I)
1330     OUTPUT @Agte507x;"*OPC?"
1340     ENTER @Agte507x;Buff$
1350     PRINT "Set SHORT to Port "&VAL$(Port(I))&". Then push [Enter]
key."
1360     INPUT "",Buff$
1370     OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:SHOR ";Port(I)
1380     OUTPUT @Agte507x;"*OPC?"
1390     ENTER @Agte507x;Buff$
1400     PRINT "Set LOAD  to Port "&VAL$(Port(I))&". Then push [Enter]
key."
1410     INPUT "",Buff$
1420     OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:LOAD ";Port(I)
1430     OUTPUT @Agte507x;"*OPC?"
1440     ENTER @Agte507x;Buff$
1450   NEXT I
1460   !
1470   ! Transmission Measurement
1480   !
1490   FOR I=1 TO Num_of_ports-1
1500     FOR J=I+1 TO Num_of_ports
1510       PRINT "Set THRU between Port "&VAL$(Port(I))&" and Port "&
VAL$(Port(J))&". Then push [Enter] key."
1520       INPUT "",Buff$
1530       OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:THRU ";Port(I);","
;Port(J)
1540       OUTPUT @Agte507x;"*OPC?"
1550       ENTER @Agte507x;Buff$
1560       OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:THRU ";Port(J);","
;Port(I)
1570       OUTPUT @Agte507x;"*OPC?"
1580       ENTER @Agte507x;Buff$
1590     NEXT J
1600   NEXT I
1610   !
1620   ! Done
1630   !
1640   OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:SAVE"
1650   PRINT "Done"
1660 SUBEND
```

Measurement with Automatic Test Systems

Example 13-2 is a sample program that performs duplexer measurement by making use of the limit test function and the handler I/O port (trigger input and test result output), assuming use with an automated test system using the handler. You can find the source file of this program, named meas_sys.htb, on the sample program disk.

When started, the program displays the screen where the user can select the calibration kit. Enter a number corresponding the desired kit and press **[Enter]**. Next, the program displays the message "Set OPEN to Port 1. Then push [Enter] key." Connect the OPEN standard to port 1 and press **[Enter]** to measure the OPEN calibration data. Likewise, connect the SHORT and the LOAD standards and measure their calibration data.Follow instructions on the screen to measure OPEN/SHORT/LOAD calibration data for ports 2 and 3 as well as for port 1.

When the measurement of OPEN/SHORT/LOAD calibration data is completed, the program displays the message "Set THRU between Port 1 and Port 2. Then push [Enter] key." Connect the THRU standard between ports 1 and 2 and press **[Enter]** to measure the THRU calibration data. Likewise, measure THRU calibration data for ports 1 and 3 as well as 2 and 3.

When the calibration is done, the program displays the message "Set DUT. Then input external trigger." Connect the DUT and supply an external trigger signal through the handler I/O port. When the measurement is finished, the program displays the measurement result, the insertion loss for Tx and Rx, and the pass band ripple. After this operation is repeated ten times, the program terminates.

The program is described in detail below:

Line 70	Assigns a GPIB address to the I/O pass.
Lines 90 to 110	These lines assign the measurement times (10), the upper limit of ripple for Tx (2 dBm), and that for Rx (2 dBm) to the variables Max_meas, Tx_rpl_lim, and Rx_rpl_lim, respectively.
Lines 130 to 190	These lines assign the IF bandwidth (70 kHz), the power level (0 dBm), the number of traces (2), the measurement parameters for trace 1 (S13), those for trace 2 (S21), the data format for trace 1 (Log Mag), and that for trace 2 (Log Mag) to the variables If_bw, Pow, Num_of_tr, Param1$, Param2$, Fmt1$, and Fmt1$, respectively.
Lines 210 to 420	These lines assign the necessary settings to the corresponding variables to create the segment sweep table shown in Table 13-1.

Table 13-1 Segment sweep table

No.	Start	Stop	Points
1	1730 MHz	1830 MHz	50
2	1830 MHz	2030 MHz	400
3	2030 MHz	2130 MHz	50
4	3650 MHz	4030 MHz	38
5	5500 MHz	6020 MHz	52

Lines 440 to 1010 These lines assign the necessary settings to the corresponding variables to create the limit tables shown in Table 13-2, Table 13-3.

Table 13-2 Limit table for trace 1

No.	Type	Begin Stimulus	End Stimulus	Begin Response	End Response
1	MAX	1730 MHz	1930 MHz	0 dBm	0 dBm
2	MIN	1850 MHz	1910 MHz	-4 dBm	-4 dBm
3	MAX	1930 MHz	1990 MHz	-35 dBm	-35 dBm
4	MAX	1990 MHz	2130 MHz	-40 dBm	-40 dBm
5	MAX	2130 MHz	6020 MHz	-25 dBm	-25 dBm

Table 13-3 Limit table for trace 2

No.	Type	Begin Stimulus	End Stimulus	Begin Response	End Response
1	MAX	1730 MHz	1850 MHz	-40 dBm	-40 dBm
2	MAX	1850 MHz	1910 MHz	-45 dBm	-45 dBm
3	MAX	1910 MHz	6020 MHz	0 dBm	0 dBm
4	MIN	1930 MHz	1990 MHz	-5 dBm	-5 dBm

Lines 1050 to 1070 These lines execute presetting and then assign the IF bandwidth for channel 1 to If_bw and the power level to Pow, respectively.

Lines 1080 to 1140 These lines set the sweep type for channel 1 to segment sweep and create a segment sweep table.

Lines 1150 to 1240 These lines assign the number of traces for channel 1 to Num_of_tr, the measurement parameters and data format for channel 1 to Para1$ and Fmt1$, those for channel 2 to Para2$ and Fmt2$, arrange two graphs tiled horizontally, and configure the display of the horizontal axis to order basis.

Lines 1280 to 1320 These lines call the sub-program Select_cal_kit to select a calibration kit for channel 1, set the ports to be used to 1, 2, and 3, and then call another sub-program Cal_solt to perform full 3-port calibration. For more information on the subprograms Select_cal_kit and Cal_solt, refer to the description in Example 4-1 on page 100.

Lines 1360 to 1370 These lines set the trigger source to the external trigger and turn on the continuous initiation mode for channel 1.

Lines 1410 to 1500 These lines create the limit table for trace 1 of channel 1 and then turn on the limit line display and limit test.

Lines 1540 to 1630 These lines create the limit table for trace 2 of channel 1 and then turn on the limit line display and limit test.

Lines 1670 to 1700 These lines set each bit in the operation status register and the service request enable register so that an SRQ is generated upon completion of the measurement.

Lines 1720 to 1740 These lines set each bit in the questionable limit channel 1 status register so that the combined test results of trace 1 and 2 are set to bit 1 in the questionable limit status event register.

Lines 1780 to 1790 These lines lock out any operation from the front panel, keyboard, or mouse.

Line 1830 This line turns OFF the updating of the LCD screen.

Lines 1870 to 2470 These lines repeat the following procedure Meas_max times.

1. Lines 1880 to 1910: Waits until the trigger system switches to “Waiting for Trigger” state.
2. Lines 1920 to 1940: Clears the status byte register, the operation status event register, the questionable limit status event register, and the questionable limit channel 1 status register.
3. Lines 1950 to 1960: These lines set the branch target for an SRQ interrupt to enable SRQ interruptions.
4. Lines 1970 to 1980: Displays a message prompting the user to connect the DUT and input an external trigger and then waits until the program terminates upon the external trigger input.

NOTE This example employs the status reporting system to synchronize the trigger input and the termination of the program. It is also possible to use /READY FOR TRIG, /INDEX, or /SWEEP END output signals from the handler I/O port for synchronizing.

5. Lines 2030 to 2050: Retrieves the combined limit test results of traces 1 and 2.

NOTE It is also possible to obtain the limit test result using the /PASS_FAIL output signal from the handler I/O port.

6. Lines 2090 to 2100: Calls the sub-program Select_cal_kit to obtain insertion loss for Tx and Rx and the value of pass band ripple.
7. Lines 2140 to 2230: Determines the ripple test results for Tx and Rx based on the ripple values for Tx and Rx.
8. Lines 2240 to 2300: Determines the overall result of all tests based on the limit test result and the ripple test results for Tx and Rx.
9. Line 2340: Output the overall result of entire test (Pass:0, Fail:1) to the bit 1 of the port A in the handler I/O port.
10. Line 2380: Updates the display on the LCD screen once.
11. Lines 2420 to 2460: Displays the measurement result.

The sub-program Analysis, which resides from line 3380 to 3560, analyzes the minimum value and the difference between maximum and minimum values. Details are as follows.

Line 3410 Sets the trace with trace number Tr$ in channel 1 active.

Lines 3430 to 3450 Sets the analysis range for the analysis command from Start to Stop.

Lines 3470 to 3500 Uses the analysis command to search for the minimum value, retrieve the value, and assign it to the Min variable.

Lines 3520 to 3550 Uses the analysis command to search for the difference between maximum and minimum values, retrieve the value, and assign it to the Ptp variable.

Example 13-2 **Measurement with Automatic Test Systems (meas_sys.htb)**

```
10     DIM Param1$[9],Param2$[9],Fmt1$[9],Fmt2$[9],Buff$[9],Judge$[9],
Handler$[9]
20     REAL If_bw,Pow,Swp(1:5,1:3),Lim1(1:5,1:5),Lim2(1:4,1:5)
30     REAL Tx_loss,Rx_loss,Tx_rpl,Rx_rpl,Tx_rpl_lim,Rx_rpl_lim
40     INTEGER Max_meas,Segm_swp,Segm_lim1,Segm_lim2,Segment,Column
50     INTEGER Port(1:4),Cond_reg,Lim_judge,Tx_rpl_judge,Rx_rpl_judge,I
60     !
70     ASSIGN @Agte507x TO 717
80     !
90     Max_meas=10       !
100    Tx_rpl_lim=2      ! Pass Band     Tx: 2 dBm
110    Rx_rpl_lim=2      !  Ripple Limit Rx: 2 dBm
120    !
130    If_bw=7.0E+4      ! IF Bandwidth    : 70 kHz
140    Pow=0             ! Power level     : 0 dBm
150    Num_of_tr=2       ! Number of Traces: 2
160    Param1$="S13"     ! Meas.     Trace1: S13
170    Param2$="S21"     !   Param.  Trace2: S21
180    Fmt1$="MLOG"      ! Data      Trace1:
190    Fmt2$="MLOG"      !   Format  Trace2:
200    !
210    ! == Segment Sweep Table ==
220    Segm_swp=5             ! Segments   : 5
230    ! -- Segment 1 --
240    Swp(1,1)=1.73E+9       ! Start      : 1730 MHz
250    Swp(1,2)=1.83E+9       ! Stop       : 1830 MHz
260    Swp(1,3)=50            ! Nop        : 50
270    ! -- Segment 2 --
280    Swp(2,1)=1.83E+9       ! Start      : 1830 MHz
290    Swp(2,2)=2.03E+9       ! Stop       : 2030 MHz
300    Swp(2,3)=400           ! Nop        : 400
310    ! -- Segment 3 --
320    Swp(3,1)=2.03E+9       ! Start      : 2030 MHz
330    Swp(3,2)=2.13E+9       ! Stop       : 2130 MHz
340    Swp(3,3)=50            ! Nop        : 50
350    ! -- Segment 4 --
360    Swp(4,1)=3.65E+9       ! Start      : 3650 MHz
370    Swp(4,2)=4.03E+9       ! Stop       : 4030 MHz
380    Swp(4,3)=38            ! Nop        : 38
390    ! -- Segment 5 --
400    Swp(5,1)=5.5E+9        ! Start      : 5500 MHz
410    Swp(5,2)=6.02E+9       ! Stop       : 6020 MHz
420    Swp(5,3)=52            ! Nop        : 52
430    !
440    ! == Trace 1 (S13) Limit Line ==
450    Segm_lim1=5            ! Segments   : 5
```

```
460    ! -- Segment 1 --
470    Lim1(1,1)=1             ! Type       : Maximum
480    Lim1(1,2)=1.73E+9       ! Freq. Start: 1730 MHz
490    Lim1(1,3)=1.93E+9       !       Stop : 1930 MHz
500    Lim1(1,4)=0             ! Resp. Start: 0 dBm
510    Lim1(1,5)=0             !       Stop : 0 dBm
520    ! -- Segment 2 --
530    Lim1(2,1)=2             ! Type       : Minimum
540    Lim1(2,2)=1.85E+9       ! Freq. Start: 1850 MHz
550    Lim1(2,3)=1.91E+9       !       Stop : 1910 MHz
560    Lim1(2,4)=-4            ! Resp. Start: -4 dBm
570    Lim1(2,5)=-4            !       Stop : -4 dBm
580    ! -- Segment 3 --
590    Lim1(3,1)=1             ! Type       : Maximum
600    Lim1(3,2)=1.93E+9       ! Freq. Start: 1930 MHz
610    Lim1(3,3)=1.99E+9       !       Stop : 1990 MHz
620    Lim1(3,4)=-35           ! Resp. Start: -35 dBm
630    Lim1(3,5)=-35           !       Stop : -35 dBm
640    ! -- Segment 4 --
650    Lim1(4,1)=1             ! Type       : Maximum
660    Lim1(4,2)=1.99E+9       ! Freq. Start: 1990 MHz
670    Lim1(4,3)=2.13E+9       !       Stop : 2130 MHz
680    Lim1(4,4)=-40           ! Resp. Start: -40 dBm
690    Lim1(4,5)=-40           !       Stop : -40 dBm
700    ! -- Segment 5 --
710    Lim1(5,1)=1             ! Type       : Maximum
720    Lim1(5,2)=2.13E+9       ! Freq. Start: 2130 MHz
730    Lim1(5,3)=6.02E+9       !       Stop : 6020 MHz
740    Lim1(5,4)=-25           ! Resp. Start: -25 dBm
750    Lim1(5,5)=-25           !       Stop : -25 dBm
760    ! == Trace 2 (S21) Limit Line ==
770    Segm_lim2=4             ! Segments   : 4
780    ! -- Segment 1 --
790    Lim2(1,1)=1             ! Type       : Maximum
800    Lim2(1,2)=1.73E+9       ! Freq. Start: 1730 MHz
810    Lim2(1,3)=1.85E+9       !       Stop : 1850 MHz
820    Lim2(1,4)=-40           ! Resp. Start: -40 dBm
830    Lim2(1,5)=-40           !       Stop : -40 dBm
840    ! -- Segment 2 --
850    Lim2(2,1)=1             ! Type       : Maximum
860    Lim2(2,2)=1.85E+9       ! Freq. Start: 1850 MHz
870    Lim2(2,3)=1.91E+9       !       Stop : 1910 MHz
880    Lim2(2,4)=-45           ! Resp. Start: -45 dBm
890    Lim2(2,5)=-45           !       Stop : -45 dBm
900    ! -- Segment 3 --
910    Lim2(3,1)=1             ! Type       : Maximum
920    Lim2(3,2)=1.91E+9       ! Freq. Start: 1910 MHz
930    Lim2(3,3)=6.20E+9       !       Stop : 6020 MHz
940    Lim2(3,4)=0             ! Resp. Start: 0 dBm
950    Lim2(3,5)=0             !       Stop : 0 dBm
960    ! -- Segment 4 --
970    Lim2(4,1)=2             ! Type       : Minimum
980    Lim2(4,2)=1.93E+9       ! Freq. Start: 1930 MHz
990    Lim2(4,3)=1.99E+9       !       Stop : 1990 MHz
1000   Lim2(4,4)=-5            ! Resp. Start: -5 dBm
1010   Lim2(4,5)=-5            !       Stop : -5 dBm
1020   !
1030   ! Measurement Conditions
1040   !
1050   OUTPUT @Agte507x;":SYST:PRES"
1060   OUTPUT @Agte507x;":SENS1:BWID ";If_bw
1070   OUTPUT @Agte507x;":SOUR1:POW ";Pow
```

```
1080   OUTPUT @Agte507x;":SENS1:SWE:TYPE SEGM"
1090   OUTPUT @Agte507x;":SENS1:SEGM:DATA 5,0,0,0,0,0,";Segm_swp;
1100   FOR Segment=1 TO Segm_swp
1110     FOR Column=1 TO 3
1120       OUTPUT @Agte507x;",";Swp(Segment,Column);
1130     NEXT Column
1140   NEXT Segment
1150   OUTPUT @Agte507x;""
1160   OUTPUT @Agte507x;":CALC1:PAR1:COUN ";Num_of_tr
1170   OUTPUT @Agte507x;":CALC1:PAR1:DEF "&Param1$
1180   OUTPUT @Agte507x;":CALC1:PAR1:SEL"
1190   OUTPUT @Agte507x;":CALC1:FORM "&Fmt1$
1200   OUTPUT @Agte507x;":CALC1:PAR2:DEF "&Param2$
1210   OUTPUT @Agte507x;":CALC1:PAR2:SEL"
1220   OUTPUT @Agte507x;":CALC1:FORM "&Fmt2$
1230   OUTPUT @Agte507x;":DISP:WIND1:SPL D1_2"
1240   OUTPUT @Agte507x;":DISP:WIND1:X:SPAC OBAS"
1250   !
1260   ! Full 3 Port Calibration
1270   !
1280   Select_cal_kit(@Agte507x,"1")
1290   Port(1)=1
1300   Port(2)=2
1310   Port(3)=3
1320   Cal_solt(@Agte507x,"1",3,Port(*))
1330   !
1340   ! Trigger System
1350   !
1360   OUTPUT @Agte507x;":TRIG:SOUR EXT"
1370   OUTPUT @Agte507x;":INIT1:CONT ON"
1380   !
1390   ! Trace 1 Limit Test
1400   !
1410   OUTPUT @Agte507x;":CALC1:PAR1:SEL"
1420   OUTPUT @Agte507x;":CALC1:LIM:DATA ";Segm_lim1;
1430   FOR Segment=1 TO Segm_lim1
1440     FOR Column=1 TO 5
1450       OUTPUT @Agte507x;",";Lim1(Segment,Column);
1460     NEXT Column
1470   NEXT Segment
1480   OUTPUT @Agte507x;""
1490   OUTPUT @Agte507x;":CALC1:LIM:DISP ON"
1500   OUTPUT @Agte507x;":CALC1:LIM ON"
1510   !
1520   ! Trace 2 Limit Test
1530   !
1540   OUTPUT @Agte507x;":CALC1:PAR2:SEL"
1550   OUTPUT @Agte507x;":CALC1:LIM:DATA ";Segm_lim2;
1560   FOR Segment=1 TO Segm_lim2
1570     FOR Column=1 TO 5
1580       OUTPUT @Agte507x;",";Lim2(Segment,Column);
1590     NEXT Column
1600   NEXT Segment
1610   OUTPUT @Agte507x;""
1620   OUTPUT @Agte507x;":CALC1:LIM:DISP ON"
1630   OUTPUT @Agte507x;":CALC1:LIM ON"
1640   !
1650   ! Status Registers
1660   !
1670   OUTPUT @Agte507x;":STAT:OPER:PTR 0"
1680   OUTPUT @Agte507x;":STAT:OPER:NTR 16"
1690   OUTPUT @Agte507x;":STAT:OPER:ENAB 16"
1700   OUTPUT @Agte507x;"*SRE 128"
```

```
1710   !
1720   OUTPUT @Agte507x;":STAT:QUES:LIM:CHAN1:ENAB 6"
1730   OUTPUT @Agte507x;":STAT:QUES:LIM:CHAN1:PTR 6"
1740   OUTPUT @Agte507x;":STAT:QUES:LIM:CHAN1:NTR 0"
1750   !
1760   ! Key Lock: ON
1770   !
1780   OUTPUT @Agte507x;":SYST:KLOC:KBD ON"
1790   OUTPUT @Agte507x;":SYST:KLOC:MOUS ON"
1800   !
1810   ! Display Update: OFF
1820   !
1830   OUTPUT @Agte507x;":DISP:ENAB OFF"
1840   !
1850   ! Measurement
1860   !
1870   FOR I=1 TO Max_meas
1880     REPEAT
1890       OUTPUT @Agte507x;":STAT:OPER:COND?"
1900       ENTER @Agte507x;Cond_reg
1910     UNTIL BIT(Cond_reg,5)
1920     OUTPUT @Agte507x;"*CLS"
1930     OUTPUT @Agte507x;"*OPC?"
1940     ENTER @Agte507x;Buff$
1950     ON INTR 7 GOTO Meas_end
1960     ENABLE INTR 7;2
1970     PRINT "Set DUT, then input external trigger!"
1980 Meas_wait: GOTO Meas_wait
1990 Meas_end: OFF INTR 7
2000     !
2010     ! Limit Test Result
2020     !
2030     OUTPUT @Agte507x;":STAT:QUES:LIM?"
2040     ENTER @Agte507x;Reg_val
2050     Lim_judge=BIT(Reg_val,1)    ! Fail:1, Pass:0
2060     !
2070     ! Insertion Loss & Ripple
2080     !
2090     Analysis(@Agte507x,"1",1.85E+9,1.91E+9,Tx_loss,Tx_rpl)
2100     Analysis(@Agte507x,"2",1.93E+9,1.99E+9,Rx_loss,Rx_rpl)
2110     !
2120     ! Pass/Fail Judgement
2130     !
2140     IF Tx_rpl>Tx_rpl_lim THEN
2150       Tx_rpl_judge=1
2160     ELSE
2170       Tx_rpl_judge=0
2180     END IF
2190     IF Rx_rpl>Rx_rpl_lim THEN
2200       Rx_rpl_judge=1
2210     ELSE
2220       Rx_rpl_judge=0
2230     END IF
2240     IF Lim_judge=0 AND Tx_rpl_judge=0 AND Rx_rpl_judge=0 THEN
2250       Judge$="PASS"
2260       Handler$="00000000"
2270     ELSE
2280       Judge$="FAIL"
2290       Handler$="00000001"
2300     END IF
```

```
2310     !
2320     ! Set Data to Handler I/O Port A
2330     !
2340     OUTPUT @Agte507x;":CONT:HAND:A ";IVAL(Handler$,2)
2350     !
2360     ! Update E507XA Display
2370     !
2380     OUTPUT @Agte507x;":DISP:UPD"
2390     !
2400     ! Display Results
2410     !
2420     PRINT "## "&Judge$&"! ##"
2430     PRINT USING "X,15A,X,SD.5DE";"[Tx] Ins. Loss:",Tx_loss
2440     PRINT USING "X,15A,X,SD.5DE";"     Ripple   :",Tx_rpl
2450     PRINT USING "X,15A,X,SD.5DE";"[Rx] Ins. Loss:",Rx_loss
2460     PRINT USING "X,15A,X,SD.5DE";"     Ripple   :",Rx_rpl
2470   NEXT I
2480   !
2490   END
2500   !============================================
2510   ! Calibration Kit Selection Function
2520   !============================================
2530 SUB Select_cal_kit(@Agte507x,Ch$)
2540   DIM Cal_kit_lbl$(1:10)[20],Inp_char$[9]
2550   INTEGER Cal_kit,I
2560   CLEAR SCREEN
2570   !
2580   FOR I=1 TO 10
2590     OUTPUT @Agte507x;":SENS1:CORR:COLL:CKIT ";I
2600     OUTPUT @Agte507x;":SENS1:CORR:COLL:CKIT:LAB?"
2610     ENTER @Agte507x;Cal_kit_lbl$(I)
2620   NEXT I
2630   ON ERROR GOTO Kit_select
2640 Kit_select: !
2650   PRINT "## Calibration Kit Selection ##"
2660   FOR I=1 TO 10
2670     PRINT USING "X,2D,A,X,20A";I,":",Cal_kit_lbl$(I)
2680   NEXT I
2690   PRINT ""
2700   PRINT "Input 1 to 10"
2710   INPUT "Input number? (1 to 10)",Inp_char$
2720   Cal_kit=IVAL(Inp_char$,10)
2730   IF Cal_kit<1 OR Cal_kit>10 THEN Kit_select
2740   OFF ERROR
2750   !
2760   OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:CKIT ";Cal_kit
2770 SUBEND
2780   !============================================
2790   ! Full n Port Calibration Function
2800   !============================================
2810 SUB Cal_solt(@Agte507x,Ch$,INTEGER Num_of_ports,INTEGER Port(*))
2820   DIM Buff$[9]
2830   INTEGER I,J
2840   !
2850   PRINT "## Full "&VAL$(Num_of_ports)&" Port Calibration ##"
2860   !
2870   ! Calibration Type Selection
2880   !
2890   OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:METH:SOLT"&VAL$(Num_of_
ports)&" ";
2900   FOR I=1 TO Num_of_ports-1
2910     OUTPUT @Agte507x;Port(I);",";
2920   NEXT I
```

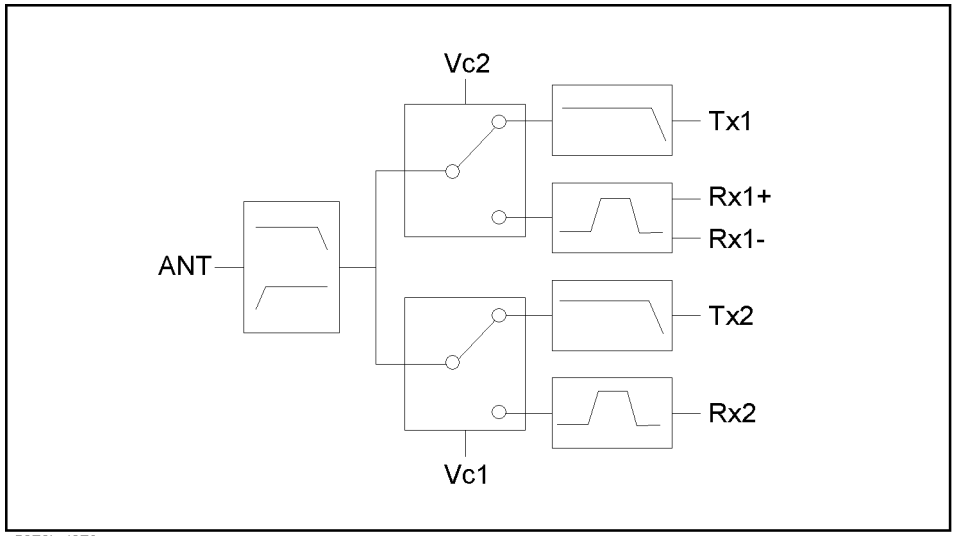
```
2930    OUTPUT @Agte507x;Port(Num_of_ports)
2940    !
2950    ! Reflection Measurement
2960    !
2970    FOR I=1 TO Num_of_ports
2980      PRINT "Set OPEN  to Port "&VAL$(Port(I))&". Then push [Enter]
key."
2990      INPUT "",Buff$
3000      OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:OPEN ";Port(I)
3010      OUTPUT @Agte507x;"*OPC?"
3020      ENTER @Agte507x;Buff$
3030      PRINT "Set SHORT to Port "&VAL$(Port(I))&". Then push [Enter]
key."
3040      INPUT "",Buff$
3050      OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:SHOR ";Port(I)
3060      OUTPUT @Agte507x;"*OPC?"
3070      ENTER @Agte507x;Buff$
3080      PRINT "Set LOAD  to Port "&VAL$(Port(I))&". Then push [Enter]
key."
3090      INPUT "",Buff$
3100      OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:LOAD ";Port(I)
3110      OUTPUT @Agte507x;"*OPC?"
3120      ENTER @Agte507x;Buff$
3130    NEXT I
3140    !
3150    ! Transmission Measurement
3160    !
3170    FOR I=1 TO Num_of_ports-1
3180      FOR J=I+1 TO Num_of_ports
3190        PRINT "Set THRU between Port "&VAL$(Port(I))&" and Port "&
VAL$(Port(J
))&". Then push [Enter] key."
3200        INPUT "",Buff$
3210        OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:THRU ";Port(I);","
;Port(J)
3220        OUTPUT @Agte507x;"*OPC?"
3230        ENTER @Agte507x;Buff$
3240        OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:THRU ";Port(J);","
;Port(I)
3250        OUTPUT @Agte507x;"*OPC?"
3260        ENTER @Agte507x;Buff$
3270      NEXT J
3280    NEXT I
3290    !
3300    ! Done
3310    !
3320    OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:SAVE"
3330    PRINT "Done"
3340  SUBEND
3350    !===========================================
3360    ! Min. Value & Peak to Peak Analysis Function
3370    !===========================================
3380  SUB Analysis(@Agte507x,Tr$,REAL Star,REAL Stop,REAL Min,REAL Ptp)
3390    REAL Dummy
3400    !
3410    OUTPUT @Agte507x;":CALC1:PAR"&Tr$&":SEL"
3420    !
3430    OUTPUT @Agte507x;":CALC1:FUNC:DOM ON"
3440    OUTPUT @Agte507x;":CALC1:FUNC:DOM:STAR ";Star
3450    OUTPUT @Agte507x;":CALC1:FUNC:DOM:STOP ";Stop
3460    !
```

```
3470   OUTPUT @Agte507x;":CALC1:FUNC:TYPE MIN"
3480   OUTPUT @Agte507x;":CALC1:FUNC:EXEC"
3490   OUTPUT @Agte507x;":CALC1:FUNC:DATA?"
3500   ENTER @Agte507x;Min,Dummy
3510   !
3520   OUTPUT @Agte507x;":CALC1:FUNC:TYPE PTP"
3530   OUTPUT @Agte507x;":CALC1:FUNC:EXEC"
3540   OUTPUT @Agte507x;":CALC1:FUNC:DATA?"
3550   ENTER @Agte507x;Ptp,Dummy
3560 SUBEND
```

Measurement using E5091A (measuring FEM)

Example 13-3 shows a sample program of front end module (FEM) measurement as a sample program of measurement using the E5091A. You can find the source file of this program, named meas_fem.htb, on the sample program disk.

This program calibrates each channel using the ECal module and then measures the transmission characteristics EGSM:Tx-Antenna (channel 1), EGSM:Antenna-Rx (channel 2), GSM1800:Tx-Antenna (channel 3), and GSM1800:Antenna-Rx (channel 4) of the 6-port dual-band FEM as shown in the below figure.



e5070buj073

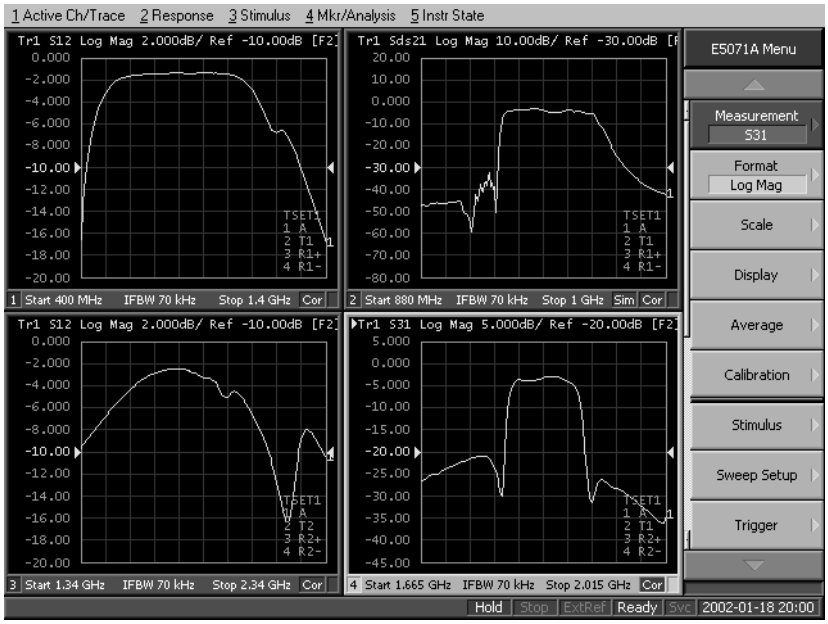
When you start the program, “Connect A and T1 to ECal Module.” is displayed. Connect the cables connected to A and T1 of the E5091A to the ECal module and press the **[Enter]** key to calibrate channel 1. If an error occurs due to a problem in the connection to the ECal module, an error message appears and “Re-try? [Y]es/[N]o” appears. You can execute calibration again by pressing the **[y]** key and then the **[Enter]** key. If you want to abort the program, press the **[n]** key and then the **[Enter]** key. For channels 2 to 4, execute the calibration in the same way.

When the calibration is complete, “Set DUT. Then Push [Enter] key.” is displayed. Connect the DUT (FEM) and the E5091A as shown below and press the **[Enter]** key to start the measurement.

FEM		**E5091A**
Antenna		A
EGSM	Tx	T1
	Rx+	R1+
	Rx-	R1-
GSM1800	Tx	T2
	Rx	R2+
Vc1		Control Line 1
Vc2		Control Line 2

Figure 13-3 shows a sample display of the LCD screen after the program exits execution.

Figure 13-3 Example of display after executing program in Example 13-3



The program is described in detail below:

Line 80 Assigns a GPIB address to the I/O path.

Line 120 Assigns the name of the test set, E5091A-009 (Option009) to the variables Model$.

Lines 140 to 330 Sets the ports assigned to port 1 to port 4 of the E5091A and the control line setting (table below) into the Port1$(*), Port2$(*), Port3$(*), Port4$(*), and C_lines(*) variables.

Channel number	Port 1	Port 2	Port 3	Port 4	Control Lines
1	A	T1	R1+	R1-	0 (00000000)
2	A	T1	R1+	R1-	2 (00000010)
3	A	T2	R2+	R2-	0 (00000000)
4	A	T2	R2+	R2-	1 (00000001)

Lines 370 to 690 Sets the settings required for the measurement conditions in the tables below to the appropriate variables.

Channel number	Sweep range		Number of points	Number of traces	Measure-ment parameter
	Start	Stop			
1	400 MHz	1.4 GHz	51	1	S12
2	880 MHz	1 GHz	101	1	Sds21
3	1.34 GHz	2.34 GHz	201	1	S12
4	1.665 GHz	2.015 GHz	101	1	S31

Channel number	Fixture simulator		Title
	ON/OFF	Topology	
1	Off	——	[EGSM] Tx-Antenna
2	On	SE:1, Bal:3,4	[EGSM] Antenna-Rx
3	Off	——	[GSM1800] Antenna-Rx
4	Off	——	[GSM1800] Tx-Antenna

Line 720 Puts the instrument into the preset state.

Line 730 Allocates the windows to the upper left, upper right, lower left, and lower right.

Line 750 Sets the test set name.

Lines770 to 1050 Repeats the following for channels 1 to 4, where i is the channel number.

Lines 810 to 850: For the E5091A whose ID is 1, sets the port assigned to port 1 to Port1$(i), the port assigned to port 2 to Port2$(i), the port assigned to port 3 to Port3$(i), and the port assigned to port 4 to Port4$(i).

Line 850: Sets the control line of the E5091A whose ID is 1 to C_lines(i).

Lines 890 to 920: Sets the sweep start value to Star(i), the sweep stop value to Stop(i), the number of points to Nop(i), and the number of traces to N_tr(i).

Lines 940 to 980: If the fixture simulator function is ON (Fsim$(i) is “ON”), sets the fixture simulator function to ON, the device type to Dev$(i), the port assignment to Top$(i), the balance-unbalance conversion to ON, and the measurement parameter (mix mode S-parameter) to Trc$(i).

Line 1000: If the fixture simulator function is OFF (Fsim$(i) is “OFF”), sets the measurement parameter (S-parameter) to Trc$.

Lines 1020 to 1040: Sets the title label to Ttl$(i), the title display to ON, and the continuous startup mode to ON, respectively.

Line 1070 Sets the trigger source to “Bus.”

Lines 1080 to 1090 For the E5091A whose ID is 1, sets the properties display to ON and the control to ON.

Lines 1130 to 1140 Uses the subprogram FNCal_solt_tset to execute the calibration of channel 1 with the ECal module (full 2-port calibration of ports A and T1). If the calibration is not completed correctly, aborts the program.

Lines 1150 to 1200 Executes the calibration of channels 2 to 4 in the same way.

Lines 1250 to 1260 Prompts the user to connect the DUT and waits for **[Enter]** to be pressed after the DUT is connected.

Lines 1280 to 1300 Triggers the instrument and waits until the measurement cycle finishes.

Lines 1320 to 1340 Executes auto scale for trace 1 of channels 1 to 4.

Lines 1360 to 1370 Prompts the user to decide whether to perform another measurement. When **[y]** is pressed followed by the **[Enter]** key, the program will return to the part where the DUT is connected and continue measurement.

The FNCal_solt_tset subprogram in lines 1430 to 1680, which performs ECal, is described below.

Line 1470 Displays the calibration type.

Line 1500 Clears the error queue.

Lines 1510 to 1530 Prompts the user to connect the Tset_Port$ of the E5091A to the ECal module and waits for the **[Enter]** key to be pressed after the connection.

Line 1540 Executes the ECal command for the full solt$-port calibration for the port Ana_port$ of the channel Ch$.

Lines 1560 to 1570 Retrieves the error number and error message from the error queue and then stores them into the variables Err_no and Err_msg$, respectively.

Lines 1590 to 1600 If Err_no returns a non-zero value (an error value), the program displays the corresponding error message.

Lines 1610 to 1630 If Err_no is other than 0 (occurrence of an error), prompts the user to decide whether to execute ECal again. When **[y]** is pressed followed by the **[Enter]** key, the program will return to the point of the connection and repeat ECal. When a key other than the **[y]** key is pressed followed by the **[Enter]** key, the program will return Err_no as the return value of the sub-program.

Lines 1650 to 1660 If Err_no is 0 (no error occurrence), displays the ECal completion message and returns Err_no (0) as the return value of the sub-program.

Example 13-3 **Measurement of FEM (meas_fem_2.htb)**

```
10     DIM
Port1$(1:4)[9],Port2$(1:4)[9],Port3$(1:4)[9],Port4$(1:4)[9]
20     DIM Fsim$(1:4)[9],Tpl$(1:4)[9],Trc$(1:4)[9],Ttl$(1:4)[30]
30     DIM Buff$[9],Inp_char$[9]
40     DIM Model$[8]
50     REAL Star(1:4),Stop(1:4)
60     INTEGER C_lines(1:4),Nop(1:4),N_tr(1:4),Ch,Res
70     !
80     ASSIGN @Agte507x TO 717
90     !
100    ! E5091A Setup
110    !
120    Model$="E5091_9"    ! Model:E5091A-009
130    !
140    Port1$(1)="A"       ![Ch1]     Port1: A
150    Port2$(1)="T1"      !          Port2: T1
160    Port3$(1)="R1"      !          Port3: R1+
170    Port4$(1)="R1"      !          Port4: R1-
180    C_lines(1)=0        !     Ctrl Lines: 0
190    Port1$(2)="A"       ![Ch2]     Port1: A
200    Port2$(2)="T1"      !          Port2: T1
210    Port3$(2)="R1"      !          Port3: R1+
220    Port4$(2)="R1"      !          Port4: R1-
230    C_lines(2)=2        !     Ctrl Lines: 2 (Line2:HIGH)
240    Port1$(3)="A"       ![Ch3]     Port1: A
250    Port2$(3)="T2"      !          Port2: T2
260    Port3$(3)="R2"      !          Port3: R2+
270    Port4$(3)="R2"      !          Port4: R2- (Dummy)
280    C_lines(3)=0        !     Ctrl Lines: 0
290    Port1$(4)="A"       ![Ch4]     Port1: A
300    Port2$(4)="T2"      !          Port2: T2
310    Port3$(4)="R2"      !          Port3: R2+
320    Port4$(4)="R2"      !          Port4: R2- (Dummy)
330    C_lines(4)=1        !     Ctrl Lines: 1 (Line1:HIGH)
340    !
350    ! Measurement Condition
360    !                    [Ch1]
370    Star(1)=4.E+8       ! Start Frequency    : 400 MHz
380    Stop(1)=1.4E+9      ! Stop Frequency     : 1.4 GHz
390    Nop(1)=51           ! Number of Points   : 51
400    N_tr(1)=1           ! Number of Traces   : 1
410    Fsim$(1)="OFF"      ! Fixture Simulator  : OFF
420    Trc$(1)="S12"       ! Meas. Param.       : S12
430    Ttl$(1)="[EGSM] Tx-Antenna"
440    !                    [Ch2]
450    Star(2)=8.8E+8      ! Start Frequency    : 880 MHz
460    Stop(2)=1.E+9       ! Stop Frequency     : 1 GHz
470    Nop(2)=101          ! Number of Points   : 101
480    N_tr(2)=1           ! Number of Traces   : 1
490    Fsim$(2)="ON"       ! Fixture Simulator  : ON
500    Dev$(2)="SBAL"      ! Bal. Device Type   : SE-Bal
510    Tpl$(2)="1,3,4"     ! Topology           : SE:1,Bal:3-4
520    Trc$(2)="SDS21"     ! Meas. Param.       : Sds21
530    Ttl$(2)="[EGSM] Antenna-Rx"
540    !                    [Ch3]
```

```
550     Star(3)=1.34E+9     ! Start Frequency     : 1.34 GHz
560     Stop(3)=2.34E+9     ! Stop Frequency      : 2.34 GHz
570     Nop(3)=201          ! Number of Points    : 201
580     N_tr(3)=1           ! Number of Traces    : 1
590     Fsim$(3)="OFF"      ! Fixture Simulator   : OFF
600     Trc$(3)="S12"       ! Meas. Param.        : S12
610     Ttl$(3)="[GSM1800] Tx-Antenna"
620     !                    [Ch4]
630     Star(4)=1.665E+9    ! Start Frequency     : 1.665 GHz
640     Stop(4)=2.015E+9    ! Stop Frequency      : 2.015 GHz
650     Nop(4)=101          ! Number of Points    : 101
660     N_tr(4)=1           ! Number of Traces    : 1
670     Fsim$(4)="OFF"      ! Fixture Simulator   : OFF
680     Trc$(4)="S31"       ! Meas. Param.        : S31
690     Ttl$(4)="[GSM1800] Antenna-Rx"
700     !
710     CLEAR SCREEN
720     OUTPUT @Agte507x;":SYST:PRES"
730     OUTPUT @Agte507x;":DISP:SPL D12_34"
740     !
750     OUTPUT @Agte507x;":SENS1:MULT1:NAME "&Model$
760     !
770     FOR Ch=1 TO 4
780       !
790       ! E5091A Setup
800       !
810       OUTPUT @Agte507x;":SENS"&VAL$(Ch)&":MULT1:PORT1
"&Port1$(Ch)
820       OUTPUT @Agte507x;":SENS"&VAL$(Ch)&":MULT1:PORT2
"&Port2$(Ch)
830       OUTPUT @Agte507x;":SENS"&VAL$(Ch)&":MULT1:PORT3
"&Port3$(Ch)
840       OUTPUT @Agte507x;":SENS"&VAL$(Ch)&":MULT1:PORT4
"&Port4$(Ch)
850       OUTPUT @Agte507x;":SENS"&VAL$(Ch)&":MULT1:OUTP
";C_lines(Ch)
860       !
870       ! Measurement Condition
880       !
890       OUTPUT @Agte507x;":SENS"&VAL$(Ch)&":FREQ:STAR ";Star(Ch)
900       OUTPUT @Agte507x;":SENS"&VAL$(Ch)&":FREQ:STOP ";Stop(Ch)
910       OUTPUT @Agte507x;":SENS"&VAL$(Ch)&":SWE:POIN ";Nop(Ch)
920       OUTPUT @Agte507x;":CALC"&VAL$(Ch)&":PAR:COUN ";N_tr(Ch)
930       IF Fsim$(Ch)="ON" THEN
940         OUTPUT @Agte507x;":CALC"&VAL$(Ch)&":FSIM:STAT ON"
950         OUTPUT @Agte507x;":CALC"&VAL$(Ch)&":FSIM:BAL:DEV
"&Dev$(Ch)
960         OUTPUT
@Agte507x;":CALC"&VAL$(Ch)&":FSIM:BAL:TOP:"&Dev$(Ch)&" "&Tpl$(Ch)
970         OUTPUT @Agte507x;":CALC"&VAL$(Ch)&":FSIM:BAL:PAR1:STAT
ON"
980         OUTPUT
@Agte507x;":CALC"&VAL$(Ch)&":FSIM:BAL:PAR1:"&Dev$(Ch)&" "&Trc$(Ch)
990       ELSE
1000        OUTPUT @Agte507x;":CALC"&VAL$(Ch)&":PAR1:DEF "&Trc$(Ch)
1010      END IF
1020      OUTPUT @Agte507x;":DISP:WIND"&VAL$(Ch)&":TITL:DATA
"""&Ttl$(Ch)&"""
```

```
1030     OUTPUT @Agte507x;":DISP:WIND"&VAL$(Ch)&":TITL ON"
1040     OUTPUT @Agte507x;":INIT"&VAL$(Ch)&":CONT ON"
1050   NEXT Ch
1060   !
1070   OUTPUT @Agte507x;":TRIG:SOUR BUS"
1080   OUTPUT @Agte507x;":SENS:MULT1:DISP ON"
1090   OUTPUT @Agte507x;":SENS:MULT1:STAT ON"
1100   !
1110   ! Calibration
1120   !
1130   Res=FNEcal_solt_tset(@Agte507x,"1","2","1,2","A and T1")
1140   IF Res<>0 THEN Prg_end
1150   Res=FNEcal_solt_tset(@Agte507x,"2","3","1,3,4","A, R1+ and
R1-")
1160   IF Res<>0 THEN Prg_end
1170   Res=FNEcal_solt_tset(@Agte507x,"3","2","1,2","A and T2")
1180   IF Res<>0 THEN Prg_end
1190   Res=FNEcal_solt_tset(@Agte507x,"4","2","1,3","A and R2+")
1200   IF Res<>0 THEN Prg_end
1210   !
1220   ! Measurement
1230   !
1240 Meas_start:!
1250   PRINT "Set DUT. Then Push [Enter] key."
1260   INPUT "",Inp_char$
1270   !
1280   OUTPUT @Agte507x;":TRIG:SING"
1290   OUTPUT @Agte507x;"*OPC?"
1300   ENTER @Agte507x;Buff$
1310   !
1320   FOR Ch=1 TO 4
1330     OUTPUT @Agte507x;":DISP:WIND"&VAL$(Ch)&":TRAC1:Y:AUTO"
1340   NEXT Ch
1350   !
1360   INPUT "Once more? [Y]es/[N]o",Inp_char$
1370   IF UPC$(Inp_char$)="Y" OR UPC$(Inp_char$)="YES" THEN
Meas_start
1380 Prg_end:!
1390   END
1400   !============================================================
1410   ! Electronic Full n Port Calibration Function for E5091A
1420   !============================================================
1430 DEF FNEcal_solt_tset(@Agte507x,Ch$,Solt$,Ana_port$,Tset_port$)
1440   DIM Buff$[9],Err_msg$[100]
1450   INTEGER Err_no
1460   !
1470   PRINT "## [Ch "&Ch$&"] Full "&Solt$&" Port Calibration (ECal)
##"
1480   !
1490 Ecal_start:!
1500   OUTPUT @Agte507x;"*CLS"
1510   PRINT "Connect "&Tset_port$&" to ECal Module."
1520   PRINT "Then push [Enter] key."
1530   INPUT "",Buff$
1540   OUTPUT @Agte507x;":SENS"&Ch$&":CORR:COLL:ECAL:SOLT"&Solt$&"
"&Ana_port$
1550   PRINT "Executing ..."
1560   OUTPUT @Agte507x;":SYST:ERR?"
```

```
1570   ENTER @Agte507x;Err_no,Err_msg$
1580   IF Err_no<>0 THEN
1590     PRINT "Error occurred!!"
1600     PRINT "  No:";Err_no,"Description: "&Err_msg$
1610     INPUT "Re-try? [Y]es/[N]o",Inp_char$
1620     IF UPC$(Inp_char$)="Y" OR UPC$(Inp_char$)="YES" THEN
Ecal_start
1630     RETURN Err_no
1640   ELSE
1650     PRINT "Done"
1660     RETURN Err_no
1670   END IF
1680 FNEND
```

Control Using SICL-LAN Server

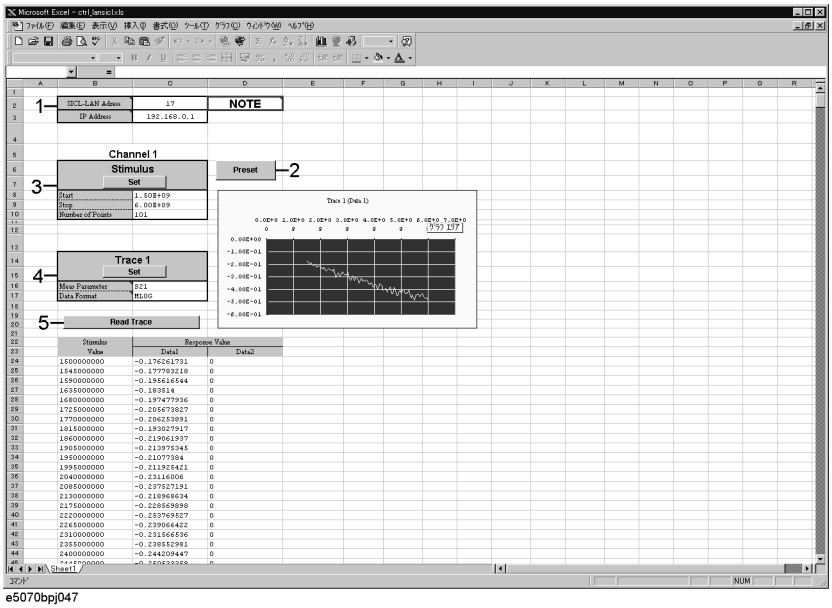
This section explains how to control the E5070B/E5071B by using SICL in the Windows environment. Here, the sample program (a VBA macro for Microsoft Excel) is written in Visual Basic. The source file of this program, ctrl_lansicl.xls, is available on the sample program disk.

NOTE To control the E5070B/E5071B using the SICL-LAN server, you need to make the preparations described in “Control over SICL-LAN server” on page 34.

Using VBA macro

Opening ctrl_lansicl.xls in Microsoft Excel displays a screen as shown in Figure 13-4.

Figure 13-4 **ctrl_lansicl.xls**



e5070bpj047

For how to use each element in Figure 13-4, refer to the following description.

We begin by describing part 1. In the cell to the right of the SICL-LAN Address, enter the address of the E5070B/E5071B for control with the SICL-LAN server. This address is **xx**, which has been set with the command **[System] - Misc Setup - Network Setup - SICL-LAN Address [xx]**. Enter the IP address of the E5070B/E5071B in the cell to the right of the IP Address. This VBA macro will not work properly without the correct values in these two cells.

Clicking the button labeled Preset in part 2 executes the presetting operation.

In part 3, the sweep range (start and stop points) and the number of measurement points for channel 1 are set. Clicking the button labeled Set executes the setting as shown in the setting table.

Part 4 sets the measurement parameters and data format for trace 1 in channel 1. Clicking the button labeled Set executes the setting as shown in the setting table.

Clicking the button labeled Read Trace in part 5 retrieves the formatted data array of trace 1 in channel 1 and displays it in tabular and graphical formats.

Description of operation in VBA macro

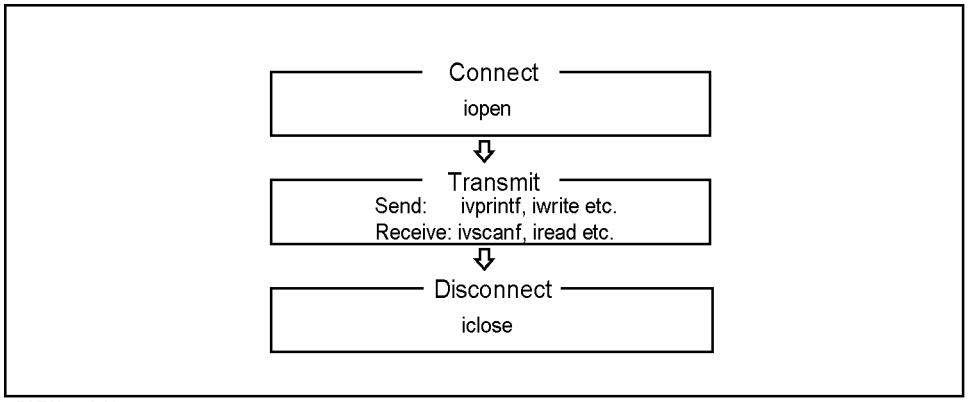
This section describes the operation of the VBA macro, focusing on the part related to control with SICL.

In order to use SICL in your VBA macro, you must declare functions and define variables with a SICL definition file (for VB). In the VBA macro, ctrl_sicllan.xls, the standard module whose object name is "SICL," is the definition file.

The basic control flow with SICL is shown in Figure 13-5.

NOTE In this sample program, the **ivprintf** function, the **ivscanf** function, and the **iread** function are used in its communication part; you can use other SICL functions as well. For details, refer to sicl.hlp (the online help of SICL).

Figure 13-5 Flow of control using SICL



e5070bpe041

NOTE For more information on how to use each function of SICL, refer to the SICL manual.

The procedures of each step in Figure 13-5 are described below.

Connection

The procedure corresponding to connection is OpenSession (Example 13-4). OpenSession establishes a connection to the E5070B/E5071B with the **iopen** function of SICL, using the SICL-LAN Address and IP Address entered in part 1 in Figure 13-4. The **iopen** function takes the address information of the E5070B/E5071B you specify as its parameters.

Syntax

addr = iopen(*dev*)

Variable

	addr
Description	Session information (output)
Data type	Integer type

	dev
Description	Address information of the instrument you specify (input)
Data type	Character string type
Grammar	*sicl-name**1[*ip-address**2]:*interface**3,*sicl-lan-address**4

*1. The SICL interface name you set with the Agilent I/O Libraries in external control.
*2. The IP address of the E5070B/E5071B.
*3. For the E5070B/E5071B, specify hpib9.
*4. The address of the E5070B/E5071B for control with the SICL-LAN server.

For example, if the parameter (*dev*) is "lan[192.168.0.1]:hpib9,17," connection is made to the address of **17** of the interface of **hpib9** with the E5070B/E5071B whose IP address is **192.168.0.1** by using the external controller whose SICL interface name is **lan**.

Example 13-4 **OpenSession**

```
Function OpenSession() As Integer

  Dim ServAddr As String
  Dim IpAddr As String

  On Error GoTo ErrHandler

  '''Get Sicl-Lan Address
  Sheets("Sheet1").Select
  Range("C2").Select
  ServAddr = ActiveCell.FormulaR1C1

  '''Get Ip Address
  Sheets("Sheet1").Select
  Range("C3").Select
  IpAddr = ActiveCell.FormulaR1C1

  OpenSession = iopen("lan[" & IpAddr & "]:hpib9," & ServAddr)
  Call itimeout(OpenSession, 10000)
  Exit Function
```

```
ErrHandler:
  MsgBox "*** Error : " & Error$
  Call siclcleanup
  End

End Function
```

Sending

The procedure corresponding to sending in communication is OutputSiclLan (Example 13-5). OutputSiclLan uses the **ivprintf** function of SICL to send messages (SCPI commands). The **ivprintf** function takes the session information outputted from the **iopen** function and a program message as its parameters.

Syntax

Status = ivprintf(*addr,mes*)

Variable

Table 13-4 Variable (*Status*)

	Status
Description	Return value of the function (output)
Data type	Integer type

Table 13-5 Variable (*addr*)

	addr
Description	Session information (input)
Data type	Integer type

	mes
Description	Program message (input)*1
Data type	Character string type

*1. When sending a program message of a SCPI command, add the message terminator at the end of the message (in Example 13-5, Chr$(10)).

Example 13-5 OutputSiclLan

```
Sub OutputSiclLan(addr As Integer, message As String)

  Dim Status As Integer
  Dim actualcnt As Long
  Dim length As Long

  On Error GoTo ErrHandler

  length = Len(message)

  Status = ivprintf(addr, message & Chr$(10))
  Exit Sub
```

```
ErrHandler:
  MsgBox "*** Error : " & Error$
  Call siclcleanup
  End

End Sub
```

Receiving

The procedure corresponding to receiving ASCII format messages in communication is EnterSiclLan (Example 13-6). EnterSiclLan uses the **ivscanf** function of SICL to receive a message in ASCII format and store it into the output variable. The **ivscanf** function takes the session information outputted from the **iopen** function, the format for output, and the data to be outputted as its parameters.

Syntax

Status = ivscanf(*addr,fmt,ap*)

Variable

	fmt
Description	Format for output (input)
Data type	Character string type

	ap
Description	Data to be outputted (output)
Data type	Character string type

For information on the variable (*Status*) and the variable (*addr*), refer to Table 13-4, “Variable (Status),” on page 268 and Table 13-5, “Variable (addr),” on page 268, respectively.

NOTE

In Visual Basic, variables must be declared as a fixed-length string when receiving string data using the **ivscanf** function.

Example 13-6 **EnterSiclLan**

```
Sub EnterSiclLan(addr As Integer, Query As String)


  Dim Status As Integer
  Dim actualcnt As Long
  Dim res As String * 256

  On Error GoTo ErrHandler

  Status = ivscanf(addr, "%t", res)
  Query = Trim(res)
  Exit Sub

ErrHandler:
  MsgBox "*** Error : " & Error$
  Call siclcleanup
```

```
  End

End Sub
```

The procedure corresponding to receiving array data in communication is EnterSiclLanArrayReal64 (Example 13-7), which uses the **iread** function of SICL to receive array data in the IEEE 64-bit floating point binary transfer format and store it into the output variable. The **iread** function takes the session information outputted from the **iopen** function, the data to be outputted, the number of data bytes, the condition to finish reading data, and the number of data bytes actually read out as its parameters.

Syntax

Status = iread(*addr,buf,bufsize,reason,actual*)

Variable

	buf
Description	Data to be outputted (output)
Data type	Character string type

	bufsize
Description	The number of data bytes (input)
Data type	Long integer type

	reason
Description	The condition to finish reading out data (input)
Data type	Integer type

	actual
Description	The number of data bytes actually read out (output)
Data type	Long integer type

For information on the variable (*Status*) and the variable (*addr*), refer to Table 13-4, “Variable (Status),” on page 268 and Table 13-5, “Variable (addr),” on page 268, respectively.

Each functional part of EnterSiclLanArrayReal64 is described below.

(1) Retrieves the data header.

(2) Stores the number of data bytes into the size variable in the header part.

(3) Retrieves the formatted data array for trace 1 in channel 1 and stores it into the databuf variable.

(4) Retrieves the message terminator at the end of the data.

Example 13-7 EnterSiclLanArrayReal64

```
Function EnterSiclLanArrayReal64(addr As Integer, databuf() As Double)
As Long

  Dim Status As Integer
  Dim actualcnt As Long
  Dim buf As String * 8
  Dim size As Long

  On Error GoTo ErrHandler

  '''Read header info of "#6NNNNNN"
  Status = iread(addr, buf, 8, I_TERM_MAXCNT, actualcnt)
'.................(1)

  size = Val(Mid$(buf, 3, 6))
'.................(2)

  '''Read data
  Status = iread(addr, databuf, size, I_TERM_MAXCNT, actualcnt)
'.................(3)

  '''Read ending LF
  Status = iread(addr, buf, 1, I_TERM_MAXCNT, actualcnt)
'.................(4)

  EnterSiclLanArrayReal64 = size / 8
  Exit Function

ErrHandler:
  MsgBox "*** Error : " & Error$
  Call siclcleanup
  End

End Function
```


Disconnection

The **iclose** function of SICL is used to disconnect communication. The **iclose** function takes the session information outputted from the **iopen** function as its parameter.

Syntax

Status = iclose(*addr*)

For information on the variable (*Status*) and the variable (*addr*), refer to Table 13-4, “Variable (Status),” on page 268 and Table 13-5, “Variable (addr),” on page 268, respectively.

Sample control

The E5070B/E5071B can be controlled by executing the above procedures in order, following the control flow in Figure 13-5. This is demonstrated by the Preset procedure (a procedure that is executed when the Preset button is clicked) as described in Example 13-8.

Example 13-8 **Preset**

```
Sub Preset()

  ''' Open Session
  E507x = OpenSession

  '''Presetting the analyzer
  Call OutputSiclLan(E507x, ":SYST:PRES")

  '''Close Session
  Call iclose(E507x)

End Sub
```

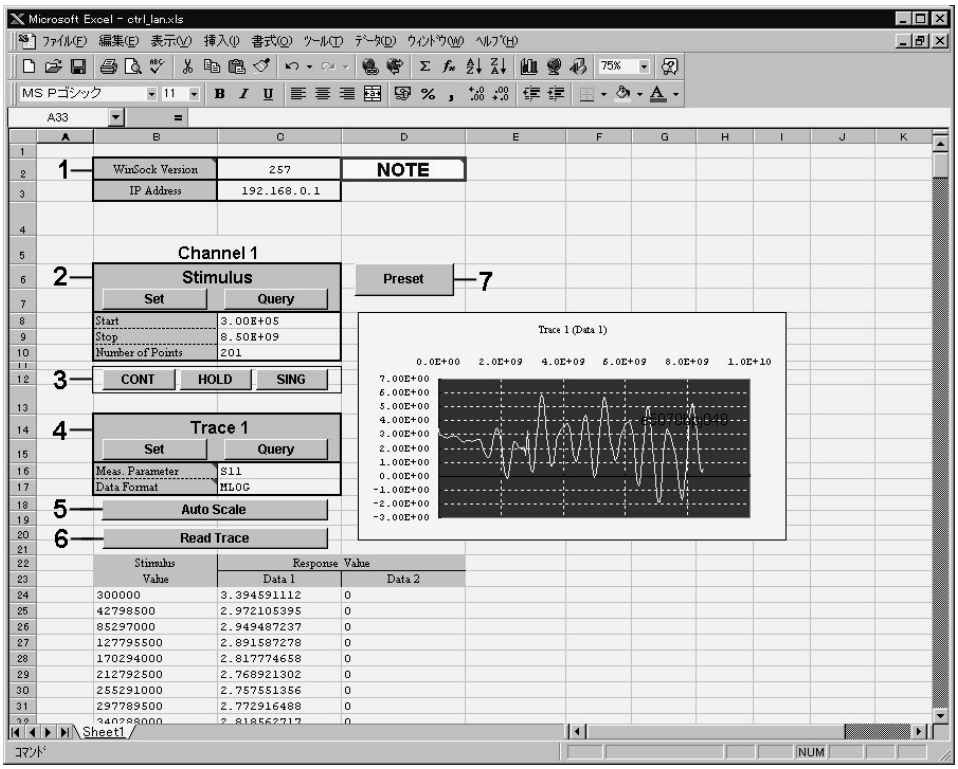
Controlling Using Telnet Server

This section explains how to control the E5070B/E5071B by using WinSock API in the Windows environment, using a sample program written in Visual Basic (VBA macro). You can find the source file of this program, named ctrl_lan.xls (Microsoft Excel file), on the sample program disk.

Using VBA macro

Opening ctrl_lan.xls in Microsoft Excel displays the screen shown in Figure 13-6.

Figure 13-6 **ctrl_lan.xls**



e5070bpj048

For how to use each element in Figure 13-6, refer to the following description.

We begin by describing part 1. Enter the version number of WinSock API in the cell to the right side of “Winsock Version.” The version number is obtained by multiplying 256 by the major version and then adding the minor version. For example, when the version of your Winsock API is 1.1, the version number is obtained as follows: 256×1+1=257. Enter the IP address of the E5070B/E5071B in the cell to the right side of “IP Address.” This VBA macro will not work properly without the correct values in these two cells.

In part 2, the sweep range (start and stop points) and the number of measurement points are set. Clicking the button labeled “Set” executes the setting operation as specified with the setting table, while clicking the button labeled “Query” retrieves the current settings of the E5070B/E5071B.

Part 3 is dedicated to setting the trigger mode.

Part 4 sets the measurement parameters and data format for trace 1 in channel 1. Clicking the button labeled “Set” executes the setting operation as specified with the setting table, while clicking the button labeled “Query” retrieves the current settings of the E5070B/E5071B.

In part 5, clicking the button labeled “Auto Scale” executes auto scaling for trace 1 in channel 1.

Clicking the button labeled “Read Trace” in part 6 retrieves the formatted data of trace 1 in channel 1 and displays it in tabular and graphical formats.

Clicking the button labeled “Preset” executes the presetting operation.

Description of operation in VBA macro

This section describes the operation of the VBA macro, focusing on the part related to control with WinSock API.

In order to use WinSock API, you must declare functions and define variables with a definition file of WinSock API, as shown in Example 13-9.

Example 13-9 Definition file of WinSock API

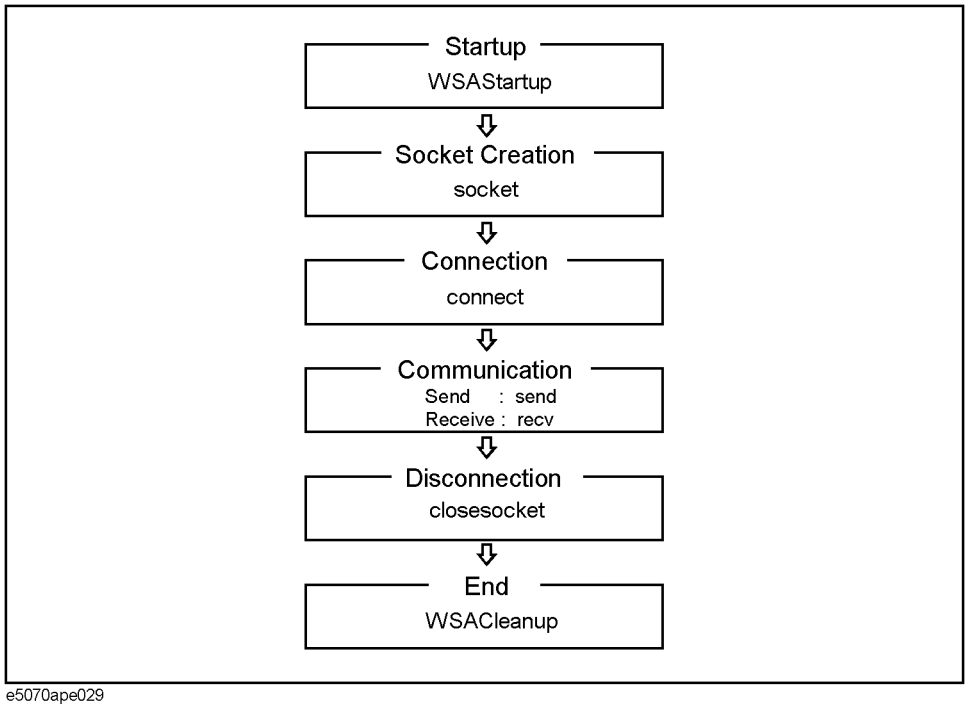
```
'This is the Winsock API definition file for Visual Basic

'Setup the variable type 'hostent' for the WSAStartup command
Type Hostent
  h_name As Long
  h_aliases As Long
  h_addrtype As String * 2
  h_length As String * 2
  h_addr_list As Long
End Type
Public Const SZHOSTENT = 16


'Set the Internet address type to a long integer (32-bit)
Type in_addr
   s_addr As Long
End Type


'A note to those familiar with the C header file for Winsock
'Visual Basic does not permit a user-defined variable type
'to be used as a return structure.  In the case of the
'variable definition below, sin_addr must
'be declared as a long integer rather than the user-defined
'variable type of in_addr.
Type sockaddr_in
   sin_family As Integer
   sin_port As Integer
   sin_addr As Long
   sin_zero As String * 8
End Type

Public Const WSADESCRIPTION_LEN = 256
Public Const WSASYS_STATUS_LEN = 128
Public Const WSA_DescriptionSize = WSADESCRIPTION_LEN + 1
Public Const WSA_SysStatusSize = WSASYS_STATUS_LEN + 1
```

```
'Setup the structure for the information returned from
'the WSAStartup() function.
Type WSAData
   wVersion As Integer
   wHighVersion As Integer
   szDescription As String * WSA_DescriptionSize
   szSystemStatus As String * WSA_SysStatusSize
   iMaxSockets As Integer
   iMaxUdpDg As Integer
   lpVendorInfo As String * 200
End Type

'Define socket return codes
Public Const INVALID_SOCKET = &HFFFF
Public Const SOCKET_ERROR = -1

'Define socket types
Public Const SOCK_STREAM = 1           'Stream socket
Public Const SOCK_DGRAM = 2            'Datagram socket
Public Const SOCK_RAW = 3              'Raw data socket
Public Const SOCK_RDM = 4              'Reliable Delivery socket
Public Const SOCK_SEQPACKET = 5        'Sequenced Packet socket


'Define address families
Public Const AF_UNSPEC = 0             'unspecified
Public Const AF_UNIX = 1               'local to host (pipes, portals)
Public Const AF_INET = 2               'internetwork: UDP, TCP, etc.
Public Const AF_IMPLINK = 3            'arpanet imp addresses
Public Const AF_PUP = 4                'pup protocols: e.g. BSP
Public Const AF_CHAOS = 5              'mit CHAOS protocols
Public Const AF_NS = 6                 'XEROX NS protocols
Public Const AF_ISO = 7                'ISO protocols
Public Const AF_OSI = AF_ISO           'OSI is ISO
Public Const AF_ECMA = 8               'european computer manufacturers
Public Const AF_DATAKIT = 9            'datakit protocols
Public Const AF_CCITT = 10             'CCITT protocols, X.25 etc
Public Const AF_SNA = 11               'IBM SNA
Public Const AF_DECnet = 12            'DECnet
Public Const AF_DLI = 13               'Direct data link interface
Public Const AF_LAT = 14               'LAT
Public Const AF_HYLINK = 15            'NSC Hyperchannel
Public Const AF_APPLETALK = 16         'AppleTalk
Public Const AF_NETBIOS = 17           'NetBios-style addresses
Public Const AF_MAX = 18               'Maximum # of address families


'Setup sockaddr data type to store Internet addresses
Type sockaddr
  sa_family As Integer
  sa_data As String * 14
End Type
Public Const SADDRLEN = 16


'Declare Socket functions

Public Declare Function closesocket Lib "wsock32.dll" (ByVal s As Long)
As Long

Public Declare Function connect Lib "wsock32.dll" (ByVal s As Long, addr
As sockaddr_in, ByVal namelen As Long) As Long

Public Declare Function htons Lib "wsock32.dll" (ByVal hostshort As Long)
```

```
As Integer

Public Declare Function inet_addr Lib "wsock32.dll" (ByVal cp As String)
As Long

Public Declare Function recv Lib "wsock32.dll" (ByVal s As Long, ByVal
buf As Any, ByVal buflen As Long, ByVal flags As Long) As Long

Public Declare Function recvB Lib "wsock32.dll" Alias "recv" (ByVal s As
Long, buf As Any, ByVal buflen As Long, ByVal flags As Long) As Long

Public Declare Function send Lib "wsock32.dll" (ByVal s As Long, buf As
Any, ByVal buflen As Long, ByVal flags As Long) As Long

Public Declare Function socket Lib "wsock32.dll" (ByVal af As Long, ByVal
socktype As Long, ByVal protocol As Long) As Long

Public Declare Function WSAStartup Lib "wsock32.dll" (ByVal
wVersionRequired As Long, lpWSAData As WSAData) As Long

Public Declare Function WSACleanup Lib "wsock32.dll" () As Long

Public Declare Function WSAUnhookBlockingHook Lib "wsock32.dll" () As
Long

Public Declare Sub CopyMemory Lib "kernel32" Alias "RtlMoveMemory"
(hpvDest As Any, hpvSource As Any, ByVal cbCopy As Long)
```

The basic control flow with WinSock API is shown in Figure 13-7.

Figure 13-7 **Control flow with WinSock API**



e5070ape029

The procedures of each step in Figure 13-7 are described below.

Startup

The procedure corresponding to Startup is StartIt (Example 13-10). StartIt launches and initializes WinSock API with **WSAStartup**, whose version is shown in part 1 of Figure 13-6. The function WSAStartup should always be used when initiating WinSock. This function takes the version number (input) and launching information (output) as its parameters.

Example 13-10 **StartIt**

```
Sub StartIt()

    Dim StartUpInfo As WSAData

    'Version 1.1 (1*256 + 1) = 257
    'version 2.0 (2*256 + 0) = 512

    'Get WinSock version
    Sheets("Sheet1").Select
    Range("C2").Select
    version = ActiveCell.FormulaR1C1

    'Initialize Winsock DLL
    x = WSAStartup(version, StartUpInfo)

End Sub
```

Socket Creation and Connection

The procedure for Socket Creation and Connection is OpenSocket (Example 13-11). OpenSocket makes a connection to an instrument associated with the IP address specified with the input parameter Hostname. It uses a socket of the port specified with the input parameter PortNumber. Each functional part of OpenSocket is described below.

In (1), the inet_aadr function of WinSock API is used to convert an IP address delimited by "." to an Internet address.

In (2), a new socket is created with the **socket** function of WinSock API and its socket descriptor is obtained. If an error occurs, the control returns to the main program with a message. The socket function takes an address family (input), a socket type (input), and a protocol number (input) as its parameters.

In (3), the socket address is specified. Note that htons, which is used for specifying the port number, is a function of WinSock API. This function converts a 2-byte integer from the Windows byte order (little endian) to the network byte order (big endian).

In (4), a connection to the E5070B/E5071B is made by using the **connect** function of WinSock API. If an error occurs, the control returns to the main program with a message. The connect function takes a socket descriptor (input), a socket address (input), and the size of the socket address (input) as its parameters.

Example 13-11 OpenSocket

```
Function OpenSocket(ByVal Hostname As String, ByVal PortNumber As Intege
r) As Integer

    Dim I_SocketAddress As sockaddr_in
    Dim ipAddress As Long

    ipAddress = inet_addr(Hostname)                        '...........(1)

    'Create a new socket
    socketId = socket(AF_INET, SOCK_STREAM, 0)             '
    If socketId = SOCKET_ERROR Then                        '
        MsgBox ("ERROR: socket = " + Str$(socketId))       '...........(2)
        OpenSocket = COMMAND_ERROR                         '
        Exit Function                                      '
    End If                                                 '

    'Open a connection to a server

    I_SocketAddress.sin_family = AF_INET                   '
    I_SocketAddress.sin_port = htons(PortNumber)           '...........(3)
    I_SocketAddress.sin_addr = ipAddress                   '
    I_SocketAddress.sin_zero = String$(8, 0)               '

    x = connect(socketId, I_SocketAddress, Len(I_SocketAddress))  '
    If socketId = SOCKET_ERROR Then                                '
        MsgBox ("ERROR: connect = " + Str$(x))                     '..(4)
        OpenSocket = COMMAND_ERROR                                 '
        Exit Function                                              '
    End If                                                         '

    OpenSocket = socketId

End Function
```

Communication

The procedure corresponding to Communication is SendCommand (Example 13-12). SendCommand transmits a message (SCPI command) specified with the input parameter “command” to the E5070B/E5071B using the **send** function of WinSock API. The send function takes a socket descriptor (input), a message to be transmitted (input), message length (input) and a flag (input) as its parameters.

Example 13-12 SendCommand

```
Function SendCommand(ByVal command As String) As Integer

    Dim strSend As String

    strSend = command + vbCrLf

    count = send(socketId, ByVal strSend, Len(strSend), 0)

    If count = SOCKET_ERROR Then
        MsgBox ("ERROR: send = " + Str$(count))
        SendCommand = COMMAND_ERROR
        Exit Function
    End If

    SendCommand = NO_ERROR

End Function
```

The procedure corresponding to the Receiving part of communication is RecvAscii (Example 13-13) and other functions. RecvAscii receives a message in ASCII format and stores it in the dataBuf output parameter. Maximum length of the message is specified with the maxLength input parameter. Each functional part of RecvAscii is described below.

In (1), a message (a response to a query for a SCPI command) is received from the E5070B/E5071B as a series of characters using the **recv** function of WinSock API. If an error occurs, the control returns to the main program with a message. The recv function takes a socket descriptor (input), a message to be received (input), message length (input) and a flag (input) as its parameters.

In (2), it is determined whether each received character is LF (ASCII code: 10). When it is LF, receiving is terminated by adding NULL (ASCII code: 0) to the end of the dataBuf string and the control returns to the main program.

In (3), the number of the last characters that were read out is added to the count value for checking the number of received characters, and the characters are appended to the end of the dataBuf string.

Example 13-13 RecvAscii

```
Function RecvAscii(dataBuf As String, ByVal maxLength As Integer) As
Integer

    Dim c As String * 1
    Dim length As Integer

    dataBuf = ""
    While length < maxLength
        DoEvents
        count = recv(socketId, c, 1, 0)                '
        If count < 1 Then                              '
            RecvAscii = RECV_ERROR                     '............(1)
            dataBuf = Chr$(0)                          '
            Exit Function                              '
        End If                                         '

        If c = Chr$(10) Then                           '
           dataBuf = dataBuf + Chr$(0)                 '............(2)
           RecvAscii = NO_ERROR                        '
           Exit Function                               '
        End If                                         '

        length = length + count                        '............(3)
        dataBuf = dataBuf + c                          '
    Wend

    RecvAscii = RECV_ERROR

End Function
```

Disconnection

The procedure corresponding to Disconnection is CloseConnection (Example 13-14). CloseConnection disconnects communication and removes a socket using the **closesocket** function of WinSock API. The closesocket function takes a socket descriptor (input) as its parameter.

Example 13-14 CloseConnection

```
Sub CloseConnection()

    x = closesocket(socketId)

    If x = SOCKET_ERROR Then
        MsgBox ("ERROR: closesocket = " + Str$(x))
        Exit Sub
    End If

End Sub
```

End

The procedure corresponding to End is EndIt (Example 13-15). EndIt disconnects WinSock API using the **WSACleanup** function of WinSock API. The function WSACleanup should always be used when terminating WinSock.

Example 13-15 EndIt

```
Sub EndIt()

    'Shutdown Winsock DLL
    x = WSACleanup()

End Sub
```

Example of control

The E5070B/E5071B can be controlled by executing the above procedures in order, following the control flow in Figure 13-7. This is demonstrated by the procedure autoscale (a procedure that is executed when the Auto Scale button is clicked) as described in Example 13-16.

Example 13-16 **autoscale**

```
Sub autoscale()
'
' auto scaling
'
    Call StartIt
    Call get_hostname
    x = OpenSocket(Hostname$, ScpiPort)

    x = SendCommand(":DISP:WIND1:TRAC1:Y:AUTO")

    Call CloseConnection
    Call EndIt

End Sub
```

NOTE

When you execute more than one command by connecting and disconnecting a socket for every command, the sequence of execution may change.

- Connection → Command 1 → Command 2 → Disconnection

  Commands 1 and 2 are always executed in this sequence.

- Connection → Command 1 → Disconnection → Connection → Command 2 → Disconnection

  These commands may also be in the sequence of Command 2 → command 1.

14 SCPI Command Reference

This chapter provides the SCPI command reference for the Agilent E5070B/E5071B. It describes the commands using their abbreviated format in alphabetical order. If you want to look up commands using their fully specified format, refer to the index for the desired SCPI command. If you want to look up commands by their function, refer to the SCPI command list ordered by function.

Notational conventions in this command reference

This section explains the rules for reading the descriptions of commands in this chapter.

Syntax

The part with heading “Syntax” describes the syntax used to send a command from the external controller to the E5070B/E5071B. A syntax consists of a command part and a parameter part. The separator between these parts is a space.

If there are several parameters, the separator between adjacent parameters is a comma (,). Ellipsis (…) between commas indicates that parameters in that part are omitted. For example, <numeric 1>,…,<numeric 4> indicates that 4 parameters, <numeric 1>,<numeric 2>, <numeric 3>,<numeric 4>, are required.

String-type parameters, <string>, <string 1>, and so on, must be enclosed in double quotation marks ("). <block> shows block format data.

You can omit the lowercase letters in syntax. For example, ":CALibration:CABLe" can be shortened as ":CAL:CABL."

The definition of symbols used in the syntax is as follows:

<>	Characters enclosed in this pair of symbols are necessary parameters when sending the command.
[]	Part enclosed in this parenthesis pair can be omitted.
{}	Part enclosed in this parenthesis pair indicates that you must select one of the items in this part. Individual items are separated by a vertical bar (|).

For example, ":CALC:CORR:EDEL:TIME 0.1," ":CALCULATE1:SELECTED:CORR:EDEL:TIME 25E-3," and so on are valid for the syntax given below.

Syntax :CALCulate{[1]|2|3|4|5|6|7|8|9}[:SELected]:CORRection:EDELay:TIME <numeric>

Description

Part with heading “Description” describes how to use the command or the operation when executed.

Parameters

Part with heading “Parameters” describes necessary parameters when sending the command. When a parameter is a value type or a string type enclosed with <>, its description, allowable setup range, preset (factory-set) value, and so on are given; when a parameter is a selection type enclosed with {}, the description of each selection item is given.

Query response

Part with heading “Query response” describes the data format read out when query (reading out data) is available with the command.

Each readout parameter is enclosed with {}. If there are several items within {} separated by the pipe (|), only one of them is read out.

When several parameters are read out, they are separated with a comma (,). Note that, 3 points (…) between commas indicate that the data of that part is omitted. For example, {numeric 1},…,{numeric 4} indicates that 4 data items, {numeric 1}, {numeric 2}, {numeric 3}, and {numeric 4}, are read out.

<newline><^END> after the parameters is the program message terminator.

Related commands

Part with heading “Related commands” describes the commands related to this command.

Equivalent key

Part with heading “Equivalent key” shows the operational procedure of the front panel keys that has the same effect as this command.

[Key]	Indicates that you press the key named Key.
[Key] - Item	Indicates a series of key operation in which you press the **[Key]** key, select (highlight) the item called **Item** on the displayed menu using the **[↓]** key and so on, and then press the **[Enter]** key.

IEEE Common Commands

This section describes the IEEE common commands.

*CLS

Syntax

*CLS

Description

Clears the followings. (No query)

- Error Queue
- Status Byte Register
- Standard Event Status Register
- Operation Status Event Register
- Questionable Status Event Register
- Questionable Limit Status Event Register
- Questionable Limit Extra Status Event Register
- Questionable Limit Channel{1-16} Status Event Register
- Questionable Limit Channel{1-16} Extra Status Event Register
- Questionable Bandwidth Limit Status Event Register
- Questionable Bandwidth Limit Extra Status Event Register
- Questionable Bandwidth Limit Channel{1-16} Status Event Register
- Questionable Bandwidth Limit Channel{1-16} Extra Status Event Register
- Questionable Ripple Limit Status Event Register
- Questionable Ripple Limit Extra Status Event Register
- Questionable Ripple Limit Channel{1-16} Status Event Register
- Questionable Ripple Limit Channel{1-16} Extra Status Event Register

Example of use

```
10   OUTPUT 717;"*CLS"
```

Equivalent key

No equivalent key is available on the front panel.

*ESE

Syntax

*ESE <numeric>

*ESE?

Description

Sets the value of the Standard Event Status Enable Register.

Parameters

	<numeric>
Description	Setup value of the register
Range	0 to 255
Preset value	0
Resolution	1

If the specified parameter is out of the allowable setup range, the result of bitwise AND with 255 (0xff) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;"*ESE 16"
20   OUTPUT 717;"*ESE?"
30   ENTER 717;A
```

Related commands

*SRE on page 290

Equivalent key

No equivalent key is available on the front panel.

*ESR?

Syntax

*ESR?

Description

Reads out the value of the Standard Event Status Register. Executing this command clears the register value. (Query only)

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;"*ESR?"
20   ENTER 717;A
```

Equivalent key

No equivalent key is available on the front panel.

*IDN?

Syntax *IDN?

Description Reads out the product information (manufacturer, model number, serial number, and firmware version number) of the E5070B/E5071B. (Query only)

Query response {string 1},{string 2},{string 3},{string 4}<newline><^END>

Readout data is as follows:

{string 1}	Manufacturer. Agilent Technologies is always read out.
{string 2}	Model number (example: E5070B).
{string 3}	Serial number (example: JP1KI00101).
{string 4}	Firmware version number (example: 03.00).

Example of use

```
10   OUTPUT 717;"*IDN?"
20   ENTER 717;A$
```

Equivalent key **[System]** - **Firmware Revision**

[System] - **Service Menu** - **Enable Options** - **Serial Number**

*OPC

Syntax *OPC

Description Sets the OPC bit (bit 0) of the Standard Event Status Register at the completion of all pending operations. (No query)

Example of use

```
10   OUTPUT 717;"*OPC"
```

Equivalent key No equivalent key is available on the front panel.

*OPC?

Syntax *OPC?

Description 1 is read out at the completion of all pending operations. (Query only)

Query response {1}<newline><^END>

Example of use

```
10   OUTPUT 717;"*OPC?"
20   ENTER 717;A
```

Equivalent key No equivalent key is available on the front panel.

*OPT?

Syntax *OPT?

Description Reads out the identification number of an option installed in the E5070B/E5071B. (Query only)

Query response {numeric}<newline><^END>

If there is no installed option, 0 is read out.

Example of use

```
10   OUTPUT 717;"*OPT?"
20   ENTER 717;A$
```

Equivalent key No equivalent key is available on the front panel.

*RST

Syntax *RST

Description Performs preset. There is the following difference from the setting state preset with the :SYST:PRES command. (No query)

- The continuous initiation mode of channel 1 is set to OFF.

Example of use

```
10   OUTPUT 717;"*RST"
```

Related commands

:SYST:PRES on page 781

:SYST:UPR on page 786

:INIT{1-16}:CONT on page 485

Equivalent key No equivalent key is available on the front panel.

*SRE

Syntax

*SRE <numeric>

*SRE?

Description

Sets the value of the Service Request Enable Register.

Parameters

	<numeric>
Description	Setup value of the register
Range	0 to 255
Preset value	0
Resolution	1

If the specified parameter is out of the allowable setup range, the result of bitwise AND with 255 (0xff) is set. Note that bit 6 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;"*SRE 128"
20   OUTPUT 717;"*SRE?"
30   ENTER 717;A
```

Related commands

*ESE on page 287

:STAT:OPER:ENAB on page 708

:STAT:QUES:ENAB on page 729

Equivalent key

No equivalent key is available on the front panel.

*STB?

Syntax *STB?

Description Reads out the value of the Status Byte Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;"*STB?"
20   ENTER 717;A
```

Equivalent key No equivalent key is available on the front panel.

*TRG

Syntax *TRG

Description If the trigger source is set to GPIB/LAN (set to BUS with the :TRIG:SOUR command), triggers the E5070B/E5071B waiting for a trigger. (No query)

Example of use

```
10   OUTPUT 717;"*TRG"
```

Related commands :TRIG:SOUR on page 793

Equivalent key No equivalent key is available on the front panel.

*WAI

Syntax *WAI

Description Waits for the execution of all commands sent before this command to be completed. (No query)

Example of use

```
10   OUTPUT 717;"*WAI"
```

Equivalent key No equivalent key is available on the front panel.

E5070B/E5071B commands

This section describes the commands specific to the E5070B/E5071B.

:ABOR

Syntax

:ABORt

Description

Aborts the measurement and changes the trigger sequence for all channels to idle state. (No query)

After the change to the idle state, the channels for which the continuous initiation mode is set to ON (set to ON with the :INIT{1-16}:CONT command) change into the initiate state.

For details about the trigger system, refer to “Trigger System” on page 128. (No query)

Example of use

```
10   OUTPUT 717;":ABOR"
```

Related commands

:INIT{1-16} on page 484

:INIT{1-16}:CONT on page 485

Equivalent key

[Trigger] - Restart

:CALC{1-16}:BLIM

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit[:STATe] {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit[:STATe]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the bandwidth test function.

Parameters

	Description
ON or 1	Turns ON the bandwidth test function.
OFF or 0 (preset value)	Turns OFF the bandwidth test function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:BLIM ON"
20   OUTPUT 717;":CALC1:BLIM?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418
:CALC{1-16}:BLIM:DB on page 294
:CALC{1-16}:BLIM:DISP:MARK on page 295
:CALC{1-16}:BLIM:DISP:VAL on page 296
:CALC{1-16}:BLIM:FAIL? on page 297
:CALC{1-16}:BLIM:MAX on page 298
:CALC{1-16}:BLIM:MIN on page 299
:CALC{1-16}:BLIM:REP? on page 300

Equivalent key

[Analysis] - **Bandwidth Limit** - **BW Test**

:CALC{1-16}:BLIM:DB

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit:DB <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit:DB?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the bandwidth threshold value (attenuation from the peak) of the bandwidth test.

Parameters

	<numeric>
Description	Bandwidth N dB points
Range	0 to 5E8
Preset value	0
Unit	dB

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:BLIM:DB 3"
20   OUTPUT 717;":CALC1:BLIM:DB?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:BLIM on page 293

Equivalent key

[Analysis] - Bandwidth Limit - N dB Points

:CALC{1-16}:BLIM:DISP:MARK

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit:DISPlay:MARKer {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit:DISPlay:MARKer?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the marker display of the bandwidth test.

Parameters

	Description
ON or 1	Turns ON the bandwidth marker.
OFF or 0 (preset value)	Turns OFF the bandwidth marker.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:BLIM:DISP:MARK ON"
20   OUTPUT 717;":CALC1:BLIM:DISP:MARK?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:BLIM on page 293

:CALC{1-16}:BLIM:DISP:VAL on page 296

Equivalent key

[Analysis] - **Bandwidth Limit** - **BW Marker**

:CALC{1-16}:BLIM:DISP:VAL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit:DISPlay:VALue {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit:DISPlay:VALue?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the bandwidth value display of the bandwidth test.

Parameters

	Description
ON or 1	Turns ON the bandwidth display.
OFF or 0 (preset value)	Turns OFF the bandwidth display.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:BLIM:DISP:VAL ON"
20   OUTPUT 717;":CALC1:BLIM:DISP:VAL?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:BLIM on page 293

:CALC{1-16}:BLIM:DISP:MARK on page 295

Equivalent key

[Analysis] - Bandwidth Limit - BW Display

:CALC{1-16}:BLIM:FAIL?

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit:FAIL?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), reads out the bandwidth test result. (Query only)

Query response

{1|0}<newline><^END>

	Description
1	The bandwidth test result is FAIL.
0	The bandwidth test result is PASS.

When the bandwidth limit test is set to OFF, 0 is always read out.

Example of use

```
10   OUTPUT 717;":CALC1:BLIM:FAIL?"
20   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:BLIM on page 293

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:BLIM:MAX

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit:MAXimum <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit:MAXimum?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the upper limit value of the bandwidth test.

Parameters

	<numeric>
Description	Maximum bandwidth.
Range	0 to 1E12
Preset value	0
Unit	Hz (hertz), dBm or second

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:BLIM:MAX 3E5"
20   OUTPUT 717;":CALC1:BLIM:MAX?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:BLIM on page 293

:CALC{1-16}:BLIM:MIN on page 299

Equivalent key

[Analysis] - Bandwidth Limit - Max Bandwidth

:CALC{1-16}:BLIM:MIN

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit:MINimum <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit:MINimum?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the lower limit value of the bandwidth test.

Parameters

	<numeric>
Description	Minimum bandwidth.
Range	0 to 1E12
Preset value	0
Unit	Hz (hertz), dBm or second

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:BLIM:MIN 1E4"
20   OUTPUT 717;":CALC1:BLIM:MIN?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:BLIM on page 293

:CALC{1-16}:BLIM:MAX on page 298

Equivalent key

[Analysis] - Bandwidth Limit - Min Bandwidth

:CALC{1-16}:BLIM:REP?

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:BLIMit:REPort[:DATA]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), reads out the bandwidth value of the bandwidth test.

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command. (Query only)

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:BLIM:REP?"
20   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:FORM:DATA on page 482

:CALC{1-16}:BLIM on page 293

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:CONV

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:CONVersion[:STATe] {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:CONVersion[:STATe]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the parameter conversion function.

Parameters

	Description
ON or 1	Turns ON the parameter conversion function.
OFF or 0 (preset value)	Turns OFF the parameter conversion function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:CONV ON"
20   OUTPUT 717;":CALC1:CONV?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:CONV:FUNC on page 302

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - **Conversion** - **Conversion**

:CALC{1-16}:CONV:FUNC

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:CONVersion:FUNCtion {ZREFlection|ZTRansmit|YREFlection|YTRansmit|INVersion|ZTSHunt|YTSHunt|CONJugation}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:CONVersion:FUNCtion?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), select the parameter after conversion using the parameter conversion function.

Parameters

	Description
ZREFlection (preset value)	Specifies the equivalent impedance in reflection measurement.
ZTRansmit	Specifies the equivalent impedance (series) in transmission measurement.
YREFlection	Specifies the equivalent admittance in reflection measurement.
YTRansmit	Specifies the equivalent admittance (series) in transmission measurement.
INVersion	Specifies the inverse S-parameter.
ZTSHunt	Specifies the equivalent impedance (shunt) in transmission measurement.
YTSHunt	Specifies the equivalent admittance (shunt) in transmission measurement.
CONJugation	Specifies the conjugate.

Query response

{ZREF|ZTR|YREF|YTR|INV|ZTSH|YTSH|CONJ}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:CONV:FUNC ZTR"
20   OUTPUT 717;":CALC1:CONV:FUNC?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:CONV on page 301

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - Conversion - Z:Reflection|Z:Transmission|Y:Reflection|Y:Transmission|1/S|Z:Trans-Shunt|Y:Trans-Shunt|Conjugation

:CALC{1-16}:CORR:EDEL:MED

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:CORRection:EDELay:MEDium {COAXial|WAVeguide}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:CORRection:EDELay:MEDium?

Description

To calculate the electrical delay time of channel 1 (:CALC1) to channel 16 (:CALC16), select the media type.

Parameters

	Description
COAXial (preset value)	Selects coaxial as a media type.
WAVeguide	Selects waveguide as a media type.

Query response

{COAXial|WAVeguide}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:CORR:EDEL:MED WAV"
20   OUTPUT 717;":CALC1:CORR:EDEL:MED?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:CORR:EDEL:TIME on page 304

:CALC{1-16}:CORR:EDEL:WGC on page 305

Equivalent key

[Scale] - Electrical Delay - Media

:CALC{1-16}:CORR:EDEL:TIME

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:CORRection:EDELay:TIME <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:CORRection:EDELay:TIME?

Description

Sets the electrical delay time of the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command).

Parameters

	<numeric>
Description	Electrical delay time
Range	-10 to 10
Preset value	0
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:CORR:EDEL:TIME 0.2"
20   OUTPUT 717;":CALC1:CORR:EDEL:TIME?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:CORR:EDEL:MED on page 303

:CALC{1-16}:CORR:EDEL:WGC on page 305

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Scale] - Electrical Delay

:CALC{1-16}:CORR:EDEL:WGC

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:CORRection:EDELay:WGCutoff <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:CORRection:EDELay:WGCutoff?

Description

For channel 1(:CALC1) to channel 16 (:CALC16), sets the cut-off frequency when the media type of the electrical delay is set to “Waveguide.”

Parameters

	<numeric>
Description	Cut-off frequency
Range	3E5 to 3.0E9 (for E5070B) 3E5 to 8.5E9 (for E5071B)
Preset value	3E5
Unit	Hz (Hertz)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:CORR:EDEL:WGC 1E9"
20   OUTPUT 717;":CALC1:CORR:EDEL:WGC?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:CORR:EDEL:MED on page 303

:CALC{1-16}:CORR:EDEL:TIME on page 304

Equivalent key

[Scale] - Electrical Delay - Cutoff Frequency

:CALC{1-16}:CORR:OFFS:PHAS

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:CORRection:OFFSet:PHASe <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:CORRection:OFFSet:PHASe?

Description

Sets the phase offset of the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command).

Parameters

	<numeric>
Description	Phase offset
Range	-360 to 360
Preset value	0
Unit	° (degree)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:CORR:OFFS:PHAS 2.5"
20   OUTPUT 717;":CALC1:CORR:OFFS:PHAS?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Scale] - Phase Offset

:CALC{1-16}:DATA:FDAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:DATA:FDATa <numeric1>,. . .,<numeric NOP×2>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:DATA:FDATa?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets/reads out the formatted data array. (It is the data array for which processing such as format has been performed for corrected data array. For details, refer to “Formatted data array” on page 169.)

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command.

Parameters

	Description
<numeric n×2-1>	Data (primary value) at the n-th measurement point.
<numeric n×2>	Data (secondary value) at the n-th measurement point. Always 0 when the data format is not the Smith chart format or the polar format.

Where NOP is the number of measurement points and n is an integer between 1 and NOP.

Query response

{numeric 1},…,{numeric NOP×2}<newline><^END>

Example of use

```
10   DIM A(1:201,1:2)
20   OUTPUT 717;":CALC1:DATA:FDAT?"
30   ENTER 717;A(*)
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:DATA:FMEM on page 308

:CALC{1-16}:DATA:SDAT on page 309

:FORM:DATA on page 482

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:DATA:FMEM

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:DATA:FMEMory <numeric 1>,...,<numeric NOP×2>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:DATA:FMEMory?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets/reads out the formatted memory array. (It is the data array for which processing such as format has been performed for corrected memory array. For details, refer to “Formatted memory arrays” on page 170.)

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command.

Parameters

	Description
<numeric n×2-1>	Data (primary value) at the n-th measurement point.
<numeric n×2>	Data (secondary value) at the n-th measurement point. Always 0 when the data format is not the Smith chart format or the polar format.

Where NOP is the number of measurement points and n is an integer between 1 and NOP.

Query response

{numeric 1},...,{numeric NOP×2}<newline><^END>

Example of use

```
10   DIM A(1:201,1:2)
20   OUTPUT 717;":CALC1:DATA:FMEM?"
30   ENTER 717;A(*)
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:DATA:FDAT on page 307

:CALC{1-16}:DATA:SMEM on page 310

:FORM:DATA on page 482

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:DATA:SDAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:DATA:SDATa <numeric 1>,...,<numeric NOP×2>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:DATA:SDATa?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets/reads out the corrected data array. (It is the data array for which processing such as error correction to measured raw data has been performed. For details, refer to "Corrected data arrays" on page 168.)

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command.

Query response

{numeric 1},...,{numeric NOP×2}<newline><^END>

	Description
{numeric n×2-1}	Real part of the data (complex number) at the n-th measurement point.
{numeric n×2}	Imaginary part of the data (complex number) at the n-th measurement point.

Where NOP is the number of measurement points and n is an integer between 1 and NOP.

Example of use

```
10   DIM A(1:201,1:2)
20   OUTPUT 717;":CALC1:DATA:SDAT?"
30   ENTER 717;A(*)
```

Related commands

:CALC{1-16}:DATA:SMEM on page 310

:CALC{1-16}:DATA:FDAT on page 307

:FORM:DATA on page 482

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:DATA:SMEM

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:DATA:SMEMory <numeric 1>,...,<numeric NOP×2>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:DATA:SMEMory?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets/reads out the corrected memory array. (It is the copy of the corrected data array when the :CALC{1-16}:MATH:MEM command is executed. For details, refer to “Corrected memory arrays” on page 168.)

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command. (Query only)

Query response

{numeric 1},...,{numeric NOP×2}<newline><^END>

	Description
{numeric n×2-1}	Real part of the data (complex number) at the n-th measurement point.
{numeric n×2}	Imaginary part of the data (complex number) at the n-th measurement point.

Where NOP is the number of measurement points and n is an integer between 1 and NOP.

Example of use

```
10   DIM A(1:201,1:2)
20   OUTPUT 717;":CALC1:DATA:SMEM?"
30   ENTER 717;A(*)
```

Related commands

:CALC{1-16}:MATH:MEM on page 410

:CALC{1-16}:DATA:SDAT on page 309

:CALC{1-16}:DATA:FMEM on page 308

:FORM:DATA on page 482

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:FILT:TIME

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME[:TYPE] {BPASs|NOTCh}
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME[:TYPE]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the gate type used for the gating function of the time domain function.

Parameters

	Description
BPASs (preset value)	Specifies the band-pass type.
NOTCh	Specifies the notch type.

Query response

{BPAS|NOTC}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FILT:TIME NOTC"
20   OUTPUT 717;":CALC1:FILT:TIME?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FILT:TIME:SHAP on page 313
:CALC{1-16}:FILT:TIME:STAT on page 316
:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - **Gating** - **Type**

:CALC{1-16}:FILT:TIME:CENT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME:CENTer <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME:CENTer?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the center value of the gate used for the gating function of the time domain function.

Parameters

	<numeric>
Description	The center value of the gate.
Range	Varies depending on the frequency span and the number of points.
Preset value	0
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FILT:TIME:CENT 1E-8"
20   OUTPUT 717;":CALC1:FILT:TIME:CENT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FILT:TIME:SPAN on page 314

:CALC{1-16}:FILT:TIME:STAT on page 316

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - Gating - Center

:CALC{1-16}:FILT:TIME:SHAP

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME:SHAPe {MAXimum|WIDE|NORMal|MINimum}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME:SHAPe?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the shape of the gate used for the gating function of the time domain function.

Parameters

	Description
MAXimum	Specifies the maximum shape.
WIDE	Specifies the wide shape.
NORMal (preset value)	Specifies the normal shape.
MINimum	Specifies the minimum shape.

Query response

{MAX|WIDE|NORM|MIN}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FILT:TIME:SHAP WIDE"
20   OUTPUT 717;":CALC1:FILT:TIME:SHAP?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FILT:TIME on page 311

:CALC{1-16}:FILT:TIME:STAT on page 316

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - Gating - Shape - Maximum|Wide|Normal|Minimum

:CALC{1-16}:FILT:TIME:SPAN

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME:SPAN <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME:SPAN?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the span value of the gate used for the gating function of the time domain function.

Parameters

	<numeric>
Description	The span value of the gate.
Range	Varies depending on the frequency span and the number of points.
Preset value	2E-8
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FILT:TIME:SPAN 1E-8"
20   OUTPUT 717;":CALC1:FILT:TIME:SPAN?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FILT:TIME:CENT on page 312

:CALC{1-16}:FILT:TIME:STAT on page 316

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - Gating - Span

:CALC{1-16}:FILT:TIME:STAR

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME:STARt <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME:STARt?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the start value of the gate used for the gating function of the time domain function.

Parameters

	<numeric>
Description	The start value of the gate.
Range	Varies depending on the frequency span and the number of points.
Preset value	-1E-8
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FILT:TIME:STAR 0"
20   OUTPUT 717;":CALC1:FILT:TIME:STAR?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FILT:TIME:STOP on page 317

:CALC{1-16}:FILT:TIME:STAT on page 316

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - **Gating** - **Start**

:CALC{1-16}:FILT:TIME:STAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME:STATe {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME:STATe?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the gating function of the time domain function.

You can turn ON the gating function only when the sweep type is the linear sweep and the number of points is 3 or more. If you execute this command to try to turn ON the gating function when the sweep type is other than the linear sweep or the number of points is less than 3, an error occurs and the command is ignored.

When the sweep type is the power sweep, you cannot turn on the gating function. If you execute this command trying to turn on the gating function during the power sweep, an error occurs and the command is ignored.

Parameters

	Description
ON or 1	Turns ON the gating function.
OFF or 0 (preset value)	Turns OFF the gating function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FILT:TIME:STAT ON"
20   OUTPUT 717;":CALC1:FILT:TIME:STAT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:SENS{1-16}:SWE:TYPE on page 682

:SENS{1-16}:SWE:POIN on page 679

Equivalent key

[Analysis] - Gating - Gating

:CALC{1-16}:FILT:TIME:STOP

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME:STOP <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FILTer[:GATE]:TIME:STOP?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the stop value of the gate used for the gating function of the time domain function.

Parameters

	<numeric>
Description	The stop value of the gate.
Range	Varies depending on the frequency span and the number of points.
Preset value	1E-8
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FILT:TIME:STOP 2E-8"
20   OUTPUT 717;":CALC1:FILT:TIME:STOP?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FILT:TIME:STAR on page 315

:CALC{1-16}:FILT:TIME:STAT on page 316

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - **Gating** - **Stop**

:CALC{1-16}:FORM

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FORMat {MLOGarithmic|PHASe|GDELay|SLINear|SLOGarithmic|SCOMplex|SMITh|SADMittance|PLINear|PLOGarithmic|POLar|MLINear|SWR|REAL|IMAGinary|UPHase|PPHase}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FORMat?

Description

Selects the data format of the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command).

Parameters

	Description
MLOGarithmic (preset value)	Specifies the logarithmic magnitude format.
PHASe	Specifies the phase format.
GDELay	Specifies the group delay format.
SLINear	Specifies the Smith chart format (Lin/Phase).
SLOGarithmic	Specifies the Smith chart format (Log/Phase).
SCOMplex	Specifies the Smith chart format (Real/Imag).
SMITh	Specifies the Smith chart format (R+jX).
SADMittance	Specifies the Smith chart format (G+jB).
PLINear	Specifies the polar format (Lin).
PLOGarithmic	Specifies the polar format (Log).
POLar	Specifies the polar format (Re/Im).
MLINear	Specifies the linear magnitude format.
SWR	Specifies the SWR format.
REAL	Specifies the real format.
IMAGinary	Specifies the imaginary format.
UPHase	Specifies the expanded phase format.
PPHase	Specifies the positive phase format.

Query response

{MLOG|PHAS|GDEL|SLIN|SLOG|SCOM|SMIT|SADM|PLIN|PLOG|POL|MLIN|SWR|REAL|IMAG|UPH|PPH}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FORM SLIN"
20   OUTPUT 717;":CALC1:FORM?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Format] - Log Mag|Phase|Group Delay|Lin Mag|SWR|Real|Imaginary|Expand Phase|Positive Phase

[Format] - Smith - Lin/Phase|Log/Phase|Real/Imag|R+jX|G+jB

[Format] - **Polor** - **Lin/Phase**|**Log/Phase**|**Real/Imag**

:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:IMAG

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:CZConversion:BPORt{[1]|2}:IMAGinary <numeric>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:CZConversion:BPORt{[1]|2}:IMAGinary?

Description

For balance port 1 (:BPOR1) or balance port 2 (:BPOR2) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the impedance value (imaginary part) for the common port impedance conversion function.

For details about the balance port number, see Figure 6-2 on page 153.

Parameters

	<numeric>
Description	Impedance value (imaginary part)
Range	-1E+18 to 1E+18
Preset value	0
Unit	Ω (ohm)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:CZC:BPOR1:IMAG 30E6"
20   OUTPUT 717;":CALC1:FSIM:BAL:CZC:BPOR1:IMAG?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:REAL on page 321

:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:Z0 on page 322

:CALC{1-16}:FSIM:BAL:CZC:STAT on page 323

Equivalent key

[Analysis] - Fixture Simulator - Cmn ZConversion - Port1(bal) Imag|Port2(bal) Imag|Port3(bal) Imag

:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:REAL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:CZConversion:BPORt{[1]|2}:REAL <numeric>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:CZConversion:BPORt{[1]|2}:REAL?

Description

For balance port 1 (:BPOR1) or balance port 2 (:BPOR2) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the impedance value (real part) for the common port impedance conversion function.

For details about the balance port number, see Figure 6-2 on page 153.

NOTE

This command functions in the same way as :CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:Z0 on page 322

Parameters

	<numeric>
Description	Impedance value (real part)
Range	1E-3 to 1E7
Preset value	25
Unit	Ω (ohm)
Resolution	0.001

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:CZC:BPOR1:REAL 30E6"
20   OUTPUT 717;":CALC1:FSIM:BAL:CZC:BPOR1:REAL?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:IMAG on page 320

:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:Z0 on page 322

:CALC{1-16}:FSIM:BAL:CZC:STAT on page 323

Equivalent key

[Analysis] - **Fixture Simulator** - **Cmn ZConversion** - **Port1(bal) Real**|**Port2(bal) Real**|**Port3(bal) Real**

:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:Z0

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:CZConversion:BPORt{[1]|2}:Z0[:R] <numeric>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:CZConversion:BPORt{[1]|2}:Z0[:R]?

Description

For balance port 1 (:BPOR1) or balance port 2 (:BPOR2) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the impedance value for the common port impedance conversion function.

For details about the balance port number, see Figure 6-2 on page 153.

Parameters

	<numeric>
Description	Impedance value
Range	1E-3 to 1E7
Preset value	25
Unit	Ω (ohm)
Resolution	0.001

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

CAUTION

This command clears setting value of ":CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:IMAG" on page 320

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:CZC:BPOR1:Z0 30"
20   OUTPUT 717;":CALC1:FSIM:BAL:CZC:BPOR1:Z0?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:IMAG on page 320

:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:REAL on page 321

:CALC{1-16}:FSIM:BAL:CZC:STAT on page 323

Equivalent key

[Analysis] - Fixture Simulator - Cmn ZConversion - Port1(bal) Real|Port2(bal) Real|Port3(bal) Real

:CALC{1-16}:FSIM:BAL:CZC:STAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:CZConversion:STATe {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:CZConversion:STATe?

Description

For all the balance ports of channel 1 (:CALC1) to channel 16 (:CALC16), turns ON/OFF the common port impedance conversion function when the fixture simulator function is ON (ON is specified with the :CALC{1-16}:FSIM:STAT command).

Parameters

	Description
ON or 1	Turns ON the common impedance conversion function.
OFF or 0 (preset value)	Turns OFF the common impedance conversion function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:CZC:STAT ON"
20   OUTPUT 717;":CALC1:FSIM:BAL:CZC:STAT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:STAT on page 365

:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:IMAG on page 320

:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:REAL on page 321

:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:Z0 on page 322

Equivalent key

[Analysis] - **Fixture Simulator** - **Cmn ZConversion** - **Cmn ZConversion**

:CALC{1-16}:FSIM:BAL:DEV

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DEVice {SBALanced|BBALanced|SSBalanced}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DEVice?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), selects the balance device type of the fixture simulator function.

For details about the balance device type, see Figure 6-2 on page 153.

Parameters

	Description
SBALanced (preset value)	Specifies the unbalance-balance (3 ports).
BBALanced	Specifies the balance-balance (4 ports).
SSBalanced	Specifies the unbalance-unbalance-balance (4 ports).

Query response

{SBAL|BBAL|SSB}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:DEV BBAL"
20   OUTPUT 717;":CALC1:FSIM:BAL:DEV?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FSIM:BAL:TOP:SBAL on page 342

:CALC{1-16}:FSIM:BAL:TOP:BBAL on page 340

:CALC{1-16}:FSIM:BAL:TOP:SSB on page 343

Equivalent key

[Analysis] - Fixture Simulator - Topology - Device

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:BPORt{[1]|2}[:TYPE] {NONE|PLPC|USER}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:BPORt{[1]|2}[:TYPE]?

Description

For balance port 1 (:BPOR1) or balance port 2 (:BPOR2) of channel 1 (:CALC1) to channel 16 (:CALC16), selects the type of the differential matching circuit.

If you want to select the user-defined circuit, you must specify the 2-port touchstone file in which the proper information on the user-defined circuit is saved in advance. If you do not specify the appropriate file and you select the user-defined circuit, an error occurs and NONE is automatically selected.

For details about the balance port number, see figure Figure 6-2 on page 153.

Parameters

	Description
NONE (preset value)	Specifies no-circuit.
PLPC	Specifies the circuit that consists of shunt L and shunt C.
USER	Specifies the user-defined circuit*1.

*1. The information on the circuit is read out from the 2-port touchstone file specified with the :CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:USER:FIL command.

For more information on the circuits, refer to "*User's Guide*."

Query response

{NONE|PLPC|USER}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:DMC:BPOR1 PLPC"
20   OUTPUT 717;":CALC1:FSIM:BAL:DMC:BPOR1?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FSIM:BAL:DMC:STAT on page 331

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:C on page 326

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:G on page 327

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:L on page 328

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:R on page 329

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:USER:FIL on page 330

Equivalent key

[Analysis] - **Fixture Simulator** - **Diff Matching** - **Select Circuit**

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:C

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:BPORt{[1]|2}:PARameters:C <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:BPORt{[1]|2}:PARameters:C?

Description

For balance port 1 (:BPOR1) or balance port 2 (:BPOR2) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the C value of the differential matching circuit.

For details about the balance port number, see figure Figure 6-2 on page 153.

Parameters

	<numeric>
Description	C value of the differential matching circuit
Range	-1E18 to 1E18
Preset value	0
Unit	F (farad)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:DMC:BPOR1:PAR:C 12.3"
20   OUTPUT 717;":CALC1:FSIM:BAL:DMC:BPOR1:PAR:C?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:BAL:DMC:STAT on page 331

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2} on page 325

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:G on page 327

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:L on page 328

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:R on page 329

Equivalent key

[Analysis] - Fixture Simulator - Diff Matching - C

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:G

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:BPORt{[1]|2}:PARameters:G <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:BPORt{[1]|2}:PARameters:G?

Description

For balance port 1 (:BPOR1) or balance port 2 (:BPOR2) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the G value of the differential matching circuit.

For details about the balance port number, see Figure 6-2 on page 153.

Parameters

	<numeric>
Description	G value of the differential matching circuit
Range	-1E18 to 1E18
Preset value	0
Unit	S (siemens)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:DMC:BPOR1:PAR:G 12.3"
20   OUTPUT 717;":CALC1:FSIM:BAL:DMC:BPOR1:PAR:G?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:BAL:DMC:STAT on page 331

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2} on page 325

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:C on page 326

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:L on page 328

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:R on page 329

Equivalent key

[Analysis] - Fixture Simulator - Diff Matching - G

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:L

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:BPORt{[1]|2}:PARameters:L <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:BPORt{[1]|2}:PARameters:L?

Description

For balance port 1 (:BPOR1) or balance port 2 (:BPOR2) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the L value of the differential matching circuit.

For details about the balance port number, see Figure 6-2 on page 153.

Parameters

	<numeric>
Description	L value of the differential matching circuit
Range	-1E18 to 1E18
Preset value	0
Unit	H (henry)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:DMC:BPOR1:PAR:L 12.3"
20   OUTPUT 717;":CALC1:FSIM:BAL:DMC:BPOR1:PAR:L?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:BAL:DMC:STAT on page 331

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2} on page 325

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:C on page 326

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:G on page 327

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:R on page 329

Equivalent key

[Analysis] - Fixture Simulator - Diff Matching - L

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:R

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:BPORt{[1]|2}:PARameters:R <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:BPORt{[1]|2}:PARameters:R?

Description

For balance port 1 (:BPOR1) or balance port 2 (:BPOR2) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the R value of the differential matching circuit.

For details about the balance port number, see Figure 6-2 on page 153.

Parameters

	<numeric>
Description	R value of the differential matching circuit
Range	-1E18 to 1E18
Preset value	0
Unit	Ω (ohm)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:DMC:BPOR1:PAR:R 12.3"
20   OUTPUT 717;":CALC1:FSIM:BAL:DMC:BPOR1:PAR:R?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:BAL:DMC:STAT on page 331

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2} on page 325

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:C on page 326

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:G on page 327

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:L on page 328

Equivalent key

[Analysis] - Fixture Simulator - Diff Matching - R

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:USER:FIL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:BPORt{[1]|2}:USER:FILename <string>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:BPORt{[1]|2}:USER:FILename?

Description

For balance port 1 (:BPOR1) or balance port 2 (:BPOR2) of channel 1 (:CALC1) to channel 16 (:CALC16), specifies the file in which the information on the user-defined differential matching circuit is saved (2-port touchstone file).

Specify the file name with the .s2p extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use directory names and file name, separate them with "/" (slash) or "\" (backslash).

Even if the specified file does not exist, no error occurs when you execute this command*1. However, when you set the type of the differential matching circuit to the user-defined circuit with the :CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2} command, an error occurs.

For details about the balance port number, see Figure 6-2 on page 153.

Parameters

	<string>
Description	2-port touchstone file name
Range	254 characters or less
Preset value	""

Query response

{string}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:DMC:BPOR1:USER:FIL ""Match_d.s2p"""
20   OUTPUT 717;":CALC1:FSIM:BAL:DMC:BPOR1:USER:FIL?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FSIM:BAL:DMC:STAT on page 331

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2} on page 325

Equivalent key

[Analysis] - Fixture Simulator - Diff Matching - User File

*1. If you set the type of the differential matching circuit to the user-defined circuit before you execute this command, an error occurs and the command is ignored when you execute this command.

:CALC{1-16}:FSIM:BAL:DMC:STAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:STATe {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DMCircuit:STATe?

Description

For all the balance ports of channel 1 (:CALC1) to channel 16 (:CALC16), turns ON/OFF the differential matching circuit embedding function when the fixture simulator function is ON (ON is specified with the :CALC{1-16}:FSIM:STAT command).

Parameters

	Description
ON or 1	Turns ON the differential matching circuit embedding function.
OFF or 0 (preset value)	Turns OFF the differential matching circuit embedding function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:DMC:STAT ON"
20   OUTPUT 717;":CALC1:FSIM:BAL:DMC:STAT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:STAT on page 365

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2} on page 325

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:C on page 326

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:G on page 327

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:L on page 328

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:R on page 329

:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:USER:FIL on page 330

Equivalent key

[Analysis] - Fixture Simulator - Diff Matching - Diff Matching

:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:IMAG

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DZConversion :BPORt{[1]|2}:IMAGinary <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DZConversion :BPORt{[1]|2}:IMAGinary?

Description

For balance port 1 (:BPOR1) or balance port 2 (:BPOR2) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the impedance value (imaginary part) for the differential port impedance conversion function.

For details about the balance port number, see Figure 6-2 on page 153.

Parameters

	<numeric>
Description	Impedance value (imaginary part)
Range	-1E+18 to 1E+18
Preset value	0
Unit	Ω (ohm)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:DZC:BPOR1:IMAG 300"
20   OUTPUT 717;":CALC1:FSIM:BAL:DZC:BPOR1:IMAG?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:Z0 on page 334

:CALC{1-16}:FSIM:BAL:DZC:STAT on page 335

Equivalent key

[Analysis] - Fixture Simulator - Diff ZConversion - Port1(bal) Imag|Port2(bal) Imag|Port3(bal) Imag

:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:REAL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DZConversion :BPORt{[1]|2}:REAL <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DZConversion :BPORt{[1]|2}:REAL?

Description

For balance port 1 (:BPOR1) or balance port 2 (:BPOR2) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the impedance value (real part) for the differential port impedance conversion function.

For details about the balance port number, see Figure 6-2 on page 153.

NOTE

This command performs in the same way as :CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:Z0 on page 334

Parameters

	<numeric>
Description	Impedance value (real part)
Range	1E-3 to 1E7
Preset value	100
Unit	Ω (ohm)
Resolution	0.001

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:DZC:BPOR1:REAL 300"
20   OUTPUT 717;":CALC1:FSIM:BAL:DZC:BPOR1:REAL?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:IMAG on page 332

:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:Z0 on page 334

:CALC{1-16}:FSIM:BAL:DZC:STAT on page 335

Equivalent key

[Analysis] - **Fixture Simulator** - **Diff ZConversion** - **Port1(bal) Real**|**Port2(bal) Real**|**Port3(bal) Real**

:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:Z0

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DZConversion :BPORt{[1]|2}:Z0[:R] <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DZConversion :BPORt{[1]|2}:Z0[:R]?

Description

For balance port 1 (:BPOR1) or balance port 2 (:BPOR2) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the impedance value for the differential port impedance conversion function.

For details about the balance port number, see Figure 6-2 on page 153.

Parameters

	<numeric>
Description	Impedance value
Range	1E-3 to 1E7
Preset value	100
Unit	Ω (ohm)
Resolution	0.001

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

CAUTION

This command clears setting value of ":CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:IMAG" on page 332

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:DZC:BPOR1:Z0 300"
20   OUTPUT 717;":CALC1:FSIM:BAL:DZC:BPOR1:Z0?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:IMAG on page 332

:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:REAL on page 333

:CALC{1-16}:FSIM:BAL:DZC:STAT on page 335

Equivalent key

[Analysis] - Fixture Simulator - Diff ZConversion - Port1(bal) Real|Port2(bal) Real|Port3(bal) Real

:CALC{1-16}:FSIM:BAL:DZC:STAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DZConversion:STATe {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:DZConversion:STATe?

Description

For all the balance ports of channel 1 (:CALC1) to channel 16 (:CALC16), turns ON/OFF the differential port impedance conversion function when the fixture simulator function is ON (ON is specified with the :CALC{1-16}:FSIM:STAT command).

Parameters

	Description
ON or 1	Turns ON the differential impedance conversion function.
OFF or 0 (preset value)	Turns OFF the differential impedance conversion function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:DZC:STAT ON"
20   OUTPUT 717;":CALC1:FSIM:BAL:DZC:STAT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:IMAG on page 332

:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:REAL on page 333

:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:Z0 on page 334

:CALC{1-16}:FSIM:STAT on page 365

Equivalent key

[Analysis] - **Fixture Simulator** - **Diff ZConversion** - **Diff ZConversion**

:CALC{1-16}:FSIM:BAL:PAR{1-16}:BBAL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:BBALanced[:DEFine] {SDD11|SDD21|SDD12|SDD22|SCD11|SCD21|SCD12|SCD22|SDC11|SDC21|SDC12|SDC22|SCC11|SCC21|SCC12|SCC22|IMB1|IMB2| CMRR}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:BBALanced[:DEFine]?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), sets the measurement parameters of trace 1 (:PAR1) to trace 16 (:PAR16) when the balance device type is set to "balance-balance" (BBAL is specified with the :CALC{1-16}:FSIM:BAL:DEV command).

Parameters

	Description
SDD11 (preset value)	Specifies Sdd11.
SDD21	Specifies Sdd21.
SDD12	Specifies Sdd12.
SDD22	Specifies Sdd22.
SCD11	Specifies Scd11.
SCD21	Specifies Scd21.
SCD12	Specifies Scd12.
SCD22	Specifies Scd22.
SDC11	Specifies Sdc11.
SDC21	Specifies Sdc21.
SDC12	Specifies Sdc12.
SDC22	Specifies Sdc22.
SCC11	Specifies Scc11.
SCC21	Specifies Scc21.
SCC12	Specifies Scc12.
SCC22	Specifies Scc22.
IMB1	Specifies Imbalance1.
IMB2	Specifies Imbalance2.
CMRR	Specifies CMRR (Sdd21/Scc21).

Query response

{SDD11|SDD21|SDD12|SDD22|SCD11|SCD21|SCD12|SCD22|SDC11|SDC21|SDC12|SDC22|SCC11|SCC21|SCC12|SCC22|IMB1|IMB2|CMRR}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:PAR1:BBAL SDD21"
20   OUTPUT 717;":CALC1:FSIM:BAL:PAR1:BBAL?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FSIM:BAL:DEV on page 324
:CALC{1-16}:FSIM:BAL:PAR{1-16}:SBAL on page 337
:CALC{1-16}:FSIM:BAL:PAR{1-16}:SSB on page 338

Equivalent key

[Analysis] - Fixture Simulator|[Meas] - Sdd11|Sdd21|Sdd12|Sdd22|Scd11|Scd21|Scd12|Scd22|Sdc11| Sdc21|Sdc12|Sdc22|Scc11|Scc21|Scc12|Scc22|Imbalance1|Imbalance2|Sdd21/Scc21

:CALC{1-16}:FSIM:BAL:PAR{1-16}:SBAL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SBALanced[:DEFine] {SSS11|SDS21| SSD12|SCS21|SSC12|SDD22|SCD22|SDC22|SCC22|IMB|CMRR|CMRR2}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SBALanced[:DEFine]?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), sets the measurement parameters of trace 1 (:PAR1) to trace 16 (:PAR16) when the balance device type is set to "unbalance-balance" (SBAL is specified with the :CALC{1-16}:FSIM:BAL:DEV command).

Parameters

	Description
SSS11 (preset value)	Specifies Sss11.
SDS21	Specifies Sds21.
SSD12	Specifies Ssd12.
SCS21	Specifies Scs21.
SSC12	Specifies Ssc12.
SDD22	Specifies Sdd22.
SCD22	Specifies Scd22.
SDC22	Specifies Sdc22.
SCC22	Specifies Scc22.
IMB	Specifies Imbalance.
CMRR	Specifies CMRR (Sds21/Scs21).
CMRR2	Specifies CMRR (Ssd12/Ssc12).

Query response

{SSS11|SDS21|SSD12|SCS21|SSC12|SDD22|SCD22|SDC22|SCC22|IMB|CMRR|CMRR2}<newline> <^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:PAR1:SBAL SDS21"
20   OUTPUT 717;":CALC1:FSIM:BAL:PAR1:SBAL?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FSIM:BAL:DEV on page 324

:CALC{1-16}:FSIM:BAL:PAR{1-16}:BBAL on page 336

:CALC{1-16}:FSIM:BAL:PAR{1-16}:SSB on page 338

Equivalent key

[Analysis] - Fixture Simulator|[Meas] - Sss11|Sds21|Ssd12|Scs21|Ssc12|Sdd22|Scd22|Sdc22|Scc22|Imbalance|Sds21/Scs21|Ssd12/Ssc12

:CALC{1-16}:FSIM:BAL:PAR{1-16}:SSB

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SSBalanced[:DEFine] {SSS11|SSS21|SSS12|SSS22|SDS31|SDS32|SSD13|SSD23|SCS31|SCS32|SSC13|SSC23|SDD33|SCD33|SDC33|SCC33|IMB1|IMB2|IMB3|IMB4|CMRR1|CMRR2}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SSBalanced[:DEFine]?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), sets the measurement parameters of trace 1 (:PAR1) to trace 16 (:PAR16) when the balance device type is set to "unbalance-unbalance-balance" (SSB is specified with the :CALC{1-16}:FSIM:BAL:DEV command).

Parameters

	Description
SSS11 (preset value)	Specifies Sss11.
SSS21	Specifies Sss21.
SSS12	Specifies Sss12.
SSS22	Specifies Sss22.
SDS31	Specifies Sds31.
SDS32	Specifies Sds32.
SSD13	Specifies Ssd13.
SSD23	Specifies Ssd23.
SCS31	Specifies Scs31.
SCS32	Specifies Scs32.
SSC13	Specifies Ssc13.
SSC23	Specifies Ssc23.
SDD33	Specifies Sdd33.
SCD33	Specifies Scd33.
SDC33	Specifies Sdc33.
SCC33	Specifies Scc33.
IMB1	Specifies Imbalance1.
IMB2	Specifies Imbalance2.
IMB3	Specifies Imbalance3.
IMB4	Specifies Imbalance4.
CMRR1	Specifies CMRR (Sds31/Scs31).
CMRR2	Specifies CMRR (Sds32/Scs32).

Query response

{SSS11|SSS21|SSS12|SSS22|SDS31|SDS32|SSD13|SSD23|SCS31|SCS32|SSC13|SSC23|SDD33|SCD33|SDC33|SCC33|IMB1|IMB2|IMB3|IMB4|CMRR1|CMRR2}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:PAR1:SSB SDS31"
20   OUTPUT 717;":CALC1:FSIM:BAL:PAR1:SSB?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FSIM:BAL:DEV on page 324
:CALC{1-16}:FSIM:BAL:PAR{1-16}:BBAL on page 336
:CALC{1-16}:FSIM:BAL:PAR{1-16}:SBAL on page 337

Equivalent key

[Analysis] - Fixture Simulator|[Meas] - Sss11|Sss21|Sss12|Sss22|Sds31|Sds32|Ssd13|Ssd23|Scs31|Scs32|Ssc13|Ssc23|Sdd33|Scd33|Sdc33|Scc33|Imbalance1|Imbalance2|Imbalance3|Imbalance4|Sds31/Scs31|Sds32/Scs32

:CALC{1-16}:FSIM:BAL:PAR{1-16}:STAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:STATe {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:STATe?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), turns ON/OFF the balance-unbalance conversion function for trace 1 (:PAR1) to trace 16 (:PAR16) when the fixture simulator function is ON (ON is specified with the :CALC{1-16}:FSIM:STAT command).

Parameters

	Description
ON or 1	Sets the balance-unbalance conversion function to ON.
OFF or 0 (preset value)	Turns OFF the balance-unbalance conversion function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:PAR1:STAT ON"
20   OUTPUT 717;":CALC1:FSIM:BAL:PAR1:STAT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:STAT on page 365

Equivalent key

[Analysis] - **Fixture Simulator** - **BalUn**

:CALC{1-16}:FSIM:BAL:TOP:BBAL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:TOPology:BBALanced [:PPORts] <numeric 1>, <numeric 2>,<numeric 3>,<numeric 4>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:TOPology:BBALanced [:PPORts]?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), sets the port assignment when the balance device type is set to “balance-balance” (BBAL is specified with the :CALC{1-16}:FSIM:BAL:DEV command).

For details about the balance device type, see Figure 6-2 on page 153.

Parameters

	<numeric 1>	**<numeric 2>**	**<numeric 3>**	**<numeric 4>**
Description	Port numbers assigned to logical port 1 (balance).		Port numbers assigned to logical port 2 (balance).	
	a in Figure 6-2	b in Figure 6-2	c in Figure 6-2	d in Figure 6-2
Range	1 to 4	1 to 4	1 to 4	1 to 4
Preset value	1	2	3	4
Resolution	1	1	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Query response

{numeric 1},{numeric 2},{numeric 3},{numeric 4}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:TOP:BBAL 1,2,3,4"
20   OUTPUT 717;":CALC1:FSIM:BAL:TOP:BBAL?"
30   ENTER 717;A,B,C,D
```

Related commands

:CALC{1-16}:FSIM:BAL:DEV on page 324

Equivalent key

[Analysis] - Fixture Simulator - Topology - Port1(bal)

[Analysis] - Fixture Simulator - Topology - Port2(bal)

NOTE When performing the operation from the front panel, set each logical port separately.

:CALC{1-16}:FSIM:BAL:TOP:PROP:STAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:TOPology :PROPerty:STATe {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:TOPology :PROPerty:STATe?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), turns on/off the property display for the topology setting when using the balance-unbalance conversion.

Parameters

	Description
ON or 1	Turns on the property display of the topology setting.
OFF or 0 (preset value)	Turns off the property display of the topology setting.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:TOP:PROP:STAT ON"
20   OUTPUT 717;":CALC1:FSIM:BAL:TOP:PROP:STAT?"
30   ENTER 717;A
```

Equivalent key

[Analysis] - **Fixture Simulator** - **Topology** - **Property**

:CALC{1-16}:FSIM:BAL:TOP:SBAL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:TOPology:SBALanced [:PPORts] <numeric 1>, <numeric 2>,<numeric 3>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:TOPology:SBALanced [:PPORts]?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), sets the port assignment when the balance device type is set to “unbalance-balance” (SBAL is specified with the :CALC{1-16}:FSIM:BAL:DEV command).

For details about the balance device type, see Figure 6-2 on page 153.

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Port number assigned to logical port 1 (unbalance). (a in Figure 6-2)	Port numbers assigned to logical port 2 (balance).	
		b in Figure 6-2	c in Figure 6-2
Range	1 to 4	1 to 4	1 to 4
Preset value	1	2	3
Resolution	1	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Query response

{numeric 1},{numeric 2},{numeric 3}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:TOP:SBAL 1,2,3"
20   OUTPUT 717;":CALC1:FSIM:BAL:TOP:SBAL?"
30   ENTER 717;A,B,C
```

Related commands

:CALC{1-16}:FSIM:BAL:DEV on page 324

Equivalent key

[Analysis] - Fixture Simulator - Topology - Port1(se)

[Analysis] - Fixture Simulator - Topology - Port2(bal)

NOTE When performing the operation from the front panel, set each logical port separately.

:CALC{1-16}:FSIM:BAL:TOP:SSB

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:TOPology:SSBalanced [:PPORts] <numeric 1>, <numeric 2>,<numeric 3>,<numeric 4>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:BALun:TOPology:SSBalanced [:PPORts]?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), sets the port assignment when the balance device type is set to "unbalance-unbalance-balance" (SSB is specified with the :CALC{1-16}:FSIM:BAL:DEV command).

For details about the balance device type, see Figure 6-2 on page 153.

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>	<numeric 4>
Description	Port number assigned to logical port 1 (unbalance). (a in Figure 6-2)	Port number assigned to logical port 2 (unbalance). (b in Figure 6-2)	Port numbers assigned to logical port 3 (balance).	
			c in Figure 6-2	d in Figure 6-2
Range	1 to 4	1 to 4	1 to 4	1 to 4
Preset value	1	2	3	4
Resolution	1	1	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Query response

{numeric 1},{numeric 2},{numeric 3},{numeric 4}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:BAL:TOP:SSB 1,2,3,4"
20   OUTPUT 717;":CALC1:FSIM:BAL:TOP:SSB?"
30   ENTER 717;A,B,C,D
```

Related commands

:CALC{1-16}:FSIM:BAL:DEV on page 324

Equivalent key

[Analysis] - Fixture Simulator - Topology - Port1(se)

[Analysis] - Fixture Simulator - Topology - Port2(se)

[Analysis] - Fixture Simulator - Topology - Port3(bal)

NOTE When performing the operation from the front panel, set each logical port separately.

:CALC{1-16}:FSIM:EMB:NETW{1-2}:FIL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:NETWork{[1]|2}:FILename <string>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:NETWork{[1]|2}:FILename?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), specifies a file in which the information of network 1 (:NETW1) or network 2 (:NETW2) you want to embed/de-embed using the 4-port network embedding/de-embedding feature is saved (4-port touchstone file).

Specify a file name with the extension ".s4p." If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use directory names and file name, separate them with "/" (slash) or "\" (backslash).

Even if the specified file does not exist, no error occurs when you execute this command.*1 However, when you set a network processing type to embedding/de-embedding with the :CALC{1-16}:FSIM:EMB:NETW{1-2}:TYPE command, an error occurs.

For information on network numbers, refer to Figure 6-1 on page 152.

NOTE This function is available with the firmware version 3.50 or greater.

Parameters

	<string>
Description	4-port touchstone file name
Range	254 characters or less
Preset value	""

Query response

{string}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:EMB:NETW1:FIL ""Network.s4p"""
20   OUTPUT 717;":CALC1:FSIM:EMB:NETW1:FIL?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FSIM:EMB:STAT on page 346

:CALC{1-16}:FSIM:EMB:NETW{1-2}:TYPE on page 345

Equivalent key

[Analysis] - Fixture Simulator - De-Embedding S4P - Topology - User File (nwk1)|User File (nwk2)

*1. If the network processing type has been set to embedding/de-embedding, an error occurs when this command is executed and the command is ignored.

:CALC{1-16}:FSIM:EMB:NETW{1-2}:TYPE

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:NETWork{[1]|2}:TYPE {NONE|EMBed|DEEMbed}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:NETWork{[1]|2}:TYPE?

Description

For the 4-port network embedding/de-embedding feature for channel 1 (:CALC1) to channel 16 (:CALC16), selects a network processing type for network 1 (:NETW1) or network 2 (:NETW2).

Before selecting embedding/de-embedding, execute the :CALC{1-16}:FSIM:EMB:NETW{1-2}:FIL command to specify the 4-port touchstone file in which the information on the network is saved. If you do not specify any appropriate file and you select network embedding/de-embedding, an error occurs and NONE is automatically selected.

NOTE This function is available with the firmware version 3.50 or greater.

Parameters

	Description
NONE (preset value)	Specifies no-processing.
EMBed	Specifies embedding.
DEEMbed	Specifies de-embedding.

Query response

{NONE|EMB|DEEM}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:EMB:NETW1:TYPE DEEM"
20   OUTPUT 717;":CALC1:FSIM:EMB:NETW1:TYPE?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FSIM:EMB:STAT on page 346

:CALC{1-16}:FSIM:EMB:NETW{1-2}:FIL on page 344

Equivalent key

[Analysis] - **Fixture Simulator** - **De-Embedding S4P** - **Topology** - **Type (nwk1)**|**Type (nwk2)** - **None**|**Embed**|**De-Embed**

:CALC{1-16}:FSIM:EMB:STAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:STATe {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:STATe?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), turns ON/OFF the 4-port network embedding/de-embedding feature when the fixture simulator feature is ON (ON is specified with the :CALC{1-16}:FSIM:STAT command).

NOTE

This function is available with the firmware version 3.50 or greater.

Parameters

	Description
ON or 1	Turns ON the 4-port network embedding/de-embedding feature.
OFF or 0 (Preset value)	Turns OFF the 4-port network embedding/de-embedding feature.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:EMB:STAT ON"
20   OUTPUT 717;":CALC1:FSIM:EMB:STAT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:STAT on page 365

:CALC{1-16}:FSIM:EMB:NETW{1-2}:TYPE on page 345

:CALC{1-16}:FSIM:EMB:NETW{1-2}:FIL on page 344

Equivalent key

[Analysis] - Fixture Simulator - De-Embedding S4P - De-Embedding S4P

:CALC{1-16}:FSIM:EMB:TOP:A:PORT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:TOPology:A:PORTs <value 1>,<value 2>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:TOPology:A:PORTs?

Description

For the 4-port network embedding/de-embedding feature of channel 1 (:CALC1) to channel 16 (:CALC16), sets the test port assignment when the connection type (Topology) is set to A (A is specified with the :CALC{1-16}:FSIM:EMB:TYPE command).

For information on the connection type, refer to Figure 6-1 on page 152.

NOTE This function is available with the firmware version 3.50 or greater.

Parameters

	<value 1>	<value 2>
Description	Port number assigned to a in Figure 6-1.	Port number assigned to b in Figure 6-1.
Range	1 to 4	1 to 4
Preset value	1	2
Resolution	1	1

For each parameter, you must specify a different port number. If you specify an identical port number for multiple parameters, an error occurs and the command is ignored.

Query response

{value 1},{value 2}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:EMB:TOP:A:PORT 1,2"
20   OUTPUT 717;":CALC1:FSIM:EMB:TOP:A:PORT?"
30   ENTER 717;A,B
```

Related commands

:CALC{1-16}:FSIM:EMB:TYPE on page 350

Equivalent key

[Analysis] - Fixture Simulator - De-Embedding S4P - Topology - Ports - 1-2|1-3|1-4|2-1|2-3|2-4|3-1|3-2|3-4|4-1|4-2|4-3

:CALC{1-16}:FSIM:EMB:TOP:B:PORT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:TOPology:B:PORTs <value 1>,<value 2>,<value 3>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:TOPology:B:PORTs?

Description

For the 4-port network embedding/de-embedding feature of channel 1 (:CALC1) to channel 16 (:CALC16), sets the test port assignment when the connection type (Topology) is set to B (B is specified with the :CALC{1-16}:FSIM:EMB:TYPE command).

For information on the connection type, refer to Figure 6-1 on page 152.

NOTE This function is available with the firmware version 3.50 or greater.

Parameters

	<value 1>	<value 2>	<value 3>
Description	Port number assigned to a in Figure 6-1.	Port number assigned to b in Figure 6-1.	Port number assigned to c in Figure 6-1.
Range	1 to 4	1 to 4	1 to 4
Preset value	1	2	3
Resolution	1	1	1

For each parameter, you must specify a different port number. If you specify an identical port number for multiple parameters, an error occurs and the command is ignored.

Query response

{value 1},{value 2},{value 3}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:EMB:TOP:B:PORT 1,2,3"
20   OUTPUT 717;":CALC1:FSIM:EMB:TOP:B:PORT?"
30   ENTER 717;A,B,C
```

Related commands

:CALC{1-16}:FSIM:EMB:TYPE on page 350

Equivalent key

[Analysis] - Fixture Simulator - De-Embedding S4P - Topology - Ports - 1-2-3|1-2-4|1-3-2|1-3-4|1-4-2|1-4-3|2-1-3|2-1-4|2-3-1|2-3-4|2-4-1|2-4-3| 3-1-2|3-1-4|3-2-1|3-2-4|3-4-1|3-4-2|4-1-2|4-1-3|4-2-1|4-2-3|4-3-1|4-3-2

:CALC{1-16}:FSIM:EMB:TOP:C:PORT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:TOPology:C:PORTs <value 1>,<value 2>,<value 3>,<value 4>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:TOPology:C:PORTs?

Description

For the 4-port network embedding/de-embedding feature of channel 1 (:CALC1) to channel 16 (:CALC16), sets the test port assignment when the connection type (Topology) is set to C (C is specified with the :CALC{1-16}:FSIM:EMB:TYPE command).

For information on the connection type, refer to Figure 6-1 on page 152.

NOTE This function is available with the firmware version 3.50 or greater.

Parameters

	<value 1>	<value 2>	<value 3>	<value 4>
Description	Port number assigned to a in Figure 6-1.	Port number assigned to b in Figure 6-1.	Port number assigned to c in Figure 6-1.	Port number assigned to d in Figure 6-1.
Range	1 to 4	1 to 4	1 to 4	1 to 4
Preset value	1	2	3	4
Resolution	1	1	1	1

For each parameter, you must specify a different port number. If you specify an identical port number for multiple parameters, an error occurs and the command is ignored.

Query response

{value 1},{value 2},{value 3},{value 4}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:EMB:TOP:C:PORT 1,2,3,4"
20   OUTPUT 717;":CALC1:FSIM:EMB:TOP:C:PORT?"
30   ENTER 717;A,B,C,D
```

Related commands

:CALC{1-16}:FSIM:EMB:TYPE on page 350

Equivalent key

[Analysis] - Fixture Simulator - De-Embedding S4P - Topology - Ports - 1-2-3-4|1-2-4-3|1-3-2-4|1-3-4-2|1-4-2-3|1-4-3-2|2-1-3-4|2-1-4-3|2-3-1-4|2-3-4-1|2-4-1-3|2-4-3-1|3-1-2-4|3-1-4-2|3-2-1-4|3-2-4-1|3-4-1-2|3-4-2-1|4-1-2-3|4-1-3-2|4-2-1-3|4-2-3-1|4-3-1-2|4-3-2-1

:CALC{1-16}:FSIM:EMB:TYPE

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:TYPE {A|B|C}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:EMBed:TYPE?

Description

For the 4-port network embedding/de-embedding feature for channel 1 (:CALC1) to channel 16 (:CALC16), selects a connection type.

For information on the connection type, refer to Figure 6-1 on page 152.

NOTE

This function is available with the firmware version 3.50 or greater.

Parameters

	Description
A (preset value)	Specifies the type (Topology A) to connect between the 2 ports of the analyzer and the DUT.
B	Specifies the type (Topology B) to connect between the 3 ports of the analyzer and the DUT.
C	Specifies the type (Topology C) to connect between the 3 ports of the analyzer and the DUT.

Query response

{A|B|C}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:EMB:TYPE A"
20   OUTPUT 717;":CALC1:FSIM:EMB:TYPE?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FSIM:EMB:TOP:A:PORT on page 347

:CALC{1-16}:FSIM:EMB:TOP:B:PORT on page 348

:CALC{1-16}:FSIM:EMB:TOP:C:PORT on page 349

Equivalent key

[Analysis] - Fixture Simulator - De-Embedding S4P - Topology - Select Topology - A|B|C

:CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4}

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:DEEMbed:PORT{[1]|2|3|4}[:TYPE] {NONE|USER}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:DEEMbed:PORT{[1]|2|3|4}[:TYPE]?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:CALC1) to channel 16 (:CALC16), selects the type of the network de-embedding.

If you want to select the user-defined network de-embedding, you must specify the 2-port touchstone file in which the information on the user-defined network is saved in advance. If you do not specify the appropriate file and you select the user-defined network de-embedding, an error occurs and NONE is automatically selected.

Parameters

	Description
NONE (preset value)	Specifies no-de-embedding.
USER	Specifies the user-defined network de-embedding*1.

*1. The information on the network is read out from the 2-port touchstone file specified with the :CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4}:USER:FIL command.

Query response

{NONE|USER}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:DEEM:PORT1 USER"
20   OUTPUT 717;":CALC1:FSIM:SEND:DEEM:PORT1?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FSIM:SEND:DEEM:STAT on page 353

:CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4}:USER:FIL on page 352

Equivalent key

[Analysis] - Fixture Simulator - De-Embedding - Select Type

:CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4}:USER:FIL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:DEEMbed:PORT{[1]|2|3|4}:USER:FILename <string>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:DEEMbed:PORT{[1]|2|3|4}:USER:FILename?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:CALC1) to channel 16 (:CALC16), specifies the file in which the information on the user-defined network for the network de-embedding function is saved (2-port touchstone file).

Specify the file name with the .s2p extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use directory names and file name, separate them with "/" (slash) or "\" (backslash).

Even if the specified file does not exist, no error occurs when you execute this command.*1 However, when you set the type of the network de-embedding to the user-defined network with the :CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4} command, an error occurs.

Parameters

	<string>
Description	2-port touchstone file name
Range	254 characters or less
Preset value	""

Query response

{string}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:DEEM:PORT1:USER:FIL ""Network.s2p"""
20   OUTPUT 717;":CALC1:FSIM:SEND:DEEM:PORT1:USER:FIL?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FSIM:SEND:DEEM:STAT on page 353

:CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4} on page 351

Equivalent key

[Analysis] - Fixture Simulator - De-Embedding - User File

*1. If you set the type of the network de-embedding to the user-defined network before you execute this command, an error occurs and the command is ignored when you execute this command.

:CALC{1-16}:FSIM:SEND:DEEM:STAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:DEEMbed:STATe {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:DEEMbed:STATe?

Description

For all the ports of channel 1 (:CALC1) to channel 16 (:CALC16), turns ON/OFF the network de-embedding function when the fixture simulator function is ON (ON is specified with the :CALC{1-16}:FSIM:STAT command).

Parameters

	Description
ON or 1	Turns ON the network de-embedding function.
OFF or 0 (preset value)	Turns OFF the network de-embedding function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:DEEM:STAT ON"
20   OUTPUT 717;":CALC1:FSIM:SEND:DEEM:STAT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:STAT on page 365

:CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4} on page 351

:CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4}:USER:FIL on page 352

Equivalent key

[Analysis] - **Fixture Simulator** - **De-Embedding** - **De-Embedding**

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:PORT{[1]|2|3|4}[:TYPE] {NONE| SLPC|PCSL|PLSC|SCPL|PLPC|USER}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:PORT{[1]|2|3|4}[:TYPE]?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:CALC1) to channel 16 (:CALC16), selects the type of the matching circuit.

If you want to select the user-defined circuit, you must specify the 2-port touchstone file in which the proper information on the user-defined circuit is saved in advance. If you do not specify the appropriate file and you select the user-defined circuit, an error occurs and NONE is automatically selected.

Parameters

	Description
NONE (preset value)	Specifies no-circuit.
SLPC	Specifies the circuit that consists of series L and shunt C.
PCSL	Specifies the circuit that consists of shunt C and series L.
PLSC	Specifies the circuit that consists of shunt L and series C.
SCPL	Specifies the circuit that consists of series C and shunt L.
PLPC	Specifies the circuit that consists of shunt L and shunt C.
USER	Specifies the user-defined circuit*1.

*1. The information on the circuit is read out from the 2-port touchstone file specified with the :CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:USER:FIL command.

For more information on the circuits, refer to "*User's Guide*."

Query response

{NONE|SLPC|PCSL|PLSC|SCPL|PLPC|USER}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:PMC:PORT1 SLPC"
20   OUTPUT 717;":CALC1:FSIM:SEND:PMC:PORT1?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FSIM:SEND:PMC:STAT on page 360

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:C on page 355

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:G on page 356

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:L on page 357

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:R on page 358

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:USER:FIL on page 359

Equivalent key

[Analysis] - **Fixture Simulator** - **Port Matching** - **Select Circuit**

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:C

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:PORT{[1]|2|3|4}:PARameters:C <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:PORT{[1]|2|3|4}:PARameters:C?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the C value of the matching circuit.

Parameters

	<numeric>
Description	C value of the matching circuit
Range	-1E18 to 1E18
Preset value	0
Unit	F (farad)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:PMC:PORT1:PAR:C 12.3"
20   OUTPUT 717;":CALC1:FSIM:SEND:PMC:PORT1:PAR:C?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:SEND:PMC:STAT on page 360

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4} on page 354

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:G on page 356

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:L on page 357

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:R on page 358

Equivalent key

[Analysis] - **Fixture Simulator** - **Port Matching** - **C**

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:G

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:PORT{[1]|2|3|4}:PARameters:G <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:PORT{[1]|2|3|4}:PARameters:G?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the G value of the matching circuit.

Parameters

	<numeric>
Description	G value of the matching circuit
Range	-1E18 to 1E18
Preset value	0
Unit	S (siemens)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:PMC:PORT1:PAR:G 12.3"
20   OUTPUT 717;":CALC1:FSIM:SEND:PMC:PORT1:PAR:G?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:SEND:PMC:STAT on page 360

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4} on page 354

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:C on page 355

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:L on page 357

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:R on page 358

Equivalent key

[Analysis] - Fixture Simulator - Port Matching - G

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:L

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:PORT{[1]|2|3|4}:PARameters:L <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:PORT{[1]|2|3|4}:PARameters:L?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the L value of the matching circuit.

Parameters

	<numeric>
Description	L value of the matching circuit
Range	-1E18 to 1E18
Preset value	0
Unit	H (henry)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:PMC:PORT1:PAR:L 12.3"
20   OUTPUT 717;":CALC1:FSIM:SEND:PMC:PORT1:PAR:L?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:SEND:PMC:STAT on page 360

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4} on page 354

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:C on page 355

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:G on page 356

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:R on page 358

Equivalent key

[Analysis] - **Fixture Simulator** - **Port Matching** - **L**

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:R

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:PORT{[1]|2|3|4}:PARameters:R <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:PORT{[1]|2|3|4}:PARameters:R?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the R value of the matching circuit.

Parameters

	<numeric>
Description	R value of the matching circuit
Range	-1E18 to 1E18
Preset value	0
Unit	Ω (ohm)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:PMC:PORT1:PAR:R 12.3"
20   OUTPUT 717;":CALC1:FSIM:SEND:PMC:PORT1:PAR:R?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:SEND:PMC:STAT on page 360

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4} on page 354

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:C on page 355

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:G on page 356

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:L on page 357

Equivalent key

[Analysis] - Fixture Simulator - Port Matching - R

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:USER:FIL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:PORT{[1]|2|3|4}:USER:FILename <string>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:PORT{[1]|2|3|4}:USER:FILename?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:CALC1) to channel 16 (:CALC16), specifies the file in which the information on the user-defined matching circuit is saved (2-port touchstone file).

Specify the file name with the .s2p extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use directory names and file name, separate them with "/" (slash) or "\" (backslash).

Even if the specified file does not exist, no error occurs when you execute this command.*1 However, when you set the type of the matching circuit to the user-defined circuit with the :CALC{1-16}:FSIM:SEND:PMC:PORT{1-4} command, an error occurs.

Parameters

	<string>
Description	2-port touchstone file name
Range	254 characters or less
Preset value	""

Query response

{string}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:PMC:PORT1:USER:FIL ""Match.s2p"""
20   OUTPUT 717;":CALC1:FSIM:SEND:PMC:PORT1:USER:FIL?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FSIM:SEND:PMC:STAT on page 360

:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4} on page 354

Equivalent key

[Analysis] - **Fixture Simulator** - **Port Matching** - **User File**

*1. If you set the type of the matching circuit to the user-defined circuit before you execute this command, an error occurs and the command is ignored when you execute this command.

:CALC{1-16}:FSIM:SEND:PMC:STAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:STATe {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:PMCircuit:STATe?

Description

For all the ports of channel 1 (:CALC1) to channel 16 (:CALC16), turns ON/OFF the matching circuit embedding function when the fixture simulator function is ON (ON is specified with the :CALC{1-16}:FSIM:STAT command).

Parameters

	Description
ON or 1	Turns ON the matching circuit embedding function.
OFF or 0 (preset value)	Turns OFF the matching circuit embedding function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:PMC:STAT ON"
20   OUTPUT 717;":CALC1:FSIM:SEND:PMC:STAT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:STAT on page 365
:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4} on page 354
:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:C on page 355
:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:G on page 356
:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:L on page 357
:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:R on page 358
:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:USER:FIL on page 359

Equivalent key

[Analysis] - Fixture Simulator - Port Matching - Port Matching

:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:IMAG

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:ZCONversion :PORT{[1]|2|3|4}:IMAGinary <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:ZCONversion :PORT{[1]|2|3|4}:IMAGinary?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the impedance value (imaginary part) for the port impedance conversion function.

Parameters

	<numeric>
Description	Impedance value (imaginary part)
Range	-1E+18 to 1E+18
Preset value	0
Unit	Ω (ohm)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:ZCON:PORT1:IMAG 75"
20   OUTPUT 717;":CALC1:FSIM:SEND:ZCON:PORT1:IMAG?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:REAL on page 362

:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:Z0 on page 363

:CALC{1-16}:FSIM:SEND:ZCON:STAT on page 364

Equivalent key

[Analysis] - **Fixture Simulator** - **Port ZConversion** - **Port1 Z0 Imag**|**Port2 Z0 Imag**|**Port3 Z0 Imag**|**Port4 Z0 Imag**

:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:REAL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:ZCONversion :PORT{[1]|2|3|4}:REAL <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:ZCONversion :PORT{[1]|2|3|4}:REAL?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the impedance value (real part) for the port impedance conversion function.

NOTE

This command performs in the same way of :CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:Z0 on page 363

Parameters

	<numeric>
Description	Impedance value (real part)
Range	1E-3 to 1E7
Preset value	50
Unit	Ω (ohm)
Resolution	0.001

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:ZCON:PORT1:REAL 75"
20   OUTPUT 717;":CALC1:FSIM:SEND:ZCON:PORT1:REAL?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:IMAG on page 361

:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:Z0 on page 363

:CALC{1-16}:FSIM:SEND:ZCON:STAT on page 364

Equivalent key

[Analysis] - **Fixture Simulator** - **Port ZConversion** - **Port1 Z0 Real**|**Port2 Z0 Real**|**Port3 Z0 Real**|**Port4 Z0 Real**

:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:Z0

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:ZCONversion :PORT{[1]|2|3|4}:Z0[:R] <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:ZCONversion :PORT{[1]|2|3|4}:Z0[:R]?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:CALC1) to channel 16 (:CALC16), sets the impedance value for the port impedance conversion function.

Parameters

	<numeric>
Description	Impedance value
Range	1E-3 to 1E7
Preset value	50
Unit	Ω (ohm)
Resolution	0.001

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

CAUTION

This command clears setting value of ":CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:IMAG" on page 361

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:ZCON:PORT1:Z0 75"
20   OUTPUT 717;":CALC1:FSIM:SEND:ZCON:PORT1:Z0?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:IMAG on page 361

:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:REAL on page 362

:CALC{1-16}:FSIM:SEND:ZCON:STAT on page 364

Equivalent key

[Analysis] - **Fixture Simulator** - **Port ZConversion** - **Port1 Z0 Real**|**Port2 Z0 Real**|**Port3 Z0 Real**|**Port4 Z0 Real**

:CALC{1-16}:FSIM:SEND:ZCON:STAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:ZCONversion:STATe {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:SENDed:ZCONversion:STATe?

Description

For all the ports of channel 1 (:CALC1) to channel 16 (:CALC16), turns ON/OFF the port impedance conversion function when the fixture simulator function is ON (ON is specified with the :CALC{1-16}:FSIM:STAT command).

Parameters

	Description
ON or 1	Turns ON the port impedance conversion function.
OFF or 0 (preset value)	Turns OFF the port impedance conversion function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:SEND:ZCON:STAT ON"
20   OUTPUT 717;":CALC1:FSIM:SEND:ZCON:STAT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FSIM:STAT on page 365

:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:REAL on page 362

:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:IMAG on page 361

Equivalent key

[Analysis] - Fixture Simulator - Port ZConversion - Port ZConversion

:CALC{1-16}:FSIM:STAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:STATe {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FSIMulator:STATe?

Description

Turns ON/OFF the fixture simulator function of channel 1 (:CALC1) to channel 16 (:CALC16).

Parameters

	Description
ON or 1	Turns ON the fixture simulator function.
OFF or 0 (preset value)	Turns OFF the fixture simulator function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FSIM:STAT ON"
20   OUTPUT 717;":CALC1:FSIM:STAT?"
30   ENTER 717;A
```

Equivalent key

[Analysis] - **Fixture Simulator** - **Fixture Simulator**

:CALC{1-16}:FUNC:DATA?

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:DATA?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), reads out the analysis result of the :CALC{1-16}:FUNC:EXEC command.

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command. (Query only)

Query response

{numeric 1},…,{numeric N×2}<newline><^END>

	Description
{numeric n×2-1}	Response value or analysis result of the searched n-th measurement point.
{numeric n×2}	Stimulus value of the searched n-th measurement point. Always set to 0 for the analysis of maximum and minimum values/standard deviation/mean value.

Where N is the number of data pairs (can be read out with :CALC{1-16}:FUNC:POIN? command) and n is an integer between 1 and N.

Example of use

```
10   OUTPUT 717;":CALC1:FUNC:POIN?"
20   ENTER 717;A
30   REDIM B(1:2*A)
40   OUTPUT 717;":CALC1:FUNC:DATA?"
50   ENTER 717;B(*)
```

Related commands

:CALC{1-16}:FUNC:EXEC on page 370

:CALC{1-16}:FUNC:POIN? on page 372

:CALC{1-16}:PAR{1-16}:SEL on page 418

:FORM:DATA on page 482

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:FUNC:DOM

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:DOMain[:STATe] {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:DOMain[:STATe]?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), sets whether to use an arbitrary range when executing the analysis with the :CALC{1-16}:FUNC:EXEC command.

When the trace coupling is off, the active trace is the target to be set.

Parameters

	Description
ON or 1	Specifies an arbitrary range*1.
OFF or 0 (preset value)	Specifies the entire sweep range.

*1. Use the :CALC{1-16}:FUNC:DOM:STAR command and the :CALC{1-16}:FUNC:DOM:STOP command to specify a range.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FUNC:DOM ON"
20   OUTPUT 717;":CALC1:FUNC:DOM?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FUNC:EXEC on page 370

:CALC{1-16}:FUNC:DOM:COUP on page 368

:CALC{1-16}:FUNC:DOM:STAR on page 369

:CALC{1-16}:FUNC:DOM:STOP on page 370

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:FUNC:DOM:COUP

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:DOMain:COUPle {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:DOMain:COUPle?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), specifies whether to set the coupling of the analysis range of the :CALC{1-16}:FUNC:EXEC command for all traces.

Parameters

	Description
ON or 1 (preset value)	Specifies the analysis range with the trace coupling.
OFF or 0	Specifies the analysis range for each trace.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FUNC:DOM:COUP OFF"
20   OUTPUT 717;":CALC1:FUNC:DOM:COUP?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FUNC:EXEC on page 370

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:FUNC:DOM:STAR

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:DOMain:STARt <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:DOMain:STARt?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), sets the start value of the analysis range of the :CALC{1-16}:FUNC:EXEC command.

When the trace coupling is off, the active trace is the target to be set.

Parameters

	<numeric>
Description	Start value of the analysis range
Preset value	0
Unit	Hz (hertz), dBm or second

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FUNC:DOM:STAR 1.7E9"
20   OUTPUT 717;":CALC1:FUNC:DOM:STAR?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FUNC:EXEC on page 370

:CALC{1-16}:FUNC:DOM on page 367

:CALC{1-16}:FUNC:DOM:COUP on page 368

:CALC{1-16}:FUNC:DOM:STOP on page 370

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:FUNC:DOM:STOP

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:DOMain:STOP <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:DOMain:STOP?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), sets the stop value of the analysis range of the :CALC{1-16}:FUNC:EXEC command.

When the trace coupling is off, the active trace is the target to be set.

Parameters

	<numeric>
Description	Stop value of the analysis range
Preset value	0
Unit	Hz (hertz), dBm or second

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FUNC:DOM:STOP 1.8E9"
20   OUTPUT 717;":CALC1:FUNC:DOM:STOP?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FUNC:EXEC on page 370

:CALC{1-16}:FUNC:DOM on page 367

:CALC{1-16}:FUNC:DOM:COUP on page 368

:CALC{1-16}:FUNC:DOM:STAR on page 369

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:FUNC:EXEC

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:EXECute

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), executes the analysis specified with the :CALC{1-16}:FUNC:TYPE command. (No query)

Example of use

```
10   OUTPUT 717;":CALC1:FUNC:EXEC"
```

Related commands

:CALC{1-16}:FUNC:TYPE on page 376

:CALC{1-16}:FUNC:DOM on page 367

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:FUNC:PEXC

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:PEXCursion <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:PEXCursion?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the lower limit for the peak excursion value when executing the peak search with the :CALC{1-16}:FUNC:EXEC command.

Parameters

	<numeric>
Description	Lower limit for the peak excursion value
Range	0 to 5e8
Preset value	3
Unit	Varies depending on the data format as follows: Logarithmic Magnitude: dB (decibel) Phase, Expand Phase, Positive Phase: ° (degree) Group Delay: s (second) Others: No unit

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FUNC:PEXC 0.2"
20   OUTPUT 717;":CALC1:FUNC:PEXC?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FUNC:EXEC on page 370

:CALC{1-16}:FUNC:PPOL on page 373

:CALC{1-16}:FUNC:TYPE on page 376

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:FUNC:POIN?

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:POINts?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), reads out the number of data pairs of the analysis result of the :CALC{1-16}:FUNC:EXEC command.

For the analysis of the mean value or the search of the maximum value, 1 is always read out; for the search of all peaks or the search of all targets, the total number of searched measurement points is read out. (Query only)

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FUNC:POIN?"
20   ENTER 717;A
```

Related commands

:CALC{1-16}:FUNC:EXEC on page 370

:CALC{1-16}:FUNC:DATA? on page 366

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:FUNC:PPOL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:PPOLarity {POSitive|NEGative|BOTH}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:PPOLarity?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the polarity when performing the peak search with the :CALC{1-16}:FUNC:EXEC command.

Parameters

	Description
POSitive (preset value)	Specifies the positive peak.
NEGative	Specifies the negative peak.
BOTH	Specifies both the positive peak and the negative peak.

Query response

{POS|NEG|BOTH}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FUNC:PPOL BOTH"
20   OUTPUT 717;":CALC1:FUNC:PPOL?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FUNC:EXEC on page 370

:CALC{1-16}:FUNC:PEXC on page 371

:CALC{1-16}:FUNC:TYPE on page 376

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:FUNC:TARG

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:TARGet <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:TARGet?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the target value when performing the target search with the :CALC{1-16}:FUNC:EXEC command.

Parameters

	<numeric>
Description	Target value
Range	-5E8 to 5E8
Preset value	0
Unit	Varies depending on the data format as follows: Logarithmic Magnitude: dB (decibel) Phase, Expand Phase, Positive Phase: ° (degree) Group Delay: s (second) Others: No unit

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FUNC:TARG -12.5"
20   OUTPUT 717;":CALC1:FUNC:TARG?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:FUNC:EXEC on page 370

:CALC{1-16}:FUNC:TTR on page 375

:CALC{1-16}:FUNC:TYPE on page 376

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:FUNC:TTR

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:TTRansition {POSitive|NEGative|BOTH}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:TTRansition?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the transition type when performing the target search with the :CALC{1-16}:FUNC:EXEC command.

Parameters

	Description
POSitive	Specifies positive.
NEGative	Specifies negative.
BOTH (preset value)	Specifies both positive and negative.

Query response

{POS|NEG|BOTH}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FUNC:TTR NEG"
20   OUTPUT 717;":CALC1:FUNC:TTR?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FUNC:EXEC on page 370

:CALC{1-16}:FUNC:TARG on page 374

:CALC{1-16}:FUNC:TYPE on page 376

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:FUNC:TYPE

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:TYPE {PTPeak|STDEV|MEAN| MAXimum|MINimum|PEAK|APEak|ATARget}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:FUNCtion:TYPE?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the type of analysis.

Parameters

	Description
PTPeak (preset value)	Specifies the analysis of the difference between the maximum value and the minimum value (Peak to Peak).
STDEV	Specifies the analysis of the standard deviation.
MEAN	Specifies the analysis of the mean value.
MAXimum	Specifies the search for the maximum value.
MINimum	Specifies the search for the minimum value.
PEAK	Specifies the search for the maximum positive (minimum negative) peak*1.
APEak	Specifies the search for all peaks*1.
ATARget	Specifies the search for all targets*2.

*1. To specify the conditions of the peak, use the :CALC{1-16}:FUNC:PEXC command and the :CALC{1-16}:FUNC:PPOL command.
*2. To specify the conditions of the target, use the :CALC{1-16}:FUNC:TARG command and the :CALC{1-16}:FUNC:TTR command.

Query response

{PTP|STDEV|MEAN|MAX|MIN|PEAK|APE|ATAR}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:FUNC:TYPE PEAK"
20   OUTPUT 717;":CALC1:FUNC:TYPE?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:FUNC:EXEC on page 370
:CALC{1-16}:FUNC:PEXC on page 371
:CALC{1-16}:FUNC:PPOL on page 373
:CALC{1-16}:FUNC:TARG on page 374
:CALC{1-16}:FUNC:TTR on page 375
:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:LIM

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit[:STATe] {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit[:STATe]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the limit test function.

Parameters

	Description
ON or 1	Turns ON the limit test.
OFF or 0 (preset value)	Turns OFF the limit test.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:LIM ON"
20   OUTPUT 717;":CALC1:LIM?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:LIM:DISP on page 379

:DISP:FSIG on page 457

Equivalent key

[Analysis] - Limit Test - Limit Test

:CALC{1-16}:LIM:DATA

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit:DATA <numeric 1>,...,<numeric 1+(N×5)>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit:DATA?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the limit table.

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command.

Parameters

	Description
<numeric 1>	The number of lines. (0 to 100)
<numeric 1+(n×5)-4>	The type of the n-th line. Specify an integer 0 to 2: 0: Off 1: Upper limit line 2: Lower limit line
<numeric 1+(n×5)-3>	The value on the horizontal axis (frequency/power/time) of the start point of the n-th line.
<numeric 1+(n×5)-2>	The value on the horizontal axis (frequency/power/time) of the end point of the n-th line.
<numeric 1+(n×5)-1>	The value on the vertical axis of the start point of the n-th line.
<numeric 1+(n×5)>	The value on the vertical axis of the end point of the n-th line.

Where N is the number of lines (specified with <numeric 1>) and n is an integer between 1 and N.

If you set the number of lines to 0 (clear the limit table), this command needs only <numeric 1> as the parameter.

Query response

{numeric 1},...,{numeric 1+(N×5)}<newline><^END>

Example of use

```
10   DIM B(1:2,1:5)
20   OUTPUT 717;":CALC1:LIM:DATA 2,1,1E9,3E9,0,0,2,1E9,3E9,-3,-3"
30   OUTPUT 717;":CALC1:LIM:DATA?"
40   ENTER 717;A,B(*)
```

```
10   OUTPUT 717;":CALC1:LIM:DATA 0"  ! Clear Limit Table
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:LIM on page 377

:CALC{1-16}:LIM:DISP on page 379

:FORM:DATA on page 482

Equivalent key

[Analysis] - Limit Test - Edit Limit Line

:CALC{1-16}:LIM:DISP

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit:DISPlay[:STATe] {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit:DISPlay[:STATe]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the limit line display.

Parameters

	Description
ON or 1	Turns ON the limit line display.
OFF or 0 (preset value)	Turns OFF the limit line display.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:LIM:DISP ON"
20   OUTPUT 717;":CALC1:LIM:DISP?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:LIM on page 377

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - **Limit Test** - **Limit Line**

:CALC{1-16}:LIM:FAIL?

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit:FAIL?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), reads out the limit test result. (Query only)

Query response

{1|0}<newline><^END>

	Description
1	The limit test result is FAIL.
0	The limit test result is PASS.

When the limit test is set to OFF, 0 is always read out.

Example of use

```
10   OUTPUT 717;":CALC1:LIM:FAIL?"
20   ENTER 717;A
```

Related commands

:CALC{1-16}:LIM on page 377

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:LIM:OFFS:AMPL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit:OFFSet:AMPLitude <numeric>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit:OFFSet:AMPLitude?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the limit line amplitude offset.

The setting of the limit line doesn't change even if the offset value is changed.

Parameters

	<numeric>
Description	The limit line amplitude offset value for the limit test.
Range	-5E8 to 5E8
Preset value	0
Unit	dB

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:LIM:OFFS:AMPL -10"
20   OUTPUT 717;":CALC1:LIM:OFFS:AMPL?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:LIM on page 377

:CALC{1-16}:LIM:OFFS:MARK on page 382

:CALC{1-16}:LIM:OFFS:STIM on page 383

Equivalent key

[Analysis] - **Limit Test** - **Limit Line Offsets** - **Amplitude Offset**

:CALC{1-16}:LIM:OFFS:MARK

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit:OFFSet:MARKer

Description

For channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the active marker value to amplitude offset using the limit line.

The setting of the limit line does not change even if the offset value is changed.

When the markers are not displayed, this command does not operate.

Example of use

```
10   OUTPUT 717;":CALC1:LIM:OFFS:MARK"
```

Related commands

:CALC{1-16}:LIM on page 377

:CALC{1-16}:LIM:OFFS:AMPL on page 381

:CALC{1-16}:LIM:OFFS:STIM on page 383

Equivalent key

[Analysis] - Limit Test - Limit Line Offsets - Marker -> Amplitude Offset

:CALC{1-16}:LIM:OFFS:STIM

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit:OFFSet:STIMulus <numeric>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit:OFFSet:STIMulus?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the stimulus offset of the limit line.

The setting of the limit line doesn't change even if the offset value is changed.

Parameters

	<numeric>
Description	The stimulus offset value of the limit line.
Range	-1E12 to 1E12
Preset value	0
Unit	Hz (hertz), dBm or second

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:LIM:OFFS:STIM 5E3"
20   OUTPUT 717;":CALC1:LIM:OFFS:STIM?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:LIM on page 377

:CALC{1-16}:LIM:OFFS:AMPL on page 381

:CALC{1-16}:LIM:OFFS:MARK on page 382

Equivalent key

[Analysis] - **Limit Test** - **Limit Line Offsets** - **Stimulus Offset**

:CALC{1-16}:LIM:REP?

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit:REPort[:DATA]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), reads out the stimulus values (frequency, power level or time) at all the measurement point that failed the limit test.

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command.(Query only)

Query response

{numeric 1},…,{numeric N}<newline><^END>

Where N is the number of the measurement points that failed (can be read out with the :CALC{1-16}:LIM:REP:POIN? command).

Example of use

```
10   OUTPUT 717;":CALC1:LIM:REP:POIN?"
20   ENTER 717;A
30   REDIM B(1:A)
40   OUTPUT 717;":CALC1:LIM:REP?"
50   ENTER 717;B(*)
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:FORM:DATA on page 482

:CALC{1-16}:LIM:REP:POIN? on page 386

:CALC{1-16}:LIM on page 377

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:LIM:REP:ALL?

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit:REPort:ALL?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), reads out the bandwidth test results (stimulus value, limit test result, upper limit value, lower limit value of all measurement points).

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command. (Query only)

Query Response

{numeric 1},…,{numeric N×4}<newline><^END>

	Description
<numeric n×4-3>	The stimulus value for the measurement point.
<numeric n×4-2>	The limit test result. Specify an integer -1 to 1: 0: Fail 1: Pass -1: No limit
<numeric n×4-1>	The upper limit value at the measurement point. (If there is no limit at this point, reads out 0.)
<numeric n×4>	The lower limit value at the measurement point. (If there is no limit at this point, reads out 0.)

Where N is the number of measurement points (specified with the :SENS{1-16}:SWE:POIN command) and n is an integer between 1 and N.

Example of use

```
10   OUTPUT 717;":SENS1:SWE:POIN?"
20   ENTER 717;A
30   REDIM B(1:4*A)
40   OUTPUT 717;":CALC1:LIM:REP:ALL?"
50   ENTER 717;B(*)
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:LIM on page 377

:CALC{1-16}:LIM:REP? on page 384

:CALC{1-16}:LIM:REP:POIN? on page 386

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:LIM:REP:POIN?

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:LIMit:REPort:POINts?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), reads out the number of the measurement points that failed the limit test. (Query only)

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:LIM:REP:POIN?"
20   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:LIM on page 377

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:MARK:BWID

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:BWIDth[:STATe] {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:BWIDth[:STATe]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the bandwidth search result display.

Parameters

	Description
ON or 1	Turns ON the bandwidth search result display.
OFF or 0 (preset value)	Turns OFF the bandwidth search result display.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK:BWID ON"
20   OUTPUT 717;":CALC1:MARK:BWID?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:MARK{1-10}:BWID:DATA? on page 396

:CALC{1-16}:MARK{1-10}:BWID:THR on page 397

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Marker Search] - Bandwidth

:CALC{1-16}:MARK:COUP

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:COUPle {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:COUPle?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), turns ON/OFF the marker coupling between traces.

Parameters

	Description
ON or 1 (preset value)	Turns ON the marker coupling.
OFF or 0	Turns OFF the marker coupling.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK:COUP OFF"
20   OUTPUT 717;":CALC1:MARK:COUP?"
30   ENTER 717;A
```

Equivalent key

[Marker Fctn] - Couple

:CALC{1-16}:MARK:FUNC:DOM

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:FUNCtion:DOMain[:STATe] {ON|OFF|1|0}
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:FUNCtion:DOMain[:STATe]?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), sets whether to use an arbitrary range when executing the marker search.

When the trace coupling is off, the active trace is the target to be set.

Parameters

	Description
ON or 1	Specifies an arbitrary range*1.
OFF or 0 (preset value)	Specifies the entire sweep range.

*1. Use the :CALC{1-16}:MARK:FUNC:DOM:STAR command and the :CALC{1-16}:MARK:FUNC:DOM:STOP command to specify a range.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK:FUNC:DOM ON"
20   OUTPUT 717;":CALC1:MARK:FUNC:DOM?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:MARK{1-10}:FUNC:EXEC on page 399
:CALC{1-16}:MARK:FUNC:DOM:COUP on page 390
:CALC{1-16}:MARK:FUNC:DOM:STAR on page 391
:CALC{1-16}:MARK:FUNC:DOM:STOP on page 392

Equivalent key

[Marker Search] - **Search Range** - **Search Range [ON/OFF]**

:CALC{1-16}:MARK:FUNC:DOM:COUP

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:FUNCtion:DOMain:COUPle {ON|OFF|1|0}
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:FUNCtion:DOMain:COUPle?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), specifies whether to set the coupling of the marker search range for all traces.

Parameters

	Description
ON or 1 (preset value)	Specifies the search range with the trace coupling.
OFF or 0	Specifies the search range for each trace.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK:FUNC:DOM:COUP OFF"
20   OUTPUT 717;":CALC1:MARK:FUNC:DOM:COUP?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:MARK:FUNC:DOM on page 389
:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Marker Search] - Search Range - Couple

:CALC{1-16}:MARK:FUNC:DOM:STAR

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:FUNCtion:DOMain:STARt <numeric>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:FUNCtion:DOMain:STARt?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), sets the start value of the marker search range.

When the trace coupling is off, the active trace is the target to be set.

Parameters

	<numeric>
Description	The start value of the search range
Preset value	0
Unit	Hz (hertz), dBm or second

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK:FUNC:DOM:STAR 1.7E9"
20   OUTPUT 717;":CALC1:MARK:FUNC:DOM:STAR?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:MARK{1-10}:FUNC:EXEC on page 399
:CALC{1-16}:MARK:FUNC:DOM on page 389
:CALC{1-16}:MARK:FUNC:DOM:STOP on page 392

Equivalent key

[Marker Search] - Search Range - Start

:CALC{1-16}:MARK:FUNC:DOM:STOP

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:FUNCtion:DOMain:STOP <numeric>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:FUNCtion:DOMain:STOP?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16), sets the stop value of the marker search range.

When the trace coupling is off, the active trace is the target to be set.

Parameters

	<numeric>
Description	The stop value of the search range
Preset value	0
Unit	Hz (hertz), dBm or second

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK:FUNC:DOM:STOP 1.8E9"
20   OUTPUT 717;":CALC1:MARK:FUNC:DOM:STOP?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:MARK{1-10}:FUNC:EXEC on page 399

:CALC{1-16}:MARK:FUNC:DOM on page 389

:CALC{1-16}:MARK:FUNC:DOM:STAR on page 391

Equivalent key

[Marker Search] - **Search Range** - **Stop**

:CALC{1-16}:MARK:REF

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:REFerence[:STATe] {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer:REFerence[:STATe]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the reference marker mode.

The reference marker mode is turned on or off when you turn on or off the display of the reference marker.

Parameters

	Description
ON or 1	Turns ON the reference marker mode.
OFF or 0 (preset value)	Turns OFF the reference marker mode.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK:REF ON"
20   OUTPUT 717;":CALC1:MARK:REF?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:MARK{1-10} on page 394

Equivalent key

[Marker] - Ref Maker Mode

:CALC{1-16}:MARK{1-10}

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}[:STATe] {ON|OFF|1|0}
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}[:STATe]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the display of marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

The display of the reference marker is turned on or off when you turn on or off the reference marker mode.

Parameters

	Description
ON or 1	Turns ON the display of the marker.
OFF or 0 (preset value)	Turns OFF the display of the marker.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK1 ON"
20   OUTPUT 717;":CALC1:MARK1?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:MARK:REF on page 393

Equivalent key

When turning ON the display of the marker

[Marker] - Marker 1|Marker 2|Marker 3|Marker 4|Ref Marker

[Marker] - More Markers - Marker 5|Marker 6|Marker 7|Marker 8|Marker 9

NOTE

When performing the operation from the front panel, a marker set to ON is automatically set to the active marker.

When turning OFF the display of the marker

[Marker] - Clear Marker Menu - Marker 1|Marker 2|Marker 3|Marker 4|Marker 5|Marker 6|Marker 7|Marker 8|Marker 9|Ref Marker

:CALC{1-16}:MARK{1-10}:ACT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:ACTivate

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10) to the active marker. (No query)

NOTE

If you set a marker set to OFF to the active marker, it is automatically set to ON.

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:ACT"
```

Related commands

:DISP:WIND{1-16}:ACT on page 464

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Marker] - **Marker 1**|**Marker 2**|**Marker 3**|**Marker 4**|**Ref Marker**

[Marker] - **More Markers** - **Marker 5**|**Marker 6**|**Marker 7**|**Marker 8**|**Marker 9**

:CALC{1-16}:MARK{1-10}:BWID:DATA?

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:BWIDth:DATA?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), reads out the bandwidth search result of marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

If the bandwidth search is impossible, an error occurs and the command is ignored. In this case, no query response is obtained. (Query only)

Query response

{numeric 1},{numeric 2},{numeric 3},{numeric 4}<newline><^END>

	Description
{numeric 1}	The bandwidth.
{numeric 2}	The center frequency.
{numeric 3}	The Q value.
{numeric 4}	The loss.

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:BWID:DATA?"
20   ENTER 717;A,B,C,D
```

Related commands

:CALC{1-16}:MARK:BWID on page 387

:CALC{1-16}:MARK{1-10}:BWID:THR on page 397

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:MARK{1-10}:BWID:THR

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:BWIDth:THReshold <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:BWIDth:THReshold?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the bandwidth definition value of marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

Parameters

	<numeric>
Description	Bandwidth definition value
Range	-5E8 to 5E8
Preset value	-3
Unit	Varies depending on the data format as follows: Logarithmic Magnitude: dB (decibel) Phase, Expand Phase, Positive Phase: ° (degree) Group Delay: s (second) Others: No unit

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:BWID:THR 6"
20   OUTPUT 717;":CALC1:MARK1:BWID:THR?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:MARK:BWID on page 387

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Marker Search] - Bandwidth Value

:CALC{1-16}:MARK{1-10}:DISC

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:DISCrete {ON|OFF|1|0}
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:DISCrete?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the discrete mode (mode in which the marker moves only at the measurement points) with marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

Parameters

	Description
ON or 1	Turn OFF the discrete mode.
OFF or 0 (preset value)	Turns OFF the discrete mode.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:DISC OFF"
20   OUTPUT 717;":CALC1:MARK1:DISC?"
30   ENTER 717;A
```

Equivalent key

[Marker Fctn] - Discrete

:CALC{1-16}:MARK{1-10}:FUNC:EXEC

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:FUNCtion:EXECute

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), executes the search with marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

To specify the type of the search, use the :CALC{1-16}:MARK{1-10}:FUNC:TYPE command. (No query)

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:FUNC:EXEC"
```

Related commands

:CALC{1-16}:MARK{1-10}:FUNC:TYPE on page 405

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:MARK:FUNC:DOM on page 389

Equivalent key

[Marker Search] - **Max**|**Min**

[Marker Search] - **Peak** - **Search Peak**|**Search Left**|**Search Right**

[Marker Search] - **Target** - **Search Target**|**Search Left**|**Search Right**

NOTE

When performing the operation from the front panel, you select the search type and execute the search at the same time.

:CALC{1-16}:MARK{1-10}:FUNC:PEXC

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:FUNCtion:PEXCursion <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:FUNCtion:PEXCursion?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the lower limit for the peak excursion value of marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

Parameters

	<numeric>
Description	Lower limit for the peak excursion value
Range	0 to 5E8
Preset value	3
Unit	Varies depending on the data format as follows: Logarithmic Magnitude: dB (decibel) Phase, Expand Phase, Positive Phase: ° (degree) Group Delay: s (second) Others: No unit

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:FUNC:PEXC 0.2"
20   OUTPUT 717;":CALC1:MARK1:FUNC:PEXC?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:MARK{1-10}:FUNC:PPOL on page 401

:CALC{1-16}:MARK{1-10}:FUNC:TYPE on page 405

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Marker Search] - **Peak** - **Peak Excursion**

:CALC{1-16}:MARK{1-10}:FUNC:PPOL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:FUNCtion:PPOLarity {POSitive|NEGative|BOTH}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:FUNCtion:PPOLarity?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the polarity of the peak to be searched with marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

Parameters

	Description
POSitive (preset value)	Specifies the positive peak.
NEGative	Specifies the negative peak.
BOTH	Specifies both the positive peak and the negative peak.

Query response

{POS|NEG|BOTH}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:FUNC:PPOL NEG"
20   OUTPUT 717;":CALC1:MARK1:FUNC:PPOL?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:MARK{1-10}:FUNC:PEXC on page 400

:CALC{1-16}:MARK{1-10}:FUNC:TYPE on page 405

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Marker Search] - **Peak** - **Peak Polarity**

:CALC{1-16}:MARK{1-10}:FUNC:TARG

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:FUNCtion:TARGet <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:FUNCtion:TARGet?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the target value to be searched with marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

Parameters

	<numeric>
Description	Target value for target search
Range	-5E8 to 5E8
Preset value	0
Unit	Varies depending on the data format as follows: Logarithmic Magnitude: dB (decibel) Phase, Expand Phase, Positive Phase: ° (degree) Group Delay: s (second) Others: No unit

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:FUNC:TARG -12.5"
20   OUTPUT 717;":CALC1:MARK1:FUNC:TARG?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:MARK{1-10}:FUNC:TTR on page 404

:CALC{1-16}:MARK{1-10}:FUNC:TYPE on page 405

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Marker Search] - Target - Target Value

:CALC{1-16}:MARK{1-10}:FUNC:TRAC

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:FUNCtion:TRACking {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:FUNCtion:TRACking?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the search tracking (function to repeat the search for each sweep) of marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

Parameters

	Description
ON or 1	Turns ON the search tracking.
OFF or 0 (preset value)	Turns OFF the search tracking.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:FUNC:TRAC ON"
20   OUTPUT 717;":CALC1:MARK1:FUNC:TRAC?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:MARK{1-10}:FUNC:EXEC on page 399

:CALC{1-16}:MARK{1-10}:FUNC:TYPE on page 405

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Marker Search] - Tracking

:CALC{1-16}:MARK{1-10}:FUNC:TTR

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:FUNCtion:TTRansition {POSitive| NEGative|BOTH}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:FUNCtion:TTRansition?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the transition type when performing the target search with marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

Parameters

	Description
POSitive	Specifies positive.
NEGative	Specifies negative.
BOTH (preset value)	Specifies both positive and negative.

Query response

{POS|NEG|BOTH}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:FUNC:TTR NEG"
20   OUTPUT 717;":CALC1:MARK1:FUNC:TTR?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:MARK{1-10}:FUNC:TARG on page 402

:CALC{1-16}:MARK{1-10}:FUNC:TYPE on page 405

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Marker Search] - Target - Target Transition

:CALC{1-16}:MARK{1-10}:FUNC:TYPE

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:FUNCtion :TYPE {MAXimum| MINimum|PEAK|LPEak|RPEak|TARGet|LTARget|RTARget}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:FUNCtion :TYPE?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the search type of marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

Parameters

	Description
MAXimum (preset value)	Specifies the maximum value search.
MINimum	Specifies the minimum value search.
PEAK	Specifies the maximum positive (minimum negative) peak*1 search.
LPEak	Specifies the peak*1 search to the left from the marker position.
RPEak	Specifies the peak*1 search to the right from the marker position.
TARGet	Specifies the search for the target*2 closest to the current marker position.
LTARget	Specifies the target*2 search to the left from the marker position.
RTARget	Specifies the target*2 search to the right from the marker position.

*1. To specify the conditions of the peak, use the :CALC{1-16}:MARK{1-10}:FUNC:PEXC command and the :CALC{1-16}:MARK{1-10}:FUNC:PPOL command.

*2. To specify the conditions of the target, use the :CALC{1-16}:MARK{1-10}:FUNC:TARG command and the :CALC{1-16}:MARK{1-10}:FUNC:TTR command.

Query response

{MAX|MIN|PEAK|LPE|RPE|TARG|LTAR|RTAR}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:FUNC:TYPE PEAK"
20   OUTPUT 717;":CALC1:MARK1:FUNC:TYPE?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:MARK{1-10}:FUNC:EXEC on page 399
:CALC{1-16}:MARK{1-10}:FUNC:PEXC on page 400
:CALC{1-16}:MARK{1-10}:FUNC:PPOL on page 401
:CALC{1-16}:MARK{1-10}:FUNC:TARG on page 402
:CALC{1-16}:MARK{1-10}:FUNC:TTR on page 404
:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Marker Search] - Max|Min

[Marker Search] - Peak - Search Peak|Search Left|Search Right

[Marker Search] - Target - Search Target|Search Left|Search Right

NOTE

When performing the operation from the front panel, you select the search type and execute the search at the same time.

:CALC{1-16}:MARK{1-10}:SET

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:SET {STARt|STOP|CENTer|RLEVel|DELay}

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the value of the specified item to the value of the position of marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

Regardless of the ON/OFF of the reference marker mode (specified with the :CALC{1-16}:MARK:REF command), the value when the reference marker mode is OFF is always set. (No query)

Parameters

	Description
STARt	Sets the sweep start value to the stimulus value at the marker position.
STOP	Sets the sweep stop value to the stimulus value at the marker position.
CENTer	Sets the sweep center value to the stimulus value at the marker position.
RLEVel	Sets the reference line value to the response value at the marker position.
DELay	Sets the electrical delay time value to the group delay value at the marker position.

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:SET CENT"
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:MARK:REF on page 393

Equivalent key

[Marker Fctn] - Marker -> Start|Marker -> Stop|Marker -> Center|Marker -> Reference|Marker -> Delay

:CALC{1-16}:MARK{1-10}:X

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:X <numeric>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:X?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the stimulus value of marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

Parameters

	<numeric>
Description	Stimulus value*1
Range	Sweep start value to sweep stop value*2
Preset value	Sweep start value*3
Unit	Hz (hertz), dBm or second

*1. When the reference marker mode is ON (ON is specified with the :CALC{1-16}:MARK:REF command), it is the value relative to the reference marker.
*2. When the span value of the sweep range is 0, the range is from 0 to sweep time value.
*3. When the span value of the sweep range is 0, the unit is 0.

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:X 1E9"
20   OUTPUT 717;":CALC1:MARK1:X?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:MARK{1-10}:Y? on page 408
:CALC{1-16}:PAR{1-16}:SEL on page 418
:CALC{1-16}:MARK:REF on page 393

Equivalent key

[Marker] - Marker 1|Marker 2|Marker 3|Marker 4|Ref Marker

[Marker] - More Markers - Marker 5|Marker 6|Marker 7|Marker 8|Marker 9

NOTE

When performing the operation from the front panel, you turn ON the marker and set the stimulus value at the same time.

:CALC{1-16}:MARK{1-10}:Y?

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MARKer{[1]|2|3|4|5|6|7|8|9|10}:Y?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), reads out the response value of marker 1 (:MARK1) to marker 9 (:MARK9) and reference marker (:MARK10).

When the reference marker mode is ON (ON is specified with the :CALC{1-16}:MARK:REF command), the readout value is the value relative to the reference marker. (Query only)

Query response

{numeric 1},{numeric 2}<newline><^END>

	Description
{numeric 1}	Response value (primary value) at the marker position.
{numeric 2}	Response value (secondary value) at the marker position. Always 0 when the data format is not the Smith chart format or the polar format.

Example of use

```
10   OUTPUT 717;":CALC1:MARK1:Y?"
30   ENTER 717;A,B
```

Related commands

:CALC{1-16}:MARK{1-10}:X on page 407

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:MARK:REF on page 393

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:MATH:FUNC

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MATH:FUNCtion {NORMal|SUBTract|DIVide|ADD|MULTiply}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MATH:FUNCtion?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the data trace display method (math method between measurement data and memory trace data).

The math result according to this setting is displayed on the data trace.

Parameters

	Description
NORMal (preset value)	Specifies *Data* (no math).
DIVide	Specifies *Data* / *Mem*.
MULTiply	Specifies *Data* × *Mem*.
SUBTract	Specifies *Data* - *Mem*.
ADD	Specifies *Data* + *Mem*.

Where *Data* is the measurement data and *Mem* is the data stored in the memory trace.

Query response

{NORM|DIV|MULT|SUBT|ADD}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MATH:FUNC DIV"
20   OUTPUT 717;":CALC1:MATH:FUNC?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Display] - Data Math - OFF|Data / Mem|Data * Mem|Data – Mem|Data + Mem

:CALC{1-16}:MATH:MEM

Syntax :CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MATH:MEMorize

Description For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), copies the measurement data at the execution of the command to the memory trace. (No query)

Example of use

```
10   OUTPUT 717;":CALC1:MATH:MEM"
```

Related commands :CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key **[Display] - Data –> Mem**

:CALC{1-16}:MIX:XAX

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MIXer:XAXis {NORMal|RFPLo|RFMLo|LOMRf}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MIXer:XAXis?

Description

Sets the X-axis frequency for the active trace of channel 1 (:CALC1) to channel 16 (:CALC16).

When using this command, set the frequency offset mode to off (refer to :SENS{1-16}:OFFS command on page 654).

Parameters

	Description
NORMal (Preset value)	Sets the normal frequency.
RFPLo	Sets RF + LO.*1
RFMLo	Sets RF - LO.*1
LOMRf	Sets LO - RF.*1

*1. RF is the normal frequency and LO is the frequency of the external signal source.

Query response

{NORM|RFPL|RFML|LOMR}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MIX:XAX RFPL"
20   OUTPUT 717;":CALC1:MIX:XAX?"
30   ENTER 717;A$
```

Related commands

:SENS{1-16}:OFFS on page 654

:CALC{1-16}:OFFS:XAX on page 414

Equivalent key

[Sweep Setup] - **Frequency Offset** - **X-Axis** - **Normal**|**RF+LO**|**RF-LO**|**LO-RF**

:CALC{1-16}:MST

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MSTatistics[:STATe] {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MSTatistics[:STATe]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the statistics value display (the mean vale, the standard deviation, and the difference between the maximum value and the minimum value).

Parameters

	Description
ON or 1	Turns ON the statistics value display.
OFF or 0 (preset value)	Turns OFF the statistics value display.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:MST ON"
20   OUTPUT 717;":CALC1:MST?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:MST:DATA? on page 413

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Marker Fctn] - Statistics

:CALC{1-16}:MST:DATA?

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:MSTatistics:DATA?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), reads out the statistics values (the mean vale, the standard deviation, and the difference between the maximum value and the minimum value) display. (Query only)

Query response

{numeric 1},{numeric 2},{numeric 3}<newline><^END>

	Description
{numeric 1}	Mean value
{numeric 2}	Standard deviation
{numeric 3}	Difference between the maximum value and the minimum value (Peak to Peak)

Example of use

```
10   OUTPUT 717;":CALC1:MST:DATA?"
20   ENTER 717;A,B,C
```

Related commands

:CALC{1-16}:MST on page 412

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:OFFS:XAX

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:OFFSet:XAXis {BASE|STIMulus|RESPonse}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:OFFSet:XAXis?

Description

Sets the X-axis frequency for the active trace of channel 1 (:CALC1) to channel 16 (:CALC16).

When using this command, set the frequency offset mode to on (refer to :SENS{1-16}:OFFS command on page 654).

Parameters

	Description
BASE	Sets the normal frequency.
STIMulus	Sets the frequency for the source port for the specified measurement parameter.
RESPonse (Preset value)	Sets the frequency for the receiver port for the specified measurement parameter.

Query response

{BASE|STIMulus|RESPonse}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:OFFS:XAX RESP"
20   OUTPUT 717;":CALC1:OFFS:XAX?"
30   ENTER 717;A$
```

Related commands

:SENS{1-16}:OFFS on page 654

:CALC{1-16}:MIX:XAX on page 411

Equivalent key

[Sweep Setup] - Frequency Offset - X-Axis - BASE|STIMulus|RESPonse

:CALC{1-16}:PAR:COUN

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:PARameter:COUNt <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:PARameter:COUNt?

Description

Sets the number of traces of channel 1 (:CALC1) to channel 16 (:CALC16).

Parameters

	<numeric>
Description	Number of traces
Range	Varies depending on the upper limit setting for channel/trace number.
Preset value	1
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:PAR:COUN 4"
20   OUTPUT 717;":CALC1:PAR:COUN?"
30   ENTER 717;A
```

Equivalent key

[Display] - Num of Traces

:CALC{1-16}:PAR{1-16}:DEF

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:DEFine
{S11|S21|S31|S41|S12|S22|S32|S42|S13|S23|S33|S43|S14|S24|S34|S44|A|B|C|D|R1|R2|R3|R4}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:DEFine?

Description

Sets the measurement parameter of trace 1 (:PAR1) to trace 16 (:PAR16) of channel 1 (:CALC1) to channel 16 (:CALC16).

Parameters

	Description
S11 (preset value)	Specifies S11.
S21	Specifies S21.
S31	Specifies S31.
S41	Specifies S41.
S12	Specifies S12.
S22	Specifies S22.
S32	Specifies S32.
S42	Specifies S42.
S13	Specifies S13.
S23	Specifies S23.
S33	Specifies S33.
S43	Specifies S43.
S14	Specifies S14.
S24	Specifies S24.
S34	Specifies S34.
S44	Specifies S44.
A	Specifies A. (when the absolute measurement is executed.)
B	Specifies B. (when the absolute measurement is executed.)
C	Specifies C. (when the absolute measurement is executed.)
D	Specifies D. (when the absolute measurement is executed.)
R1	Specifies R1. (when the absolute measurement is executed.)
R2	Specifies R2. (when the absolute measurement is executed.)

	Description
R3	Specifies R3. (when the absolute measurement is executed.)
R4	Specifies R4. (when the absolute measurement is executed.)

When the absolute measurement parameter above is selected, selects the source port specified with the :CALC{1-16}:PAR{1-16}:SPOR on page 419 command.

Query response

{S11|S21|S31|S41|S12|S22|S32|S42|S13|S23|S33|S43|S14|S24|S34|S44|A|B|C|D|R1|R2|R3|R4}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:PAR1:DEF S21"
20   OUTPUT 717;":CALC1:PAR1:DEF?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:PAR{1-16}:SPOR on page 419

Equivalent key

[Meas] - **S11**|**S21**|**S31**|**S41**|**S12**|**S22**|**S32**|**S42**|**S13**|**S23**|**S33**|**S43**|**S14**|**S24**|**S34**|**S44**

[Meas] - **Absolute** - **A(1)**|**A(2)**|**A(3)**|**A(4)**|---|**R4(1)**|**R4(2)**|**R4(3)**|**R4(4)**

:CALC{1-16}:PAR{1-16}:SEL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SELect

Description

Sets trace 1 (:PAR1) to trace 16 (:PAR16) of channel 1 (:CALC1) to channel 16 (:CALC16) to the active trace.

You can set only the displayed trace to the active trace. If you execute this command trying to set a not displayed trace to the active trace, an error occurs and the command is ignored. (No query)

Example of use

```
10   OUTPUT 717;":CALC1:PAR1:SEL"
```

Related commands

:DISP:WIND{1-16}:ACT on page 464

Equivalent key

[Trace Prev] / **[Trace Next]**

:CALC{1-16}:PAR{1-16}:SPOR

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SPORt <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SPORt?

Description

Sets the output port for absolute measurement.

Parameters

	<value>
Description	Output port number
Range	Depends on the number of ports.
Preset value	1
Resolution	1

When setting the output port with this command, specify the measurement parameter for absolute measurement with the :CALC{1-16}:PAR{1-16}:DEF on page 416 command.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:PAR1:DEF B"
20   OUTPUT 717;":CALC1:PAR1:SPOR 4"
30   OUTPUT 717;":CALC1:PAR1:SPOR?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:DEF on page 416

Equivalent key

[Meas] - **Absolute** - **A(1)**~**A(4)** ... **D(1)**~**D(4)** ... **R1(1)**~**R1(4)** ... **R4(1)**~**R4(4)**

:CALC{1-16}:RLIM

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:RLIMit[:STATe] {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:RLIMit[:STATe]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the ripple test function.

Parameters

	Description
ON or 1	Turns ON the ripple test function.
OFF or 0 (preset value)	Turns OFF the ripple test function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:RLIM ON"
20   OUTPUT 717;":CALC1:RLIM?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:RLIM:DATA on page 421

:CALC{1-16}:RLIM:DISP:LINE on page 422

:CALC{1-16}:RLIM:DISP:SEL on page 423

:CALC{1-16}:RLIM:DISP:VAL on page 424

:CALC{1-16}:RLIM:FAIL? on page 425

:CALC{1-16}:RLIM:REP? on page 426

Equivalent key

[Analysis] - Ripple Limit - Ripple Limit Test

:CALC{1-16}:RLIM:DATA

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:RLIMit:DATA <numeric 1>,...,<numeric 1+(N×4)>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:RLIMit:DATA?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the ripple limit table.

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command.

Parameters

	Description
<numeric 1>	The number of ripple limit bands. (0 to 12)
<numeric 1+(n×4)-3>	The type of the n-th ripple limit band. Specify an integer 0 to 1: 0: Off 1: On
<numeric 1+(n×4)-2>	The value on the horizontal axis (frequency/power/time) of the start point of the n-th line.
<numeric 1+(n×4)-1>	The value on the horizontal axis (frequency/power/time) of the end point of the n-th line.
<numeric 1+(n×4)>	The value of maximum ripple (dB) range.

Where N is the number of lines (specified with <numeric 1>) and n is an integer between 1 and N.

If you set the number of lines to 0 (clear the limit table), this command needs only <numeric 1> as the parameter.

Query response

{numeric 1},...,{numeric 1+(N×4)}<newline><^END>

Example of use

```
10   DIM B(1:2,1:4)
20   OUTPUT 717;":CALC1:RLIM:DATA 2,1,1E9,3E9,3,1,5E9,7E9,3"
30   OUTPUT 717;":CALC1:RLIM:DATA?"
40   ENTER 717;A,B(*)
```

```
10   OUTPUT 717;":CALC1:RLIM:DATA 0"  ! Clear Ripple Limit Table
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:RLIM on page 420

Equivalent key

[Analysis] - Ripple Limit - Edit Ripple Limit - Add

:CALC{1-16}:RLIM:DISP:LINE

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:RLIMit:DISPlay:LINE {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:RLIMit:DISPlay:LINE?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the ripple limit line display.

Parameters

	Description
ON or 1	Turns ON the ripple limit line display.
OFF or 0 (preset value)	Turns OFF the ripple limit line display.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:RLIM:DISP:LINE ON"
20   OUTPUT 717;":CALC1:RLIM:DISP:LINE?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:RLIM on page 420

:CALC{1-16}:RLIM:DISP:SEL on page 423

:CALC{1-16}:RLIM:DISP:VAL on page 424

Equivalent key

[Analysis] - Ripple Limit - Ripple Limit

:CALC{1-16}:RLIM:DISP:SEL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:RLIMit:DISPlay:SELect <numeric>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:RLIMit:DISPlay:SELect?

Description

For channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the ripple limit band for ripple value display.

Parameters

	<numeric>
Description	The ripple limit band.
Range	1 to 12
Preset value	1

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:RLIM:DISP:SEL 5"
20   OUTPUT 717;":CALC1:RLIM:DISP:SEL?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418
:CALC{1-16}:RLIM on page 420
:CALC{1-16}:RLIM:DISP:LINE on page 422
:CALC{1-16}:RLIM:DISP:VAL on page 424

Equivalent key

[Analysis] - Ripple Limit - Ripple Band

:CALC{1-16}:RLIM:DISP:VAL

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:RLIMit:DISPlay:VALue {OFF|ABS|MAR}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:RLIMit:DISPlay:VALue?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the display type for the ripple value.

Parameters

	Description
OFF (preset value)	Specifies the display off.
ABS	Specifies the absolute value for display type.
MAR	Specifies the margin for display type.

Query response

{OFF|ABS|MAR}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:RLIM:DISP:VAL ABS"
20   OUTPUT 717;":CALC1:RLIM:DISP:VAL?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:RLIM on page 420

:CALC{1-16}:RLIM:DISP:LINE on page 422

:CALC{1-16}:RLIM:DISP:SEL on page 423

Equivalent key

[Analysis] - **Ripple Limit** - **Ripple Value** - **OFF** | **Absolute** | **Margin**

:CALC{1-16}:RLIM:FAIL?

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:RLIMit:FAIL?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), reads out the ripple test result. (Query only)

Query response

{1|0}<newline><^END>

	Description
1	The ripple test result is FAIL.
0	The ripple test result is PASS.

When the ripple test is set to OFF, 0 is always read out.

Example of use

```
10   OUTPUT 717;":CALC1:RLIM:FAIL?"
20   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:RLIM on page 420

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:RLIM:REP?

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:RLIMit:REPort[:DATA]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), reads out the ripple value of the ripple test.

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command. (Query only)

Query response

{numeric 1},…,{numeric 1+N×3}<newline><^END>

	Description
<numeric 1>	Number of ripple limit line (1 to 12)
<numeric 1+(n×3)-2>	Number of ripple limit bands
<numeric 1+(n×3)-1>	Ripple value
<numeric 1+(n×3)>	Results of ripple test 0: Pass 1: Fail

Where N is the number of lines (specified with <numeric 1>) and n is an integer between 1 and 12.

Example of use

```
10   DIM B(1:2,1:3)
20   OUTPUT 717;":CALC1:RLIM:REP?"
30   ENTER 717;A,B(*)
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:RLIM on page 420

Equivalent key

No equivalent key is available on the front panel.

:CALC{1-16}:SMO

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:SMOothing[:STATe] {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:SMOothing[:STATe]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the smoothing.

Parameters

	Description
ON or 1	Turns ON the smoothing.
OFF or 0 (preset value)	Turns OFF the smoothing.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:SMO:STAT ON"
20   OUTPUT 717;":CALC1:SMO:STAT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:SMO:APER on page 428

Equivalent key

[Avg] - **Smoothing**

:CALC{1-16}:SMO:APER

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:SMOothing:APERture <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:SMOothing:APERture?

Description

Sets the smoothing aperture for channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command).

Parameters

	<numeric>
Description	Percentage relative to the sweep span value
Range	0.05 to 25
Preset value	1.5
Unit	% (percent)
Resolution	1E-14

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:SMO:APER 2.5"
20   OUTPUT 717;":CALC1:SMO:APER?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:CALC{1-16}:SMO on page 427

Equivalent key

[Avg] - Smo Aperture

:CALC{1-16}:TRAN:TIME

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME[:TYPE] {BPASs|LPASs}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME[:TYPE]?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the transformation type used for the transformation function of the time domain function.

Parameters

	Description
BPASs (preset value)	Specifies the band-pass*1.
LPASs	Specifies the low-pass*2.

*1. You do not need to select the stimulus type. Impulse is selected automatically.
*2. You need to select the stimulus type (impulse or step) with the :CALC{1-16}:TRAN:TIME:STIM command.

Query response

{BPAS|LPAS}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:TRAN:TIME LPAS"
20   OUTPUT 717;":CALC1:TRAN:TIME?"
30   ENTER 717;A$
```

Related commands

:CALC{1-16}:TRAN:TIME:STIM on page 437
:CALC{1-16}:TRAN:TIME:STAT on page 435
:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - **Transform** - **Type** - **Bandpass**|**Lowpass Step**|**Lowpass Imp.**

NOTE

When performing this operation from the front panel, you select the stimulus type at the same time.

:CALC{1-16}:TRAN:TIME:CENT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:CENTer <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:CENTer?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the center value used for the transformation function of the time domain function.

Parameters

	<numeric>
Description	Center value
Range	Varies depending on the frequency span and the number of points.
Preset value	0
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:TRAN:TIME:CENT 1E-8"
20   OUTPUT 717;":CALC1:TRAN:TIME:CENT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:TRAN:TIME:SPAN on page 433

:CALC{1-16}:TRAN:TIME:STAT on page 435

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - Transform - Center

:CALC{1-16}:TRAN:TIME:IMP:WIDT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:IMPulse:WIDTh <numeric>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:IMPulse:WIDTh?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the shape of the Kayser Bessel window using the impulse width used for the transformation function of the time domain function.

Parameters

	<numeric>
Description	Impulse width
Range	Varies depending on the frequency span and the transformation type.
Preset value	Varies depending on the frequency span and the transformation type.
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:TRAN:TIME:IMP:WIDT 1E-10"
20   OUTPUT 717;":CALC1:TRAN:TIME:IMP:WIDT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:TRAN:TIME:KBES on page 432
:CALC{1-16}:TRAN:TIME:STEP:RTIM on page 436
:CALC{1-16}:TRAN:TIME:STAT on page 435
:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - **Transform** - **Window** - **User** - **Impulse Width**

:CALC{1-16}:TRAN:TIME:KBES

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:KBESsel <numeric>
:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:KBESsel?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the shape of the Kayser Bessel window using β used for the transformation function of the time domain function.

Parameters

	<numeric>
Description	The value of β.
Range	0 to 13
Preset value	6

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:TRAN:TIME:KBES 3"
20   OUTPUT 717;":CALC1:TRAN:TIME:KBES?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:TRAN:TIME:IMP:WIDT on page 431
:CALC{1-16}:TRAN:TIME:STEP:RTIM on page 436
:CALC{1-16}:TRAN:TIME:STAT on page 435
:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - Transform - Window - User - Kaiser Beta

:CALC{1-16}:TRAN:TIME:LPFR

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:LPFRequency

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), changes the frequency range to match with the low-pass type transformation of the transformation function of the time domain function. (No query)

Related commands

:CALC{1-16}:TRAN:TIME on page 429

:CALC{1-16}:TRAN:TIME:STAT on page 435

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - Transform - Set Freq Low pass

:CALC{1-16}:TRAN:TIME:SPAN

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:SPAN <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:SPAN?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the span value used for the transformation function of the time domain function.

Parameters

	<numeric>
Description	Span value
Range	Varies depending on the frequency span and the number of points.
Preset value	2E-8
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:TRAN:TIME:SPAN 1E-8"
20   OUTPUT 717;":CALC1:TRAN:TIME:SPAN?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:TRAN:TIME:CENT on page 430

:CALC{1-16}:TRAN:TIME:STAT on page 435

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - Transform - Span

:CALC{1-16}:TRAN:TIME:STAR

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:STARt <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:STARt?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the start value used for the transformation function of the time domain function.

Parameters

	<numeric>
Description	Start value
Range	Varies depending on the frequency span and the number of points.
Preset value	-1E-8
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:TRAN:TIME:STAR 0"
20   OUTPUT 717;":CALC1:TRAN:TIME:STAR?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:TRAN:TIME:STOP on page 438

:CALC{1-16}:TRAN:TIME:STAT on page 435

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - **Transform** - **Start**

:CALC{1-16}:TRAN:TIME:STAT

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:STATe {ON|OFF|1|0}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:STATe?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), turns ON/OFF the transformation function of the time domain function.

You can enable the transformation function only when the sweep type is the linear sweep and the number of points is 3 or more. If you execute this command to try to enable the transformation function when the sweep type is other than the linear sweep or the number of points is less than 3, an error occurs and the command is ignored.

When the sweep type is the power sweep, you cannot turn on the transformation function. If you execute this command trying to turn on the transformation function during the power sweep, an error occurs and the command is ignored.

Parameters

	Description
ON or 1	Turns ON the transformation function.
OFF or 0 (preset value)	Turns OFF the transformation function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:TRAN:TIME:STAT ON"
20   OUTPUT 717;":CALC1:TRAN:TIME:STAT?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:SENS{1-16}:SWE:TYPE on page 682

:SENS{1-16}:SWE:POIN on page 679

Equivalent key

[Analysis] - **Transform** - **Transform**

:CALC{1-16}:TRAN:TIME:STEP:RTIM

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:STEP:RTIMe <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:STEP:RTIMe?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), sets the shape of the Kayser Bessel window using the rise time of step signal used for the transformation function of the time domain function.

Parameters

	<numeric>
Description	The rise time of step signal
Range	Varies depending on the frequency span.
Preset value	Varies depending on the frequency span.
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:TRAN:TIME:STEP:RTIM 1E-10"
20   OUTPUT 717;":CALC1:TRAN:TIME:STEP:RTIM?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:TRAN:TIME:IMP:WIDT on page 431

:CALC{1-16}:TRAN:TIME:KBES on page 432

:CALC{1-16}:TRAN:TIME:STAT on page 435

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - Transform - Window - User - Rise Time

:CALC{1-16}:TRAN:TIME:STIM

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:STIMulus {IMPulse|STEP}

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:STIMulus?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the stimulus type used for the transformation function of the time domain function.

Parameters

	Description
IMPulse (preset value)	Specifies the impulse*1.
STEP	Specifies the step*2.

*1. You need to select the transformation type (band-pass or low-pass) with the :CALC{1-16}:TRAN:TIME command.

*2. You do not need to select the transformation type. Low-pass is selected automatically.

Query response

{IMP|STEP}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:TRAN:TIME LPAS"
20   OUTPUT 717;":CALC1:TRAN:TIME:STIM STEP"
30   OUTPUT 717;":CALC1:TRAN:TIME:STIM?"
40   ENTER 717;A$
```

Related commands

:CALC{1-16}:TRAN:TIME on page 429

:CALC{1-16}:TRAN:TIME:STAT on page 435

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - Transform - Type - Bandpass|Lowpass Step|Lowpass Imp.

NOTE

When performing this operation from the front panel, you select the transformation type at the same time.

:CALC{1-16}:TRAN:TIME:STOP

Syntax

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:STOP <numeric>

:CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:SELected]:TRANsform:TIME:STOP?

Description

For the active trace of channel 1 (:CALC1) to channel 16 (:CALC16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command), selects the stop value used for the transformation function of the time domain function.

Parameters

	<numeric>
Description	Stop value
Range	Varies depending on the frequency span and the number of points.
Preset value	1E-8
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CALC1:TRAN:TIME:STOP 2E-8"
20   OUTPUT 717;":CALC1:TRAN:TIME:STOP?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:TRAN:TIME:STAR on page 434

:CALC{1-16}:TRAN:TIME:STAT on page 435

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - **Transform** - **Stop**

:CONT:HAND:A

Syntax :CONTrol:HANDler:A[:DATA] <numeric>

Description Outputs data to output port A (A0 to A7) of the handler I/O. Data is outputted as 8-bit binary using A0 as LSB and A7 as MSB. (No query)

For details about the handler I/O, see Chapter 10.

Parameters

	<numeric>
Description	Output data
Range	0 to 255
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Example of use

```
10   OUTPUT 717;":CONT:HAND:A 15"
```

Equivalent key No equivalent key is available on the front panel.

:CONT:HAND:B

Syntax :CONTrol:HANDler:B[:DATA] <numeric>

Description Outputs data to output port B (B0 to B7) of the handler I/O. Data is outputted as 8-bit binary using B0 as LSB and B7 as MSB. (No query)

For details about the handler I/O, see Chapter 10.

Parameters

	<numeric>
Description	Output data
Range	0 to 255
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Example of use

```
10   OUTPUT 717;":CONT:HAND:B 15"
```

Equivalent key No equivalent key is available on the front panel.

:CONT:HAND:C

Syntax

:CONTrol:HANDler:C[:DATA] <numeric>

:CONTrol:HANDler:C[:DATA]?

Description

When input/output port C of the handler I/O is set to the output port, outputs data to output port C (C0 to C3).

When input/output port C is set to the input port, reads out data inputted to port C (C0 to C3).

Data is outputted as 4-bit binary using C0 as LSB and C3 as MSB.

For details about the handler I/O, see Chapter 10.

Parameters

	<numeric>
Description	Output data/input data
Range	0 to 15
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CONT:HAND:C:MODE OUTP"
20   OUTPUT 717;":CONT:HAND:C 15"
```

```
10   OUTPUT 717;":CONT:HAND:C:MODE INP"
20   OUTPUT 717;":CONT:HAND:C?"
30   ENTER 717;A
```

Related commands

:CONT:HAND:C:MODE on page 441

Equivalent key

No equivalent key is available on the front panel.

:CONT:HAND:C:MODE

Syntax

:CONTrol:HANDler:C:MODE {INPut|OUTPut}

:CONTrol:HANDler:C:MODE?

Description

Sets the input/output direction of port C of the handler I/O.

For details about the handler I/O, see Chapter 10.

Parameters

	Description
INPut (preset value)	Specifies input.
OUTPut	Specifies output.

Query response

{INP|OUTP}<newline><^END>

Example of use

```
10   OUTPUT 717;":CONT:HAND:C:MODE OUTP"
20   OUTPUT 717;":CONT:HAND:C:MODE?"
30   ENTER 717;A$
```

Related commands

:CONT:HAND:C on page 440

Equivalent key

No equivalent key is available on the front panel.

:CONT:HAND:D

Syntax

:CONTrol:HANDler:D[:DATA] <numeric>

:CONTrol:HANDler:D[:DATA]?

Description

When input/output port D of the handler I/O is set to the output port, outputs data to output port D (D0 to D3).

When input/output port D is set to the input port, reads out data inputted to port D (D0 to D3).

Data is outputted as 4-bit binary using D0 as LSB and D3 as MSB.

For details about the handler I/O, see Chapter 10.

Parameters

	<numeric>
Description	Output data/input data
Range	0 to 15
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CONT:HAND:D:MODE OUTP"
20   OUTPUT 717;":CONT:HAND:D 15"
```

```
10   OUTPUT 717;":CONT:HAND:D:MODE INP"
20   OUTPUT 717;":CONT:HAND:D?"
30   ENTER 717;A
```

Related commands

:CONT:HAND:D:MODE on page 443

Equivalent key

No equivalent key is available on the front panel.

:CONT:HAND:D:MODE

Syntax

:CONTrol:HANDler:C:MODE {INPut|OUTPut}

:CONTrol:HANDler:C:MODE?

Description

Sets the input/output direction of port D of the handler I/O.

For details about the handler I/O, see Chapter 10.

Parameters

	Description
INPut (preset value)	Specifies input.
OUTPut	Specifies output.

Query response

{INP|OUTP}<newline><^END>

Example of use

```
10   OUTPUT 717;":CONT:HAND:D:MODE OUTP"
20   OUTPUT 717;":CONT:HAND:D:MODE?"
30   ENTER 717;A$
```

Related commands

:CONT:HAND:D on page 442

Equivalent key

No equivalent key is available on the front panel.

:CONT:HAND:E

Syntax

:CONTrol:HANDler:E[:DATA] <numeric>

:CONTrol:HANDler:E[:DATA]?

Description

When input/output port E (port C + port D) of the handler I/O is set to the output port, outputs data to output port E.

When input/output port E is set to the input port, reads out data inputted to port E.

Data is outputted as 8-bit binary using C0 as LSB and D3 as MSB.

For details about the handler I/O, see Chapter 10.

Parameters

	<numeric>
Description	Output data/input data
Range	0 to 255
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":CONT:HAND:C:MODE OUTP"
20   OUTPUT 717;":CONT:HAND:D:MODE OUTP"
30   OUTPUT 717;":CONT:HAND:E 128"
```

```
10   OUTPUT 717;":CONT:HAND:C:MODE INP"
20   OUTPUT 717;":CONT:HAND:D:MODE INP"
30   OUTPUT 717;":CONT:HAND:E?"
40   ENTER 717;A
```

Related commands

:CONT:HAND:C:MODE on page 441

:CONT:HAND:D:MODE on page 443

:CONT:HAND:C on page 440

:CONT:HAND:D on page 442

Equivalent key

No equivalent key is available on the front panel.

:CONT:HAND:F

Syntax

:CONTrol:HANDler:F[:DATA] <numeric>

Description

Outputs data to output port F (port A + port B) of the handler I/O. Data is outputted as 16-bit binary using A0 as LSB and B7 as MSB. (No query)

For details about the handler I/O, see Chapter 10.

Parameters

	<numeric>
Description	Output data
Range	0 to 65535
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Example of use

```
10   OUTPUT 717;":CONT:HAND:F 511"
```

Related commands

:CONT:HAND:A on page 439

:CONT:HAND:B on page 439

Equivalent key

No equivalent key is available on the front panel.

:CONT:HAND:IND:STAT

Syntax

:CONTrol:HANDler[:EXTension]:INDex:STATe {ON|OFF|1|0}

:CONTrol:HANDler[:EXTension]:INDex:STATe?

Description

Turns ON/OFF outputting the INDEX signal to B6 of the handler I/O.

For details about the handler I/O, see Chapter 10.

Parameters

	Description
ON or 1	Turns ON the INDEX signal output.
OFF or 0 (preset value)	Turns OFF the INDEX signal output.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CONT:HAND:IND:STAT ON"
20   OUTPUT 717;":CONT:HAND:IND:STAT?"
30   ENTER 717;A
```

Related commands

:CONT:HAND:RTR:STAT on page 447

Equivalent key

No equivalent key is available on the front panel.

:CONT:HAND:OUTP{1-2}

Syntax

:CONTrol:HANDler:OUTPut{[1]|2}[:DATA] {1|0}

:CONTrol:HANDler:OUTPut{[1]|2}[:DATA]?

Description

Sets HIGH/LOW of OUTPUT1 (:OUTP1) or OUTPUT2 (:OUTP2) of the handler I/O.

For details about the handler I/O, see Chapter 10.

Parameters

	Description
1	Specifies LOW.
0	Specifies HIGH.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CONT:HAND:OUTP1 1"
20   OUTPUT 717;":CONT:HAND:OUTP1?"
30   ENTER 717;A
```

Equivalent key

No equivalent key is available on the front panel.

:CONT:HAND:RTR:STAT

Syntax

:CONTrol:HANDler[:EXTension]:RTRigger:STATe {ON|OFF|1|0}

:CONTrol:HANDler[:EXTension]:RTRigger:STATe?

Description

Turns ON/OFF outputting the READY FOR TRIGGER signal to B7 of the handler I/O.

For details about the handler I/O, see Chapter 10.

Parameters

	Description
ON or 1	Turns ON the READY FOR TRIGGER signal output.
OFF or 0 (preset value)	Turns OFF the READY FOR TRIGGER signal output.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":CONT:HAND:RTR:STAT ON"
20   OUTPUT 717;":CONT:HAND:RTR:STAT?"
30   ENTER 717;A
```

Related commands

:CONT:HAND:IND:STAT on page 446

Equivalent key

No equivalent key is available on the front panel.

:DISP:ANN:FREQ

Syntax

:DISPlay:ANNotation:FREQuency[:STATe] {ON|OFF|1|0}

:DISPlay:ANNotation:FREQuency[:STATe]?

Description

Turns ON/OFF the frequency display on the LCD display.

Parameters

	Description
ON or 1 (preset value)	Turns ON the frequency display.
OFF or 0	Turns OFF the frequency display.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:ANN:FREQ OFF"
20   OUTPUT 717;":DISP:ANN:FREQ?"
30   ENTER 717;A
```

Equivalent key

[Display] - Frequency

:DISP:CCL

Syntax

:DISPlay:CCLear

Description

Clears the error message display on the instrument status bar (at the bottom of the LCD display). (No query)

Example of use

```
10   OUTPUT 717;":DISP:CCL"
```

Equivalent key

All front panel keys.

:DISP:CLOC

Syntax

:DISPlay:CLOCk {ON|OFF|1|0}

:DISPlay:CLOCk?

Description

Turns ON/OFF the clock display at the right edge of the instrument status bar (at the bottom of the LCD display).

Parameters

	Description
ON or 1 (preset value)	Turns ON the clock display.
OFF or 0	Turns OFF the clock display.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:CLOC OFF"
20   OUTPUT 717;":DISP:CLOC?"
30   ENTER 717;A
```

Equivalent key

[System] - Misc Setup - Clock Setup - Show Clock

:DISP:COL{1-2}:BACK

Syntax

:DISPlay:COLor{[1]|2}:BACK <numeric 1>,<numeric 2>,<numeric 3>

:DISPlay:COLor{[1]|2}:BACK?

Description

Sets the background color for normal display (:COL1) and inverted display (:COL2).

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Amount of red	Amount of green	Amount of blue
Range	0 to 5	0 to 5	0 to 5
Resolution	1	1	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric 1},{numeric 2},{numeric 3}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:COL:BACK 1,2,3"
20   OUTPUT 717;":DISP:COL:BACK?"
30   ENTER 717;A,B,C
```

Related commands

:DISP:COL{1-2}:RES on page 452

Equivalent key

[System] - Misc Setup - Color Setup - Normal|Invert - Background

:DISP:COL{1-2}:GRAT{1-2}

Syntax

:DISPlay:COLor{[1]|2}:GRATicule{[1]|2} <numeric 1>,<numeric 2>,<numeric 3>

:DISPlay:COLor{[1]|2}:GRATicule{[1]|2}?

Description

Sets the color of the graticule label and the outer frame line of the graph (:GRAT1) and the color of the grid line of the graph (:GRAT2) for normal display (:COL1) and inverted display (:COL2).

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Amount of red	Amount of green	Amount of blue
Range	0 to 5	0 to 5	0 to 5
Resolution	1	1	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric 1},{numeric 2},{numeric 3}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:COL1:GRAT1 1,2,3"
20   OUTPUT 717;":DISP:COL1:GRAT1?"
30   ENTER 717;A,B,C
```

Related commands

:DISP:COL{1-2}:RES on page 452

Equivalent key

[System] - Misc Setup - Color Setup - Normal|Invert - Graticule Main|Graticule Sub

:DISP:COL{1-2}:LIM{1-2}

Syntax

:DISPlay:COLor{[1]|2}:LIMit{[1]|2} <numeric 1>,<numeric 2>,<numeric 3>

:DISPlay:COLor{[1]|2}:LIMit{[1]|2}?

Description

Sets the fail display color used for the limit test result, bandwidth test result, and ripple test result (:LIM1) and the color of the limit line (:LIM2) for normal display (:COL1) and inverted display (:COL2).

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Amount of red	Amount of green	Amount of blue
Range	0 to 5	0 to 5	0 to 5
Resolution	1	1	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric 1},{numeric 2},{numeric 3}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:COL1:LIM1 1,2,3"
20   OUTPUT 717;":DISP:COL1:LIM1?"
30   ENTER 717;A,B,C
```

Related commands

:DISP:COL{1-2}:RES on page 452

Equivalent key

[System] - Misc Setup - Color Setup - Normal|Invert - Limit Fail|Limit Line

:DISP:COL{1-2}:RES

Syntax

:DISPlay:COLor{[1]|2}:RESet

Description

Resets the display color settings for all the items to the factory preset state for normal display (:COL1) and inverted display (:COL2). (No query)

Example of use

```
10   OUTPUT 717;":DISP:COL1:RES"
```

Related commands

:DISP:COL{1-2}:BACK on page 450

:DISP:COL{1-2}:GRAT{1-2} on page 451

:DISP:COL{1-2}:LIM{1-2} on page 452

:DISP:COL{1-2}:BACK on page 450

:DISP:COL{1-2}:BACK on page 450

Equivalent key

[System] - Misc Setup - Color Setup - Normal|Invert - Reset Color - OK

:DISP:COL{1-2}:TRAC{1-16}:DATA

Syntax

:DISPlay:COLor{[1]|2}:TRAC{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:DATA <numeric 1>,<numeric 2>,<numeric 3>
:DISPlay:COLor{[1]|2}:TRAC{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:DATA?

Description

Sets the color of the data trace of trace 1 (:TRAC1) to trace 16 (:TRAC16) for normal display (:COL1) and inverted display (:COL2).

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Amount of red	Amount of green	Amount of blue
Range	0 to 5	0 to 5	0 to 5
Resolution	1	1	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric 1},{numeric 2},{numeric 3}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:COL1:TRAC1:DATA 1,2,3"
20   OUTPUT 717;":DISP:COL1:TRAC1:DATA?"
30   ENTER 717;A,B,C
```

Related commands

:DISP:COL{1-2}:RES on page 452

Equivalent key

[System] - Misc Setup - Color Setup - Normal|Invert - Data Trace 1|Data Trace 2|Data Trace 3|Data Trace 4|Data Trace 5|Data Trace 6|Data Trace 7|Data Trace 8|Data Trace 9

:DISP:COL{1-2}:TRAC{1-16}:MEM

Syntax

:DISPlay:COLor{[1]|2}:TRAC{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MEMory <numeric 1>,<numeric 2>,<numeric 3>
:DISPlay:COLor{[1]|2}:TRAC{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MEMory?

Description

Sets the color of the memory trace of trace 1 (:TRAC1) to trace 16 (:TRAC16) for normal display (:COL1) and inverted display (:COL2).

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Amount of red	Amount of green	Amount of blue
Range	0 to 5	0 to 5	0 to 5
Resolution	1	1	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric 1},{numeric 2},{numeric 3}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:COL1:TRAC1:MEM 1,2,3"
20   OUTPUT 717;":DISP:COL1:TRAC1:MEM?"
30   ENTER 717;A,B,C
```

Related commands

:DISP:COL{1-2}:RES on page 452

Equivalent key

[System] - Misc Setup - Color Setup - Normal|Invert - Mem Trace 1|Mem Trace 2|Mem Trace 3|Mem Trace 4|Mem Trace 5|Mem Trace 6|Mem Trace 7|Mem Trace 8|Mem Trace 9

:DISP:ECHO

Syntax :DISPlay:ECHO[:DATA] <string>

Description Displays a character string in the echo window. (No query)

Parameters

	<string>
Description	Character string you want to display
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":DISP:ECHO ""TEST RESULT"""
```

Related commands

:DISP:ECHO:CLE on page 455
:DISP:TABL on page 462
:DISP:TABL:TYPE on page 463

Equivalent key No equivalent key is available on the front panel.

:DISP:ECHO:CLE

Syntax :DISPlay:ECHO:CLEar

Description Clears all character strings displayed in the echo window. (No query)

Example of use

```
10   OUTPUT 717;":DISP:ECHO:CLE"
```

Related commands

:DISP:ECHO on page 455

Equivalent key **[Macro Setup] - Clear Echo**

:DISP:ENAB

Syntax

:DISPlay:ENABle {ON|OFF|1|0}

:DISPlay:ENABle?

Description

Turns ON/OFF the update of the LCD display.

When the update of the LCD display is OFF, You can update the LCD display once using :DISP:UPD command.

Parameters

	Description
ON or 1 (preset value)	Turns ON the update.
OFF or 0	Turns OFF the update.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:ENAB OFF"
20   OUTPUT 717;":DISP:ENAB?"
30   ENTER 717;A
```

Related commands

:DISP:UPD on page 464

Equivalent key

[Display] - Update

:DISP:FSIG

Syntax

:DISPlay:FSIGn {ON|OFF|1|0}

:DISPlay:FSIGn?

Description

Turns on or off the Fail display when the limit test or bandwidth test or ripple test fails.

Parameters

	Description
ON or 1 (preset value)	Turns on the Fail display.
OFF or 0	Turns off the Fail display.

On/off of the Fail display cannot be set at each test. When the Fail display of either of test is turned on, the Fail display of other tests turns on, too.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:FSIG OFF"
20   OUTPUT 717;":DISP:FSIG?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:LIM on page 377

:CALC{1-16}:RLIM on page 420

:CALC{1-16}:BLIM on page 293

Equivalent key

[Analysis] - **Limit Test** - **Fail Sign**

[Analysis] - **Ripple Limit** - **Fail Sign**

[Analysis] - **Bandwidth Limit** - **Fail Sign**

:DISP:IMAG

Syntax

:DISPlay:IMAGe {NORMal|INVert}

:DISPlay:IMAGe?

Description

Selects the display type of the LCD display.

Parameters

	Description
NORMal (preset value)	Specifies the normal display (background color: black).
INVert	Specifies the display in which the color of the normal display is inverted (background color: white).

Query response

{NORM|INV}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:IMAG INV"
20   OUTPUT 717;":DISP:IMAG?"
30   ENTER 717;A$
```

Equivalent key

[Display] - Invert Color

:DISP:MAX

Syntax

:DISPlay:MAXimize {ON|OFF|1|0}

:DISPlay:MAXimize?

Description

Turns ON/OFF the window maximization of the active channel (specified with the :DISP:WIND{1-16}:ACT command).

If you turned ON the maximization, only the window of the active channel is maximized on the LCD display and the windows of the other channels are not displayed.

Parameters

	Description
ON or 1	Turns ON the maximization.
OFF or 0 (preset value)	Turns OFF the maximization.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:MAX ON"
20   OUTPUT 717;":DISP:MAX?"
30   ENTER 717;A
```

Related commands

:DISP:WIND{1-16}:ACT on page 464

Equivalent key

[Channel Max]

:DISP:SKEY

Syntax

:DISPlay:SKEY[:STATe] {ON|OFF|1|0}

:DISPlay:SKEY[:STATe]?

Description

Turns ON/OFF the display of the softkey labels.

Parameters

	Description
ON or 1 (preset value)	Specifies ON.
OFF or 0	Specifies OFF.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:MAX ON"
20   OUTPUT 717;":DISP:MAX?"
30   ENTER 717;A
```

Equivalent key

[Entry Off] (**[Softkey On/Off]**)

:DISP:SPL

Syntax

:DISPlay:SPLit {D1|D12|D1_2|D112|D1_1_2|D123|D1_2_3|D12_33|D11_23|D13_23|D12_13|D1234|D1_2_3_4|D12_34|D123_456|D12_34_56|D1234_5678|D12_34_56_78|D123_456_789|D123__ABC|D1234__9ABC|D1234__DEFG}

:DISPlay:SPLit?

Description

Sets the layout of the windows on the LCD display. For details about the window layout, refer to Figure 3-1 on page 58.

Parameters

	Description
D1 (preset value)	Specifies the layout in which the window for channel 1 only is displayed on the entire display.
D12	Specifies the layout in which the window for channel 1 is displayed on the left side of the display area and the window for channel 2 on the right side.
D1_2	Specifies the layout in which the window for channel 1 is displayed in the upper part and the window for channel 2 in the lower part.
D112	Specifies the layout in which the window for channel 1 is displayed on the left side of 2/3 and the window for channel 2 on the right side of 1/3.
D1_1_2	Specifies the layout in which the window for channel 1 is displayed in the upper part of 2/3 and the window for channel 2 in the lower part of 1/3.
D123	Specifies the layout in which the windows for channel 1, 2, and 3 are displayed in the left side, middle part, and right side, respectively.
D1_2_3	Specifies the layout in which the windows for channel 1, 2, and 3 are displayed in the upper part, middle part, and the lower part, respectively.
D12_33	Specifies the layout in which the windows for channel 1, 2, and 3 are displayed in the upper left, upper right, and lower part, respectively.
D11_23	Specifies the layout in which the windows for channel 1, 2, and 3 are displayed in the upper part, lower left, and lower right, respectively.
D13_23	Specifies the layout in which the windows for channel 1, 2, and 3 are displayed in the upper left, lower left, and right side, respectively.
D12_13	Specifies the layout in which the windows for channel 1, 2, and 3 are displayed in the left side, upper right, and lower right, respectively.
D1234	Specifies the layout in which the windows for channel 1, 2, 3 and 4 are displayed by splitting the screen horizontally into four equal parts.
D1_2_3_4	Specifies the layout in which the windows for channel 1, 2, 3 and 4 are displayed by splitting the screen vertically into four equal parts.
D12_34	Specifies the layout in which the windows for channel 1, 2, 3, and 4 are displayed in the upper left, upper right, lower left, and lower right, respectively.
D123_456	Specifies the layout in which the windows for channel 1, 2, 3, 4, 5 and 6 are displayed in the upper left, upper middle, upper right, lower left, lower middle, and lower right, respectively.
D12_34_56	Specifies the layout in which the windows for channel 1, 2, 3, 4, 5 and 6 are displayed in the upper left, upper right, middle left, middle right, lower left, and lower right, respectively.
D1234_5678	Specifies the layout in which the windows for channel 1, 2, 3 and 4 are displayed in the upper part and the windows for channel 5, 6, 7 and 8 are displayed in the lower part of the window.
D12_34_56_78	Specifies the layout in which the windows for channel 1, 3, 5 and 7 are displayed on the left side and the windows for channel 2, 4, 6 and 8 are displayed on the right side of the window.

	Description
D123_456_789	Specifies the layout in which the windows for channel 1, 2, 3, 4, 5, 6, 7, 8 and 9 are displayed in the left, middle, and right of the upper part of the window, in the left, middle, and right of the middle part, and in the left, middle, and right of the lower part, respectively.
D123__ABC	Specifies the window layout as follows: windows for channels 1, 4, 7, and 10 from the top of the 1st column, windows for channels 2, 5, 8, and 11 from the top of the 2nd column, and windows for channels 3, 6, 9, and 12 from the top of the 3rd column.
D1234__9ABC	Specifies the window layout as follows: windows for channels 1, 2, 3, and 4 from the left of the upper part, windows for channels 5, 6, 7, and 8 from the left of the middle part, and the windows for channels 9, 10, 11, and 12 from the left of the lower part.
D1234__DEFG	Specifies the window layout as follows: windows for channels 1, 5, 9, and 13 from the top of the 1st column, windows for channels 2, 6, 10, and 14 from the top of the 2nd column, windows for channels 3, 7, 11, and 15 from the top of the 3rd column, and windows for channels 4, 8, 12, and 16 from the top of the 4th column.

Query response

{D1|D12|D1_2|D112|D1_1_2|D123|D1_2_3|D12_33|D11_23|D13_23|D12_13|D1234|D1_2_3_4|D12_34|D123_456|D12_34_56|D1234_5678|D12_34_56_78|D123_456_789|D123__ABC|D1234__9ABC|D1234__DEFG}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:SPL D1_2"
20   OUTPUT 717;":DISP:SPL?"
30   ENTER 717;A$
```

Related commands

:DISP:WIND{1-16}:SPL on page 469

Equivalent key

[Display] - Allocate Channels

:DISP:TABL

Syntax

:DISPlay:TABLe[:STATe] {ON|OFF|1|0}

:DISPlay:TABLe[:STATe]?

Description

Turns ON/OFF the display of the window selected with the :DISP:TABL:TYPE command.

Parameters

	Description
ON or 1	Turns ON the display.
OFF or 0 (preset value)	Turns OFF the display.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:TABL ON"
20   OUTPUT 717;":DISP:TABL?"
30   ENTER 717;A
```

Related commands

:DISP:TABL:TYPE on page 463

Equivalent key

[Sweep Setup] - **Edit Segment Table**

[Marker] - **Marker Table**

[Analysis] - **Limit Test** - **Edit Limit Line**

[Analysis] - **Ripple Limit** - **Edit Ripple Limit**

[Macro Setup] - **Echo Window**

[Cal] - **Power Calibration** - **Loss Compen**

[Cal] - **Power Calibration** - **Sensor A Settings**|**Sensor B Settings**

NOTE

When performing the operation from the front panel, you select the window and turn ON/OFF the display at the same time.

:DISP:TABL:TYPE

Syntax

:DISPlay:TABLe:TYPE {MARKer|LIMit|SEGMent|ECHO|PLOSs|SCFactor|RLIMit}

:DISPlay:TABLe:TYPE?

Description

Selects the window whose display is turned ON/OFF with the :DISP:TABL command.

Parameters

	Description
MARKer (preset value)	Specifies the marker table window.
LIMit	Specifies the limit test table window.
SEGMent	Specifies the segment table window.
ECHO	Specifies the echo window.
PLOSs	Specifies the loss compensation table window.
SCFactor	Specifies the power sensor's calibration factor table window.
RLIMit	Specifies the ripple test table window.

Query response

{MARK|LIM|SEGM|ECHO|PLOS|SCF|RLIM}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:TABL:TYPE SEGM"
20   OUTPUT 717;":DISP:TABL:TYPE?"
30   ENTER 717;A$
```

Related commands

:DISP:TABL on page 462

Equivalent key

[Sweep Setup] - **Edit Segment Table**

[Marker] - **Marker Table**

[Analysis] - **Limit Test** - **Edit Limit Line**

[Macro Setup] - **Echo Window**

[Cal] - **Power Calibration** - **Loss Compen**

[Cal] - **Power Calibration** - **Sensor A Settings|Sensor B Settings**

[Analysis] - **Ripple Limit** - **Edit Ripple Limit**

NOTE

When performing the operation from the front panel, you select the window and turn ON/OFF the display at the same time.

:DISP:UPD

Syntax :DISPlay:UPDate[:IMMediate]

Description Updates the LCD display once when the update of the LCD display is OFF (OFF is specified with the :DISP:ENAB command). (No query)

Example of use
```
10   OUTPUT 717;":DISP:UPD"
```

Related commands :DISP:ENAB on page 456

Equivalent key No equivalent key is available on the front panel.

:DISP:WIND{1-16}:ACT

Syntax :DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ACTivate

Description Sets one of channel 1 (:WIND1) to channel 16 (:WIND16) to the active channel.

You can set only the displayed channel to the active channel. If you execute this command trying to set a not displayed channel to the active channel, an error occurs and the command is ignored. (No query)

Example of use
```
10   OUTPUT 717;":DISP:WIND1:ACT"
```

Related commands :CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key **[Channel Prev]** / **[Channel Next]**

:DISP:WIND{1-16}:ANN:MARK:ALIG

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ANNotation:MARKer:ALIGn[:STATe] {ON|OFF|1|0}

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ANNotation:MARKer:ALIGn[:STATe]?

Description

For channel 1 (:WIND1) to channel 16 (:WIND16), turn ON/OFF the mode that align the marker display position of each trace based on trace 1.

Parameters

	Description
ON or 1 (preset value)	Turns ON the mode that allign marker display position based on trace 1.
OFF or 0	Turns OFF the alignment.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:ANN:MARK:ALIG OFF"
20   OUTPUT 717;":DISP:WIND1:ANN:MARK:ALIG?"
30   ENTER 717;A
```

Related commands

:DISP:WIND{1-16}:ANN:MARK:SING on page 466

:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:X on page 472

:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:Y on page 473

Equivalent key

[Marker Fctn] - **Annotation Options** - **Align**

:DISP:WIND{1-16}:ANN:MARK:SING

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ANNotation:MARKer:SINGle[:STATe] {ON|OFF|1|0}

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ANNotation:MARKer:SINGle[:STATe]?

Description

For channel 1 (:WIND1) to channel 16 (:Wind16), turns ON/OFF the display of the marker value of only active traces.

If you turn off the function, marker values of all traces (markers) will be displayed.

Parameters

	Description
ON or 1 (preset value)	Displays the marker values of only active traces.(ON)
OFF or 0	Displays the marker values of all traces. (OFF)

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:ANN:MARK:SING OFF"
20   OUTPUT 717;":DISP:WIND1:ANN:MARK:SING?"
30   ENTER 717;A
```

Related commands

:DISP:WIND{1-16}:ANN:MARK:ALIG on page 465

:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:X on page 472

:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:Y on page 473

Equivalent key

[Marker Fctn] - **Annotation Options** - **Active Only**

:DISP:WIND{1-16}:LAB

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:LABel {ON|OFF|1|0}

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:LABel?

Description

Turns ON/OFF the display of the graticule label of channel 1 (:WIND1) to channel 16 (:WIND16).

Parameters

	Description
ON or 1 (preset value)	Turns ON the graticule label display.
OFF or 0	Turns OFF the graticule label display.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:LAB ON"
20   OUTPUT 717;":DISP:WIND1:LAB?"
30   ENTER 717;A
```

Equivalent key

[Display] - Graticule Label

:DISP:WIND{1-16}:MAX

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MAXimize {ON|OFF|1|0}

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MAXimize?

Description

Turns ON/OFF the maximization of the active trace of channel 1 (:WIND1) to channel 16 (:WIND16) (specified with the :CALC{1-16}:PAR{1-16}:SEL command).

If you turned ON the maximization, only the maximized active trace is displayed in the window and the other traces are not displayed.

Parameters

	Description
ON or 1	Turns ON the maximization.
OFF or 0 (preset value)	Turns OFF the maximization.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:MAX ON"
20   OUTPUT 717;":DISP:WIND1:MAX?"
30   ENTER 717;A
```

Related commands

:CALC{1-16}:PAR{1-16}:SEL on page 418

:DISP:MAX on page 459

Equivalent key

[Trace Max]

:DISP:WIND{1-16}:SPL

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SPLit {D1|D12|D1_2|D112|D1_1_2|D123|D1_2_3|D12_33|D11_23|D13_23|D12_13|D1234|D1_2_3_4|D12_34|D123_456|D12_34_56|D1234_5678|D12_34_56_78|D123_456_789|D123__ABC|D1234__9ABC|D1234__DEFG}

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SPLit?

Description

Sets the graph layout of channel 1 (:WIND1) to channel 16 (:WIND16). For details about the graph layout, refer to Figure 3-1 on page 58.

Parameters

	Description
D1 (preset value)	Specifies the layout in which one graph is displayed in the entire window.
D12	Specifies the layout in which 2 graphs in total are displayed on the left side and right side of the window.
D1_2	Specifies the layout in which 2 graphs in total are displayed in the upper part and lower part of the window.
D112	Specifies the layout in which 2 graphs in total are displayed on the left side of 2/3 and right side of 1/3 of the window.
D1_1_2	Specifies the layout in which 2 graphs in total are displayed in the upper part of 2/3 and lower part of 1/3 of the window.
D123	Specifies the layout in which 3 graphs in total are displayed on the left side, middle part, and right side of the window.
D1_2_3	Specifies the layout in which 3 graphs in total are displayed in the upper part, middle part, and lower part of the window.
D12_33	Specifies the layout in which 3 graphs in total are displayed in the upper left, upper right, and lower part of the window.
D11_23	Specifies the layout in which 3 graphs in total are displayed in the upper part, lower left, and lower right of the window.
D13_23	Specifies the layout in which 3 graphs in total are displayed in the upper left, lower left, and right side of the window.
D12_13	Specifies the layout in which 3 graphs in total are displayed in the left side, upper right, and lower right of the window.
D1234	Specifies the layout in which 4 graphs in total are displayed by splitting the window horizontally into four equal parts.
D1_2_3_4	Specifies the layout in which 4 graphs in total are displayed by splitting the window vertically into four equal parts.
D12_34	Specifies the layout in which 4 graphs in total are displayed in the upper left, upper right, lower left, and lower right of the window.
D123_456	Specifies the layout in which 6 graphs in total are displayed in the upper left, upper middle, upper right, lower left, lower middle, and lower right of the window.
D12_34_56	Specifies the layout in which 6 graphs in total are displayed in the upper left, upper right, middle left, middle right, lower left, and lower right of the window.
D1234_5678	Specifies the layout in which 8 graphs in total (4 in the upper part and 4 in the lower part of the window) are displayed.
D12_34_56_78	Specifies the layout in which 8 graphs in total (4 on the left side and 4 on the right side of the window) are displayed.
D123_456_789	Specifies the layout in which 9 graphs in total (in the left, middle, and right of the upper part of the window, in the left, middle, and right of the middle part, and in the left, middle, and right of the lower part) are displayed.

	Description
D123__ABC	Specifies the layout in which 12 graphs in total are displayed: 4 graphs in the 1st column, 4 in the 2nd column, and 4 in the 3rd column from the left of the window.
D1234__9ABC	Specifies the layout in which 12 graphs in total (4 in the upper part, 4 in the middle part, and 4 in the lower part of the window) are displayed.
D1234__DEFG	Specifies the layout in which 16 graphs in total are displayed: 4 graphs in the 1st column, 4 in the 2nd column, 4 in the 3rd column, and 4 in the 4th column from the left of the window.

Query response

{D1|D12|D1_2|D112|D1_1_2|D123|D1_2_3|D12_33|D11_23|D13_23|D12_13|D1234|D1_2_3_4|D12_34|D123_456|D12_34_56|D1234_5678|D12_34_56_78|D123_456_789|D123__ABC|D1234__9ABC|D1234__DEFG}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND:SPL D1_2"
20   OUTPUT 717;":DISP:WIND:SPL?"
30   ENTER 717;A$
```

Related commands

:DISP:SPL on page 460

Equivalent key

[Display] - Allocate Traces

:DISP:WIND{1-16}:TITL

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TITLe[:STATe] {ON|OFF|1|0}

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TITLe[:STATe]?

Description

Turns ON/OFF the display of the title label of channel 1 (:WIND1) to channel 16 (:WIND16) in the title area.

Parameters

	Description
ON or 1	Turns ON the title label display.
OFF or 0 (preset value)	Turns OFF the title label display.

Query response

```
10   OUTPUT 717;":DISP:WIND1:TITL ON"
20   OUTPUT 717;":DISP:WIND1:TITL?"
30   ENTER 717;A
```

Related commands

:DISP:WIND{1-16}:TITL:DATA on page 471

Equivalent key

[Display] - Title Label

:DISP:WIND{1-16}:TITL:DATA

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TITLe:DATA <string>

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TITLe:DATA?

Description

Sets the title label displayed in the title area of channel 1 (:WIND1) to channel 16 (:WIND16).

Parameters

	<string>
Description	Title label
Range	254 characters or less
Preset value	""

Query response

{string}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:TITL:DATA ""Title"""
20   OUTPUT 717;":DISP:WIND1:TITL?"
30   ENTER 717;A$
```

Related commands

:DISP:WIND{1-16}:TITL on page 470

Equivalent key

[Display] - Edit Title Label

:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:X

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ANNotation:MARKer:POSition:X <numeric>

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ANNotation:MARKer:POSition:X?

Description

For trace 1 (:TRAC1) to trace 16 (:TRAC16) of channel 1 (:WIND1) to channel 16 (:WIND16), sets the display position of the marker value on the X-axis by a percentage of the width of the display span.

Parameters

	<numeric>
Description	Display position of the marker value on the X-axis.
Range	-15 to 100
Preset value	1
Unit	% (percent)
Resolution	1

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:TRAC1:ANN:MARK:POS:X 33"
20   OUTPUT 717;":DISP:WIND1:TRAC1:ANN:MARK:POS:X?"
30   ENTER 717;A
```

Related commands

:DISP:WIND{1-16}:ANN:MARK:ALIG on page 465

:DISP:WIND{1-16}:ANN:MARK:SING on page 466

:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:Y on page 473

Equivalent key

[Marker Fctn] - Annotation Options - Marker Info X Pos

:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:Y

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ANNotation:MARKer:POSition:Y <numeric>

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ANNotation:MARKer:POSition:Y?

Description

For trace 1 (:TRAC1) to trace 16 (:TRAC16) of channel 1 (:WIND1) to channel 16 (:WIND16), sets the display position of the marker value on the Y-axis by a percentage of the height of the display span.

Parameters

	<numeric>
Description	Display position of the marker value on the Y-axis.
Range	-15 to 100
Preset value	1
Unit	% (percent)
Resolution	1

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:TRAC1:ANN:MARK:POS:Y 33"
20   OUTPUT 717;":DISP:WIND1:TRAC1:ANN:MARK:POS:Y?"
30   ENTER 717;A
```

Related commands

:DISP:WIND{1-16}:ANN:MARK:ALIG on page 465

:DISP:WIND{1-16}:ANN:MARK:SING on page 466

:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:X on page 472

Equivalent key

[Marker Fctn] - **Annotation Options** - **Marker Info Y Pos**

:DISP:WIND{1-16}:TRAC{1-16}:MEM

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MEMory[:STATe] {ON|OFF|1|0}

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MEMory[:STATe]?

Description

For trace 1 (:TRAC1) to trace 16 (:TRAC16) of channel 1 (:WIND1) to channel 16 (:WIND16), turns ON/OFF the display of the memory trace.

Parameters

	Description
ON or 1	Turns ON the memory trace display.
OFF or 0 (preset value)	Turns OFF the memory trace display.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:TRAC1:MEM ON"
20   OUTPUT 717;":DISP:WIND1:TRAC1:MEM?"
30   ENTER 717;A
```

Related commands

:DISP:WIND{1-16}:TRAC{1-16}:STAT on page 475

:CALC{1-16}:MATH:MEM on page 410

Equivalent key

[Display] - **Display** - **Mem** (when the data trace display is OFF)

[Display] - **Display** - **Data & Mem** (when the data trace display is ON)

:DISP:WIND{1-16}:TRAC{1-16}:STAT

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:STATe {ON|OFF|1|0}

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:STATe?

Description

For trace 1 (:TRAC1) to trace 16 (:TRAC16) of channel 1 (:WIND1) to channel 16 (:WIND16), turns ON/OFF the display of the data trace.

Parameters

	Description
ON or 1 (preset value)	Turns ON the data trace display.
OFF or 0	Turns OFF the data trace display.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:TRAC1:STAT ON"
20   OUTPUT 717;":DISP:WIND1:TRAC1:STAT?"
30   ENTER 717;A
```

Related commands

:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:X on page 472

Equivalent key

[Display] - **Display** - **Data** (when the memory trace display is OFF)

[Display] - **Display** - **Data & Mem** (when the memory trace display is ON)

:DISP:WIND{1-16}:TRAC{1-16}:Y:AUTO

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:Y[:SCALe]:AUTO

Description

For trace 1 (:TRAC1) to trace 16 (:TRAC16) of channel 1 (:WIND1) to channel 16 (:WIND16), executes the auto scale (function to automatically adjust the value of the reference graticule line and the scale per division to display the trace appropriately). (No query)

Example of use

```
10   OUTPUT 717;":DISP:WIND1:TRAC1:Y:AUTO"
```

Related commands

:DISP:WIND{1-16}:TRAC{1-16}:Y:PDIV on page 476

:DISP:WIND{1-16}:TRAC{1-16}:Y:RLEV on page 477

Equivalent key

[Scale] - **Auto Scale**

:DISP:WIND{1-16}:TRAC{1-16}:Y:PDIV

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:Y[:SCALe]:PDIVision <numeric>

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:Y[:SCALe]:PDIVision?

Description

For trace 1 (:TRAC1) to trace 16 (:TRAC16) of channel 1 (:WIND1) to channel 16 (:WIND16): when the data format is not the Smith chart format or the polar format, sets the scale per division; when the data format is the Smith chart format or the polar format, sets the full scale value (the value of the outermost circle).

Parameters

	<numeric>
Description	Scale value
Range	1E-18 to 1E8
Preset value	Varies depending on the data format as follows: Logarithmic Magnitude: 10 Phase, Expand Phase, Positive Phase: 90 Group Delay: 1E-8 Smith, Polar, SWR: 1 Linear Magnitude: 0.1 Real, Imaginary: 0.2
Unit	Varies depending on the data format as follows: Logarithmic Magnitude: dB (decibel) Phase, Expand Phase, Positive Phase: ° (degree) Group Delay: s (second) Others: No unit

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:TRAC1:Y:PDIV 2.5"
20   OUTPUT 717;":DISP:WIND1:TRAC1:Y:PDIV?"
30   ENTER 717;A
```

Related commands

:DISP:WIND{1-16}:Y:DIV on page 480

:DISP:WIND{1-16}:TRAC{1-16}:Y:RLEV on page 477

:DISP:WIND{1-16}:TRAC{1-16}:Y:RPOS on page 478

Equivalent key

[Scale] - Scale/Div

:DISP:WIND{1-16}:TRAC{1-16}:Y:RLEV

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:Y[:SCALe]:RLEVel <numeric>

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:Y[:SCALe]:RLEVel?

Description

For trace 1 (:TRAC1) to trace 16 (:TRAC16) of channel 1 (:WIND1) to channel 16 (:WIND16), sets the value of the reference graticule line.

Parameters

	<numeric>
Description	Value of reference graticule line
Range	-5E8 to 5E8
Preset value	0*1
Unit	Varies depending on the data format as follows: Logarithmic Magnitude: dB (decibel) Phase, Expand Phase, Positive Phase: ° (degree) Group Delay: s (second) Others: No unit

*1. When the data format is “SWR,” the preset value is 1.

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:TRAC1:Y:RLEV 1E2"
20   OUTPUT 717;":DISP:WIND1:TRAC1:Y:RLEV?"
30   ENTER 717;A
```

Related commands

:DISP:WIND{1-16}:Y:DIV on page 480

:DISP:WIND{1-16}:TRAC{1-16}:Y:PDIV on page 476

:DISP:WIND{1-16}:TRAC{1-16}:Y:RPOS on page 478

Equivalent key

[Scale] - Reference Value

:DISP:WIND{1-16}:TRAC{1-16}:Y:RPOS

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:Y[:SCALe]:RPOSition <numeric>

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:Y[:SCALe]:RPOSition?

Description

For trace 1 (:TRAC1) to trace 16 (:TRAC16) of channel 1 (:WIND1) to channel 16 (:WIND16), specifies a reference graticule line with its number (an integer assigned starting from 0 from the lowest division).

Parameters

	<numeric>
Description	Number of graticule line
Range	0 to the number of divisions*1
Preset value	5*2
Resolution	1

*1. Set with the :DISP:WIND{1-16}:Y:DIV commands.
*2. When the data format is "Linear Magnitude" or "SWR," the preset value is 1.

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:TRAC1:Y:RPOS 6"
20   OUTPUT 717;":DISP:WIND1:TRAC1:Y:RPOS?"
30   ENTER 717;A
```

Related commands

:DISP:WIND{1-16}:Y:DIV on page 480

:DISP:WIND{1-16}:TRAC{1-16}:Y:PDIV on page 476

:DISP:WIND{1-16}:TRAC{1-16}:Y:RLEV on page 477

Equivalent key

[Scale] - Reference Position

:DISP:WIND{1-16}:X:SPAC

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:X:SPACing {LINear|OBASe}

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:X:SPACing?

Description

Selects the display method of the graph horizontal axis of channel 1 (:WIND1) to channel 16 (:WIND16) for segment sweep.

Parameters

	Description
LINear	Specifies the frequency base (linear frequency axis with the minimum frequency at the left edge and the maximum frequency at the right edge).
OBASe (preset value)	Specifies the order base (axis in which the measurement point numbers are positioned evenly in the order of measurement).

Query response

{LIN|OBAS}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:X:SPAC OBAS"
20   OUTPUT 717;":DISP:WIND1:X:SPAC?"
30   ENTER 717;A$
```

Related commands

:SENS{1-16}:SWE:TYPE on page 682

Equivalent key

[Sweep Setup] - Segment Display

:DISP:WIND{1-16}:Y:DIV

Syntax

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:Y[:SCALe]:DIVisions <numeric>

:DISPlay:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:Y[:SCALe]:DIVisions?

Description

Sets the number of divisions of all the graphs of channel 1 (:WIND1) to channel 16 (:WIND16).

The number of graticule line (specified with the :DISP:WIND{1-16}:TRAC{1-16}:Y:RPOS command) depends on this setting.

Parameters

	<numeric>
Description	Divisions
Range	4 to 30
Preset value	10
Resolution	2

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":DISP:WIND1:Y:DIV 12"
20   OUTPUT 717;":DISP:WIND1:Y:DIV?"
30   ENTER 717;A
```

Related commands

:DISP:WIND{1-16}:TRAC{1-16}:Y:PDIV on page 476

:DISP:WIND{1-16}:TRAC{1-16}:Y:RLEV on page 477

:DISP:WIND{1-16}:TRAC{1-16}:Y:RPOS on page 478

Equivalent key

[Scale] - Divisions

:FORM:BORD

Syntax

:FORMat:BORDer {NORMal|SWAPped}

:FORMat:BORDer?

Description

When the data transfer format is set to the binary transfer format, sets the transfer order of each byte in data (byte order).

For details about the data transfer format, refer to “Data Transfer Format” on page 164.

Parameters

	Description
NORMal (preset value)	Specifies the byte order in which transfer starts from the byte including MSB (Most Significant Bit).
SWAPped	Specifies the byte order in which transfer starts from the byte including LSB (Least Significant Bit).

Query response

{NORM|SWAP}<newline><^END>

Example of use

```
10   OUTPUT 717;":FORM:BORD SWAP"
20   OUTPUT 717;":FORM:BORD?"
30   ENTER 717;A$
```

Related commands

:FORM:DATA on page 482

Equivalent key

No equivalent key is available on the front panel.

:FORM:DATA

Syntax

:FORMat:DATA {ASCii|REAL|REAL32}

:FORMat:DATA?

Description

Use the following commands to set the format to transfer data.

- :CALC{1-16}:DATA:FDAT on page 307
- :CALC{1-16}:DATA:FMEM on page 308
- :CALC{1-16}:DATA:SDAT on page 309
- :CALC{1-16}:DATA:SMEM on page 310
- :CALC{1-16}:FUNC:DATA? on page 366
- :CALC{1-16}:LIM:DATA on page 378
- :CALC{1-16}:LIM:REP? on page 384
- :CALC{1-16}:LIM:REP:ALL? on page 385
- :CALC{1-16}:BLIM:REP? on page 300
- :CALC{1-16}:RLIM:DATA on page 421
- :CALC{1-16}:RLIM:REP? on page 426
- :SENS{1-16}:FREQ:DATA? on page 641
- :SENS{1-16}:SEGM:DATA on page 674
- :SOUR:POW:PORT:CORR:COLL:TABL:ASEN:DATA on page 687
- :SOUR:POW:PORT:CORR:COLL:TABL:BSEN:DATA on page 688
- :SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS:DATA on page 700
- :SOUR{1-16}:POW:PORT{1-4}:CORR:DATA on page 701

For details about the data transfer format, refer to “Data Transfer Format” on page 164.

Parameters

	Description
ASCii (preset value)	Specifies the ASCII transfer format.
REAL	Specifies the IEEE 64-bit floating point binary transfer format.
REAL32	Specifies the IEEE 32-bit floating point binary transfer format.

Query response

{ASC|REAL|REAL32}<newline><^END>

Example of use

```
10   OUTPUT 717;":FORM:DATA REAL"
20   OUTPUT 717;":FORM:DATA?"
30   ENTER 717;A$
```

Related commands :FORM:BORD on page 481

Equivalent key No equivalent key is available on the front panel.

:HCOP

Syntax :HCOPy[:IMMediate]

Description Outputs the display image on the LCD display to the printer connected to the E5070B/E5071B. (No query)

Example of use
```
10   OUTPUT 717;":HCOP"
```

Related commands :HCOP:ABOR on page 483

:HCOP:IMAG on page 484

Equivalent key **[System] - Print**

:HCOP:ABOR

Syntax :HCOPy:ABORt

Description Aborts the print output. (No query)

Example of use
```
10   OUTPUT 717;":HCOP:ABOR"
```

Related commands :HCOP on page 483

Equivalent key **[System] - Abort Printing**

:HCOP:IMAG

Syntax

:HCOPy:IMAGe {NORMal|INVert}

:HCOPy:IMAGe?

Description

Selects the print color for output to the printer.

Parameters

	Description
NORMal	Specifies printing in close color to the display color.
INVert (preset value)	Specifies printing in the inverted color of the display color.

Query response

{NORM|INV}<newline><^END>

Example of use

```
10   OUTPUT 717;":HCOP:IMAG NORM"
20   OUTPUT 717;":HCOP:IMAG?"
30   ENTER 717;A$
```

Related commands

:HCOP on page 483

Equivalent key

[System] - Invert Image

:INIT{1-16}

Syntax

:INITiate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:IMMediate]

Description

Changes the state of each channel of channel 1 (:INIT1) to channel 16 (:INIT16) to the startup state in the trigger system.

When this command is executed for a channel in the idle state, it goes into the initiate state immediately. Then, after measurement is executed once, it goes back to the idle state.

If this command is executed for a channel that is not in the idle state or for which the continuous initiation mode is set to ON (ON is specified with the :INIT{1-16}:CONT command), an error occurs and the command is ignored.

For details about the trigger system, refer to “Trigger System” on page 128. (No query)

Example of use

```
10   OUTPUT 717;":INIT1"
```

Related commands

:INIT{1-16}:CONT on page 485

Equivalent key

[Trigger] - Single

:INIT{1-16}:CONT

Syntax

:INITiate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CONTinuous {ON|OFF|1|0}

:INITiate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CONTinuous?

Description

Turns ON/OFF of the continuous initiation mode of channel 1 (:INIT1) to channel 16 (:INIT16) in the trigger system.

For details about the trigger system, refer to "Trigger System" on page 128.

Parameters

	Description
ON or 1	Turns ON the continuous initiation mode.
OFF or 0	Turns OFF the continuous initiation mode.

Regarding to this setting, only channel 1 is initialized to ON with the :SYST:PRES command; all the channels are initialized to OFF with the *RST command.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":INIT1:CONT OFF"
20   OUTPUT 717;":INIT1:CONT?"
30   ENTER 717;A
```

Related commands

:INIT{1-16} on page 484

Equivalent key

[Trigger] - **Continuous** (continuous initiation mode ON)

[Trigger] - **Hold** (continuous initiation mode OFF)

:MMEM:CAT?

Syntax

:MMEMory:CATalog? <string 1>

Description

Reads out the following information on the built-in storage device of the E5070B/E5071B.

To read out the information in the root directory (folder), specify "\" (backslash). If you want to specify a directory on the floppy disk drive, you need to add "A:" at the beginning of the file name. Separate directory names with "/" (slash) or "\" (backslash). (Query only)

- Space in use
- Available space
- Name and size of all files (including directories) in the specified directory.

Parameters

	<string 1>
Description	Directory name whose information you want to read out
Range	254 characters or less

Query response

{string 2}<newline><^END>

The format of the readout character string is as follows:

"{used_size},{free_size},{name 1},,{size 1},…,{name N},,{size N}"

Where N is the number of all files in the specified directory and n is an integer between 1 and N.

{used_size}: Space in use of the built-in storage device (byte)*1.

{free_size}: Available space of the built-in storage device (byte)*1.

{name n}: Name of the n-th file (directory).

{size n}: Size (byte) of the n-th file (directory). Always 0 for directories.

Example of use

```
10   DIM A$[1000]
20   OUTPUT 717;":MMEM:CAT? ""\"""
30   ENTER 717;A$
```

Equivalent key

No equivalent key is available on the front panel.

*1. If you specify a directory on the floppy disk drive, it is the capacity of the floppy disk in the drive.

:MMEM:COPY

Syntax

:MMEMory:COPY <string 1>,<string 2>

Description

Copies a file.

Specify the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you use directory (folder) names and file name, separate them with “/” (slash) or “\” (backslash).

If the specified copy source file does not exist, an error occurs and the command is ignored. Notice that, if a file with the same name as the specified copy destination file name exists, its contents are overwritten. (No query)

Parameters

	<string 1>	<string 2>
Description	Copy source file name	Copy destination file name
Range	254 characters or less	254 characters or less

Example of use

```
10 OUTPUT 717;":MMEM:COPY ""Test1/State01.sta"","A:Test1_01.sta"""
```

Equivalent key

[Save/Recall] - Save State - File Dialog...

:MMEM:DEL

Syntax

:MMEMory:DELete <string>

Description

Deletes an existing file or directory (folder).

When you delete a directory, all the files and directories in it are deleted.

Specify the file name with the extension. If you want to specify a file or directory on the floppy disk drive, you need to add “A:” at the beginning of its name. When you specify a file (directory) under an existing directory, separate them with “/” (slash) or “\” (backslash).

If the specified file or directory does not exist, an error occurs and the command is ignored. (No query)

Parameters

	<string>
Description	File name or directory name you want to delete
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:DEL ""Test1/State01.sta"""
10   OUTPUT 717;":MMEM:DEL ""A:State01.sta"""
```

Equivalent key

[Save/Recall] - **Save State** - **File Dialog...**

:MMEM:LOAD

Syntax

:MMEMory:LOAD[:STATe] <string>

Description

Recalls the specified instrument state file (file with the .sta extension saved with the :MMEM:STOR command).

Specify the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use directory names and file name, separate them with "/" (slash) or "\" (backslash).

If the specified file does not exist, an error occurs and the command is ignored. (No query)

Parameters

	<string>
Description	Instrument state file name
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:LOAD ""Test1/State01.sta"""
10   OUTPUT 717;":MMEM:LOAD ""A:State01.sta"""
```

Related commands

:MMEM:STOR on page 500

Equivalent key

[Save/Recall] - Recall State

:MMEM:LOAD:ASCF

Syntax

:MMEMory:LOAD:ASCFactor <string>

Description

Recalls the file (file with the .csv extension saved with the :MMEM:STOR:ASCF command) you want to specify as the table for the reference calibration coefficient and the calibration coefficient table for power sensor A.

Specify the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you use directory names and file name, separate them with “/” (slash) or “\” (backslash).

If the specified file does not exist, an error occurs and the command is ignored. (No query)

Parameters

	<string>
Description	A file name of the reference calibration coefficient and the calibration coefficient table for power sensor A.
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:LOAD:ASCF ""Test1/Sensor01.csv"""
10   OUTPUT 717;":MMEM:LOAD:ASCF ""A:Sensor01.csv"""
```

Related commands

:MMEM:STOR:ASCF on page 501

Equivalent key

[Cal] - Power Calibration - Sensor A Settings - Import from CSV File

:MMEM:LOAD:BSCF

Syntax

:MMEMory:LOAD:BSCFactor <string>

Description

Recalls the file (file with the .csv extension saved with the :MMEM:STOR:BSCF command) you want to specify as the table for the reference calibration coefficient and the calibration coefficient table for power sensor B.

Specify the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use directory names and file name, separate them with "/" (slash) or "\" (backslash).

If the specified file does not exist, an error occurs and the command is ignored. (No query)

Parameters

	<string>
Description	A file name of the reference calibration coefficient and the calibration coefficient table for power sensor B.
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:LOAD:BSCF ""Test1/Sensor01.csv"""
10   OUTPUT 717;":MMEM:LOAD:BSCF ""A:Sensor01.csv"""
```

Related commands

:MMEM:STOR:BSCF on page 502

Equivalent key

[Cal] - Power Calibration - Sensor B Settings - Import from CSV File

:MMEM:LOAD:CHAN

Syntax

:MMEMory:LOAD:CHANnel[:STATe] {A|B|C|D}

Description

Recalls the instrument state for an individual channel (saved with the :MMEM:STOR:CHAN command) from the specified register as the setting of the active channel (specified with the :DISP:WIND{1-16}:ACT command).

It is possible to recall the register from a different channel where it was saved.

If no instrument state has been saved in the specified register, an error occurs and the command is ignored. (No query)

Parameters

	Description
A	Specifies register A.
B	Specifies register B.
C	Specifies register C.
D	Specifies register D.

Example of use

```
10   OUTPUT 717;":MMEM:LOAD:CHAN A"
```

Related commands

:MMEM:STOR:CHAN on page 503

:DISP:WIND{1-16}:ACT on page 464

Equivalent key

[Save/Recall] - Recall Channel - A|B|C|D

:MMEM:LOAD:CKIT{1-20}

Syntax

:MMEMory:LOAD:CKIT{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20} <string>

Description

Recall a definition file of the calibration kit (saved with the :MMEM:STOR:CHAN command with the extension .ckx) you want to specify.

Specifies the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use a directory name and file name, separate them with a "/" (slash), or a "\" (backslash).

If the specified file does not exist, an error occurs and the command is ignored. (No query)

Parameters

	<string>
Description	File name of the definition table of a calibration kit
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:LOAD:CKIT1 ""Test1/Ckit01.ckx"""
10   OUTPUT 717;":MMEM:LOAD:LIM ""A:Ckit01.ckx"""
```

Related commands

:MMEM:STOR:CKIT{1-20} on page 504

Equivalent key

[Cal] - Modify Cal Kit - Import Cal Kit...

:MMEM:LOAD:LIM

Syntax

:MMEMory:LOAD:LIMit <string>

Description

As the limit table for the active trace (specified with the :CALC{1-16}:PAR{1-16}:SEL command) of the active channel (specified with the :DISP:WIND{1-16}:ACT command), recalls the specified limit table file (file with the .csv extension saved with the :MMEM:STOR:LIM command).

Specify the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you use directory names and file name, separate them with “/” (slash) or “\” (backslash).

If the specified file does not exist, an error occurs and the command is ignored. (No query)

Parameters

	<string>
Description	File name of limit table
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:LOAD:LIM ""Test1/Limit01.csv"""
10   OUTPUT 717;":MMEM:LOAD:LIM ""A:Limit01.csv"""
```

Related commands

:MMEM:STOR:LIM on page 507

:DISP:WIND{1-16}:ACT on page 464

Equivalent key

[Analysis] - Limit Test - Edit Limit Line - Import from CSV File

:MMEM:LOAD:PLOS{1-4}

Syntax

:MMEMory:LOAD:PLOSs{[1]|2|3|4} <string>

Description

For port 1 (:PLOS1) to port 4(:PLOS4), as the loss compensation table for the active channel (specified with the :DISP:WIND{1-16}:ACT command), recalls the specified loss compensation table file (a file with the .csv extension saved with the :MMEM:STOR:PLOS{1-4} command).

Specify the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use directory names and file name, separate them with "/" (slash) or "\" (backslash).

If the specified file does not exist, an error occurs and the command is ignored. (No query)

Parameters

	<string>
Description	A file name of the loss compensation table
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:LOAD:PLOS1 ""Test1/Loss01.csv"""
10   OUTPUT 717;":MMEM:LOAD:PLOS1 ""A:Loss01.csv"""
```

Related commands

:MMEM:STOR:PLOS{1-4} on page 508

:DISP:WIND{1-16}:ACT on page 464

Equivalent key

[Cal] - Power Calibration - Loss Compen - Import from CSV File

:MMEM:LOAD:PROG

Syntax

:MMEMory:LOAD:PROGram <string>

Description

Loads (or imports) a VBA project (a file with the .vba extension), a module (a file with the .bas extension), a user form (a file with the .frm extension) or a class module (a file with the .cls extension).

Specify the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you use directory names and file name, separate them with “/” (slash) or “\” (backslash).

If the specified file does not exist, an error occurs and the command is ignored. (No query)

Parameters

	<string>
Description	File name
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:LOAD:PROG ""Test1/Test1_01.vba"""
10   OUTPUT 717;":MMEM:LOAD:PROG ""A:Test1_01.vba"""
```

Related commands

:MMEM:STOR:PROG on page 509

Equivalent key

[Macro Setup] - Load VBA Project

:MMEM:LOAD:RLIM

Syntax

:MMEMory:LOAD:RLIMit <string>

Description

As the ripple limit table for the active trace (specified with the :CALC{1-16}:PAR{1-16}:SEL command) of the active channel (specified with the :DISP:WIND{1-16}:ACT command), recalls the specified ripple limit table file (file with the .csv extension saved with the :MMEM:STOR:RLIM command).

Specify the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you write directory names and the file name, separate them with a "/" (slash) or "\" (backslash).

If the specified file does not exist, an error occurs and the command is ignored. (No query)

Parameters

	<string>
Description	File name of the ripple limit table.
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:LOAD:RLIM ""RTest1/Rlim01.csv"""
10   OUTPUT 717;":MMEM:LOAD:RLIM ""A:Rlim01.csv"""
```

Related commands

:MMEM:STOR:RLIM on page 510

:DISP:WIND{1-16}:ACT on page 464

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - Ripple Limit - Edit Ripple Limit - Import from CSV File

:MMEM:LOAD:SEGM

Syntax

:MMEMory:LOAD:SEGMent <string>

Description

As the segment sweep table for the active channel (specified with the :DISP:WIND{1-16}:ACT command), recalls the specified segment sweep table file (a file with the .csv extension saved with the :MMEM:STOR:SEGM command).

Specify the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you use directory names and file name, separate them with “/” (slash) or “\” (backslash).

If the specified file does not exist, an error occurs and the command is ignored. (No query)

Parameters

	<string>
Description	File name of segment sweep table
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:LOAD:SEGM ""Test1/Segm01.csv"""
10   OUTPUT 717;":MMEM:LOAD:SEGM ""A:Segm01.csv"""
```

Related commands

:MMEM:STOR:SEGM on page 512

:DISP:WIND{1-16}:ACT on page 464

Equivalent key

[Sweep Setup] - Edit Segment Table - Import from CSV File

:MMEM:MDIR

Syntax

:MMEMory:MDIRectory <string>

Description

Creates a new directory (folder).

If you want to create a directory on the floppy disk drive, you need to add “A:” at the beginning of the directory name. When you create a directory under an existing directory, separate between the directory names with “/” (slash) or “\” (backslash).

If a directory with the same name as the specified directory name exists, an error occurs and the command is ignored. (No query)

Parameters

	<string>
Description	Directory name you want to create
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:MDIR ""Test1"""
10   OUTPUT 717;":MMEM:MDIR ""A:Test1"""
```

Equivalent key

[Save/Recall] - **Save State** - **File Dialog...**

:MMEM:STOR

Syntax

:MMEMory:STORe[:STATe] <string>

Description

Saves the instrument state (data to be saved specified with the command) into a file.

Specify the file name with the .sta extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you use directory names and file name, separate them with “/” (slash) or “\” (backslash).

Notice that, if a file with the specified file name exists, its contents are overwritten. (No query)

NOTE

The instrument setting file saved with the autorec.sta (or A:autorec.sta) file name is automatically recalled when turning on the E5070B/E5071B.

Parameters

	<string>
Description	File name in which you want to save the instrument state
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:STOR ""Test1/State01.sta"""
10   OUTPUT 717;":MMEM:STOR ""A:State01.sta"""
```

Related commands

:MMEM:LOAD on page 489

on page 519

Equivalent key

[Save/Recall] - Save State|Re-Save State

:MMEM:STOR:ASCF

Syntax

:MMEMory:STORe:ASCFactor <string>

Description

Saves the reference calibration coefficient and the calibration coefficient table for power sensor A into a CSV file.

Specify the file name with the .sta extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use directory names and file name, separate them with "/" (slash) or "\" (backslash).

Notice that, if a file with the specified file name exists, its contents are overwritten. (No query)

Parameters

	<string>
Description	A file name used to save the reference calibration coefficient and the calibration coefficient table for power sensor A.
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:STOR:ASCF ""Test1/Sensor01.csv"""
10   OUTPUT 717;":MMEM:STOR:ASCF ""A:Sensor01.csv"""
```

Related commands

:MMEM:LOAD:ASCF on page 490

Equivalent key

[Cal] - Power Calibration - Sensor A Settings - Export to CSV File

:MMEM:STOR:BSCF

Syntax

:MMEMory:STORe:BSCFactor <string>

Description

Saves the reference calibration coefficient and the calibration coefficient table for power sensor B into a CSV file.

Specify the file name with the .sta extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you use directory names and file name, separate them with “/” (slash) or “\” (backslash).

Notice that, if a file with the specified file name exists, its contents are overwritten. (No query)

Parameters

	<string>
Description	A file name used to save the reference calibration coefficient and the calibration coefficient table for power sensor B.
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:STOR:BSCF ""Test1/Sensor01.csv"""
10   OUTPUT 717;":MMEM:STOR:BSCF ""A:Sensor01.csv"""
```

Related commands

:MMEM:LOAD:BSCF on page 491

Equivalent key

[Cal] - **Power Calibration** - **Sensor B Settings** - **Export to CSV File**

:MMEM:STOR:CHAN

Syntax

:MMEMory:STORe:CHANnel[:STATe] {A|B|C|D}

Description

Saves the instrument state of the items set for the active channel (specified with the :DISP:WIND{1-16}:ACT command) specific to that channel only into the specified register (volatile memory).

Notice that, if an instrument state has been saved already in the specified register, its contents are overwritten. (No query)

Parameters

	Description
A	Specifies register A.
B	Specifies register B.
C	Specifies register C.
D	Specifies register D.

Example of use

```
10   OUTPUT 717;":MMEM:STOR:CHAN A"
```

Related commands

:MMEM:LOAD:CHAN on page 492

:DISP:WIND{1-16}:ACT on page 464

Equivalent key

[Save/Recall] - **Save Channel** - **A**|**B**|**C**|**D**

:MMEM:STOR:CHAN:CLE

Syntax

:MMEMory:STORe:CHANnel:CLEar

Description

Deletes the instrument state for each channel (saved with the :MMEM:STOR:CHAN command) in all the registers. (No query)

Example of use

```
10   OUTPUT 717;":MMEM:STOR:CHAN:CLE"
```

Related commands

:MMEM:STOR:CHAN on page 503

Equivalent key

[Save/Recall] - **Save Channel** - **Clear States** - **OK**

:MMEM:STOR:CKIT{1-20}

Syntax

:MMEMory:STORe:CKIT{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20} <string>

Description

Saves the definition table of the calibration kit to a file.

Specify the file name with the .ckx extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use a directory name and file name, separate them with "/" (slash) or "\" (backslash).

Notice that, if a file with the specified file name exists, its contents are overwritten. (No query)

Parameters

	<string>
Description	A file name used to save the definition of the calibration kit.
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:STOR:CKITÅ@""Test1/Ckit01.ckx"""
10   OUTPUT 717;":MMEM:STOR:CKITÅ@""a:Ckit01.ckx"""
```

Related commands

:MMEM:LOAD:CKIT{1-20} on page 493

Equivalent key

[Cal] - **Modify Cal Kit** - **Export Cal Kit...**

:MMEM:STOR:FDAT

Syntax

:MMEMory:STORe:FDATa <string>

Description

Saves the formatted data array of the active trace (specified with the :CALC{1-16}:PAR{1-16}:SEL command) of the active channel (specified with the :DISP:WIND{1-16}:ACT command) into a file in the CSV format.

Specify the file name with the .csv extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you use directory names and file name, separate them with “/” (slash) or “\” (backslash).

Notice that, if a file with the specified file name exists, its contents are overwritten. (No query)

Parameters

	<string>
Description	File name in which you want to save the formatted data array
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:STOR:FDAT ""Result/Trace01.csv"""
10   OUTPUT 717;":MMEM:STOR:FDAT ""A:Trace01.csv"""
```

Related commands

:DISP:WIND{1-16}:ACT on page 464

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Save/Recall] - Save Trace Data

:MMEM:STOR:IMAG

Syntax

:MMEMory:STORe:IMAGe <string>

Description

Saves the display image on the LCD display at the execution of the command into a file in the bitmap (.bmp) or portable network graphics (.png) format.

Specify the file name with the .bmp or .png extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you use directory names and file name, separate them with “/” (slash) or “\” (backslash).

Notice that, if a file with the specified file name exists, its contents are overwritten. (No query)

Parameters

	<string>
Description	File name in which you want to save the display image on the LCD display
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:STOR:IMAG ""Result/Image01.bmp"""
10   OUTPUT 717;":MMEM:STOR:IMAG ""A:Image01.png"""
```

Equivalent key

[System] - Dump Screen Image

When performing the operation from the front panel, the image on the LCD display memorized in the volatile memory (clipboard) (the image on the LCD display when the **[Capture]** key is pressed) is saved. Notice that, if no image is memorized in the clipboard, in the same way as the command, the image on the LCD display at the execution is memorized in the clipboard and then it is saved.

:MMEM:STOR:LIM

Syntax

:MMEMory:STORe:LIMit <string>

Description

Saves the limit table for the active trace (specified with the :CALC{1-16}:PAR{1-16}:SEL command) of the active channel (specified with the :DISP:WIND{1-16}:ACT command) into a file in the CSV format.

Specify the file name with the .csv extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you use directory names and file name, separate them with “/” (slash) or “\” (backslash).

Notice that, if a file with the specified file name exists, its contents are overwritten. (No query)

Parameters

	<string>
Description	File name in which you want to save the limit table
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:STOR:LIM ""Test1/Limit01.csv"""
10   OUTPUT 717;":MMEM:STOR:LIM ""A:Limit01.csv"""
```

Related commands

:DISP:WIND{1-16}:ACT on page 464

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - Limit Test - Edit Limit Line - Export to CSV File

:MMEM:STOR:PLOS{1-4}

Syntax

:MMEMory:STORe:PLOSs{[1]|2|3|4} <string>

Description

For port 1 (:PLOS1) to port 4 (:PLOS4), saves the loss compensation table for the active channel (specified with the :DISP:WIND{1-16}:ACT command) into a file in the CSV format.

Specify the file name with the .csv extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use directory names and file name, separate them with "/" (slash) or "\" (backslash).

Notice that, if a file with the specified file name exists, its contents are overwritten. (No query)

Parameters

	<string>
Description	A file name in which you want to save the loss compensation table
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:STOR:PLOS1 ""Test1/Loss01.csv"""
10   OUTPUT 717;":MMEM:STOR:PLOS1 ""A:Loss01.csv"""
```

Related commands

:MMEM:LOAD:PLOS{1-4} on page 495

:DISP:WIND{1-16}:ACT on page 464

Equivalent key

[Cal] - Power Calibration - Loss Compen - Export to CSV File

:MMEM:STOR:PROG

Syntax

:MMEMory:STORe:PROGram <string>

Description

Saves a VBA project opened on the VBA editor into a file.

Specify the file name with the .vba extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you use directory names and file name, separate them with “/” (slash) or “\” (backslash).

Notice that, if a file with the specified file name exists, its contents are overwritten. (No query)

Parameters

	<string>
Description	File name in which you want to save the VBA project
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:STOR:PROG ""Test1/Test1_01.vba"""
10   OUTPUT 717;":MMEM:STOR:PROG ""A:Test1_01.vba"""
```

Related commands

:MMEM:LOAD:PROG on page 496

Equivalent key

[Macro Setup] - Save VBA Project

:MMEM:STOR:RLIM

Syntax

:MMEMory:STORe:RLIMit <string>

Description

Saves the ripple limit table of the active trace (specified with the :CALC{1-16}:PAR{1-16}:SEL command) of the active channel (specified with the :DISP:WIND{1-16}:ACT command) into a file in the CSV format.

Specify the file name with the .sta extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you write directory names and the file name, separate them with a “/” (slash) or “\” (backslash).

Note that if a file with the specified file name already exists, its contents will be overwritten. (No query)

Parameters

	<string>
Description	File name used to save the ripple limit table.
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:STOR:RLIM ""RTest1/Rlim01.csv"""
10   OUTPUT 717;":MMEM:STOR:RLIM ""A:Rlim01.csv"""
```

Related commands

:MMEM:LOAD:RLIM on page 497

:DISP:WIND{1-16}:ACT on page 464

:CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key

[Analysis] - Ripple Limit - Edit Ripple Limit - Export to CSV File

:MMEM:STOR:SALL

Syntax

:MMEMory:STORe:SALL {ON|OFF|1|0}

:MMEMory:STORe:SALL?

Description

Selects whether to save the setting of all channels/traces or that of the displayed channels/traces only as the instrument state to be saved.

Parameters

	Description
ON or 1	Specifies the setting of all channels/traces as the target to be saved.
OFF or 0 (preset value)	Specifies the setting of displayed channels/traces only as the target to be saved.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":MMEM:STOR:SALL ON"
20   OUTPUT 717;":MMEM:STOR:SALL?"
30   ENTER 717;A
```

Related commands

:MMEM:STOR on page 500

Equivalent key

[Save/Recall] - Channel/Trace

:MMEM:STOR:SEGM

Syntax

:MMEMory:STORe:SEGMent <string>

Description

Saves the segment sweep table for the active channel (specified with the :DISP:WIND{1-16}:ACT command) into a file in the CSV format.

Specify the file name with the .csv extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you use directory names and file name, separate them with “/” (slash) or “\” (backslash).

Notice that, if a file with the specified file name exists, its contents are overwritten. (No query)

Parameters

	<string>
Description	File name in which you want to save the segment sweep table
Range	254 characters or less

Example of use

```
10   OUTPUT 717;":MMEM:STOR:SEGM ""Test1/Segm01.csv"""
10   OUTPUT 717;":MMEM:STOR:SEGM ""A:Segm01.csv"""
```

Related commands

:MMEM:LOAD:SEGM on page 498

:DISP:WIND{1-16}:ACT on page 464

Equivalent key

[Sweep Setup] - Edit Segment Table - Export to CSV File

:MMEM:STOR:SNP

Syntax

:MMEMory:STORe:SNP[:DATA] <string>

Description

Saves the measurement data for the active channel (specified with the :DISP:WIND{1-16}:ACT command) to a file in the touchstone format.

You need to specify a file format and file type before saving a file. The extension differs depending on the file type.

<file type>	<extension>
When specifying one port	s1p
When specifying two ports	s2p
When specifying three ports	s3p
When specifying four ports	s4p

If you want to specify a file on a floppy disk, you need to add “A:” at the beginning of the file name. When you use directory names and file name, separate them with “/” (slash) or “\” (back slash).

Note that if a file with the specified file name exists, its contents are overwritten. (No query)

Parameters

	<string>
Description	File name you want to use when saving the file in touchstone format
Range	254 characters or less

NOTE

When an invalid extension is specified, an error message appears and the command is ignored.

Example of use

```
10   OUTPUT 717;"DISP:WIND1:ACT"
20   OUTPUT 717;":MMEM:STOR:SNP:FORM RI"
30   OUTPUT 717;":MMEM:STOR:SNP:TYPE:S3P 1,2,4"
40   OUTPUT 717;":MMEM:STOR:SNP ""SNP01.s3p"""
```

Related commands

:DISP:WIND{1-16}:ACT on page 464

:MMEM:STOR:SNP:FORM on page 514

:MMEM:STOR:SNP:TYPE:S1P on page 515

:MMEM:STOR:SNP:TYPE:S2P on page 516

:MMEM:STOR:SNP:TYPE:S3P on page 517

:MMEM:STOR:SNP:TYPE:S4P on page 518

Equivalent key After a file type is specified, a dialog box will appear.

:MMEM:STOR:SNP:FORM

Syntax :MMEMory:STORe:SNP:FORMat {AUTO|MA|DB|RI}

:MMEMory:STORe:SNP:FORMat?

Description Specifies data format for saving measurement data for the active channel (specified with :DISP:WIND{1-16}:ACT command) to a file in the touchstone format.

Parameters

	Description
AUTO	Specifies data format automatically according to the display format of the active trace.*1
MA	Specifies data format “log magnitude - angle.”
DB	Specifies data format “linear magnitude - angle.”
RI	Specifies data format “real part - imaginary part.”

*1. When the display format of the active trace is set to one other than log magnitude format (LogMag), linear magnitude format (LinMag), or real-imaginary number format (Real/Imag), the data format is automatically set to “real part -imaginary part.”

Query response {AUTO|MA|DB|RI}<newline><^END>

Example of use

```
10   OUTPUT 717;":MMEM:STOR:SNP:FORM MA"
20   OUTPUT 717;":MMEM:STOR:SNP:FORM?"
30   ENTER 717;A$
```

Related commands :DISP:WIND{1-16}:ACT on page 464

:MMEM:STOR:SNP on page 513

Equivalent key **[Save/Recall] - Save Snp - Snp Format - AUTO|LogMag/Angle|LinMag/Angle|Real/Imaginary**

:MMEM:STOR:SNP:TYPE:S1P

Syntax

:MMEMory:STORe:SNP:TYPE:S1P <numeric>

:MMEMory:STORe:SNP:TYPE:S1P?

Description

Sets specified port to the file type (1 port) when saving measurement data for the active channel (specified with :DISP:WIND{1-16}:ACT command) to a file in the touchstone format.

Parmeters

	<numeric>
Description	Port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":MMEM:STOR:SNP:TYPE:S1P 2"
20   OUTPUT 717;":MMEM:STOR:SNP:TYPE:S1P?"
30   ENTER 717;A$
```

Related commands

:DISP:WIND{1-16}:ACT on page 464

:MMEM:STOR:SNP on page 513

:MMEM:STOR:SNP:FORM on page 514

Equivalent key

[Save/Recall] - Save Snp - S1p - 1|2|3|4

:MMEM:STOR:SNP:TYPE:S2P

Syntax

:MMEMory:STORe:SNP:TYPE:S2P <numeric1>, <numeric 2>

:MMEMory:STORe:SNP:TYPE:S2P?

Description

Sets specified port to the file type (2 ports) when saving measurement data for the active channel (specified with :DISP:WIND{1-16}:ACT command) to a file in the touchstone format.

Parameters

	<numeric 1>	<numeric 2>
Description	Port number	Port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for two or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":MMEM:STOR:SNP:TYPE:S2P 2,3"
20   OUTPUT 717;":MMEM:STOR:SNP:TYPE:S2P?"
30   ENTER 717;A$
```

Related commands

:DISP:WIND{1-16}:ACT on page 464

:MMEM:STOR:SNP on page 513

:MMEM:STOR:SNP:FORM on page 514

Equivalent key

[Save/Recall] - **Save Snp** - **S2p** - **1-2**|**1-3**|**1-4**|**2-3**|**2-4**|**3-4**

:MMEM:STOR:SNP:TYPE:S3P

Syntax

:MMEMory:STORe:SNP:TYPE:S3P <numeric 1>, <numeric 2>, <numeric 3>

:MMEMory:STORe:SNP:TYPE:S3P?

Description

Sets specified port to the file type (3 ports) when saving measurement data for the active channel (specified with :DISP:WIND{1-16}:ACT command) to a file in the touchstone format.

Parmeters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Port number	Port number	Port number
Range	1 to 4	1 to 4	1 to 4
Resolution	1	1	1

For each parameter, you must specify a different port number. If you specify the same port number for two or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":MMEM:STOR:SNP:TYPE:S3P 2,3,4"
20   OUTPUT 717;":MMEM:STOR:SNP:TYPE:S3P?"
30   ENTER 717;A$
```

Related commands

:DISP:WIND{1-16}:ACT on page 464

:MMEM:STOR:SNP on page 513

:MMEM:STOR:SNP:FORM on page 514

Equivalent key

[Save/Recall] - Save Snp - S3p - 1-2-3|1-2-4|1-3-4|2-3-4

:MMEM:STOR:SNP:TYPE:S4P

Syntax

:MMEMory:STORe:SNP:TYPE:S4P 1, 2, 3, 4

:MMEMory:STORe:SNP:TYPE:S4P?

Description

Sets specified port to the file type (4 ports) when saving measurement data for the active channel (specified with :DISP:WIND{1-16}:ACT command) to a file in the touchstone format.

Example of use

```
10   OUTPUT 717;":MMEM:STOR:SNP:TYPE:S4P 1,2,3,4"
20   OUTPUT 717;":MMEM:STOR:SNP:TYPE:S3P?"
30   ENTER 717;A$
```

Related commands

:DISP:WIND{1-16}:ACT on page 464

:MMEM:STOR:SNP on page 513

:MMEM:STOR:SNP:FORM on page 514

Equivalent key

[Save/Recall] - **Save Snp** - **S4p** - **1-2-3-4**

:MMEM:STOR:STYP

Syntax

:MMEMory:STORe:STYPe {STATe|CSTate|DSTate|CDSTate}

:MMEMory:STORe:STYPe?

Description

Selects the contents saved when saving the instrument state into a file with the :MMEM:STOR command.

Parameters

	Description
STATe	Specifies the save of the measurement conditions*1 only.
CSTate (preset value)	Specifies the save of the measurement conditions*1 and the calibration state.
DSTate	Specifies the save of the measurement conditions*1 and the formatted data array.
CDSTate	Specifies the save of the measurement conditions*1, the calibration state, and the formatted data array.

*1. For details about the measurement conditions that can be saved, refer to the *User's Guide*.

Query response

{STAT|CST|DST|CDST}<newline><^END>

Example of use

```
10   OUTPUT 717;":MMEM:STOR:STYP CDST"
20   OUTPUT 717;":MMEM:STOR:STYP?"
30   ENTER 717;A$
```

Related commands

:MMEM:STOR on page 500

Equivalent key

[Save/Recall] - Save Type - State Only|State & Cal|State & Trace|All

:MMEM:TRAN

Syntax

:MMEMory:TRANsfer <string>,<block>

:MMEMory:TRANsfer? <string>

Description

Writes/reads data to/from a file on the built-in storage device of the E5070B/E5071B.

By reading out data with this command and writing it to a file on the external controller, file transfer from the E5070B/E5071B to the external controller can be realized. On the other hand, by reading out data from the external controller and writing it to a file on the E5070B/E5071B with this command, file transfer from the external controller to the E5070B/E5071B can be realized.

Specify the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add “A:” at the beginning of the file name. When you use directory names and file name, separate them with “/” (slash) or “\” (backslash).

If a file with the specified file name already exists for writing or if the specified file does not exist for reading out (Query), an error occurs and the command is ignored.

Parameters

	<string>	**<block>**
Description	File name on the E5070B/E5071B	Data written on/read out from the file.
Range	254 characters or less	GPIB: 20 Mbytes or less LAN: 100 Kbytes or less

Query response

{block}<newline><^END>

Example of use

```
10   OUTPUT 717;":MMEM:TRAN ""Trace01.csv"",#6012345";Dat$
```

```
10   OUTPUT 717;":MMEM:TRAN? ""Trace01.csv"""
20   ENTER 717 USING "#,A";A$
30   ENTER 717 USING "#,A";Digit$
40   Img$="#,"&Digit$&"A"
50   ENTER 717 USING Img$;Byte$
60   Img$=Byte$&"A"
70   ALLOCATE Dat$[VAL(Byte$)]
80   ENTER 717 USING Img$;Dat$
```

Equivalent key

No equivalent key is available on the front panel.

:OUTP

Syntax

:OUTPut[:STATe] {ON|OFF|1|0}

:OUTPut[:STATe]?

Description

Turns on/off of the stimulus signal output. You cannot perform measurement until you turn on the stimulus signal output.

Parameters

	Description
ON or 1 (preset value)	Turns on the stimulus signal output.
OFF or 0	Turns off the stimulus signal output.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":OUTP ON"
20   OUTPUT 717;":OUTP?"
30   ENTER 717;A
```

Equivalent key

[Sweep Setup] - Power - RF Out

:PROG:CAT?

Syntax

:PROGram:CATalog?

Description

Reads out the list of all executable VBA macros (procedures defined by Public including the VBA project loaded on the VBA editor). (Query only)

Query response

{string}<newline><^END>

The character string in the following format, in which each macro is separated by a comma (.), is read out.

"{macro 1},{macro 2},…,{macro N}"

Where N is the total number of VBA macros.

{macro n}: VBA macro name (module name.procedure name)

Example of use

```
10   DIM A$[1000]
20   OUTPUT 717;":PROG:CAT?"
30   ENTER 717;A$
```

Equivalent key

[Macro Setup] - Select Macro

:PROG:NAME

Syntax

:PROGram[:SELected]:NAME <string>

:PROGram[:SELected]:NAME?

Description

Selects the VBA macro controlled with the :PROG:STAT command.

Selectable VBA macro names can be read out with the :PROG:CAT? command.

Parameters

	<string>
Description	VBA macro name (module name.procedure name)
Range	254 characters or less
Preset value	""

Query response

{string}<newline><^END>

Example of use

```
10   OUTPUT 717;":PROG:NAME ""Module1.main"""
20   OUTPUT 717;":PROG:NAME?"
30   ENTER 717;A$
```

Related commands

:PROG:CAT? on page 521

:PROG:STAT on page 523

Equivalent key

[Macro Setup] - Select Macro

NOTE

When performing the operation from the front panel, you select the VBA macro and execute it at the same time.

:PROG:STAT

Syntax

:PROGram[:SELected]:STATe {STOP|RUN}

:PROGram[:SELected]:STATe?

Description

Reads out the control/state of the VBA macro selected with the :PROG:STAT command.

Parameters

	Description
STOP (preset value)	Specifies stop.
RUN	Specifies run.

Query response

{STOP|RUN}<newline><^END>

Example of use

```
10   OUTPUT 717;":PROG:STAT RUN"
20   OUTPUT 717;":PROG:STAT?"
30   ENTER 717;A$
```

Related commands

:PROG:NAME on page 522

Equivalent key

[Macro Break] (to stop)

[Macro Setup] - **Select Macro** (to run)

NOTE

When performing the operation from the front panel, you select the VBA macro and execute it at the same time.

:SENS:CORR:COLL:ECAL:ORI

Syntax

:SENSe:CORRection:COLLect:ECAL:ORIentation[:STATe] {ON|OFF|1|0}
:SENSe:CORRection:COLLect:ECAL:ORIentation[:STATe]?

Description

Turns ON/OFF the ECal auto detect funcion.

Parameters

	Description
ON or 1 (preset value)	Turns ON the auto detect function.
OFF or 0	Turns OFF the auto detect function.

Query response

{0|1}<newline><^END>

	Description
0	Nothing is connected.
1	Port A is connected.
2	Port B is connected.
3	Port C is connected.
4	Port D is connected.

Example of use

```
10   OUTPUT 717;":SENS:CORR:COLL:ECAL:ORI ON"
20   OUTPUT 717;":SENS:CORR:COLL:ECAL:ORI?"
30   ENTER 717;A
```

Related commands

:SENS:CORR:COLL:ECAL:PATH on page 525

Equivalent key

[Cal] - ECal - Orientation

:SENS:CORR:COLL:ECAL:PATH

Syntax

:SENSe:CORRection:COLLect:ECAL:PATH <numeric 1>,<numeric 2>

:SENSe:CORRection:COLLect:ECAL:PATH? <numeric 1>

Description

Specify the ECal module n port number which is connected to a specified port.

Parameters

	<numeric 1>	<numeric 2>
Description	ENA port number	ECal module port number
Range	1 to 4	0 to 4
Resolution	1	1

CAUTION

If you specify 0 for <numeric 2>, the ECal moduel port will not be connected to the ENA port.

ECal module port number

	Description
0	Nothing is connected.
1	Port A is connected.
2	Port B is connected.
3	Port C is connected.
4	Port D is connected.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:ECAL:PATH 1,2"
```

Related commands

:SENS:CORR:COLL:ECAL:ORI on page 524

Equivalent key

[Cal] - **ECal** - **Orientation** - **Port n** - **Port n**

:SENS:CORR:IMP

Syntax

:SENSe:CORRection:IMPedance[:INPut][:MAGNitude] <numeric>

:SENSe:CORRection:IMPedance[:INPut][:MAGNitude]?

Description

Sets the system characteristic impedance (Z0) value.

NOTE

This command is available with the firmware version 3.01 or greater.

Parameters

	<numeric>
Description	System Z0 value
Range	1E-3 to 1000
Preset value	50
Unit	Ω (ohm)
Resolution	0.001

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS:CORR:IMP 75"
20   OUTPUT 717;":SENS:CORR:IMP?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Set Z0

:SENS:MULT:CAT?

Syntax :SENSe:MULTiplexer{[1]|2}:CATalog?

Description Reads the name (E5091_9 or E5091_13 or E5091_16) of the E5091A test set. (Query only)

Query response {string}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS:MULT:CAT?"
20   ENTER 717;A$
```

Related commands :SENS:MULT{1-2}:NAME on page 530

Equivalent key No equivalent key is available on the front panel.

:SENS:MULT{1-2}:COUN?

Syntax :SENSe:MULTiplexer{[1]|2}:COUNt?

Description Reads the number of ports (7 or 9) of the E5091A whose ID is 1 (:MULT1) or 2 (:MULT2). (Query only)

Query response {numeric}<newline><^END>

0 is read when the E5091A is not connected.

Example of use

```
10   OUTPUT 717;":SENS:MULT1:COUN?"
20   ENTER 717;A
```

Equivalent key No equivalent key is available on the front panel.

:SENS:MULT{1-2}:DISP

Syntax :SENSe:MULTiplexer{[1]|2}:DISPlay[:STATe] {ON|OFF|1|0}

:SENSe:MULTiplexer{[1]|2}:DISPlay[:STATe]?

Description Turns ON/OFF the property display (the state of the port assignment) of the E5091A whose ID is 1 (:MULT1) or 2 (:MULT2).

Parameters

	Description
ON or 1	Turns ON the property display.
OFF or 0 (preset value)	Turns OFF the property display.

Query response {1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS:MULT1:DISP ON"
20   OUTPUT 717;":SENS:MULT1:DISP?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:MULT{1-2}:TSET9:PORT1 on page 650
:SENS{1-16}:MULT{1-2}:TSET9:PORT2 on page 651
:SENS{1-16}:MULT{1-2}:TSET9:PORT3 on page 652
:SENS{1-16}:MULT{1-2}:TSET9:PORT4 on page 653
:SENS{1-16}:MULT{1-2}:PORT{1-20} on page 646
:SENS{1-16}:MULT{1-2}:PORT{1-20}:CAT? on page 648

Equivalent key **[System] - Multiport Test Set Setup - Test Set 1|Test Set 2 - Property**

:SENS:MULT{1-2}:INC?

Syntax

:SENSe:MULTiplexer{[1]|2}:INCount?

Description

The E5091A returns the number of input ports of ID 1 (:MULT1) or ID 2 (:MULT2) (Query only)

When model name is E5091_9 or E5091_13, the return value is 4.

When model name is E5091_16, the return value is 7.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS:MULT1:INC?"
20   ENTER 717;A
```

Related commands

:SENS:MULT{1-2}:NAME on page 530

Equivalent key

No equivalent key is available on the front panel.

:SENS:MULT{1-2}:NAME

Syntax

:SENSe:MULTiplexer{[1]|2}:NAME {E5091_9|E5091_13|E5091_16}

:SENSe:MULTiplexer{[1]|2}:NAME?

Description

Specifies the name of the E5091A test set.

There is no distinction between upper and lower cases.

Parameters

	Description
E5091_9	Select the E5091A option 009.
E5091_13	Select the E5091A option 016 for the 13-port device function.
E5091_16	Select the E5091A option 016 for the 16-port device function.

Query response

{E5091_9|E5091_13|E5091_16}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS:MULT1:NAME E5091_9"
20   OUTPUT 717;":SENS:MULT1:NAME?"
30   ENTER 717;A$
```

Related commands

:SENS:MULT:CAT? on page 527

:SENS:MULT{1-2}:INC? on page 529

Equivalent key

[System] - Multiport Test Set Setup - Test Set 1|Test Set 2 - Select Test Set - E5091_9|E5091_13|E5091_16

:SENS:MULT{1-2}:STAT

Syntax

:SENSe:MULTiplexer{[1]|2}:STATe {ON|OFF|1|0}

:SENSe:MULTiplexer{[1]|2}:STATe?

Description

Turns ON/OFF the control (switching the internal switch that connects between the ports and changing control line output) of the E5091A whose ID is 1 (:MULT1) or 2 (:MULT2).

Parameters

	Description
ON or 1	Turns ON the control.
OFF or 0 (preset value)	Turns OFF the control.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS:MULT1:STAT ON"
20   OUTPUT 717;":SENS:MULT1:STAT?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:MULT{1-2}:OUTP on page 645

:SENS{1-16}:MULT{1-2}:PORT{1-20} on page 646

:SENS{1-16}:MULT{1-2}:TSET9:OUTP on page 649

:SENS{1-16}:MULT{1-2}:TSET9:PORT1 on page 650

:SENS{1-16}:MULT{1-2}:TSET9:PORT2 on page 651

:SENS{1-16}:MULT{1-2}:TSET9:PORT3 on page 652

:SENS{1-16}:MULT{1-2}:TSET9:PORT4 on page 653

Equivalent key

[System] - Multiport Test Set Setup - Test Set 1|Test Set 2 - Control

:SENS{1-16}:AVER:CLE

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:AVERage:CLEar

Description

Clears the measurement data used for averaging of channel 1 (:SENS1) to channel 16 (:SENS16). Measurement data before the execution of this command is not used for averaging. (No query)

Example of use

```
10   OUTPUT 717;":SENS1:AVER:CLE"
```

Related commands

:SENS{1-16}:AVER on page 532

:SENS{1-16}:AVER:COUN on page 533

Equivalent key

[Avg] - Averaging Restart

:SENS{1-16}:AVER

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:AVERage[:STATe] {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:AVERage[:STATe]?

Description

Turns ON/OFF the averaging function of channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	Description
ON or 1	Turns ON the averaging function.
OFF or 0 (preset value)	Turns OFF the averaging function.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:AVER ON"
20   OUTPUT 717;":SENS1:AVER?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:AVER:CLE on page 532

:SENS{1-16}:AVER:COUN on page 533

Equivalent key

[Avg] - Averaging

:SENS{1-16}:AVER:COUN

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:AVERage:COUNt <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:AVERage:COUNt?

Description

Sets the averaging factor of channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	<numeric>
Description	Averaging factor
Range	1 to 999
Preset value	16
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:AVER:COUN 4"
20   OUTPUT 717;":SENS1:AVER:COUN?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:AVER on page 532

:SENS{1-16}:AVER:CLE on page 532

Equivalent key

[Avg] - Avg Factor

:SENS{1-16}:BAND

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:BANDwidth[:RESolution] <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:BANDwidth[:RESolution]?

Description

Sets the IF bandwidth of channel 1 (:SENS1) to channel 16 (:SENS16).

This command provides the same function as the :SENS{1-16}:BWID command.

Parameters

	<numeric>
Description	IF bandwidth
Range	10 to 100000
Preset value	100000
Unit	Hz (hertz)
Resolution	In steps of 1, 1.5, 2, 3, 4, 5, or 7

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:BAND 1.5E3"
20   OUTPUT 717;":SENS1:BAND?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:BWID on page 535

Equivalent key

[Avg] - IF Bandwidth

:SENS{1-16}:BWID

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:BWIDth[:RESolution] <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:BWIDth[:RESolution]?

Description

Sets the IF bandwidth of channel 1 (:SENS1) to channel 16 (:SENS16).

This command provides the same function as the :SENS{1-16}:BAND command.

Parameters

	<numeric>
Description	IF bandwidth
Range	10 to 100000
Preset value	70000
Unit	Hz (hertz)
Resolution	In steps of 1, 1.5, 2, 3, 4, 5, or 7

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:BWID 1.5E3"
20   OUTPUT 717;":SENS1:BWID?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:BAND on page 534

Equivalent key

[Avg] - IF Bandwidth

:SENS{1-16}:CORR:CLE

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:CLEar

Description

Clears the error coefficient for calibration when the frequency offset mode is off for channel 1 (:SENS1) to channel 16 (:SENS16). (No query)

To toggle the frequency offset mode, use :SENS{1-16}:OFFS command on page 654.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:CLE"
```

Related commands

:SENS{1-16}:OFFS on page 654

:SENS{1-16}:CORR:OFFS:CLE on page 620

Equivalent key

[Cal] - Clear - OK

:SENS{1-16}:CORR:COEF

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COEFficient[:DATA] {ES|ER|ED|EL|ET|EX},<numeric 1>, <numeric 2>, <numeric 3>,..., <numeric 3 n×2>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COEFficient[:DATA]? {ES|ER|ED|EL|ET|EX},<numeric 1>, <numeric 2>

Description

Reads out/write the calibration coefficient data for specified channel.

When the calibration factor is interpolated, the interpolated calibration coefficient array is read. Similarly, when the calibration factor is not interpolated, a non-interpolated calibration coefficient array is read.

After writing the calibration coefficient array, the written value becomes effective only after the :SENS{1-16}:CORR:COEF:SAVE command is executed.

Parameters

	<numeric>
ES	Source match
ER	Reflection tracking
ED	Directivity
EL	Load match
ET	Transmission tracking
EX	Isolation
numeric 1	Response port
numeric 2	Stimulus port
numeric 3 ... numeric 3 n×2	Calibration coefficient array for measurement point. (The values of the real part and the imaginary part are necessary for each measurement point.)

If ES, ER, or ED is used, the response port and the stimulus port must be the same, while EL, ET, or EX is used, the response port and the stimulus port must be different.

Query response

{numeric 1},…,{numeric NOP×2}<newline><^END>

	Description
{numeric n×2-1}	Real part of data (complex number) at the n-th measurement point.
{numeric n×2}	Imaginary part of data (complex number) at the n-th measurement point.

Because the calibration coefficient array is expressed by a complex number, the real part and the imaginary part of one measurement point are returned and obtained as a value. Here, NOP is the number of measurement points and n is an integer between 1 and NOP.

Example of use

```
10   DIM A(1:201)
20   OUTPUT 717;":SENS1:CORR:COEF? EL,1,2"
30   ENTER 717;A(*)
```

Related commands

:SENS{1-16}:CORR:COEF:METH:ERES on page 539

:SENS{1-16}:CORR:COEF:METH:OPEN on page 540

:SENS{1-16}:CORR:COEF:METH:SHOR on page 541

:SENS{1-16}:CORR:COEF:METH:SOLT1 on page 542

:SENS{1-16}:CORR:COEF:METH:SOLT2 on page 543

:SENS{1-16}:CORR:COEF:METH:SOLT3 on page 544

:SENS{1-16}:CORR:COEF:METH:SOLT4 on page 545

:SENS{1-16}:CORR:COEF:METH:THRU on page 546

:SENS{1-16}:CORR:COEF:SAVE on page 547

:SENS{1-16}:CORR:COLL:METH:TRL2 on page 593

:SENS{1-16}:CORR:COLL:METH:TRL3 on page 594

:SENS{1-16}:CORR:COLL:METH:TRL4 on page 595

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:CORR:COEF:METH:ERES

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COEFficient:METHod:ERESponse <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the enhanced response calibration between the two specified ports when the calibration coefficient data array is written with the :SENS{1-16}:CORR:COEF command. (No query)

Parameters

	<numeric 1>	<numeric 2>
Description	Response port number	Stimulus port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COEF:METH:ERES 1,2"
```

Related commands

:SENS{1-16}:CORR:COEF on page 537

:SENS{1-16}:CORR:COEF:SAVE on page 547

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:CORR:COEF:METH:OPEN

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COEFficient:METHod[:RESPonse]:OPEN <numeric>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the response calibration (open) of the specified port when the calibration coefficient data array is written with the :SENS{1-16}:CORR:COEF command. (No query)

Parameters

	<numeric>
Description	Port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COEF:METH:OPEN 1"
```

Related commands

:SENS{1-16}:CORR:COEF on page 537

:SENS{1-16}:CORR:COEF:SAVE on page 547

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:CORR:COEF:METH:SHOR

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COEFficient:METHod[:RESPonse]:SHORt <numeric>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the response calibration (short) of the specified port when the calibration coefficient data array is written with the :SENS{1-16}:CORR:COEF command. (No query)

Parameters

	<numeric>
Description	Port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COEF:METH:SHOR 1"
```

Related commands

:SENS{1-16}:CORR:COEF on page 537

:SENS{1-16}:CORR:COEF:SAVE on page 547

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:CORR:COEF:METH:SOLT1

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COEFficient:METHod:SOLT1 <numeric>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the 1-port calibration of the specified port when the calibration coefficient data array is written with the :SENS{1-16}:CORR:COEF command. (No query)

Parameters

	<numeric>
Description	Port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COEF:METH:SOLT1 1"
```

Related commands

:SENS{1-16}:CORR:COEF on page 537

:SENS{1-16}:CORR:COEF:SAVE on page 547

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:CORR:COEF:METH:SOLT2

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COEFficient:METHod:SOLT2 <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to full 2-port calibration between the two specified ports when the calibration coefficient data array is written with the :SENS{1-16}:CORR:COEF command. (No query)

Parameters

	<numeric 1>	<numeric 2>
Description	Port number	Port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COEF:METH:SOLT2 1,2"
```

Related commands

:SENS{1-16}:CORR:COEF on page 537

:SENS{1-16}:CORR:COEF:SAVE on page 547

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:CORR:COEF:METH:SOLT3

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COEFficient:METHod:SOLT3 <numeric 1>,<numeric 2>, <numeric 3>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to full 3-port calibration between the three specified ports when the calibration coefficient data array is written with the :SENS{1-16}:CORR:COEF command. (No query)

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Port number	Port number	Port number
Range	1 to 4	1 to 4	1 to 4
Resolution	1	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COEF:METH:SOLT3 1,2,3"
```

Related commands

:SENS{1-16}:CORR:COEF on page 537

:SENS{1-16}:CORR:COEF:SAVE on page 547

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:CORR:COEF:METH:SOLT4

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COEFficient:METHod:SOLT4 <numeric 1>, <numeric 2>, <numeric 3>, <numeric 4>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to full 4-port calibration when the calibration coefficient data array is written with the :SENS{1-16}:CORR:COEF command. (No query)

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>	<numeric 4>
Description	Port number	Port number	Port number	Port number
Range	1 to 4	1 to 4	1 to 4	1 to 4
Resolution	1	1	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COEF:METH:SOLT4 1,2,3,4"
```

Related commands

:SENS{1-16}:CORR:COEF on page 537

:SENS{1-16}:CORR:COEF:SAVE on page 547

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:CORR:COEF:METH:THRU

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COEFficient:METHod[:RESPonse]:THRU <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the response calibration (open) between the two specified ports when the calibration coefficient data array is written with the :SENS{1-16}:CORR:COEF command. (No query)

Parameters

	<numeric 1>	<numeric 2>
Description	Response port number	Stimulus port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for two or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COEF:METH:THRU 2,1"
```

Related commands

:SENS{1-16}:CORR:COEF on page 537

:SENS{1-16}:CORR:COEF:SAVE on page 547

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:CORR:COEF:SAVE

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COEFficient:SAVE

Description

From the writing calibration data, enables the calibration coefficients depending on the selected calibration type.

Enabling the calibration coefficients clears all calibration data regardless of whether the data are used for the calculation and also clears the calibration type selections.

If you execute this command before all calibration data needed for calculating the calibration coefficients are written, an error occurs and the command is ignored. (No query)

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COEF:SAVE"
```

Related commands

:SENS{1-16}:CORR:COEF on page 537
:SENS{1-16}:CORR:COEF:METH:ERES on page 539
:SENS{1-16}:CORR:COEF:METH:OPEN on page 540
:SENS{1-16}:CORR:COEF:METH:SHOR on page 541
:SENS{1-16}:CORR:COEF:METH:SOLT1 on page 542
:SENS{1-16}:CORR:COEF:METH:SOLT2 on page 543
:SENS{1-16}:CORR:COEF:METH:SOLT3 on page 544
:SENS{1-16}:CORR:COEF:METH:SOLT4 on page 545
:SENS{1-16}:CORR:COEF:METH:THRU on page 546
:SENS{1-16}:CORR:COLL:METH:TRL2 on page 593
:SENS{1-16}:CORR:COLL:METH:TRL3 on page 594
:SENS{1-16}:CORR:COLL:METH:TRL4 on page 595

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:CORR:COLL:CKIT

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT[:SELect] <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT[:SELect]?

Description

Selects the calibration kit of channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	<numeric>
Description	Number of calibration kit*1
Range	1 to 20
Preset value	1
Resolution	1

*1. The numbers of 1 to 20 assigned from the top to the calibration kit names displayed on the softkey labels when performing **[Cal]** - **Cal Kit**.

If the specified parameter is out of the allowable setup range, an error occurs and the command is ignored.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT 3"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT?"
30   ENTER 717;A
```

Equivalent key

[Cal] - **Cal Kit**

:SENS{1-16}:CORR:COLL:CKIT:LAB

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:LABel <string>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:LABel?

Description

Sets a calibration kit name for the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	<string>
Description	Calibration kit name
Range	254 characters or less
Preset value	Varies depending on the calibration kit number as follows: 1: “85033E” 2: “85033D” 3: “85052D” 4: “85032F” 5: “85032B” 6: “85036B/E” 7: “85031B” 8: “85050C/D” 9: “85052C” 10 to 20: “User”

Query response

{string}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:LAB ""MY_KIT"""
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:LAB?"
30   ENTER 717;A$
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT on page 548

Equivalent key

[Cal] - Modify Cal Kit - Label Kit

:SENS{1-16}:CORR:COLL:CKIT:ORD

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer[:SELect] <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer[:SELect]?

Description

Sets a subclass of the standard for calibrating channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	<numeric>
Description	The number of the standard subclass for the calibration.
Range	1 to 8
Resolution	1

If the specified parameter is out of the allowable setup range, an error occurs and the command is ignored.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD 1"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT on page 548
:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD on page 551
:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN on page 552
:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR on page 553
:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU on page 554
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLL on page 555
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLR on page 556
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLT on page 557

Equivalent key

[Cal] - Modify Cal Kit - Specify CLSs - Sub Class - Sub Class 1|•••|Sub Class 8

:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:LOAD <numeric 1>,<numeric 2>
:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:LOAD? <numeric 1>

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), selects the standard used for the load measurement of the specified port.

If the standard number is 0, the standard is invalid for that subclass.

Parameters

	<numeric 1>	<numeric 2>
Description	Port number	Standard number
Range	1 to 4	0 to 21
Resolution	1	1

If the specified parameter is out of the allowable setup range, an error occurs and the command is ignored.

Query response

{numeric 2}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:LOAD 1,9"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:LOAD? 1"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT on page 548
:SENS{1-16}:CORR:COLL:CKIT:ORD on page 550
:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN on page 552
:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR on page 553
:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU on page 554
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLL on page 555
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLR on page 556
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLT on page 557

Equivalent key

[Cal] - Modify Cal Kit - Specify CLSs - Load - Port 1|Port 2|Port 3|Port 4

:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:OPEN <numeric 1>,<numeric 2>
:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:OPEN? <numeric 1>

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), selects the standard used for the open measurement of the specified port.

If the standard number is 0, the standard is invalid for that subclass.

Parameters

	<numeric 1>	<numeric 2>
Description	Port number	Standard number
Range	1 to 4	0 to 21
Resolution	1	1

If the specified parameter is out of the allowable setup range, an error occurs and the command is ignored.

Query response

{numeric 2}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:OPEN 1,2"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:OPEN? 1"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT on page 548
:SENS{1-16}:CORR:COLL:CKIT:ORD on page 550
:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD on page 551
:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR on page 553
:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU on page 554
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLL on page 555
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLR on page 556
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLT on page 557

Equivalent key

[Cal] - Modify Cal Kit - Specify CLSs - Open - Port 1|Port 2|Port 3|Port 4

:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:SHORt <numeric 1>,<numeric 2>
:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:SHORt? <numeric 1>

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), selects the standard used for the short measurement of the specified port.

If the standard number is 0, the standard is invalid for that subclass.

Parameters

	<numeric 1>	<numeric 2>
Description	Port number	Standard number
Range	1 to 4	0 to 21
Resolution	1	1

If the specified parameter is out of the allowable setup range, an error occurs and the command is ignored.

Query response

{numeric 2}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:SHOR 1,1"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:SHOR? 1"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT on page 548
:SENS{1-16}:CORR:COLL:CKIT:ORD on page 550
:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD on page 551
:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN on page 552
:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU on page 554
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLL on page 555
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLR on page 556
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLT on page 557

Equivalent key

[Cal] - Modify Cal Kit - Specify CLSs - Short - Port 1|Port 2|Port 3|Port 4

:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:THRU <numeric 1>,<numeric 2>, <numeric 3>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:THRU? <numeric 1>,<numeric 2>

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), selects the standard used for the thru measurement between the specified 2 ports.

the standard is invalid for that subclass 0, the standard is invalid for that subclass.

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Port number 1	Port number 2	Standard number
Range	1 to 4	1 to 4	0 to 21
Resolution	1	1	1

For <numeric 1> and <numeric 2>, you must specify a different port number. If you specify the same port number, an error occurs and the command is ignored.

If the specified parameter is out of the allowable setup range, an error occurs and the command is ignored.

Query response

{numeric 3}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:THRU 1,2,11"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:THRU? 1,2"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT on page 548

:SENS{1-16}:CORR:COLL:CKIT:ORD on page 550

:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD on page 551

:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN on page 552

:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR on page 553

:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLL on page 555

:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLR on page 556

:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLT on page 557

Equivalent key

[Cal] - Modify Cal Kit - Specify CLSs - Thru - Port 1-2|Port 1-3|Port 1-4|Port 2-3|Port 2-4|Port 3-4

:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLL

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:TRLLine <numeric 1>,<numeric 2>, <numeric 3>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:TRLLine? <numeric 1>,<numeric 2>

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), selects the standard used for the line measurement of the TRL calibration between the two specified ports.

If the standard number is 0, the standard is invalid for that subclass.

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Port number 1	Port number 2	Standard number
Range	1 to 4	1 to 4	0 to 21
Resolution	1	1	1

For <numeric 1> and <numeric 2>, you must specify a different port number. If you specify the same port number, an error occurs and the command is ignored.

If the specified parameter is out of the allowable setup range, an error occurs and the command is ignored.

Query response

{numeric 3}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:TRLL 1,2,11"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:TRLL? 1,2"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT on page 548
:SENS{1-16}:CORR:COLL:CKIT:ORD on page 550
:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD on page 551
:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN on page 552
:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR on page 553
:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU on page 554
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLR on page 556
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLT on page 557

Equivalent key

[Cal] - **Modify Cal Kit** - **Specify CLSs** - **TRL Line/Match** - **Set All**|**Port 1-2**|**Port 1-3**|**Port 1-4**|**Port 2-3**|**Port 2-4**|**Port 3-4**

:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLR

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:TRLReflect <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:TRLReflect?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), selects the standard used for the reflection measurement of the TRL calibration between the two specified ports.

If the standard number is 0, the standard is invalid for that subclass.

Parameters

	<numeric>
Description	Setup value of the standard number
Range	0 to 21
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:TRLR 11"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:TRLR?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT on page 548

:SENS{1-16}:CORR:COLL:CKIT:ORD on page 550

:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD on page 551

:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN on page 552

:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR on page 553

:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU on page 554

:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLL on page 555

:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLT on page 557

Equivalent key

[Cal] - **Modify Cal Kit** - **Specify CLSs** - **TRL Reflect**

:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLT

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:TRLThru <numeric 1>, <numeric 2>, <numeric 3>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:ORDer:TRLThru? <numeric 1>,<numeric 2>

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), selects the standard used for the THRU measurement of the TRL calibration between the two specified ports.

If the standard number is 0, the standard is invalid for that subclass.

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Port number 1	Port number 2	Standard number
Range	1 to 4	1 to 4	0 to 21
Resolution	1	1	1

For <numeric 1> and <numeric 2>, you must specify a different port number. If you specify the same port number, an error occurs and the command is ignored.

If the specified parameter is out of the allowable setup range, an error occurs and the command is ignored.

Query response

{numeric 3}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:TRLT 1,2,5"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:ORD:TRLT? 1,2"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT on page 548
:SENS{1-16}:CORR:COLL:CKIT:ORD on page 550
:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD on page 551
:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN on page 552
:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR on page 553
:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU on page 554
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLL on page 555
:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLR on page 556

Equivalent key

[Cal] - **Modify Cal Kit** - **Specify CLSs** - **TRL Thru** - **Set All**|**Port 1-2**|**Port 1-3**|**Port 1-4**|**Port 2-3**|**Port 2-4**|**Port 3-4**

:SENS{1-16}:CORR:COLL:CKIT:RES

Syntax :SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:RESet

Description Resets the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16) to the factory setting state. (No query)

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:RES"
```

Related commands :SENS{1-16}:CORR:COLL:CKIT on page 548

Equivalent key **[Cal]** - **Modify Cal Kit** - **Restore Cal Kit**

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:ARB

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:ARBitrary <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:ARBitrary?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the arbitrary impedance of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<numeric>
Description	Arbitrary impedance
Range	-1E18 to 1E18
Preset value	Varies depending on the calibration kit and the standard.
Unit	Ω (ohm)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:ARB 50.5"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:ARB?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- Arb. Impedance**

*1.no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C0

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:C0 <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:C0?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the C0 of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<numeric>
Description	C0
Range	-1E18 to 1E18
Preset value	Varies depending on the calibration kit and the standard.
Unit	fF (femtofarad)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:C0 12.3"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:C0?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- C0**

*1. no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C1

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:C1 <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:C1?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the C1 of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<numeric>
Description	C1
Range	-1E18 to 1E18
Preset value	Varies depending on the calibration kit and the standard.
Unit	1E-27 F/Hz (1E-27 farad/hertz)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:C1 12.3"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:C1?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- C1**

*1.no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C2

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:C2 <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:C2?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the C2 of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<numeric>
Description	C2
Range	-1E18 to 1E18
Preset value	Varies depending on the calibration kit and the standard.
Unit	1E-36 F/Hz^2 (1E-36 farad/hertz^2)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:C2 12.3"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:C2?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- C2**

*1. no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C3

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:C3 <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:C3?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the C3 of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<numeric>
Description	C3
Range	-1E18 to 1E18
Preset value	Varies depending on the calibration kit and the standard.
Unit	1E-45 F/Hz^3 (1E-45 farad/hertz^3)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:C3 12.3"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:C3?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- C3**

*1.no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:CHAR

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:CHARacter {COAXial|WAVeguide}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:CHARacter?

Description

For the standard 1 (:STAN1) to standard 21 (:STAN21) selected for the channel 1 (:SENS1) to channel 16 (: SENS16), set the media type.

Parameters

	Description
COAXial (preset value)	Selects the coaxial as the media type.
WAVeguide	Selects the waveguide as the media type.

Query response

{COAXial|WAVeguide}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:CHAR WAV"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:CHAR?"
30   ENTER 717;A$
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:DEL on page 565

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name*1 - Media

*1. no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:DEL

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:DELay <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:DELay?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the offset delay of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<numeric>
Description	Offset delay
Range	-1E18 to 1E18
Preset value	Varies depending on the calibration kit and the standard.
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:DEL 12.3"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:DEL?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:CHAR on page 564

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- Offset Delay**

*1.no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMAX

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:FMAXimum <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:FMAXimum?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the stop frequency of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<numeric>
Description	Stop frequency of the selected standard.
Range	0 to 999E9
Preset value	Varies depending on the calibration kit and the standard.
Unit	Hz (hertz)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:FMAX 5E9"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:FMAX?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMIN on page 567

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- Max. Frequency**

*1. no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMIN

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:FMINimum <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:FMINimum?

Description

For the standard1 (:STAN1) to standard 21 (:STAN21) selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the start frequency.

NOTE

When the media type defined by the standard is “Waveguide,” sets the start frequency of the cut-off frequency.

Parameters

	<numeric>
Description	Start frequency of the selected standard.
Range	0 to 999E9
Preset value	Varies depending on the calibration kit and the standard.
Unit	Hz (hertz)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:FMIN 1E9"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:FMIN?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMAX on page 566

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- Min. Frequency**

*1.no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L0

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:L0 <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:L0?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the L0 of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<numeric>
Description	L0
Range	-1E18 to 1E18
Preset value	Varies depending on the calibration kit and the standard.
Unit	pH (picohenry)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:L0 12.3"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:L0?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- L0**

*1. no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L1

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:L1 <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:L1?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the L1 of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<numeric>
Description	L1
Range	-1E18 to 1E18
Preset value	Varies depending on the calibration kit and the standard.
Unit	1E-24 H/Hz (1E-24 henry/hertz)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:L1 12.3"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:L1?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- L1**

*1. no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L2

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:L2 <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:L2?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the L2 of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<numeric>
Description	L2
Range	-1E18 to 1E18
Preset value	Varies depending on the calibration kit and the standard.
Unit	1E-33 H/Hz^2 (1E-33 henry/hertz^2)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:L2 12.3"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:L2?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- L2**

*1. no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L3

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:L3 <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:L3?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the L3 of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<numeric>
Description	L3
Range	-1E18 to 1E18
Preset value	Varies depending on the calibration kit and the standard.
Unit	1E-42 H/Hz^3 (1E-42 henry/hertz^3)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:L3 12.3"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:L3?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- L3**

*1.no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:LAB

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:LABel <string>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:LABel?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the name of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<string>
Description	Standard name
Range	254 characters or less
Preset value	Varies depending on the calibration kit and the standard.

Query response

{string}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:LAB ""OPEN"""
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:LAB?"
30   ENTER 717;A$
```

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- Label**

*1. no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:LOSS

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:LOSS <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:LOSS?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the offset loss of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<numeric>
Description	Offset Loss
Range	-1E18 to 1E18
Preset value	Varies depending on the calibration kit and the standard.
Unit	Ω/s (ohm/second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:LOSS 12.3"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:LOSS?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- Offset Loss**

*1. no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:TYPE {OPEN|SHORt|LOAD|THRU|ARBI|NONE}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:TYPE?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the standard type of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	Description
OPEN	Specifies open.
SHORt	Specifies short.
LOAD	Specifies load.
THRU	Specifies thru.
ARBI	Specify arbitrary impedance.
NONE	Specifies DUT of which theoretical values are 0.

Query response

{OPEN|SHORt|LOAD|THRU|ARBI|NONE}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:TYPE OPEN"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:TYPE?"
30   ENTER 717;A$
```

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- STD Type**

*1. no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:Z0

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:Z0 <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}:Z0?

Description

For the calibration kit selected for channel 1 (:SENS1) to channel 16 (:SENS16), sets the value of the Offset Z0 of the standard1 (:STAN1) to standard 21 (:STAN21).

Parameters

	<numeric>
Description	Offset Z0
Range	-1E18 to 1E18
Preset value	Varies depending on the calibration kit and the standard.
Unit	Ω (ohm)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:Z0 50"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:STAN1:Z0?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name[*1] **- Offset Z0**

*1.no: standard number (1 to 21), name: standard name (variable)

:SENS{1-16}:CORR:COLL:CKIT:TRL:IMP

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:TRLoption:IMPedance {LINE|SYSTem}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:TRLoption:IMPedance?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16). selects the reference impedance during the TRL calibration.

Parameters

	Description
SYSTem (preset value)	Calculates the error coefficients by setting the system impedance to the reference impedance.
LINE	Calculates the error coefficients by setting the characteristic impedance of the line standard to the reference impedance.

Query response

{LINE|SYST}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:TRL:IMP LINE"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:TRL:IMP?"
30   ENTER 717;A$
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT:TRL:RPL on page 577

Equivalent key

[Cal] - Modify Cal Kit - TRL Option - Impedance

:SENS{1-16}:CORR:COLL:CKIT:TRL:RPL

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:TRLoption:RPLane {THRU|REFLect}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CKIT:TRLoption:RPLANE?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16). selects the calculation method of the calibration plane.

Parameters

	Description
THRU (preset value)	Uses the length of the THRU and LINE standard to calculate the calibration plane.
REFLect	Uses the reflection coefficient of the reflection standard to calculate the calibration plane.

Query response

{THRU|REFL}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CKIT:TRL:RPL REFL"
20   OUTPUT 717;":SENS1:CORR:COLL:CKIT:TRL:RPL?"
30   ENTER 717;A$
```

Related commands

:SENS{1-16}:CORR:COLL:CKIT:TRL:IMP on page 576

Equivalent key

[Cal] - Modify Cal Kit - TRL Option - Reference Plane

:SENS{1-16}:CORR:COLL:CLE

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:CLEar

Description

Clears the measurement value of the Mechanical Cal kit for calibration when the frequency offset mode is off for channel 1 (:SENS1) to channel 16 (:SENS16). (No query)

To toggle the frequency offset mode, use :SENS{1-16}:OFFS command on page 654.

Settings that have been temporarily changed due to measurement for each standard (number of traces, measurement parameter, and so on) return to their original values.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:CLE"
```

Related commands

:SENS{1-16}:OFFS on page 654

Equivalent key

[Cal] - Calibrate - Response(Open) - Cancel - OK

[Cal] - Calibrate - Response(Short) - Cancel - OK

[Cal] - Calibrate - Response(Thru) - Cancel - OK

[Cal] - Calibrate - 1-Port Cal - Cancel - OK

[Cal] - Calibrate - 2-Port Cal - Cancel - OK

[Cal] - Calibrate - 3-Port Cal - Cancel - OK

[Cal] - Calibrate - 4-Port Cal - Cancel - OK

:SENS{1-16}:CORR:COLL:ECAL:CCH

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:ECAL:CCHeck[:ACQuire]

Description

Using ECal (Electronic Calibration), executes the confidence check of the calibration coefficients for channel 1 (:SENS1) to channel 16 (:SENS16) (sets the data measured with the analyzer and the data stored in ECal so that they can be compared).

If you execute this command when the ECal module is not connected or when ports are not properly connected wtih each other, an error occurs and the command is ignored. (No query)

NOTE

This function is available with the firmware version 3.50 or greater.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:ECAL:CCH"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Equivalent key

[Cal] - ECal - Confidence Check

:SENS{1-16}:CORR:COLL:ECAL:ERES

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:ECAL:ERESponse <numeric 1>,<numeric 2>

Description

Executes enhanced response calibration between the two specified ports of channel 1 (:SENS1) to channel 16 (:SENS16) using the ECal (Electrical Calibration) module.

If you execute this command when the ECal module is not connected, an error occurs and the command is ignored. (No query)

Parameters

	<numeric 1>	**<numeric 2>**
Description	Response port number	Stimulus port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:ECAL:ERES 1,2"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Equivalent key

[Cal] - ECal - Enhanced Response - 2-1 (S21 S11)|3-1 (S31 S11)|...|**3-4 (S34 S44)**

:SENS{1-16}:CORR:COLL:ECAL:ISOL

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:ECAL:ISOLation[:STATe] {ON|OFF|1|0}
:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:ECAL:ISOLation[:STATe]?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), turns ON/OFF the isolation measurement when executing Ecal (Electrical Calibration).

Parameters

	Description
ON or 1	Turns ON the isolation measurement.
OFF or 0 (preset value)	Turns OFF the isolation measurement.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:ECAL:ISOL ON"
20   OUTPUT 717;":SENS1:CORR:COLL:ECAL:ISOL?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:ECAL:SOLT1 on page 582
:SENS{1-16}:CORR:COLL:ECAL:SOLT2 on page 582
:SENS{1-16}:CORR:COLL:ECAL:SOLT3 on page 583
:SENS{1-16}:CORR:COLL:ECAL:SOLT4 on page 583
:SENS{1-16}:CORR:COLL:ECAL:THRU on page 584

Equivalent key

[Cal] - ECal - Isolation

:SENS{1-16}:CORR:COLL:ECAL:SOLT1

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:ECAL:SOLT1 <numeric>

Description

Executes 1-port calibration of the specified port of channel 1 (:SENS1) to channel 16 (:SENS16) using the ECal (Electrical Calibration) module.

If you execute this command when the ECal module is not connected, an error occurs and the command is ignored. (No query)

Parameters

	<numeric>
Description	Port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:ECAL:SOLT1 1"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Equivalent key

[Cal] - ECal - 1-Port Cal - Port 1|Port 2|Port 3|Port 4

:SENS{1-16}:CORR:COLL:ECAL:SOLT2

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:ECAL:SOLT2 <numeric 1>,<numeric 2>

Description

Executes full 2-port calibration between the 2 specified ports of channel 1 (:SENS1) to channel 16 (:SENS16) using the ECal (Electrical Calibration) module.

If you execute this command when the ECal module is not connected, an error occurs and the command is ignored. (No query)

Parameters

	<numeric 1>	<numeric 2>
Description	Port number	Port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:ECAL:SOLT2 1,2"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Equivalent key

[Cal] - ECal - 2-Port Cal - Port 1-2|Port 1-3|Port 1-4|Port 2-3|Port 2-4|Port 3-4

:SENS{1-16}:CORR:COLL:ECAL:SOLT3

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:ECAL:SOLT3 <numeric 1>,<numeric 2>,<numeric 3>

Description

Executes full 3-port calibration between the 3 specified ports of channel 1 (:SENS1) to channel 16 (:SENS16) using the ECal (Electrical Calibration) module.

If you execute this command when the 4 ports ECal module is not connected, an error occurs and the command is ignored. (No query)

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Port number	Port number	Port number
Range	1 to 4	1 to 4	1 to 4
Resolution	1	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:ECAL:SOLT3 1,2,3"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Equivalent key

[Cal] - ECal - 3-Port Cal - Port 1-2-3|Port 1-2-4|Port 1-3-4|Port 2-3-4

:SENS{1-16}:CORR:COLL:ECAL:SOLT4

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:ECAL:SOLT4 1,2,3,4

Description

Executes full 4-port calibration of channel 1 (:SENS1) to channel 16 (:SENS16) using the ECal (Electrical Calibration) module.

If you execute this command when the 4 ports ECal module is not connected, an error occurs and the command is ignored. (No query)

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:ECAL:SOLT4 1,2,3,4"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Equivalent key

[Cal] - ECal - 4-Port Cal

:SENS{1-16}:CORR:COLL:ECAL:THRU

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:ECAL:THRU <numeric 1>,<numeric 2>

Description

Executes response calibration (thru) between the 2 specified ports of channel 1 (:SENS1) to channel 16 (:SENS16) using the ECal (Electrical Calibration) module.

If you execute this command when the ECal module is not connected, an error occurs and the command is ignored. (No query)

Parameters

	<numeric 1>	<numeric 2>
Description	Response port number	Stimulus port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:ECAL:SOLT2 1,2"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Equivalent key

[Cal] - ECal - Thru Cal - 2-1 (S21)|3-1 (S31)|4-1 (S41)|1-2 (S12)|3-2 (S32)|4-2 (S42)|1-3 (S13)|2-3 (S23)|4-3 (S43)|1-4 (S14)|2-4 (S24)|3-4 (S34)

:SENS{1-16}:CORR:COLL:ECAL:UCH

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:ECAL:UCHar {CHAR0|CHAR1 |CHAR2|CHAR3|CHAR4|CHAR5}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:ECAL:UCHar?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), selects the ECal characteristic used when executing the user-defined ECal.

The user-defined ECal is a type of ECal that is executed using the characteristic stored in the ECal's flash memory that has been acquired by the user. For more information, refer to *User's Guide*.

When the ECal module is not connected or the characteristic is not stored at the specified location number, executing this command will cause an error and the execution will be ignored.

NOTE This function is available with the firmware version 3.50 or greater.

Parameters

	Description
CHAR0 (preset value)	Specifies the factory-default characteristic. (Normal ECal)
CHAR1	Specifies the characteristic stored at location number 1 in the ECal's flash memory.
CHAR1	Specifies the characteristic stored at location number 2 in the ECal's flash memory.
CHAR3	Specifies the characteristic stored at location number 3 in the ECal's flash memory.
CHAR4	Specifies the characteristic stored at location number 4 in the ECal's flash memory.
CHAR5	Specifies the characteristic stored at location number 5 in the ECal's flash memory.

Query response {CHAR0|CHAR1|CHAR2|CHAR3|CHAR4|CHAR5}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:ECAL:UCH CHAR1"
20   OUTPUT 717;":SENS1:CORR:COLL:ECAL:UCH?"
30   ENTER 717;A$
```

Equivalent key **[Cal] - ECal - Characterization - Factory|User1|User2|User3|User4|User5**

:SENS{1-16}:CORR:COLL:ISOL

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect[:ACQuire]:ISOLation <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), measure the calibration data of the isolation from the stimulus port to the response port. (No query)

Parameters

	<numeric 1>	<numeric 2>
Description	Response port number	Stimulus port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:ISOL 1,2"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Calibrate - Response (Thru) - Isolation (Optional)

[Cal] - Calibrate - n-Port Cal - Isolation (Optional) - Port m-n Isol

:SENS{1-16}:CORR:COLL:LOAD

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect[:ACQuire]:LOAD <numeric>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), measures the calibration data of the load standard of the specified port. (No query)

Parameters

	<numeric>
Description	Port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:LOAD 1"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Calibrate - Response (Open)|Response (Short) - Load (Optional)

[Cal] - Calibrate - 1-Port Cal - Load

[Cal] - Calibrate - n-Port Cal - Reflection - Port m Load

:SENS{1-16}:CORR:COLL:METH:ERES

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:METHod:ERESponse <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the enhanced response calibration between the two specified ports. (No query)

Parameters

	<numeric 1>	<numeric 2>
Description	Response port number	Stimulus port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:METH:ERES 1,2"
```

Related commands

:SENS{1-16}:CORR:COLL:METH:TYPE? on page 596

Equivalent key

[Cal] - **Calibrate** - **Enhanced Response** - **Select Ports** - **2-1 (S21 S11)**|**3-1 (S31 S11)**|...|**3-4 (S34 S44)**

:SENS{1-16}:CORR:COLL:METH:OPEN

Syntax :SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:METHod[:RESPonse]:OPEN <numeric>

Description For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the response calibration (open) of the specified port. (No query)

Parameters

	<numeric>
Description	Port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:METH:OPEN 1"
```

Related commands :SENS{1-16}:CORR:COLL:METH:TYPE? on page 596

Equivalent key **[Cal]** - **Calibrate** - **Response (Open)** - **Select Port**

:SENS{1-16}:CORR:COLL:METH:SHOR

Syntax :SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:METHod[:RESPonse]:SHORt <numeric>

Description For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the response calibration (short) of the specified port. (No query)

Parameters

	<numeric>
Description	Port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:METH:SHOR 1"
```

Related commands :SENS{1-16}:CORR:COLL:METH:TYPE? on page 596

Equivalent key **[Cal]** - **Calibrate** - **Response (Short)** - **Select Port**

:SENS{1-16}:CORR:COLL:METH:SOLT1

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:METHod:SOLT1 <numeric>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the 1-port calibration of the specified port. (No query)

Parameters

	<numeric>
Description	Port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:METH:SOLT1 1"
```

Related commands

:SENS{1-16}:CORR:COLL:METH:TYPE? on page 596

Equivalent key

[Cal] - Calibrate - 1-Port Cal - Select Port

:SENS{1-16}:CORR:COLL:METH:SOLT2

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:METHod:SOLT2 <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the full 2-port calibration between the 2 specified ports. (No query)

Parameters

	<numeric 1>	<numeric 2>
Description	Port number	Port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:METH:SOLT2 1,2"
```

Related commands

:SENS{1-16}:CORR:COLL:METH:TYPE? on page 596

Equivalent key

[Cal] - Calibrate - 2-Port Cal - Select Ports

:SENS{1-16}:CORR:COLL:METH:SOLT3

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:METHod:SOLT3 <numeric 1>, <numeric 2>,<numeric 3>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the full 3-port calibration between the 3 specified ports. (No query)

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Port number	Port number	Port number
Range	1 to 4	1 to 4	1 to 4
Resolution	1	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:METH:SOLT3 1,2,3"
```

Related commands

:SENS{1-16}:CORR:COLL:METH:TYPE? on page 596

Equivalent key

[Cal] - Calibrate - 3-Port Cal - Select Ports

:SENS{1-16}:CORR:COLL:METH:SOLT4

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:METHod:SOLT4 1,2,3,4

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the full 4-port calibration. (No query)

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:METH:SOLT3 1,2,3,4"
```

Related commands

:SENS{1-16}:CORR:COLL:METH:TYPE? on page 596

Equivalent key

[Cal] - Calibrate - 4-Port Cal

:SENS{1-16}:CORR:COLL:METH:THRU

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:METHod[:RESPonse]:THRU <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the response calibration (thru) between the 2 specified ports. (No query)

Parameters

	<numeric 1>	<numeric 2>
Description	Port number	Port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:METH:THRU 1,2"
```

Related commands

:SENS{1-16}:CORR:COLL:METH:TYPE? on page 596

Equivalent key

[Cal] - **Calibrate** - **Response (Thru)** - **Select Ports**

:SENS{1-16}:CORR:COLL:METH:TRL2

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect
:METHod:TRL2 <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the TRL calibration between the two specified ports. (No query)

Parameters

	<numeric 1>	<numeric 2>
Description	Port number	Port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:METH:TRL2 1,2"
```

Related commands

:SENS{1-16}:CORR:COEF on page 537

:SENS{1-16}:CORR:COEF:SAVE on page 547

Equivalent key

[Cal] - **Calibrate** - **2-Port TRL Cal** - **Select Ports** - **1-2**|**1-3**[*1]|**1-4**[*2]|**2-3**[*1]|**2-4**[*2]|**3-4**[*2]

*1. Only with Options 313, 314, 413, and 414.
*2. Only with Options 413 and 414.

:SENS{1-16}:CORR:COLL:METH:TRL3

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect
:METHod:TRL3 <numeric 1>,<numeric 2>,<numeric 3>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the TRL calibration between the 3 specified ports. (No query)

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Port number	Port number	Port number
Range	1 to 4	1 to 4	1 to 4
Resolution	1	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:METH:TRL3 1,2,3"
```

Related commands

:SENS{1-16}:CORR:COEF on page 537

:SENS{1-16}:CORR:COEF:SAVE on page 547

Equivalent key

[Cal] - **Calibrate** - **3-Port TRL Cal**[*1] - **Select Ports** - **1-2-3**|**1-2-4**[*2]|**1-3-4**[*2]|**2-3-4**[*2]

*1. Only with Options 313, 314, 413, and 414.
*2. Only with Options 413 and 414.

:SENS{1-16}:CORR:COLL:METH:TRL4

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect
:METHod:TRL4 <numeric 1>,<numeric 2>,<numeric 3>,<numeric 4>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the calibration type to the TRL calibration between the 4 specified ports. (No query)

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>	<numeric 4>
Description	Port number	Port number	Port number	Port number
Range	1 to 4	1 to 4	1 to 4	1 to 4
Resolution	1	1	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:METH:TRL4 1,2,3,4"
```

Related commands

:SENS{1-16}:CORR:COEF on page 537

:SENS{1-16}:CORR:COEF:SAVE on page 547

Equivalent key

[Cal] - **Calibrate** - **4-Port TRL Cal***1

*1. Only with Options 413 and 414.

:SENS{1-16}:CORR:COLL:METH:TYPE?

Syntax :SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:METHod:TYPE?

Description For channel 1 (:SENS1) to channel 16 (:SENS16), reads out the calibration type selected for calculation of the calibration coefficients. (Query only)

Query response {ERES|NONE|RESPO|RESPS|RESPT|SOLT1|SOLT2|SOLT3|SOLT4|TRL2|TRL3|TRL4}<newline><^END>

	Description
ERES	The calibration type is the enhanced response calibration.
NONE	The calibration type is set to nothing.
RESPO	The calibration type is the response calibration (open).
RESPS	The calibration type is the response calibration (short).
RESPT	The calibration type is the response calibration (thru).
SOLT1	The calibration type is the 1-port calibration.
SOLT2	The calibration type is the full 2-port calibration.
SOLT3	The calibration type is the full 3-port calibration.
SOLT4	The calibration type is the full 4-port calibration.
TRL2	The calibration type is the TRL 2-port calibration.
TRL3	The calibration type is the TRL 3-port calibration.
TRL4	The calibration type is the TRL 4-port calibration.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:METH:TYPE?"
20   ENTER 717;A$
```

Equivalent key No equivalent key is available on the front panel.

:SENS{1-16}:CORR:COLL:OPEN

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect[:ACQuire]:OPEN <numeric>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), measures the calibration data of the open standard of the specified port. (No query)

Parameters

	<numeric>
Description	Port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:OPEN 1"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Calibrate - Response (Open)|1-Port Cal - Open

[Cal] - Calibrate - n-Port Cal - Reflection - Port m Open

:SENS{1-16}:CORR:COLL:PART:SAVE

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:PARTial:SAVE

Description

For partial overwrite, recalculates the calibration coefficients from the measured calibration data depending on the selected calibration type.

Calculating the calibration coefficients clears all calibration data, regardless of whether the data are used for the calculation, and also clears the calibration type selections.

If you execute partial overwrite before selecting the calibration type, an error occurs and the command is ignored. (No query)

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:PART:SAVE"
```

Equivalent key

[Cal] - **Calibrate** - **n-Port Cal** - **Overwrite**

:SENS{1-16}:CORR:COLL:SAVE

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:SAVE

Description

From the measured calibration data, calculates the calibration coefficients depending on the selected calibration type.

Calculating the calibration coefficients clears all calibration data whether or not used for the calculation and also clears the calibration type selections.

If you execute this command before all necessary calibration data for calculating the calibration coefficients is measured, an error occurs and the command is ignored. (No query)

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:SAVE"
```

Related commands

:SENS{1-16}:CORR:COLL:METH:OPEN on page 589
:SENS{1-16}:CORR:COLL:METH:SHOR on page 589
:SENS{1-16}:CORR:COLL:METH:THRU on page 592
:SENS{1-16}:CORR:COLL:METH:SOLT1 on page 590
:SENS{1-16}:CORR:COLL:METH:SOLT2 on page 590
:SENS{1-16}:CORR:COLL:METH:SOLT3 on page 591
:SENS{1-16}:CORR:COLL:METH:SOLT4 on page 591

Equivalent key

[Cal] - Calibrate - Response|n-Port Cal - Done

:SENS{1-16}:CORR:COLL:SHOR

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect[:ACQuire]:SHORt <numeric>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), measures the calibration data of the short standard of the specified port. (No query)

Parameters

	<numeric>
Description	Port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:SHOR 1"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Calibrate - Response (Short)|1-Port Cal - Short

[Cal] - Calibrate - n-Port Cal - Reflection - Port m Short

:SENS{1-16}:CORR:COLL:SIMP:SAVE

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect:SIMPlified:SAVE

Description

When the full 3/4 port calibration is selected as the calibration type, calculates the calibration coefficients for the simplified full 3 port calibration or the simplified full 4 port calibration from the measured calibration data.

If the response calibration or the 1/2 port calibration is selected as the calibration type, this command provides the same function as the :SENS{1-16}:CORR:COLL:SAVE command.

After the calibration coefficients are calculated, the measured data and the calibration type setting are cleared.

If you execute this command before all the necessary calibration data for calculating the calibration coefficients for the simplified full 3 port calibration or the simplified full 4 port calibration is measured, an error occurs and the command is ignored. (No query)

NOTE This function is available with the firmware version 3.50 or greater.

NOTE With the firmware version 6.50 or greater, when the 3/4 port TRL calibration is selected as the calibration type, calculates the calibration coefficients for simplified 3 port TRL calibration and simplified 4 port TRL calibration from the measured calibration data.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:SIMP:SAVE"
```

Related commands

:SENS{1-16}:CORR:COLL:METH:SOLT3 on page 591
:SENS{1-16}:CORR:COLL:METH:SOLT4 on page 591
:SENS{1-16}:CORR:COLL:METH:TRL3 on page 594
:SENS{1-16}:CORR:COLL:METH:TRL4 on page 595

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:CORR:COLL:SUBC

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect[:ACQuire]:SUBClass <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect[:ACQuire]:SUBClass?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the standard subclass for the calibration.

Parameters

	<numeric>
Description	The setting number of the standard subclass for the calibration.
Range	1 to 8
Resolution	1

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:SUBC 1"
```

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:CORR:COLL:THRU

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect[:ACQuire]:THRU <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), measure the calibration data of the thru standard from the stimulus port to the response port. (No query)

Parameters

	<numeric 1>	<numeric 2>
Description	Response port number	Stimulus port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:THRU 1,2"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Equivalent key

[Cal] - **Calibrate** - **Response (Thru)** - **Thru**

[Cal] - **Calibrate** - **n-Port Cal** - **Transmission** - **Port m-n Thru**

:SENS{1-16}:CORR:COLL:TRLL

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect[:ACQuire]:TRLLine <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), executes LINE or MATCH measurement of the TRL calibration for the selected calibration kit.

(No Query)

Parameters

	<numeric 1>	<numeric 2>
Description	Response port number	Stimulus port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:TRLL 1,2"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:TRLR on page 604

:SENS{1-16}:CORR:COLL:TRLT on page 605

Equivalent key

[Cal] - Calibrate - 2-Port TRL Cal - Line/Match - x-y Line/Match|x-y Fwd (Syx)|x-y Rvs (Sxy)

[Cal] - Calibrate - 3-Port TRL Cal - Line/Match - x-y Line/Match|x-y Fwd (Syx)|x-y Rvs (Sxy)|x-z Line/Match|x-z Fwd (Szx)|x-z Rvs (Sxz)|y-z Line/Match|y-z Fwd (Szy)|y-z Rvs (Syz)

[Cal] - Calibrate - 4-Port TRL Cal - Line/Match - x-y Line/Match|x-y Fwd (Syx)|x-y Rvs (Sxy) - x-z Line/Match|x-z Fwd (Szx)|x-z Rvs (Sxz) - x-w Line/Match|x-w Fwd (Swx)|x-w Rvs (Sxw) - y-z Line/Match|y-z Fwd (Szy)|y-z Rvs (Syz) - y-w Line/Match|y-w Fwd (Swy)|y-w Rvs (Syw) - z-w Line/Match|z-w Fwd (Swz)|z-w Rvs (Szw)

:SENS{1-16}:CORR:COLL:TRLR

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect[:ACQuire]:TRLReflect <numeric>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), executes the reflection measurement of the TRL calibration for the selected calibration kit.(No Query)

Parameters

	<numeric>
Description	Port number
Range	1 to 4
Resolution	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:TRLR 1"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:TRLL on page 603

:SENS{1-16}:CORR:COLL:TRLT on page 605

Equivalent key

[Cal] - Calibrate - 2-Port TRL Cal - Reflect - Portx Reflect|Porty Reflect

[Cal] - Calibrate - 3-Port TRL Cal - Reflect - Portx Reflect|Porty Reflect|Portz Reflect

[Cal] - Calibrate - 4-Port TRL Cal - Reflect - Portx Reflect|Porty Reflect|Portz Reflect|Portw Reflect

:SENS{1-16}:CORR:COLL:TRLT

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:COLLect[:ACQuire]:TRLThru <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), executes the THRU measurement of the TRL calibration for the selected calibration kit. (No Query)

Parameters

	<numeric 1>	<numeric 2>
Description	Response port number	Stimulus port number
Range	1 to 4	1 to 4
Resolution	1	1

For each parameter, you must specify a different port number. If you specify the same port number for 2 or more parameters, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:COLL:TRLT 1,2"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:COLL:TRLL on page 603

:SENS{1-16}:CORR:COLL:TRLR on page 604

Equivalent key

[Cal] - Calibrate - 2-Port TRL Cal - Thru/Line - Port x-y Thru

[Cal] - Calibrate - 3-Port TRL Cal - Thru/Line - Port x-y Thru|Port x-z Thru|Port y-z Thru

[Cal] - Calibrate - 4-Port TRL Cal - Thru/Line - Port x-y Thru|Port x-z Thru|Port x-w Thru|Port y-z Thru|Port y-w Thru|Port z-w Thru

:SENS{1-16}:CORR:EXT

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension[:STATe] {ON|OFF|1|0}
:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension[:STATe]?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), turns ON/OFF the port extension.

Parameters

	Description
ON or 1	Turns ON the port extension.
OFF or 0 (preset value)	Turns OFF the port extension.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT ON"
20   OUTPUT 717;":SENS1:CORR:EXT?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:EXT:AUTO:PORT{1-4} on page 611
:SENS{1-16}:CORR:EXT:AUTO:PORT{1-4} on page 611
:SENS{1-16}:CORR:EXT:PORT{1-4}:INCL{1-2} on page 617
:SENS{1-16}:CORR:EXT:PORT{1-4}:LDC on page 618
:SENS{1-16}:CORR:EXT:PORT{1-4}:LOSS{1-2} on page 619

Equivalent key

[Cal] - **Port Extensions** - **Extensions**

:SENS{1-16}:CORR:EXT:AUTO:CONF

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:CONFig {CSPN|AMKR|USPN}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:CONFig?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the frequency point to calculate the loss value of the auto port extension.

Parameters

	Description
CSPN (preset value)	Uses the frequency of the current sweep range.
AMKR	Use the frequency of the active marker.*1 This is applied to Loss 1 and Loss 2 is ignored.
USPN	This action is executed with the arbitrarily specified start frequency and stop frequency.

*1. Even if active marker is set to OFF, it turns on automatically.

Query response

{CSPN|AMKR|USPN}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT:AUTO:CONF CSPN"
20   OUTPUT 717;":SENS1:CORR:EXT:AUTO:CONF?"
30   ENTER 717;A$
```

Related commands

:SENS{1-16}:CORR:EXT:AUTO:STAR on page 613

:SENS{1-16}:CORR:EXT:AUTO:STOP on page 614

Equivalent key

[Cal] - Port Extensions - Auto Port Extension - Method - Current Span|Active Marker|User Span

:SENS{1-16}:CORR:EXT:AUTO:DCOF

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:DCOFfset {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:DCOFfset?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16),enables or disables the usage of DC loss value for the results of the auto port extension.

Parameters

	Description
ON or 1	Uses the DC loss value for the results.
OFF or 0 (preset value)	Does not use the DC loss value for the results.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT:AUTO:DCOF ON"
20   OUTPUT 717;":SENS1:CORR:EXT:AUTO:DCOF?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:EXT on page 606

:SENS{1-16}:CORR:EXT:AUTO:LOSS on page 609

:SENS{1-16}:CORR:EXT:AUTO:MEAS on page 610

:SENS{1-16}:CORR:EXT:AUTO:PORT{1-4} on page 611

Equivalent key

[Cal] - **Port Extensions** - **Auto Port Extension** - **Adjust Mismatch**

:SENS{1-16}:CORR:EXT:AUTO:LOSS

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:LOSS {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:LOSS?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), enables or disables the loss correction for the auto port extension results.

Parameters

	Description
ON or 1	Turns on the loss compensation
OFF or 0 (preset value)	Turns off the loss compensation

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT:AUTO:LOSS ON"
20   OUTPUT 717;":SENS1:CORR:EXT:AUTO:LOSS?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:EXT on page 606

:SENS{1-16}:CORR:EXT:AUTO:DCOF on page 608

:SENS{1-16}:CORR:EXT:AUTO:MEAS on page 610

:SENS{1-16}:CORR:EXT:AUTO:PORT{1-4} on page 611

Equivalent key

[Cal] - **Port Extensions** - **Auto Port Extension** - **Include Loss**

:SENS{1-16}:CORR:EXT:AUTO:MEAS

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:MEASure {OPEN|SHORt}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:MEASure?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), measures the calibration data of the OPEN standard or SHORT standard of the auto port extension.

Parameters

	Description
OPEN	Measures the calibration data of the OPEN standard
SHORt (preset value)	Measures the calibration data of the SHORT standard

Query response

{OPEN|SHOR}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT:AUTO:MEAS OPEN"
20   OUTPUT 717;":SENS1:CORR:EXT:AUTO:MEAS?"
30   ENTER 717;A$
```

Related commands

:SENS{1-16}:CORR:EXT on page 606

:SENS{1-16}:CORR:EXT:AUTO:DCOF on page 608

:SENS{1-16}:CORR:EXT:AUTO:LOSS on page 609

:SENS{1-16}:CORR:EXT:AUTO:PORT{1-4} on page 611

Equivalent key

[Cal] - Port Extensions - Auto Port Extension - Measure OPEN|Measure Short-All|Port 1|Port 2|Port 3|Port 4

:SENS{1-16}:CORR:EXT:AUTO:PORT{1-4}

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:PORT{[1]|2|3|4} {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:PORT{[1]|2|3|4}?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), turns ON/OFF the auto port extension.

Parameters

	Description
ON or 1 (preset value)	Turns ON the auto port extension
OFF or 0	Turns OFF the auot port extension

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT:AUTO:PORT1 ON"
20   OUTPUT 717;":SENS1:CORR:EXT:AUTO:PORT1?"
30   ENTER 717;A$
```

Related commands

:SENS{1-16}:CORR:EXT on page 606

:SENS{1-16}:CORR:EXT:AUTO:DCOF on page 608

:SENS{1-16}:CORR:EXT:AUTO:LOSS on page 609

:SENS{1-16}:CORR:EXT:AUTO:MEAS on page 610

Equivalent key

[Cal] - Port Extensions - Auto Port Extension - Select Ports - Port 1|Port 2|Port 3|Port 4

:SENS{1-16}:CORR:EXT:AUTO:RESet

Syntax :SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:RESet

Description For channel 1 (:SENS1) to channel 16 (:SENS16), deletes the finished measurement data (OPEN and SHORT). (No Query)

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT:AUTO:RESet"
```

Related commands

:SENS{1-16}:CORR:EXT on page 606
:SENS{1-16}:CORR:EXT:AUTO:CONF on page 607
:SENS{1-16}:CORR:EXT:AUTO:DCOF on page 608
:SENS{1-16}:CORR:EXT:AUTO:LOSS on page 609
:SENS{1-16}:CORR:EXT:AUTO:MEAS on page 610
:SENS{1-16}:CORR:EXT:AUTO:PORT{1-4} on page 611
:SENS{1-16}:CORR:EXT:AUTO:STAR on page 613
:SENS{1-16}:CORR:EXT:AUTO:STOP on page 614

Equivalent key No equivalent key is available on the front panel.

:SENS{1-16}:CORR:EXT:AUTO:STAR

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:STARt <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:STARt?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the start frequency within the frequency range of the user specified auto port extension.

Parameters

	<numeric>
Description	Start frequency
Range	3E5 to 3.0E9 (for E5070B) 3E5 to 8.5E9 (for E5071B)
Preset value	3E5
Unit	Hz (hertz)

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT:AUTO:STAR 1.2E9"
20   OUTPUT 717;":SENS1:CORR:EXT:AUTO:STAR?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:EXT on page 606
:SENS{1-16}:CORR:EXT:AUTO:CONF on page 607
:SENS{1-16}:CORR:EXT:AUTO:PORT{1-4} on page 611
:SENS{1-16}:CORR:EXT:AUTO:STOP on page 614

Equivalent key

[Cal] - Port Extensions - Auto Port Extension - Method - User Span Start

:SENS{1-16}:CORR:EXT:AUTO:STOP

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:STOP <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:AUTO:STOP?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the stop frequency within the frequency range of the user specified auto port extension.

Parameters

	<numeric>
Description	Stop frequency
Range	3E5 to 3.0E9 (for E5070B) 3E5 to 8.5E9 (for E5071B)
Preset value	3.0E9 (for E5070B) 8.5E9 (for E5071B)
Unit	Hz (hertz)

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT:AUTO:STOP 1.5E9"
20   OUTPUT 717;":SENS1:CORR:EXT:AUTO:STOP?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:EXT on page 606

:SENS{1-16}:CORR:EXT:AUTO:CONF on page 607

:SENS{1-16}:CORR:EXT:AUTO:PORT{1-4} on page 611

:SENS{1-16}:CORR:EXT:AUTO:STAR on page 613

Equivalent key

[Cal] - **Port Extensions** - **Auto Port Extension** - **Method** - **User Span Start**

:SENS{1-16}:CORR:EXT:PORT{1-4}

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:PORT{[1]|2|3|4} <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:PORT{[1]|2|3|4}?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the correction amount for the port extension of port 1 (:PORT1) to port 4 (:PORT4) as the delay time.

Parameters

	<numeric>
Description	Delay time
Range	-10 to 10
Preset value	0
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT:PORT1 1E-3"
20   OUTPUT 717;":SENS1:CORR:EXT?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:EXT on page 606

:SENS{1-16}:CORR:EXT:PORT{1-4}:FREQ{1-2} on page 616

:SENS{1-16}:CORR:EXT:PORT{1-4}:INCL{1-2} on page 617

:SENS{1-16}:CORR:EXT:PORT{1-4}:LDC on page 618

:SENS{1-16}:CORR:EXT:PORT{1-4}:LOSS{1-2} on page 619

Equivalent key

[Cal] - Port Extensions - Extension Port 1|Extension Port 2|Extension Port 3|Extension Port 4

:SENS{1-16}:CORR:EXT:PORT{1-4}:FREQ{1-2}

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:PORT{[1]|2|3|4}:FREQuency{[1]|2} <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:PORT{[1]|2|3|4}:FREQuency{[1]|2}?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the frequency used for the loss calculation of frequency 1 (:FREQ1) or frequency 2(FREEQ2) of port 1 (:PORT1) to port 4 (:PORT4).

Parameters

	<numeric>
Description	Frequency
Range	3E5 to 3.0E9 (for E5070B) 3E5 to 8.5E9 (for E5071B)
Preset value	1E9
Unit	Hz (hertz)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT:PORT1:FREQ1 10E6"
20   OUTPUT 717;":SENS1:CORR:EXT:PORT1:FREQ1?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:EXT on page 606

:SENS{1-16}:CORR:EXT:PORT{1-4} on page 615

:SENS{1-16}:CORR:EXT:PORT{1-4}:INCL{1-2} on page 617

:SENS{1-16}:CORR:EXT:PORT{1-4}:LDC on page 618

:SENS{1-16}:CORR:EXT:PORT{1-4}:LOSS{1-2} on page 619

Equivalent key

[Cal] - **Port Extensions** - **Loss** - **Freq1**|**Freq2**

:SENS{1-16}:CORR:EXT:PORT{1-4}:INCL{1-2}

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:PORT{[1]|2|3|4}:INCLude{[1]|2}[:STATe] {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:PORT{[1]|2|3|4}:INCLude{[1]|2}[:STATe]?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), turns ON/OFF the set of loss value and frequency value of include 1 (: INCL1) and include 2 (: INCL2) of port 1 (:PORT1) to port 4 (:PORT4).

Parameters

	Description
ON or 1	Turns ON the loss value and frequency value.
OFF or 0 (preset value)	Turns OFF the loss value and frequency value.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT:PORT1:INCL1 ON"
20   OUTPUT 717;":SENS1:CORR:EXT:PORT1:INCL1?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:EXT on page 606

:SENS{1-16}:CORR:EXT:PORT{1-4} on page 615

:SENS{1-16}:CORR:EXT:PORT{1-4}:FREQ{1-2} on page 616

:SENS{1-16}:CORR:EXT:PORT{1-4}:LDC on page 618

:SENS{1-16}:CORR:EXT:PORT{1-4}:LOSS{1-2} on page 619

Equivalent key

[Cal] - Port Extensions - Loss - Loss1|Loss2

:SENS{1-16}:CORR:EXT:PORT{1-4}:LDC

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:PORT{[1]|2|3|4}:LDC <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:PORT{[1]|2|3|4}:LDC?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the DC loss value of the port 1 (:PORT1) to port 4 (:PORT4).

Parameters

	<numeric>
Description	The loss value of DC.
Range	-90 to 90
Preset value	0
Unit	dBm

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT:PORT1:LDC 1.2"
20   OUTPUT 717;":SENS1:CORR:EXT:PORT1:LDC?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:EXT on page 606

:SENS{1-16}:CORR:EXT:PORT{1-4} on page 615

:SENS{1-16}:CORR:EXT:PORT{1-4}:FREQ{1-2} on page 616

:SENS{1-16}:CORR:EXT:PORT{1-4}:INCL{1-2} on page 617

:SENS{1-16}:CORR:EXT:PORT{1-4}:LOSS{1-2} on page 619

Equivalent key

[Cal] - Port Extensions - Loss - Loss at DC

:SENS{1-16}:CORR:EXT:PORT{1-4}:LOSS{1-2}

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:PORT{[1]|2|3|4}:LOSS{[1]|2} <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:EXTension:PORT{[1]|2|3|4}:LOSS{[1]|2}?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the loss value of the loss 1 (:LOSS1) or loss 2 (:LOSS2) of the port 1 (:PORT1) to port 4 (:PORT4).

Parameters

	<numeric>
Description	The loss value
Range	-90 to 90
Preset value	0
Unit	dBm

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:EXT:PORT1:LOSS1 0.8"
20   OUTPUT 717;":SENS1:CORR:EXT:PORT1:LOSS1?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:EXT on page 606

:SENS{1-16}:CORR:EXT:PORT{1-4} on page 615

:SENS{1-16}:CORR:EXT:PORT{1-4}:FREQ{1-2} on page 616

:SENS{1-16}:CORR:EXT:PORT{1-4}:INCL{1-2} on page 617

:SENS{1-16}:CORR:EXT:PORT{1-4}:LDC on page 618

Equivalent key

[Cal] - Port Extensions - Loss - Loss1|Loss2

:SENS{1-16}:CORR:OFFS:CLE

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:OFFSet:CLEar

Description

Clears the error coefficient for calibration when the frequency offset mode is on for channel 1 (:SENS1) to channel 16 (:SENS16). (No query)

To toggle the frequency offset mode, use :SENS{1-16}:OFFS command on page 654.

This command does not clear the error coefficient when the frequency offset mode is off.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:OFFS:CLE"
```

Related commands

:SENS{1-16}:OFFS on page 654

:SENS{1-16}:CORR:CLE on page 536

Equivalent key

[Cal] - **Mixer/Converter Calibration** - **Clear** - **OK**

:SENS{1-16}:CORR:OFFS:COLL:CLE

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:OFFSet:COLLect:CLEar

Description

Clears the measurement value of the Mechanical Cal kit for calibration when the frequency offset mode is on for channel 1 (:SENS1) to channel 16 (:SENS16). This command also clears the measurement value of the power meter. (No query)

To toggle the frequency offset mode, use :SENS{1-16}:OFFS command on page 654.

Settings that have been temporarily changed due to measurement for each standard (number of traces, measurement parameter, and so on) return to their original values.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:OFFS:COLL:CLE"
```

Related commands

:SENS{1-16}:OFFS on page 654

:SENS{1-16}:CORR:OFFS:CLE on page 620

Equivalent key

[Cal] - Mixer/Converter Calibration - Scalar Cal (Manual) - Cancel - OK

:SENS{1-16}:CORR:OFFS:COLL:ECAL:SMIX2

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:OFFSet:COLLect:ECAL:SMIX2 <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), performs 2-port ECal module measurement and error coefficient calculation (scalar-mixer calibration) when the frequency offset mode is on. (No query)

Note that power meter measurement with :SENS{1-16}:CORR:OFFS:COLL:PMET command on page 628 must be complete to execute this command.

Parameters

	<value 1>	**<value 2>**
Description	Port number 1*1	Port number 2*1
Range	1 to 4	1 to 4
Resolution	1	1

*1. The direction (forward or reverse) is determined by the presence/absence of power meter measurement data instead of port number 1 or port number 2 specified here.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:OFFS:COLL:ECAL:SMIX2 1,2"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS on page 654

:SENS{1-16}:CORR:OFFS:COLL:PMET on page 628

:SENS{1-16}:CORR:OFFS:COLL:ECAL:SOLT1 on page 623

Equivalent key

[Cal] - Mixer/Converter Calibration - Scalar Cal (ECal) - ECal & Done

:SENS{1-16}:CORR:OFFS:COLL:ECAL:SOLT1

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:OFFSet:COLLect:ECAL:SOLT1 <numeric>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), performs 1-port ECal module measurement and error coefficient calculation (scalar-mixer calibration) when the frequency offset mode is on. (No query)

Parameters

	<value>
Description	Port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":SENS1:CORR:OFFS:COLL:ECAL:SOLT1 2"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS on page 654

:SENS{1-16}:CORR:OFFS:COLL:ECAL:SMIX2 on page 622

Equivalent key

[Cal] - Mixer/Converter Calibration - Scalar Cal (ECal) - ECal & Done

:SENS{1-16}:CORR:OFFS:COLL:LOAD

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:OFFSet:COLLect[:ACQuire]:LOAD <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), measures the calibration data of the load standard of the specified port when the frequency offset mode is on. (No query)

Parameters

	<value 1>	**<value 2>**
Description	Port number for measurement	Port number for which the frequency is specified*1
Range	1 to 4	1 to 4
Resolution	1	1

*1. The specified frequency is used for the specified port. For information on how to set the frequency for the port, refer to the desired command in the related commands list.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:OFFS:COLL:LOAD 1,4"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS on page 654
:SENS{1-16}:CORR:OFFS:COLL:OPEN on page 627
:SENS{1-16}:CORR:OFFS:COLL:SHOR on page 630
:SENS{1-16}:OFFS:PORT{1-4}:DIV on page 668
:SENS{1-16}:OFFS:PORT{1-4}:MULT on page 669
:SENS{1-16}:OFFS:PORT{1-4}:OFFS on page 670
:SENS{1-16}:OFFS:PORT{1-4}:STAR on page 671
:SENS{1-16}:OFFS:PORT{1-4}:STOP on page 672

Equivalent key

[Cal] - Mixer/Converter Calibration - Scalar Cal (Manual) - Reflection - PortX@FreqY [Broadband]

NOTE

The softkey, PortX and FreqY, changes depending on the selected Cal method and port.

:SENS{1-16}:CORR:OFFS:COLL:METH:SMIX2

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:OFFSet:COLLect:METHod:SMIX2 <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), specifies the port used for the execution of 2-port scalar-mixer calibration when the frequency offset mode is on. (No query)

Different values must be specified for 2 ports. The order of port number 1 and port number 2 is arbitrary.

Parameters

	<value 1>	**<value 2>**
Description	Port number 1*1	Port number 2*1
Range	1 to 4	1 to 4
Resolution	1	1

*1. The direction (forward, reverse, or both) is determined by appropriately calling one of the :SENS{1-16}:CORR:OFFS:COLL:LOAD command on page 624, :SENS{1-16}:CORR:OFFS:COLL:OPEN command on page 627, :SENS{1-16}:CORR:OFFS:COLL:SHOR command on page 630, and :SENS{1-16}:CORR:OFFS:COLL:THRU command on page 631 commands, instead of port number 1 or port number 2 specified here.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:OFFS:COLL:METH:SMIX2 1,2"
```

Related commands

:SENS{1-16}:OFFS on page 654

:SENS{1-16}:CORR:OFFS:COLL:LOAD on page 624

:SENS{1-16}:CORR:OFFS:COLL:OPEN on page 627

:SENS{1-16}:CORR:OFFS:COLL:SHOR on page 630

:SENS{1-16}:CORR:OFFS:COLL:THRU on page 631

:SENS{1-16}:CORR:OFFS:COLL:METH:SOLT1 on page 626

Equivalent key

[Cal] - **Mixer/Converter Calibration** - **Scalar Cal (Manual)** - **Select Ports** - **2-1(fwd)|1-2(rev) | 1,2(both)** ...

:SENS{1-16}:CORR:OFFS:COLL:METH:SOLT1

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:OFFSet:COLLect:METHod:SOLT1 <numeric>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), specifies the port used for the execution of 1-port scalar-mixer calibration when the frequency offset mode is on. (No query)

Parameters

	<value 1>
Description	Port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":SENS1:CORR:OFFS:COLL:METH:SOLT1 2"
```

Related commands

:SENS{1-16}:OFFS on page 654

:SENS{1-16}:CORR:OFFS:COLL:METH:SMIX2 on page 625

Equivalent key

[Cal] - **Mixer/Converter Calibration** - **Scalar Cal (Manual)** - **Select Ports** - **Port 1** |**Port 2** | **Port 3** ...

:SENS{1-16}:CORR:OFFS:COLL:OPEN

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:OFFSet:COLLect[:ACQuire]:OPEN <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), measures the calibration data of the open standard of the specified port when the frequency offset mode is on. (No query)

Parameters

	<value 1>	**<value 2>**
Description	Port number for measurement	Port number for which the frequency is specified*1
Range	1 to 4	1 to 4
Resolution	1	1

*1. The specified frequency is used for the specified port. For information on how to set the frequency for the port, refer to the desired command in the related commands list.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:OFFS:COLL:OPEN 1,4"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS on page 654
:SENS{1-16}:CORR:OFFS:COLL:LOAD on page 624
:SENS{1-16}:CORR:OFFS:COLL:SHOR on page 630
:SENS{1-16}:OFFS:PORT{1-4}:DIV on page 668
:SENS{1-16}:OFFS:PORT{1-4}:MULT on page 669
:SENS{1-16}:OFFS:PORT{1-4}:OFFS on page 670
:SENS{1-16}:OFFS:PORT{1-4}:STAR on page 671
:SENS{1-16}:OFFS:PORT{1-4}:STOP on page 672

Equivalent key

[Cal] - Mixer/Converter Calibration - Scalar Cal (Manual) - Reflection - PortX@FreqY [Open]

NOTE The softkey, PortX and FreqY, changes depending on the selected Cal method and port.

:SENS{1-16}:CORR:OFFS:COLL:PMET

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:OFFSet:COLLect[:ACQuire]:PMETer <numeric 1>,<numeric 2>,{ASENsor|BSENsor}

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), performs measurement with the power meter for the specified port when the frequency offset mode is on. (No query)

Parameters

	<value 1>	**<value 2>**
Description	Port number for measurement	Port number for which the frequency is specified*1
Range	1 to 4	1 to 4
Resolution	1	1

*1. The specified frequency is used for the specified port. For information on how to set the frequency for the port, refer to the desired command in the related commands list.

	Description
ASENsor	Specifies the power sensor registered as A sensor.
BSENsor	Specifies the power sensor registered as B sensor.

NOTE

The setting of the power sensor is common to that for power meter calibration. Make the settings on the menu under **[Cal]** - **Power Calibration** - **Sensor A/B Settings**.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:OFFS:COLL:PMET 1,4,ASEN"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS on page 654
:SENS{1-16}:CORR:OFFS:COLL:LOAD on page 624
:SENS{1-16}:CORR:OFFS:COLL:OPEN on page 627
:SENS{1-16}:CORR:OFFS:COLL:SHOR on page 630

Equivalent key

[Cal] - **Mixer/Converter Calibration** - **Scalar Cal (Manual)** - **Power Meter** - **PortX@FreqY**

NOTE

The softkey, PortX and FreqY, changes depending on the selected Cal method and port.

:SENS{1-16}:CORR:OFFS:COLL:SAVE

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:OFFSet:COLLect:SAVE

Description

From the measured calibration data, calculates the error coefficient for the calibration type selected with :SENS{1-16}:CORR:OFFS:COLL:METH:SMIX2 command on page 625 or :SENS{1-16}:CORR:OFFS:COLL:METH:SOLT1 command on page 626. (No query)

After the error coefficient is calculated, the measured data and the calibration type setting are cleared.

If you execute this command before all necessary calibration data for calculating the calibration coefficient is measured, an error occurs and the command is ignored.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:OFFS:COLL:SAVE"
```

Related commands

:SENS{1-16}:CORR:OFFS:COLL:METH:SMIX2 on page 625

:SENS{1-16}:CORR:OFFS:COLL:METH:SOLT1 on page 626

:SENS{1-16}:CORR:OFFS:COLL:LOAD on page 624

:SENS{1-16}:CORR:OFFS:COLL:OPEN on page 627

:SENS{1-16}:CORR:OFFS:COLL:SHOR on page 630

:SENS{1-16}:CORR:OFFS:COLL:THRU on page 631

Equivalent key

[Cal] - Mixer/Converter Calibration - Scalar Cal (Manual) - Done

:SENS{1-16}:CORR:OFFS:COLL:SHOR

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:OFFSet:COLLect[:ACQuire]:SHORt <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), measures the calibration data of the short standard of the specified port when the frequency offset mode is on. (No query)

Parameters

	<value 1>	**<value 2>**
Description	Port number for measurement	Port number for which the frequency is specified*1
Range	1 to 4	1 to 4
Resolution	1	1

*1. The specified frequency is used for the specified port. For information on how to set the frequency for the port, refer to the desired command in the related commands list.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:OFFS:COLL:SHOR 1,4"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS on page 654
:SENS{1-16}:CORR:OFFS:COLL:LOAD on page 624
:SENS{1-16}:CORR:OFFS:COLL:OPEN on page 627
:SENS{1-16}:OFFS:PORT{1-4}:DIV on page 668
:SENS{1-16}:OFFS:PORT{1-4}:MULT on page 669
:SENS{1-16}:OFFS:PORT{1-4}:OFFS on page 670
:SENS{1-16}:OFFS:PORT{1-4}:STAR on page 671
:SENS{1-16}:OFFS:PORT{1-4}:STOP on page 672

Equivalent key

[Cal] - Mixer/Converter Calibration - Scalar Cal (Manual) - Reflection - PortX@FreqY [Short]

NOTE The softkey, PortX and FreqY, changes depending on the selected Cal method and port.

:SENS{1-16}:CORR:OFFS:COLL:THRU

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:OFFSet:COLLect[:ACQuire]:THRU <numeric 1>,<numeric 2>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), measures the calibration data of the thru standard from the stimulus port to the response port when the frequency offset mode is on. (No query)

Parameters

	<value 1>	**<value 2>**
Description	Response port number	Stimulus port number
Range	1 to 4	1 to 4
Resolution	1	1

NOTE

If the same port number is specified for the response port number and the stimulus port number, an error occurs.

Example of use

```
10   OUTPUT 717;":SENS1:CORR:OFFS:COLL:THRU 1,4"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS on page 654

:SENS{1-16}:CORR:OFFS:COLL:LOAD on page 624

:SENS{1-16}:CORR:OFFS:COLL:OPEN on page 627

:SENS{1-16}:CORR:OFFS:COLL:SHOR on page 630

Equivalent key

[Cal] - Mixer/Converter Calibration - Scalar Cal (Manual) - Transmission - ThruX-Y@FreqZ [Thru]

NOTE

The softkey, ThruX-Y and FreqZ, changes depending on the selected Cal method and port.

:SENS{1-16}:CORR:PROP

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:PROPerty {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:PROPerty?

Description

Turns ON/OFF the display of the calibration property of channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	Description
ON or 1	Turns ON the calibration property display.
OFF or 0 (preset value)	Turns OFF the calibration property display.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:PROP ON"
20   OUTPUT 717;":SENS1:CORR:PROP?"
30   ENTER 717;A
```

Equivalent key

[Cal] - **Property**

:SENS{1-16}:CORR:REC{1-4}

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:RECeiver{[1]|2|3|4}[:STATe] {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:RECeiver{[1]|2|3|4}[:STATe]?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), turns on/off the receiver correction.

Parameters

	Description
ON or 1	Turns on the receiver correction.
OFF or 0 (preset value)	Turns off the receiver correction.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:REC1 ON"
20   OUTPUT 717;":SENS1:CORR:REC1?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:CORR:REC{1-4}:COLL:ACQ on page 634

Equivalent key

[Cal] - Receiver Calibration - Correction

:SENS{1-16}:CORR:REC{1-4}:COLL:ACQ

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:RECeiver{[1]|2|3|4}:COLLect:ACQuire <numeric>

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), calculates the receiver calibration error coefficient for the specified port (executes receiver calibration). (No query)

The measurement port and the source port are THRU-connected for execution. Therefore, if the same port number is specified for the measurement port and the source port, an error occurs.

Because information of power calibration for both the measurement port and the source port is used for error coefficient calculation, the precision of receiver calibration is improved by executing power calibration for the both ports before executing receiver calibration.

Parameters

	<value 1>
Description	Source port number
Range	1 to 4
Resolution	1

Example of use

```
10   OUTPUT 717;":SENS1:CORR:REC1:COLL:ACQ 2"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Related commands

:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL on page 696

:SENS{1-16}:CORR:REC{1-4} on page 633

Equivalent key

[Cal] - Receiver Calibration - Take Cal Sweep

:SENS{1-16}:CORR:RVEL:COAX

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:RVELocity:COAX <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:RVELocity:COAX?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), sets the velocity factor.

Parameters

	<numeric>
Description	Velocity factor
Range	0 to 10
Preset value	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:RVEL:COAX 0.7"
20   OUTPUT 717;":SENS1:CORR:RVEL:COAX?"
30   ENTER 717;A
```

Equivalent key

[Cal] - **Velocity Factor**

:SENS{1-16}:CORR:STAT

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:STATe {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:STATe?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), turns ON/OFF the error correction.

Parameters

	Description
ON or 1	Turns ON the error correction.
OFF or 0 (preset value)	Turns OFF the error correction.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:STAT ON"
20   OUTPUT 717;":SENS1:CORR:STAT?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Correction

:SENS{1-16}:CORR:TRIG:FREE

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:TRIGger:FREE[:STATe] {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:TRIGger:FREE[:STATe]?

Description

Sets the trigger source for calibration to internal (ON) or to the state of the trigger source (:TRIG:SOUR) when measurement is made (OFF).

When you change the trigger source during sweep, the sweep is canceled.

Parameters

	Description
0 or 1 (preset value)	Specifies internal for the trigger source for calibration. It corresponds to the softkey “Internal”.
OFF or 0	Matches the state of the trigger source when measurement is made. It corresponds to the softkey “System”.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:CORR:TRIG:FREE OFF"
20   OUTPUT 717;":SENS1:CORR:TRIG:FREE?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Cal Trigger Source - Internal|System

:SENS{1-16}:CORR:TYPE{1-16}?

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CORRection:TYPE{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}?

Description

For trace 1 (:TYPE1) to trace 16 (:TYPE16) of channel 1 (:SENS1) to channel 16 (:SENS16), reads out the information (calibration type, port numbers) of the applied calibration coefficients for the actual error correction.

Query response

{ERES|NONE|RESPO|RESPS|RESPT|SOLT1|SOLT2|SOLT3|SOLT4|SMIX2},{numeric 1},{numeric 2}, {numeric 3},{numeric 4}<newline><^END>

{ERES|NONE|RESPO|RESPS|RESPT|SOLT1|SOLT2|SOLT3|SOLT4|SMIX2}:

	Description
ERES	The enhanced response calibration is applied.
NONE	Any calibration is not applied.
RESPO	The response calibration (open) is applied.
RESPS	The response calibration (short) is applied.
RESPT	The response calibration (thru) is applied.
SMIX2	The scalar-mixer calibration is applied.
SOLT1	The 1-port calibration is applied.
SOLT2	The full 2-port calibration is applied.
SOLT3	The full 3-port calibration is applied.
SOLT4	The full 4-port calibration is applied.

{numeric 1}: the calibration port number
(This parameter is 0 when the first parameter is NONE.)
the response port number when the SMIX2 is selected.

{numeric 2}: the calibration port number
(This parameter is 0 when the first parameter is not ERES, RESPT, SOLT2, SOLT3, SOLT4 and SMIX2.)
the stimulus port number when the SMIX2 is selected.

{numeric 3}: the calibration port number
(This parameter is 0 when the first parameter is not SOLT3 and SOLT4.)

{numeric 4}: the calibration port number
(This parameter is 0 when the first parameter is not SOLT4.)

Example of use

```
10   OUTPUT 717;":SENS1:CORR:TYPE1?"
20   ENTER 717;A$
```

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:FREQ

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FREQuency[:CW|FIXed] <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FREQuency[:CW|FIXed]?

Description

Sets the fixed frequency (CW frequency) for the power sweep for channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	<numeric>
Description	Fixed frequency
Range	3E5 to 8.5E9
Preset value	3E5
Unit	Hz (hertz)
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:FREQ 1E9"
20   OUTPUT 717;":SENS1:FREQ?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:SWE:TYPE on page 682

Equivalent key

[Sweep Setup] - Power - CW Freq

:SENS{1-16}:FREQ:CENT

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FREQuency:CENTer <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FREQuency:CENTer?

Description

Sets the center value of the sweep range of channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	<numeric>
Description	Center value
Range	3E5 to 8.5E9
Preset value	4.25015E9
Unit	Hz (hertz)
Resolution	0.5 or 1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:FREQ:CENT 2E9"
20   OUTPUT 717;":SENS1:FREQ:CENT?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:FREQ:SPAN on page 642

Equivalent key

[Center]

:SENS{1-16}:FREQ:DATA?

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FREQuency:DATA?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), reads out the frequencies of all measurement point.

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command. (Query only)

Query response

{numeric 1},…,{numeric NOP}<newline><^END>

	Description
{numeric n}	Frequency at the n-th measurement point

Where NOP is the number of measurement points and n is an integer between 1 and NOP.

Example of use

```
10   DIM A(1:201)
20   OUTPUT 717;":SENS1:FREQ:DATA?"
30   ENTER 717;A(*)
```

Related commands

:FORM:DATA on page 482

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:FREQ:SPAN

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FREQuency:SPAN <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FREQuency:SPAN?

Description

Sets the span value of the sweep range of channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	<numeric>
Description	Span value
Range	0 to 8.4997E9
Preset value	8.4997E9
Unit	Hz (hertz)
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:FREQ:SPAN 1E9"
20   OUTPUT 717;":SENS1:FREQ:SPAN?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:FREQ:CENT on page 640

Equivalent key

[Span]

:SENS{1-16}:FREQ:STAR

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FREQuency:STARt <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FREQuency:STARt?

Description

Sets the start value of the sweep range of channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	<numeric>
Description	Start value
Range	3E5 to 8.5E9
Preset value	3E5
Unit	Hz (hertz)
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:FREQ:STAR 100E6"
20   OUTPUT 717;":SENS1:FREQ:STAR?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:FREQ:STOP on page 644

Equivalent key

[Start]

:SENS{1-16}:FREQ:STOP

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FREQuency:STOP <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:FREQuency:STOP?

Description

Sets the stop value of the sweep range of channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	<numeric>
Description	Stop value
Range	3E5 to 8.5E9
Preset value	8.5E9
Unit	Hz (hertz)
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:FREQ:STOP 100E6"
20   OUTPUT 717;":SENS1:FREQ:STOP?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:FREQ:STAR on page 643

Equivalent key

[Stop]

:SENS{1-16}:MULT{1-2}:OUTP

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:OUTPut[:DATA] <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:OUTPut[:DATA]?

Description

Sets HIGH/LOW for all the control lines of the E5091A whose ID is 1 (:MULT1) or 2 (:MULT2) when measuring channel 1 (:SENS1) to channel 16 (:SENS16) in measurements using the E5091A.

To set the control lines, use the values obtained by converting 8-bit binary values expressed HIGH (1) / LOW (0) of individual lines as decimal values, assuming line 1 as LSB and line 8 as MSB.

Parameters

	<numeric>
Description	Sets/gets control line value
Range	0 to 255
Preset value	0
Unit	Hz (hertz), dBm or second

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:MULT1:OUTP 5"
20   OUTPUT 717;":SENS1:MULT1:OUTP?"
30   ENTER 717;A
```

Related commands

:SENS:MULT{1-2}:STAT on page 531

Equivalent key

[System] - Multiport Test Set Setup - Test Set 1|Test Set 2 - Control Lines

:SENS{1-16}:MULT{1-2}:PORT{1-20}

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:PORT{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20}[:SELect] <string>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:PORT{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20}[:SELect]?

Description

Selects a port assigned to Port 1 (:PORT1) to Port 20 (:PORT20) of the E5091A whose ID is 1 (:MULT1) or 2 (MULT2) when measuring channel 1 (:SENS1) to channel 16 (:SENS16) in the measurement using the E5091A.

The upper case and lower case are not distinguished.

Parameters

When the E5091A-009 is Connected

Port name	Description
Port1	Selects a port between A or T1*1
Port2	Selects a port between T1*1 or T2
Port3	Selects a port among R1+, R2+ or R3+
Port4	Selects a port among R1-, R2- or R3-

*1. If port T1 has already been assigned to port 2 when you try to assign port T1 to port 1, port T2 is automatically assigned to port 2. If port T1 has already been assigned to port 1 when you try to assign port T1 to port 2, port A is automatically assigned to port 1.

When the E5091A-013 is Connected

Port name	Description
Port1	Selects a port among A1,T1,T2, or T3
Port2	Selects a port among T1,T2,T3 or T4
Port3	Selects a port among R1+, R2+,R3+ or R4+
Port4	Selects a port among R1-, R2-, or R3-

When the E5091A-016 is Connected

Port name	Description
Port1	Selects among A1(A), A2, A3, A4, T1, T2 or T3.
Port2	Selects among B1(T4), B2, B3, B4, T1, T2, or T3.
Port3	Selects among R1+, R2+, R3+ or R4+
Port4	Selects among R1-, R2-, R3- or R4-
Port5	Selects between X1 or X2.
Port6	Selects between Y1 or Y2
Port7	Selects between Z1 or Z2.

Query response {string}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:MULT1:PORT1 A"
20   OUTPUT 717;":SENS1:MULT1:PORT1?"
30   ENTER 717;A$
```

Related commands

:SENS:MULT{1-2}:DISP on page 528

:SENS{1-16}:MULT{1-2}:PORT{1-20}:CAT? on page 648

:SENS{1-16}:MULT{1-2}:TSET9:PORT1 on page 650

:SENS{1-16}:MULT{1-2}:TSET9:PORT2 on page 651

:SENS{1-16}:MULT{1-2}:TSET9:PORT3 on page 652

:SENS{1-16}:MULT{1-2}:TSET9:PORT4 on page 653

Equivalent key **[System] - Multiport Test Set Setup - Test Set 1|Test Set 2 - Port 1|Port 2|Port 3|Port 4|Port 5|Port 6|Port 7**

:SENS{1-16}:MULT{1-2}:PORT{1-20}:CAT?

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:PORT{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20}:CATalog?

Description

Selects a port assigned to Port 1 (:PORT1) to Port 20 (:PORT20) of the E5091A whose ID is 1 (:MULT1) or 2 (MULT2) when measuring channel 1 (:SENS1) to channel 16 (:SENS16) in the measurement using the E5091A. (Query only)

Query response

{string}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:MULT1:PORT1:CAT?"
20   ENTER 717;A$
```

Related commands

:SENS:MULT{1-2}:DISP on page 528

:SENS{1-16}:MULT{1-2}:PORT{1-20} on page 646

:SENS{1-16}:MULT{1-2}:TSET9:PORT1 on page 650

:SENS{1-16}:MULT{1-2}:TSET9:PORT2 on page 651

:SENS{1-16}:MULT{1-2}:TSET9:PORT3 on page 652

:SENS{1-16}:MULT{1-2}:TSET9:PORT4 on page 653

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:MULT{1-2}:TSET9:OUTP

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:TSET9:OUTPut[:DATA] <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:TSET9:OUTPut[:DATA]?

Description

Sets the HIGH/LOW of all the control line of the E5091A whose ID is 1 (:MULT1) or 2 (:MULT2) when measuring channel 1 (:SENS1) to channel 16 (:SENS16) in the measurement using the E5091A.

To set the control lines, use values obtained by converting 8-bit binary values expressed by HIGH (1)/LOW (0) of individual lines to decimal values, assuming line 1 as LSB and line 8 as MSB.

Parameters

	<numeric>
Description	Setting value the control line
Range	0 to 255
Preset value	0
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:MULT1:TSET9:OUTP 5"
20   OUTPUT 717;":SENS1:MULT1:TSET9:OUTP?"
30   ENTER 717;A
```

Related commands

:SENS:MULT{1-2}:STAT on page 531

Equivalent key

[System] - Multiport Test Set Setup - Test Set 1|Test Set 2 - Control Lines

:SENS{1-16}:MULT{1-2}:TSET9:PORT1

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:TSET9:PORT1 {A|T1}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:TSET9:PORT1?

Description

Selects a port assigned to Port 1 of the E5091A whose ID is 1 (:MULT1) or 2 (:MULT2) when measuring channel 1 (:SENS1) to channel 16 (:SENS16) in the measurement using the E5091A.

If the port assigned to Port 2 is T1 and you select T1 as the port assigned to Port 1, the port assigned to Port 2 is changed to T2 automatically.

Parameters

	Description
A (preset value)	Specifies A.
T1	Specifies T1.

Query response

{A|T1}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:MULT1:TSET9:PORT1 T1"
20   OUTPUT 717;":SENS1:MULT1:TSET9:PORT1?"
30   ENTER 717;A$
```

Related commands

:SENS:MULT{1-2}:DISP on page 528

:SENS:MULT{1-2}:STAT on page 531

:SENS{1-16}:MULT{1-2}:PORT{1-20}:CAT? on page 648

:SENS{1-16}:MULT{1-2}:TSET9:PORT2 on page 651

:SENS{1-16}:MULT{1-2}:TSET9:PORT3 on page 652

:SENS{1-16}:MULT{1-2}:TSET9:PORT4 on page 653

Equivalent key

[System] - Multiport Test Set Setup - Test Set 1|Test Set 2 - Port1 - A|T1

:SENS{1-16}:MULT{1-2}:TSET9:PORT2

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:TSET9:PORT2 {T1|T2}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:TSET9:PORT2?

Description

Selects a port assigned to Port 2 of the E5091A whose ID is 1 (:MULT1) or 2 (:MULT2) when measuring channel 1 (:SENS1) to channel 16 (:SENS16) in the measurement using the E5091A.

If the port assigned to Port 1 is T1 and you select T1 as the port assigned to Port 2, the port assigned to Port 1 is changed to A automatically.

Parameters

	Description
T1 (preset value)	Specifies T1.
T2	Specifies T2.

Query response

{A|T1}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:MULT1:TSET9:PORT2 T2"
20   OUTPUT 717;":SENS1:MULT1:TSET9:PORT2?"
30   ENTER 717;A$
```

Related commands

:SENS:MULT{1-2}:DISP on page 528

:SENS:MULT{1-2}:STAT on page 531

:SENS{1-16}:MULT{1-2}:PORT{1-20}:CAT? on page 648

:SENS{1-16}:MULT{1-2}:TSET9:PORT1 on page 650

:SENS{1-16}:MULT{1-2}:TSET9:PORT3 on page 652

:SENS{1-16}:MULT{1-2}:TSET9:PORT4 on page 653

Equivalent key

[System] - Multiport Test Set Setup - Test Set 1|Test Set 2 - Port2 - T1|T2

:SENS{1-16}:MULT{1-2}:TSET9:PORT3

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:TSET9:PORT3 {R1|R2}R3}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:TSET9:PORT3?

Description

Selects a port assigned to Port 3 of the E5091A whose ID is 1 (:MULT1) or 2 (:MULT2) when measuring channel 1 (:SENS1) to channel 16 (:SENS16) in the measurement using the E5091A.

Parameters

	Description
R1 (preset value)	Specifies R1+.
R2	Specifies R2+.
R3	Specifies R3+*1.

*1. For Option 007 (7 ports), R2+.

Query response

{R1|R2}R3}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:MULT1:TSET9:PORT3 R2"
20   OUTPUT 717;":SENS1:MULT1:TSET9:PORT3?"
30   ENTER 717;A$
```

Related commands

:SENS:MULT{1-2}:DISP on page 528

:SENS:MULT{1-2}:STAT on page 531

:SENS{1-16}:MULT{1-2}:PORT{1-20}:CAT? on page 648

:SENS{1-16}:MULT{1-2}:TSET9:PORT1 on page 650

:SENS{1-16}:MULT{1-2}:TSET9:PORT2 on page 651

:SENS{1-16}:MULT{1-2}:TSET9:PORT4 on page 653

Equivalent key

[System] - Multiport Test Set Setup - Test Set 1|Test Set 2 - Port3 - R1+|R2+|R3+

:SENS{1-16}:MULT{1-2}:TSET9:PORT4

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:TSET9:PORT4 {R1|R2|R3}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:MULTiplexer{[1]|2}:TSET9:PORT4?

Description

Selects a port assigned to Port 4 of the E5091A whose ID is 1 (:MULT1) or 2 (:MULT2) when measuring channel 1 (:SENS1) to channel 16 (:SENS16) in the measurement using the E5091A.

Parameters

	Description
R1 (preset value)	Specifies R1-.
R2	Specifies R2-.
R3	Specifies R3-*1.

*1. For Option 007 (7 ports), R2-.

Query response

{R1|R2}R3}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:MULT1:TSET9:PORT4 R2"
20   OUTPUT 717;":SENS1:MULT1:TSET9:PORT4?"
30   ENTER 717;A$
```

Related commands

:SENS:MULT{1-2}:DISP on page 528

:SENS:MULT{1-2}:STAT on page 531

:SENS{1-16}:MULT{1-2}:PORT{1-20}:CAT? on page 648

:SENS{1-16}:MULT{1-2}:TSET9:PORT1 on page 650

:SENS{1-16}:MULT{1-2}:TSET9:PORT2 on page 651

:SENS{1-16}:MULT{1-2}:TSET9:PORT3 on page 652

Equivalent key

[System] - Multiport Test Set Setup - Test Set 1|Test Set 2 - Port4 - R1-|R2-|R3-

:SENS{1-16}:OFFS

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet[:STATe] {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet[:STATe]?

Description

Turns on/off the frequency offset for channel 1 (:SENS1) to channel 16 (:SENS16).

When the frequency offset mode is on, different frequencies can be used for measurement for each port. Frequencies set for each port are used regardless of whether the port is on the stimulus side or response side.

Parameters

	Description
ON or 1	Turns on the frequency offset mode.
OFF or 0 (preset value)	Turns off the frequency offset mode.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS ON"
20   OUTPUT 717;":SENS1:OFFS?"
30   ENTER 717;A
```

Equivalent key

[Sweep Setup] - Frequency Offset - Frequency Offset

:SENS{1-16}:OFFS:ASP

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:ASPurious {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:ASPurious?

Description

Turns on/off the spurious avoidance for channel 1 (:SENS1) to channel 16 (:SENS16).

When the spurious avoidance is on, measurement is performed avoiding spurious that occurs due to the following signals.

- Source signal and its harmonics
- When the frequency setting for the external signal source is enabled, the set signal and its harmonics.

Parameters

	Description
ON or 1	Turns on the spurious avoidance.
OFF or 0 (preset value)	Turns off the spurious avoidance.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:ASP ON"
20   OUTPUT 717;":SENS1:OFFS:ASP?"
30   ENTER 717;A
```

Equivalent key

[Sweep Setup] - Frequency Offset - Avoid Spurious

:SENS{1-16}:OFFS:LOC:CONT

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal:CONTrol[:STATe] {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal:CONTrol[:STATe]?

Description

Turns on/off the external signal source control for channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	Description
ON or 1	Turns on the external signal source control.
OFF or 0 (preset value)	Turns off the external signal source control.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:LOC:CONT ON"
20   OUTPUT 717;":SENS1:OFFS:LOC:CONT?"
30   ENTER 717;A
```

Equivalent key

[Sweep Setup] - Frequency Offset - External Source - Control

:SENS{1-16}:OFFS:LOC:DATA?

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal[:FREQuency]:DATA?

Description

Reads out the frequency data of the external signal source for channel 1 (:SENS1) to channel 16 (:SENS16). (Query only)

This command reads out the frequencies of all measurement points as an array.

Query response

{value 1},…,{value NOP}<newline><^END>

NOTE

Where, NOP is the number of points.

Example of use

```
10   DIM A(1:201)
20   OUTPUT 717;":SENS1:OFFS:LOC:DATA?"
30   ENTER 717;A(*)
```

Related commands

:SENS{1-16}:OFFS:LOC:DIV on page 658

:SENS{1-16}:OFFS:LOC:MULT on page 659

:SENS{1-16}:OFFS:LOC:OFFS on page 660

:SENS{1-16}:OFFS:LOC:STAR on page 661

:SENS{1-16}:OFFS:LOC:STOP on page 662

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:OFFS:LOC:DIV

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal[:FREQuency]:DIVisor <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal[:FREQuency]:DIVisor?

Description

Sets a divisor when making the frequency setting of the external signal source as a multiplier, divisor, or offset for channel 1 (:SENS1) to channel 16 (:SENS16).

NOTE

There are two methods to set the frequency range of the external signal source: using a multiplier, divisor, or offset for the normal frequency setting (:SENS[<chan>]:FREQ Node or segment list setting) and using the start frequency and the stop frequency.

Parameters

	<value>
Description	Divisor
Range	1 to 100
Preset value	1
Unit	N/A

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:LOC:DIV 1E1"
20   OUTPUT 717;":SENS1:OFFS:LOC:DIV?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:LOC:MULT on page 659

:SENS{1-16}:OFFS:LOC:OFFS on page 660

:SENS{1-16}:OFFS:LOC:STAR on page 661

:SENS{1-16}:OFFS:LOC:STOP on page 662

Equivalent key

[Sweep Setup] - Frequency Offset - External Source - Divisor

:SENS{1-16}:OFFS:LOC:MULT

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal[:FREQuency]:MULTiplier <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal[:FREQuency]:MULTiplier?

Description

Sets a multiplier when making the frequency setting of the external signal source as a multiplier, divisor, or offset for channel 1 (:SENS1) to channel 16 (:SENS16).

NOTE

There are two methods to set the frequency range of the external signal source: using a multiplier, divisor, or offset for the normal frequency setting (:SENS[<chan>]:FREQ Node or segment list setting) and using the start frequency and the stop frequency.

Parameters

	<value>
Description	Multiplier
Range	-100 to 100
Preset value	0
Unit	N/A

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:LOC:MULT -1E1"
20   OUTPUT 717;":SENS1:OFFS:LOC:MULT?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:LOC:DIV on page 658

:SENS{1-16}:OFFS:LOC:OFFS on page 660

:SENS{1-16}:OFFS:LOC:STAR on page 661

:SENS{1-16}:OFFS:LOC:STOP on page 662

Equivalent key

[Sweep Setup] - Frequency Offset - External Source - Multiplier

:SENS{1-16}:OFFS:LOC:OFFS

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal[:FREQuency]:OFFSet <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal[:FREQuency]:OFFSet?

Description

Sets an offset when making the frequency setting of the external signal source as a multiplier, divisor, or offset for channel 1 (:SENS1) to channel 16 (:SENS16).

NOTE

There are two methods to set the frequency range of the external signal source: using a multiplier, divisor, or offset for the normal frequency setting (:SENS[<chan>]:FREQ Node or segment list setting) and using the start frequency and the stop frequency.

Parameters

	<value>
Description	Offset
Range	-1e+012 to 1e+012
Preset value	0
Unit	Hz

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:LOC:OFFS 5E9"
20   OUTPUT 717;":SENS1:OFFS:LOC:OFFS?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:LOC:DIV on page 658

:SENS{1-16}:OFFS:LOC:MULT on page 659

:SENS{1-16}:OFFS:LOC:STAR on page 661

:SENS{1-16}:OFFS:LOC:STOP on page 662

Equivalent key

[Sweep Setup] - Frequency Offset - External Source - Offset

:SENS{1-16}:OFFS:LOC:STAR

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal[:FREQuency]:STARt <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal[:FREQuency]:STARt?

Description

Sets a start frequency when making the frequency setting of the external signal source as a start frequency and the stop frequency for channel 1 (:SENS1) to channel 16 (:SENS16).

NOTE

There are two methods to set the frequency range of the external signal source: using a multiplier, divisor, or offset for the normal frequency setting (:SENS[<chan>]:FREQ Node or segment list setting) and using the start frequency and the stop frequency.

Parameters

	<value>
Description	Start frequency
Range	0 to 1e+012
Preset value	0
Unit	Hz

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:LOC:STAR 5E9"
20   OUTPUT 717;":SENS1:OFFS:LOC:STAR?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:LOC:DIV on page 658

:SENS{1-16}:OFFS:LOC:MULT on page 659

:SENS{1-16}:OFFS:LOC:OFFS on page 660

:SENS{1-16}:OFFS:LOC:STOP on page 662

Equivalent key

[Sweep Setup] - Frequency Offset - External Source - Start

:SENS{1-16}:OFFS:LOC:STOP

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal[:FREQuency]:STOP <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal[:FREQuency]:STOP?

Description

Sets a stop frequency when making the frequency setting of the external signal source as a start frequency and the stop frequency for channel 1 (:SENS1) to channel 16 (:SENS16).

NOTE

There are two methods to set the frequency range of the external signal source: using a multiplier, divisor, or offset for the normal frequency setting (:SENS[<chan>]:FREQ Node or segment list setting) and using the start frequency and the stop frequency.

Parameters

	<value>
Description	Stop frequency
Range	0 to 1e+012
Preset value	0
Unit	Hz

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:LOC:STOP 5E9"
20   OUTPUT 717;":SENS1:OFFS:LOC:STOP?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:LOC:DIV on page 658

:SENS{1-16}:OFFS:LOC:MULT on page 659

:SENS{1-16}:OFFS:LOC:OFFS on page 660

:SENS{1-16}:OFFS:LOC:STAR on page 661

Equivalent key

[Sweep Setup] - Frequency Offset - External Source - Stop

:SENS{1-16}:OFFS:LOC:POW

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal:POWer[:LEVel][:IMMediate][:AMPLitude] <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal:POWer[:LEVel][:IMMediate][:AMPLitude]?

Description

Sets the power level of the external signal source for channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	<value>
Description	Power level
Range	-150 to 30
Preset value	-10
Unit	dBm
Resolution	0.01

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:LOC:POW -12.5"
20   OUTPUT 717;":SENS1:OFFS:LOC:POW?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:LOC:POW:SLOP on page 664

:SENS{1-16}:OFFS:LOC:POW:SLOP:STAT on page 665

Equivalent key

[Sweep Setup] - **Frequency Offset** - **External Source** - **Power**

:SENS{1-16}:OFFS:LOC:POW:SLOP

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal:POWer[:LEVel]:SLOPe[:DATA] <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal:POWer[:LEVel]:SLOPe[:DATA]?

Description

Sets the power slop value of the external signal source for channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	<value>
Description	Power slope value
Range	-2 to 2
Preset value	0
Unit	dB/GHz
Resolution	0.01

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:LOC:POW:SLOP 1.0"
20   OUTPUT 717;":SENS1:OFFS:LOC:POW:SLOP?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:LOC:POW on page 663

:SENS{1-16}:OFFS:LOC:POW:SLOP:STAT on page 665

Equivalent key

[Sweep Setup] - Frequency Offset - External Source - Slope

:SENS{1-16}:OFFS:LOC:POW:SLOP:STAT

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal:POWer[:LEVel]:SLOPe:STATe {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal:POWer[:LEVel]:SLOPe:STATe?

Description

Turns on/off the power slope setting of the external signal source for channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	Description
ON or 1	Turns on the power slope of the external signal source.
OFF or 0 (preset value)	Turns off the power slope of the external signal source.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:LOC:POW:SLOP:STAT ON"
20   OUTPUT 717;":SENS1:OFFS:LOC:POW:SLOP:STAT?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:LOC:POW on page 663

:SENS{1-16}:OFFS:LOC:POW:SLOP on page 664

Equivalent key

[Sweep Setup] - Frequency Offset - External Source - Slope

:SENS{1-16}:OFFS:LOC:STAT

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal:STATe {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:LOCal:STATe?

Description

Turns on/off the frequency setting of the external signal source for measurement regardless of on/off of the frequency offset mode for channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	Description
ON or 1	Uses the frequency setting of the external signal source.
OFF or 0 (preset value)	Does not use the frequency setting of the external signal source.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:LOC:STAT ON"
20   OUTPUT 717;":SENS1:OFFS:LOC:STAT?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:LOC:DIV on page 658

:SENS{1-16}:OFFS:LOC:MULT on page 659

:SENS{1-16}:OFFS:LOC:OFFS on page 660

:SENS{1-16}:OFFS:LOC:STAR on page 661

:SENS{1-16}:OFFS:LOC:STOP on page 662

Equivalent key

[Sweep Setup] - Frequency Offset - External Source - LO Frequency

:SENS{1-16}:OFFS:PORT{1-4}:DATA?

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:PORT{[1]|2|3|4}[:FREQuency]:DATA?

Description

Reads out the frequency data of the specified port when the frequency offset mode is on for channel 1 (:SENS1) to channel 16 (:SENS16). (Query only)

This command reads out the frequencies of all measurement points as an array.

Query response

{value 1},…,{value NOP}<newline><^END>

NOTE

Where, NOP is the number of points.

Example of use

```
10   DIM A(1:201)
20   OUTPUT 717;":SENS1:OFFS:PORT2:DATA?"
30   ENTER 717;A(*)
```

Related commands

:SENS{1-16}:OFFS:PORT{1-4}:DIV on page 668

:SENS{1-16}:OFFS:PORT{1-4}:MULT on page 669

:SENS{1-16}:OFFS:PORT{1-4}:OFFS on page 670

:SENS{1-16}:OFFS:PORT{1-4}:STAR on page 671

:SENS{1-16}:OFFS:PORT{1-4}:STOP on page 672

Equivalent key

No equivalent key is available on the front panel.

:SENS{1-16}:OFFS:PORT{1-4}:DIV

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:PORT{[1]|2|3|4}[:FREQuency]:DIVisor <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:PORT{[1]|2|3|4}[:FREQuency]:DIVisor?

Description

Sets a divisor when the setting method for the frequency setting for the specified port is a multiplier, divisor, or offset when the frequency offset mode is on for channel 1 (:SENS1) to channel 16 (:SENS16).

NOTE

There are two methods to set the frequency when the frequency offset mode is on: using a multiplier, divisor, or offset for the normal frequency setting (:SENS[<chan>]:FREQ Node or segment list setting) and using the start frequency and the stop frequency.

Parameters

	<value>
Description	Divisor
Range	1 to 100
Preset value	1
Unit	N/A

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:PORT2:DIV 1E1"
20   OUTPUT 717;":SENS1:OFFS:PORT2:DIV?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:PORT{1-4}:MULT on page 669
:SENS{1-16}:OFFS:PORT{1-4}:OFFS on page 670
:SENS{1-16}:OFFS:PORT{1-4}:STAR on page 671
:SENS{1-16}:OFFS:PORT{1-4}:STOP on page 672

Equivalent key

[Sweep Setup] - Frequency Offset - Port X - Divisor

NOTE

Choose the softkey of the port number you want to set as Port X.

:SENS{1-16}:OFFS:PORT{1-4}:MULT

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:PORT{[1]|2|3|4}[:FREQuency]:MULTiplier <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:PORT{[1]|2|3|4}[:FREQuency]:MULTiplier?

Description

Sets a multiplier when the setting method for the frequency setting for the specified port is a multiplier, divisor, or offset when the frequency offset mode is on for channel 1 (:SENS1) to channel 16 (:SENS16).

NOTE

There are two methods to set the frequency when the frequency offset mode is on: using a multiplier, divisor, or offset for the normal frequency setting (:SENS[<chan>]:FREQ Node or segment list setting) and using the start frequency and the stop frequency.

Parameters

	<value>
Description	Multiplier
Range	-100 to 100
Preset value	1
Unit	N/A

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:PORT2:MULT 1E1"
20   OUTPUT 717;":SENS1:OFFS:PORT2:MULT?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:PORT{1-4}:DIV on page 668

:SENS{1-16}:OFFS:PORT{1-4}:OFFS on page 670

:SENS{1-16}:OFFS:PORT{1-4}:STAR on page 671

:SENS{1-16}:OFFS:PORT{1-4}:STOP on page 672

Equivalent key

[Sweep Setup] - Frequency Offset - Port X - Multiplier

NOTE

Choose the softkey of the port number you want to set as Port X.

:SENS{1-16}:OFFS:PORT{1-4}:OFFS

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:PORT{[1]|2|3|4}[:FREQuency]:OFFSet <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:PORT{[1]|2|3|4}[:FREQuency]:OFFSet?

Description

Sets an offset when the setting method for the frequency setting for the specified port is a multiplier, divisor, or offset when the frequency offset mode is on for channel 1 (:SENS1) to channel 16 (:SENS16).

NOTE

There are two methods to set the frequency when the frequency offset mode is on: using a multiplier, divisor, or offset for the normal frequency setting (:SENS[<chan>]:FREQ Node or segment list setting) and using the start frequency and the stop frequency.

Parameters

	<value>
Description	Offset
Range	-1e+012 to 1e+012
Preset value	0
Unit	Hz

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:PORT2:OFFS 1E9"
20   OUTPUT 717;":SENS1:OFFS:PORT2:OFFS?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:PORT{1-4}:DIV on page 668

:SENS{1-16}:OFFS:PORT{1-4}:MULT on page 669

:SENS{1-16}:OFFS:PORT{1-4}:STAR on page 671

:SENS{1-16}:OFFS:PORT{1-4}:STOP on page 672

Equivalent key

[Sweep Setup] - Frequency Offset - Port X - Offset

NOTE

Choose the softkey of the port number you want to set as Port X.

:SENS{1-16}:OFFS:PORT{1-4}:STAR

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:PORT{[1]|2|3|4}[:FREQuency]:STARt <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:PORT{[1]|2|3|4}[:FREQuency]:STARt?

Description

Sets a start frequency when the setting method for the frequency setting for the specified port is the start frequency and the stop frequency when the frequency offset mode is on for channel 1 (:SENS1) to channel 16 (:SENS16).

NOTE

There are two methods to set the frequency when the frequency offset mode is on: using a multiplier, divisor, or offset for the normal frequency setting (:SENS[<chan>]:FREQ Node or segment list setting) and using the start frequency and the stop frequency.

Parameters

	<value>
Description	Start frequency
Range	300000 to 3.0e+009 or 8.5e+009
Preset value	300000
Unit	Hz

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:PORT2:STAR 300000"
20   OUTPUT 717;":SENS1:OFFS:PORT2:STAR?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:PORT{1-4}:DIV on page 668

:SENS{1-16}:OFFS:PORT{1-4}:MULT on page 669

:SENS{1-16}:OFFS:PORT{1-4}:OFFS on page 670

:SENS{1-16}:OFFS:PORT{1-4}:STOP on page 672

Equivalent key

[Sweep Setup] - Frequency Offset - Port X - Start

NOTE

Choose the softkey of the port number you want to set as Port X.

:SENS{1-16}:OFFS:PORT{1-4}:STOP

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:PORT{[1]|2|3|4}[:FREQuency]:STOP <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:OFFSet:PORT{[1]|2|3|4}[:FREQuency]:STOP?

Description

Sets a stop frequency when the setting method for the frequency setting for the specified port is the start frequency and the stop frequency when the frequency offset mode is on for channel 1 (:SENS1) to channel 16 (:SENS16).

NOTE

There are two methods to set the frequency when the frequency offset mode is on: using a multiplier, divisor, or offset for the normal frequency setting (:SENS[<chan>]:FREQ Node or segment list setting) and using the start frequency and the stop frequency.

Parameters

	<value>
Description	Stop frequency
Range	300000 to 3.0e+009 or 8.5e+009
Preset value	8500000000
Unit	Hz

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:OFFS:PORT2:STOP 1e+009"
20   OUTPUT 717;":SENS1:OFFS:PORT2:STOP?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:PORT{1-4}:DIV on page 668

:SENS{1-16}:OFFS:PORT{1-4}:MULT on page 669

:SENS{1-16}:OFFS:PORT{1-4}:OFFS on page 670

:SENS{1-16}:OFFS:PORT{1-4}:STAR on page 671

Equivalent key

[Sweep Setup] - Frequency Offset - Port X - Stop

NOTE

Choose the softkey of the port number you want to set as Port X.

:SENS{1-16}:ROSC:SOUR?

Syntax :SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ROSCillator:SOURce?

Description Reads out whether the external reference signal is inputted to the Ref In connector on the rear panel. (Query only)

Query response {INTernal|EXTernal}<newline><^END>

	Description
INTernal	The external reference signal is not inputted.
EXTernal	The external reference signal is inputted.

Example of use

```
10   OUTPUT 717;":SENS1:ROSC:SOUR?"
20   ENTER 717;A$
```

Equivalent key Displayed on the instrument status bar (at the bottom of the LCD display).

:SENS{1-16}:SEGM:DATA

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SEGMent:DATA
5,<mode>,<ifbw>,<pow>,<del>,<time>,<segm>,
<star 1>,<stop 1>,<nop 1>,<ifbw 1>,<pow 1>,<del 1>,<time 1>,…,
<star n>,<stop n>,<nop n>,<ifbw n>,<pow n>,<del n>,<time n>,…,
<star N>,<stop N>,<nop N>,<ifbw N>,<pow N>,<del N>,<time N>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SEGMent:DATA
6,<mode>,<ifbw>,<pow>,<del>,<swp>,<time>,<segm>,
<star 1>,<stop 1>,<nop 1>,<ifbw 1>,<pow 1>,<del 1>,<swp 1>,<time 1>,…,
<star n>,<stop n>,<nop n>,<ifbw n>,<pow n>,<del n>,<swp n>,<time n>,…,
<star N>,<stop N>,<nop N>,<ifbw N>,<pow N>,<del N>,<swp N>,<time N>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SEGMent:DATA?

Where N is the number of segments (specified with <segm>) and n is an integer between 1 and N.

Description

Creates the segment sweep table for channel 1 (:SENS1) to channel 16 (:SENS16).

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command.

Parameters

The first value is 5 or 6 and the parameters listed below follow.

	Description
<mode>	Stimulus setting mode 0: Specifies with start/stop values 1: Specifies with center/span values
<ifbw>	ON/OFF of the IF bandwidth setting for each segment 0: Off, 1: On
<pow>	ON/OFF of the power setting for each segment 0: Off, 1: On
<del>	ON/OFF of the sweep delay time setting for each segment 0: Off, 1: On
<swp>	ON/OFF of the sweep mode setting for each segment 0: Off, 1: On Not required when the first value is 5
<time>	ON/OFF of the sweep time setting for each segment 0: Off, 1: On
<segm>	Number of segments (1 to 201)
<star n>	Start value/center value of the n-th segment
<stop n>	Stop value/span value of the n-th segment
<nop n>	Number of measurement points of the n-th segment
<ifbw n>	IF bandwidth of the n-th segment Not required when the IF bandwidth setting for each segment is OFF (<ifbw> = 0)

	Description
<pow n>	Power of the n-th segment Not required when the power setting for each segment is OFF (<pow> = 0)
<del n>	Sweep delay time of the n-th segment Not required when the sweep delay time setting for each segment is OFF (<del> = 0)
<swp n>	Sweep mode of the n-th segment 0: Stepped mode 1: Swept mode 2: Fast stepped mode 3: Fast swept mode Not required when the first value is 5 or the sweep mode setting for each segment is OFF (<swp> = 0)
<time n>	Sweep time of the n-th segment (specify 0 If you want to set “auto setting”) Not required when the sweep time setting for each segment is OFF (<time> = 0)

Query response

When the sweep mode setting for each segment is OFF:

5,{mode},{ifbw},{pow},{del},{time},{segm},
{star 1},{stop 1},{nop 1},{pow 1},{del 1},{time 1},…,
{star n},{stop n},{nop n},{pow n},{del n},{time n},…,
{star N},{stop N},{nop N},{pow N},{del N},{time N}<newline><^END>

When the sweep mode setting for each segment is ON:

6,{mode},{ifbw},{pow},{del},{swp},{time},{segm},
{star 1},{stop 1},{nop 1},{pow 1},{del 1},{swp 1},{time 1},…,
{star n},{stop n},{nop n},{pow n},{del n},{swp n},{time n},…,
{star N},{stop N},{nop N},{pow N},{del N},{swp N},{time N}<newline><^END>

Example of use

```
10   DIM H(1:3,1:4)
20   OUTPUT 717;":SENS1:SEGM:DATA 5,0,1,0,0,0,3,";
30   OUTPUT 717;"1E9,3E9,11,70e3,";
40   OUTPUT 717;"3E9,4E9,51,7e3,";
50   OUTPUT 717;"4E9,6E9,11,70e3"
60   OUTPUT 717;":SENS1:SEGM:DATA?"
70   ENTER 717;A,B,C,D,E,F,G,H(*)
```

```
10   DIM H(1:3,1:5)
20   OUTPUT 717;":SENS1:SEGM:DATA 6,0,1,0,0,1,0,3,";
30   OUTPUT 717;"1E9,3E9,11,70e3,3,";
40   OUTPUT 717;"3E9,4E9,51,7e3,2,";
50   OUTPUT 717;"4E9,6E9,11,70e3,3"
60   OUTPUT 717;":SENS1:SEGM:DATA?"
70   ENTER 717;A,B,C,D,E,F,G,H(*)
```

Related commands

:SENS{1-16}:SWE:TYPE on page 682

:FORM:DATA on page 482

Equivalent key

[Sweep Setup] - Edit Segment Table

:SENS{1-16}:SEGM:SWE:POIN?

Syntax :SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SEGMent:SWEep:POINts?

Description For the segment sweep table of channel 1 (:SENS1) to channel 16 (:SENS16), reads out the total number of the measurement points of all segments. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:SEGM:SWE:POIN?"
20   ENTER 717;A
```

Related commands :SENS{1-16}:SEGM:DATA on page 674

Equivalent key No equivalent key is available on the front panel.

:SENS{1-16}:SEGM:SWE:TIME?

Syntax :SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SEGMent:SWEep:TIME?

Description For the segment sweep table of channel 1 (:SENS1) to channel 16 (:SENS16), reads out the total sweep time of all segments. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:SEGM:SWE:TIME?"
20   ENTER 717;A
```

Related commands :SENS{1-16}:SEGM:DATA on page 674

Equivalent key No equivalent key is available on the front panel.

:SENS{1-16}:SWE:ASP

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:ASPurious {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:ASPurious?

Description

For channel 1 (:SENS1) to channel 16 (:SENS16), turns ON/OFF the spurious avoidance mode.

Parameters

	Description
ON or 1 (preset value)	Turns ON the spurious avoidance mode.
OFF or 0	Turns OFF the spurious avoidance mode.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:SWE:ASP OFF"
20   OUTPUT 717;":SENS1:SWE:ASP?"
30   ENTER 717;A
```

Equivalent key

[System] - Service Menu - Avoid Spurious

:SENS{1-16}:SWE:DEL

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:DELay <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:DELay?

Description

Sets the sweep delay time of channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	<numeric>
Description	Sweep delay time
Range	0 to 1
Preset value	0
Unit	s (second)
Resolution	0.001

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:SWE:DEL 0.05"
20   OUTPUT 717;":SENS1:SWE:DEL?"
30   ENTER 717;A
```

Equivalent key

[Sweep Setup] - Sweep Delay

:SENS{1-16}:SWE:GEN

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:GENeration {STEPped|ANALog|FSTepped|FANalog}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:GENeration?

Description

Selects the sweep mode of channel 1 (:SENS1) to channel 16 (:SENS16).

When the sweep type is the power sweep (POW specified with the :SENS{1-16}:SWE:TYPE command), when the power calibration is on (ON specified with the :SOUR{1-16}:POW:PORT{1-4}:CORR command), or the power slope value is other than 0 and the power slope function is on (ON specified with the :SOUR{1-16}:POW:SLOP:STAT command), if you execute this command to try to set the sweep mode to the swept mode or the fast swept mode, an error occurs and the sweep mode is automatically set to the step mode or the fast step mode, respectively.

Parameters

	Description
STEPped (preset value)	Specifies stepped mode.
ANALog	Specifies swept mode.
FSTepped	Specifies fast stepped mode.
FANalog	Specifies fast swept mode.

Query response

{STEP|ANAL|FST|FAN}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:SWE:GEN ANAL"
20   OUTPUT 717;":SENS1:SWE:GEN?"
30   ENTER 717;A$
```

Related commands

:SENS{1-16}:SWE:TYPE on page 682

:SOUR{1-16}:POW:PORT{1-4}:CORR on page 696

:SOUR{1-16}:POW:SLOP:STAT on page 703

Equivalent key

[Sweep Setup] - **Sweep Mode** - **Std Stepped**|**Std Swept**|**Fast Stepped**|**Fast Swept**

:SENS{1-16}:SWE:POIN

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:POINts <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:POINts?

Description

Sets the number of measurement points of channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	<numeric>
Description	Number of measurement points
Range	2 to 1601
Preset value	201
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:SWE:POIN 801"
20   OUTPUT 717;":SENS1:SWE:POIN?"
30   ENTER 717;A
```

Equivalent key

[Sweep Setup] - Points

:SENS{1-16}:SWE:TIME

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:TIME[:DATA] <numeric>

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:TIME[:DATA]?

Description

Sets the sweep time of channel 1 (:SENS1) to channel 16 (:SENS16).

When the auto setting of the sweep time is ON, even if you try to set the sweep time to any value with this command, it automatically returns to the value defined by the E5070B/E5071B. Before using this command, turns OFF the auto setting of the sweep time (specify OFF with the :SENS{1-16}:SWE:TIME:AUTO command).

Parameters

	<numeric>
Description	Sweep time
Range	Varies depending on the measurement conditions.
Preset value	Varies depending on the measurement conditions.
Unit	s (second)

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:SWE:TIME 1.5"
20   OUTPUT 717;":SENS1:SWE:TIME?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:SWE:TIME:AUTO on page 681

Equivalent key

[Sweep Setup] - Sweep Time

:SENS{1-16}:SWE:TIME:AUTO

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:TIME:AUTO {ON|OFF|1|0}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:TIME:AUTO?

Description

Sets whether to automatically set the sweep time of channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	Description
ON or 1 (preset value)	Turns ON the auto setting.
OFF or 0	Turns OFF the auto setting.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:SWE:TIME:AUTO ON"
20   OUTPUT 717;":SENS1:SWE:TIME:AUTO?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:SWE:TIME on page 680

Equivalent key

[Sweep Setup] - Sweep Time

:SENS{1-16}:SWE:TYPE

Syntax

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:TYPE {LINear|LOGarithmic|SEGMent|POWer}

:SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:SWEep:TYPE?

Description

Sets the sweep type of channel 1 (:SENS1) to channel 16 (:SENS16).

Parameters

	Description
LINear (preset value)	Specifies the linear sweep.
LOGarithmic	Specifies the logarithmic sweep.*1
SEGMent	Specifies the segment sweep.
POWer	Specifies the power sweep.

*1. If you execute this command to try to specify the log sweep when the frequency span condition necessary for the log sweep is not satisfied (the stop frequency is about 4 times or more the start frequency), an error occurs and the command is ignored.

Query response

{LIN|LOG|SEGM|POW}<newline><^END>

Example of use

```
10   OUTPUT 717;":SENS1:SWE:TYPE SEGM"
20   OUTPUT 717;":SENS1:SWE:TYPE?"
30   ENTER 717;A$
```

Equivalent key

[Sweep Setup] - Sweep Type - Lin Freq|Log Freq|Segment

:SERV:CHAN:ACT?

Syntax

:SERVice:CHANnel:ACTive?

Description

Reads out the active channel number. (Query only)

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SERV:CHAN:ACT?"
20   ENTER 717;A
```

Related commands

:DISP:WIND{1-16}:ACT on page 464

Equivalent key

No equivalent key is available on the front panel.

:SERV:CHAN:COUN?

Syntax :SERVice:CHANnel:COUNt?

Description Reads out the upper limit of the number of channels of the E5070B/E5071B. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SERV:CHAN:COUN?"
20   ENTER 717;A
```

Equivalent key No equivalent key is available on the front panel.

:SERV:CHAN{1-16}:TRAC:ACT?

Syntax :SERVice:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:TRACe:ACTive?

Description Reads out the active trace number of channel 1 (:CHAN1) to channel 16 (:CHAN16). (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SERV:CHAN1:TRAC:ACT?"
20   ENTER 717;A
```

Related commands :CALC{1-16}:PAR{1-16}:SEL on page 418

Equivalent key No equivalent key is available on the front panel.

:SERV:CHAN:TRAC:COUN?

Syntax :SERVice:CHANnel:TRACe:COUNt?

Description Reads out the upper limit of the number of traces per channel. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SERV:CHAN:TRAC:COUN?"
20   ENTER 717;A
```

Equivalent key No equivalent key is available on the front panel.

:SERV:PORT:COUN?

Syntax :SERVice:PORT:COUNt?

Description Reads out the number of ports of the E5070B/E5071B. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SERV:PORT:COUN?"
20   ENTER 717;A
```

Equivalent key No equivalent key is available on the front panel.

:SERV:SREV?

Syntax :SERVice:SREVision?

Description Reads out the system spec version of the E5070B/E5071B. (Query only)

1 means applying new system specifications.

0 means applying old system specifications.

Query response {1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SERV:SREV?"
20   ENTER 717;A
```

Equivalent key No equivalent key is available on the front panel.

:SOUR:POW:PORT:CORR:COLL:ASEN:RCF

Syntax

:SOURce:POWer:PORT:CORRection:COLLect:ASENsor:RCFactor <numeric>

:SOURce:POWer:PORT:CORRection:COLLect:ASENsor:RCFactor?

Description

Sets the reference calibration factor (the calibration factor at 50 MHz) for power sensor A.

Parameters

	<numeric>
Description	Reference calibration factor
Range	1 to 150
Preset value	100
Unit	% (percent)
Resolution	0.01

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR:POW:PORT:CORR:COLL:ASEN:RCF 99.5"
20   OUTPUT 717;":SOUR:POW:PORT:CORR:COLL:ASEN:RCF?"
30   ENTER 717;A
```

Related commands

:SOUR:POW:PORT:CORR:COLL:BSEN:RCF on page 686

Equivalent key

[Cal] - Power Calibration - Sensor A Settings - Ref Cal Factor

:SOUR:POW:PORT:CORR:COLL:BSEN:RCF

Syntax

:SOURce:POWer:PORT:CORRection:COLLect:BSENsor:RCFactor <numeric>

:SOURce:POWer:PORT:CORRection:COLLect:BSENsor:RCFactor?

Description

Sets the reference calibration factor (the calibration factor at 50 MHz) for power sensor B.

Parameters

	<numeric>
Description	Reference calibration factor
Range	1 to 150
Preset value	100
Unit	% (percent)
Resolution	0.01

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR:POW:PORT:CORR:COLL:BSEN:RCF 99.5"
20   OUTPUT 717;":SOUR:POW:PORT:CORR:COLL:BSEN:RCF?"
30   ENTER 717;A
```

Related commands

:SOUR:POW:PORT:CORR:COLL:ASEN:RCF on page 685

Equivalent key

[Cal] - Power Calibration - Sensor B Settings - Ref Cal Factor

:SOUR:POW:PORT:CORR:COLL:TABL:ASEN:DATA

Syntax

:SOURce:POWer:PORT:CORRection:COLLect:TABLe:ASENsor:DATA <numeric 1>,…,<numeric 1+(N×2)>

:SOURce:POWer:PORT:CORRection:COLLect:TABLe:ASENsor:DATA?

Description

Sets the calibration factor table for power sensor A.

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command.

Parameters

	Description
<numeric 1>	The number of data items (0 to 100).
<numeric 1+(n×2)-1>	The frequency of the n-th data item (1 kHz to 500 GHz).
<numeric 1+(n×2)>	The calibration factor of the n-th data item (1% to 150%).

Where N is the number of data items (specified with <numeric 1>) and n is an integer between 1 and N.

When the number of data items is 0 (to clear the calibration coefficient table), you specify only the <numeric 1> parameter.

Query response

{numeric 1},…,{numeric 1+(N×2)}<newline><^END>

Example of use

```
10 DIM B(1:3,1:2)
20 OUTPUT 717;":SOUR:POW:PORT:CORR:COLL:TABL:ASEN:DATA 3,";
30 OUTPUT 717;"1E6,98.5,1E7,99,1E8,99.5"
40 OUTPUT 717;":SOUR:POW:PORT:CORR:COLL:TABL:ASEN:DATA?"
50 ENTER 717;A,B(*)
```

```
10 OUTPUT 717;":SOUR:POW:PORT:CORR:COLL:TABL:ASEN:DATA 0" !Clear Table
```

Related commands

:SOUR:POW:PORT:CORR:COLL:TABL:BSEN:DATA on page 688

:FORM:DATA on page 482

Equivalent key

[Cal] - Power Calibration - Sensor A Settings - Delete|Add|Clear Cal Factor Table

:SOUR:POW:PORT:CORR:COLL:TABL:BSEN:DATA

Syntax

:SOURce:POWer:PORT:CORRection:COLLect:TABLe:BSENsor:DATA <numeric 1>,…,<numeric 1+(N×2)>

:SOURce:POWer:PORT:CORRection:COLLect:TABLe:BSENsor:DATA?

Description

Sets the calibration factor table for power sensor B.

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command.

Parameters

	Description
<numeric 1>	The number of data items (0 to 100).
<numeric 1+(n×2)-1>	The frequency of the n-th data item (1 kHz to 500 GHz).
<numeric 1+(n×2)>	The calibration factor of the n-th data item (1% to 150%).

Where N is the number of data items (specified with <numeric 1>) and n is an integer between 1 and N.

When the number of data items is 0 (to clear the calibration coefficient table), you specify only the <numeric 1> parameter.

Query response

{numeric 1},…,{numeric 1+(N×2)}<newline><^END>

Example of use

```
10 DIM B(1:3,1:2)
20 OUTPUT 717;":SOUR:POW:PORT:CORR:COLL:TABL:BSEN:DATA 3,";
30 OUTPUT 717;"1E6,98.5,1E7,99,1E8,99.5"
40 OUTPUT 717;":SOUR:POW:PORT:CORR:COLL:TABL:BSEN:DATA?"
50 ENTER 717;A,B(*)
```

```
10 OUTPUT 717;":SOUR:POW:PORT:CORR:COLL:TABL:BSEN:DATA 0" !Clear Table
```

Related commands

:SOUR:POW:PORT:CORR:COLL:TABL:ASEN:DATA on page 687

:FORM:DATA on page 482

Equivalent key

[Cal] - Power Calibration - Sensor B Settings - Delete|Add|Clear Cal Factor Table

:SOUR{1-16}:POW

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer[:LEVel][:IMMediate][:AMPLitude] <numeric>

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer[:LEVel][:IMMediate][:AMPLitude]?

Description

Sets the power level of channel 1 (:SOUR1) to channel 16 (:SOUR16).

Parameters

	<numeric>
Description	Power level
Range	Varies depending on the power range.
Preset value	0
Unit	dBm
Resolution	0.05

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW -12.5"
20   OUTPUT 717;":SOUR1:POW?"
30   ENTER 717;A
```

Related commands

:SOUR{1-16}:POW:ATT on page 690

:SOUR{1-16}:POW:ATT:AUTO on page 691

Equivalent key

[Sweep Setup] - Power

:SOUR{1-16}:POW:ATT

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:ATTenuation[:DATA] <numeric>

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:ATTenuation[:DATA]?

Description

Sets the power range of channel 1 (:SOUR1) to channel 16 (:SOUR16).

The power range is selected depending on the setting of the attenuator. The following table shows the relationship between the attenuator value and the power range.

When Auto Power Range set function is effective, this command is ignored and an attenuator level and a power range are selected automatically acording to a maximum frequency and a maximum setting power.

Attenuator	Power range	Attenuator	Power range
0 dB	-20 to +12 dBm	5 dB	-25 to +7 dBm
10 dB	-30 to +2 dBm	15 dB	-35 to -3 dBm
20 dB	-40 to -8 dBm	25 dB	-45 to -13 dBm
30 dB	-50 to -18 dBm	35 dB	-55 to -23 dBm

If you execute this command when the power range extension function is not installed, an error occurs and the command is ignored.

Parameters

	<numeric>
Description	Attenuator value
Range	0 to 35
Preset value	0
Unit	dB
Resolution	5

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:ATT 15"
20   OUTPUT 717;":SOUR1:POW:ATT?"
30   ENTER 717;A
```

Related commands

:SOUR{1-16}:POW on page 689

:SOUR{1-16}:POW:ATT:AUTO on page 691

Equivalent key

[Sweep Setup] - Power - Power Ranges

:SOUR{1-16}:POW:ATT:AUTO

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:ATTenuation:AUTO {ON|OFF|1|0}

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:ATTenuation:AUTO?

Description

Sets whether to turn ON or OFF the Auto Power Range set function of channel 1 (:SOUR1) to channel 16 (:SOUR16).

When the Auto Power Range set function is ON, an attenuator level and a power range are selected automatically according to a maximum frequency and a maximum output power level as following figures.

Also minimum power level of power sweep setting is limited to an available power level of below figures. If it is impossible to set necessary power sweep width, turn off this fucntion.

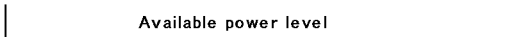
Figure 14-1 Available power level with Auto Power Range set function ON (Maximum frequency is 3GHz and below)

Max power setting	Auto selected power range	Source attenuator
+5 < Max power ≦ +10 dBm	−20 ～ +10 dBm	0 dB
0 < Max power ≦ +5 dBm	−25 ～ +7 dBm	5 dB
−5 < Max power ≦ 0 dBm	−30 ～ +2 dBm	10 dB
−10 < Max power ≦ −5 dBm	−35 ～ −3 dBm	15 dB
−15 < Max power ≦ −10 dBm	−40 ～ −8 dBm	20 dB
−20 < Max power ≦ −15 dBm	−45 ～ −13 dBm	25 dB
−25 < Max power ≦ −20 dBm	−50 ～ −18 dBm	30 dB
−55 < Max power ≦ −25 dBm	−55 ～ −23 dBm	35 dB

e5070bue0101

Figure 14-2 Available power level with Auto Power Range set function ON (Maximum frequency is larger than 3GHz (for E5071B only))

Max power setting	Auto selected power range	Source attenuator
0 < Max power ≦ +10 dBm	−20 ～ +10 dBm	0 dB
−5 < Max power ≦ 0 dBm	−25 ～ +7 dBm	5 dB
−10 < Max power ≦ −5 dBm	−30 ～ +2 dBm	10 dB
−15 < Max power ≦ −10 dBm	−35 ～ −3 dBm	15 dB
−20 < Max power ≦ −15 dBm	−40 ～ −8 dBm	20 dB
−25 < Max power ≦ −20 dBm	−45 ～ −13 dBm	25 dB
−30 < Max power ≦ −25 dBm	−50 ～ −18 dBm	30 dB
−55 < Max power ≦ −30 dBm	−55 ～ −23 dBm	35 dB



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Parameters

	Description
ON or 1 (preset value)	Turn ON the Auto Power Range set function.
OFF or 0	Turn OFF the Auto Power Range set function.

Query response {1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:ATT:AUTO ON"
20   OUTPUT 717;":SOUR1:POW:ATT:AUTO?"
30   ENTER 717;A
```

Related commands

:SOUR{1-16}:POW on page 689

:SOUR{1-16}:POW:ATT on page 690

Equivalent key **[Sweep Setup]** - **Power** - **Auto Range**

:SOUR{1-16}:POW:CENT

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:CENTer <numeric>

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:CENTer?

Description

Sets the center value of the sweep range for the power sweep for channel 1 (:SOUR1) to channel 16 (:SOUR16).

Parameters

	<numeric>
Description	Center value
Range	Varies depending on the power range.
Preset value	-7.5
Unit	dBm
Resolution	0.05 or 0.025

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:CENT 0"
20   OUTPUT 717;":SOUR1:POW:CENT?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:SWE:TYPE on page 682

:SOUR{1-16}:POW:ATT on page 690

:SOUR{1-16}:POW:SPAN on page 704

Equivalent key

[Center]

:SOUR{1-16}:POW:PORT:COUP

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT:COUPle {ON|OFF|1|0}

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT:COUPle?

Description

Sets whether to output the same power level for each port of channel 1 (:SOUR1) to channel 16 (:SOUR16). When the power slope feature is on (ON specified with the :SOUR{1-16}:POW:SLOP:STAT command), the same power level is always outputted to all ports regardless of this setting because different power levels cannot be outputted for each port.

Parameters

	Description
ON or 1 (preset value)	Outputs the same power level to individual ports.
OFF or 0	Outputs different power levels to individual ports.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:PORT:COUP OFF"
20   OUTPUT 717;":SOUR1:POW:PORT:COUP?"
30   ENTER 717;A
```

Related commands

:SOUR{1-16}:POW:PORT{1-4} on page 695

Equivalent key

[Sweep Setup] - Power - Port Couple

:SOUR{1-16}:POW:PORT{1-4}

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}[:LEVel][:IMMediate][:AMPLitude] <numeric>
:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}[:LEVel][:IMMediate][:AMPLitude]?

Description

Sets the power level of port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:SOUR1) to channel 16 (:SOUR16).

Parameters

	<numeric>
Description	The power level at the specified port.
Range	Varies depending on the power range.
Preset value	0
Unit	dBm
Resolution	0.05

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:PORT1 -12.5"
20   OUTPUT 717;":SOUR1:POW:PORT1?"
30   ENTER 717;A
```

Related commands

:SOUR{1-16}:POW:PORT:COUP on page 694

:SOUR{1-16}:POW:ATT on page 690

Equivalent key

[Sweep Setup] - **Power** - **Port Power** - **Port 1 Power**|**Port 2 Power**|**Port 3 Power**|**Port 4 Power**

:SOUR{1-16}:POW:PORT{1-4}:CORR

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}:CORRection[:STATe] {ON|OFF|1|0}
:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}:CORRection[:STATe]?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:SOUR1) to channel 16 (:SOUR16), turn on/off the error correction of the power level.

Parameters

	Description
ON or 1	Turns on the power level error correction.
OFF or 0 (preset value)	Turns off the power level error correction.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:PORT1:CORR ON"
20   OUTPUT 717;":SOUR1:POW:PORT1:CORR?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Power Calibration - Correction

:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}:CORRection:COLLect[:ACQuire] {ASENsor|BSENsor}

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:SOUR1) to channel 16 (:SOUR16), measure the power calibration data using the specified power sensor. When the measurement is complete successfully, the power level error correction is automatically turned on.

If the power sensor is not connected, an error occurs and the command is ignored. (No query)

Parameters

	Description
ASENsor	Specifies power sensor A.
BSENsor	Specifies power sensor B.

Example of use

```
10   OUTPUT 717;":SOUR1:POW:PORT1:CORR:COLL ASEN"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Related commands

:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:AVER on page 697

Equivalent key

[Cal] - Power Calibration - Take Cal Sweep

:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:AVER

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}:CORRection:COLLect:AVERage[:COUNt] <numeric>

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}:CORRection:COLLect:AVERage[:COUNt]?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:SOUR1) to channel 16 (:SOUR16), sets the number of power calibration data measurements per measurement point (averaging factor).

Parameters

	<numeric>
Description	Averaging factor
Range	1 to 100
Preset value	1
Resolution	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:PORT1:CORR:COLL:AVER 6"
20   OUTPUT 717;":SOUR1:POW:PORT1:CORR:COLL:AVER?"
30   ENTER 717;A
```

Related commands

:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL on page 696

Equivalent key

[Cal] - Power Calibration - Num of Readings

:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:NTOL

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}
:CORRection:COLLect:NTOLerance <numeric>

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}
:CORRection:COLLect:NTOLerance?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:SOUR1) to channel 16 (:SOUR16), sets the tolerance of power calibration data for each measurement point.

Parameters

	<numeric>
Description	Tolerance of power calibration
Range	0 to 100
Preset value	5
Unit	dB
Resolution	0.001

When the measurement result is outside the tolerance, an error message appears and the power-correction function is not turned on.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:PORT1:CORR:COLL:NTOL 6"
20   OUTPUT 717;":SOUR1:POW:PORT1:CORR:COLL:NTOL?"
30   ENTER 717;A
```

Related commands

:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL on page 696

Equivalent key

[Cal] - Power Calibration - Tolerance

:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}:CORRection:COLLect:TABLe:LOSS[:STATe] {ON|OFF|1|0}

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}:CORRection:COLLect:TABLe:LOSS[:STATe]?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:SOUR1) to channel 16 (:SOUR16), turn on/off the loss compensation.

Parameters

	Description
ON or 1	Turns on the loss compensation.
OFF or 0 (preset value)	Turns off the loss compensation.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:PORT1:CORR:COLL:TABL:LOSS ON"
20   OUTPUT 717;":SOUR1:POW:PORT1:CORR:COLL:TABL:LOSS?"
30   ENTER 717;A
```

Equivalent key

[Cal] - Power Calibration - Loss Compen - Compensation

:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS:DATA

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}:CORRection:COLLect:TABLe:LOSS:DATA <numeric 1>,…,<numeric 1+(N×2)>

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}:CORRection:COLLect:TABLe:LOSS:DATA?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:SOUR1) to channel 16 (:SOUR16), sets the loss compensation table.

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command.

Parameters

	Description
<numeric 1>	The number of data items (0 to 100).
<numeric 1+(n×2)-1>	The frequency of the n-th data item (1 kHz to 500 GHz).
<numeric 1+(n×2)>	The loss of the n-th data item (-100 dB to 100 dB).

Where N is the number of data items (specified with <numeric 1>) and n is an integer between 1 and N.

When the number of data items is 0 (to clear the loss coefficient table), you specify only the <numeric 1> parameter.

Query response

{numeric 1},…,{numeric 1+(N×2)}<newline><^END>

Example of use

```
10 DIM B(1:2,1:2)
20 OUTPUT 717;":SOUR:POW:PORT:CORR:COLL:TABL:LOSS:DATA 2,";
30 OUTPUT 717;"1E8,0.5,1E9,0.8"
40 OUTPUT 717;":SOUR:POW:PORT:CORR:COLL:TABL:LOSS:DATA?"
50 ENTER 717;A,B(*)
```

```
10 OUTPUT 717;":SOUR:POW:PORT:CORR:COLL:TABL:LOSS:DATA 0" ! Clear Table
```

Related commands

:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS on page 699

:FORM:DATA on page 482

Equivalent key

[Cal] - Power Calibration - Loss Compen - Delete|Add|Clear Loss Table

:SOUR{1-16}:POW:PORT{1-4}:CORR:DATA

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}:CORRection:DATA <numeric 1>, …,<numeric NOP>

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:PORT{[1]|2|3|4}:CORRection:DATA?

Description

For port 1 (:PORT1) to port 4 (:PORT4) of channel 1 (:SOUR1) to channel 16 (:SOUR16), sets/reads out the power calibration data array.

The data transfer format when this command is executed depends on the setting with the :FORM:DATA command.

Parameters

	Description
<numeric n>	Data at the n-th measurement point

Where NOP is the number of points and n is an integer between 1 and NOP.

Query response

{numeric 1},…,{numeric NOP}<newline><^END>

Example of use

```
10   DIM A(1:201)
20   OUTPUT 717;":SOUR1:POW:PORT1:CORR:DATA?"
30   ENTER 717;A(*)
```

Related commands

:SOUR{1-16}:POW:PORT{1-4}:CORR on page 696

:FORM:DATA on page 482

Equivalent key

No equivalent key is available on the front panel.

:SOUR{1-16}:POW:SLOP

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer[:LEVel]:SLOPe[:DATA] <numeric>

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer[:LEVel]:SLOPe[:DATA]?

Description

Sets the correction value of the power slope feature of channel 1 (:SOUR1) to channel 16 (:SOUR16).

Parameters

	<numeric>
Description	The correction value of the power slope feature
Range	-2 to 2
Preset value	0
Unit	dB/GHz
Resolution	0.01

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:SLOP 0.1"
20   OUTPUT 717;":SOUR1:POW:SLOP?"
30   ENTER 717;A
```

Related commands

:SOUR{1-16}:POW:SLOP:STAT on page 703

Equivalent key

[Sweep Setup] - Power - Slop [xxx dB/GHz]

:SOUR{1-16}:POW:SLOP:STAT

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer[:LEVel]:SLOPe:STATe {ON|OFF|1|0}

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer[:LEVel]:SLOPe:STATe?

Description

Turns on/off the power slope feature of channel 1 (:SOUR1) to channel 16 (:SOUR16). This function is a function to correct the attenuation of simple power level proportional to the frequency (attenuation due to cables and so on).

Parameters

	Description
ON or 1	Turns on the power slope feature.
OFF or 0 (preset value)	Turns off the power slope feature.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:SLOP:STAT ON"
20   OUTPUT 717;":SOUR1:POW:SLOP:STAT?"
30   ENTER 717;A
```

Related commands

:SOUR{1-16}:POW:SLOP on page 702

Equivalent key

[Sweep Setup] - Power - Slop [ON/OFF]

:SOUR{1-16}:POW:SPAN

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:SPAN <numeric>

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:SPAN?

Description

Sets the span value of the sweep range for the power sweep for channel 1 (:SOUR1) to channel 16 (:SOUR16).

Parameters

	<numeric>
Description	Span value
Range	Varies depending on the power range.
Preset value	15
Unit	dBm
Resolution	0.05

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:SPAN 10"
20   OUTPUT 717;":SOUR1:POW:SPAN?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:SWE:TYPE on page 682

:SOUR{1-16}:POW:ATT on page 690

:SOUR{1-16}:POW:CENT on page 693

Equivalent key

[Span]

:SOUR{1-16}:POW:STAR

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:STARt <numeric>

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:STARt?

Description

Sets the start value of the sweep range for the power sweep for channel 1 (:SOUR1) to channel 16 (:SOUR16).

Parameters

	<numeric>
Description	Start value
Range	Varies depending on the power range.
Preset value	-15
Unit	dBm
Resolution	0.05

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:STAR -10"
20   OUTPUT 717;":SOUR1:POW:STAR?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:SWE:TYPE on page 682

:SOUR{1-16}:POW:ATT on page 690

:SOUR{1-16}:POW:STOP on page 706

Equivalent key

[Start]

:SOUR{1-16}:POW:STOP

Syntax

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:STOP <numeric>

:SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:POWer:STOP?

Description

Sets the stop value of the sweep range for the power sweep for channel 1 (:SOUR1) to channel 16 (:SOUR16).

Parameters

	<numeric>
Description	Stop value
Range	Varies depending on the power range.
Preset value	0
Unit	dBm
Resolution	0.05

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SOUR1:POW:STOP 10"
20   OUTPUT 717;":SOUR1:POW:STOP?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:SWE:TYPE on page 682

:SOUR{1-16}:POW:ATT on page 690

:SOUR{1-16}:POW:STAR on page 705

Equivalent key

[Stop]

:STAT:OPER?

Syntax :STATus:OPERation[:EVENt]?

Description Reads out the value of the Operation Status Event Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:OPER?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:OPER:COND?

Syntax :STATus:OPERation:CONDition?

Description Reads out the value of the Operation Status Condition Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:OPER:COND?"
20   ENTER 717;A
```

Related commands :STAT:OPER:NTR on page 709

:STAT:OPER:PTR on page 710

Equivalent key No equivalent key is available on the front panel.

:STAT:OPER:ENAB

Syntax

:STATus:OPERation:ENABle <numeric>

:STATus:OPERation:ENABle?

Description

Sets the value of the Operation Status Enable Register.

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	0
Resolution	1

Note that bit 0 to bit 3, bit 6 to bit 13 and bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:OPER:ENAB 16"
20   OUTPUT 717;":STAT:OPER:ENAB?"
30   ENTER 717;A
```

Related commands

*SRE on page 290

Equivalent key

No equivalent key is available on the front panel.

:STAT:OPER:NTR

Syntax

:STATus:OPERation:NTRansition <numeric>

:STATus:OPERation:NTRansition?

Description

Sets the value of negative transition filter of the Operation Status Register.

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Note that bit 0 to bit 3, bit 6 to bit 13 and bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:OPER:NTR 16"
20   OUTPUT 717;":STAT:OPER:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:OPER? on page 707

:STAT:OPER:PTR on page 710

Equivalent key

No equivalent key is available on the front panel.

:STAT:OPER:PTR

Syntax

:STATus:OPERation:PTRansition <numeric>

:STATus:OPERation:PTRansition?

Description

Sets the value of positive transition filter of the Operation Status Register.

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	16432
Resolution	1

Note that bit 0 to bit 3, bit 6 to bit 13 and bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:OPER:PTR 16"
20   OUTPUT 717;":STAT:OPER:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:OPER? on page 707

:STAT:OPER:NTR on page 709

Equivalent key

No equivalent key is available on the front panel.

:STAT:PRES

Syntax :STATus:PRESet

Description Initialize the Operation Status Register, Questionable Status Register, Questionable Limit Status Register, Questionable Limit Extra Status Register, Questionable Limit Channel Status Register, and Questionable Limit Channel Extra Status Register. (No query)

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES?

Syntax :STATus:QUEStionable[:EVENt]?

Description Reads out the value of the Questionable Status Event Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:BLIM?

Syntax :STATus:QUEStionable:BLIMit[:EVENt]?

Description Reads out the value of the Questionable Bandwidth Limit Status Event Register. (Query only)

Query response {numeric}<newline><^END>

Example of use
```
10   OUTPUT 717;":STAT:QUES:BLIM?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:BLIM:CHAN{1-16}?

Syntax :STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:EVENt]?

Description Reads out the value of the Questionable Bandwidth Limit Channel Status Event Register of channel 1 (:CHAN1) to channel 16 (:CHAN16). (Query only)

Query response {numeric}<newline><^END>

Example of use
```
10   OUTPUT 717;":STAT:QUES:BLIM:CHAN1?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:BLIM:CHAN{1-16}:COND?

Syntax :STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CONDition?

Description Reads out the value of the Questionable Bandwidth Limit Channel Status Condition Register of channel 1 (:CHAN1) to channel 16 (:CHAN16). (Query only)

Query response {numeric}<newline><^END>

Example of use
```
10   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:COND?"
20   ENTER 717;A
```

Related commands :STAT:QUES:BLIM:CHAN{1-16}:NTR on page 719

:STAT:QUES:BLIM:CHAN{1-16}:PTR on page 720

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:BLIM:CHAN{1-16}:ECH?

Syntax :STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel[:EVENt]?

Description Reads out the value of the Questionable Bandwidth Limit Channel Extra Status Event Register of channel 1 (:CHAN1) to channel 16 (:CHAN16). (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:ECH?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:BLIM:CHAN{1-16}:ECH:COND?

Syntax :STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:CONDition?

Description Reads out the value of the Questionable Bandwidth Limit Channel Extra Status Condition Register of channel 1 (:CHAN1) to channel 16 (:CHAN16). (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:ECH:COND?"
20   ENTER 717;A
```

Related commands :STAT:QUES:BLIM:CHAN{1-16}:ECH:NTR on page 716

:STAT:QUES:BLIM:CHAN{1-16}:ECH:PTR on page 717

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:BLIM:CHAN{1-16}:ECH:ENAB

Syntax

:STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:ENABle <numeric>

:STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:ENABle?

Description

Sets the value of the Questionable Bandwidth Limit Channel Extra Status Enable Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:ECH:ENAB 6"
20   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:ECH:ENAB?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:BLIM:CHAN{1-16}:ENAB on page 718

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:BLIM:CHAN{1-16}:ECH:NTR

Syntax

:STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:NTRansition <numeric>

:STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:NTRansition?

Description

Sets the value of the negative transition filter of the Questionable Bandwidth Limit Channel Extra Status Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:ECH:NTR 6"
20   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:ECH:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:BLIM:CHAN{1-16}:ECH? on page 714

:STAT:QUES:BLIM:CHAN{1-16}:ECH:PTR on page 717

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:BLIM:CHAN{1-16}:ECH:PTR

Syntax

:STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:PTRansition <numeric>

:STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:PTRansition?

Description

Sets the value of the positive transition filter of the Questionable Bandwidth Limit Channel Extra Status Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:ECH:PTR 6"
20   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:ECH:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:BLIM:CHAN{1-16}:ECH? on page 714

:STAT:QUES:BLIM:CHAN{1-16}:ECH:NTR on page 716

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:BLIM:CHAN{1-16}:ENAB

Syntax

:STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ENABle <numeric>

:STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ENABle?

Description

Sets the value of the Questionable Bandwidth Limit Channel Status Enable Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:ENAB 16"
20   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:ENAB?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:BLIM:ENAB on page 725

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:BLIM:CHAN{1-16}:NTR

Syntax

:STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:NTRansition <numeric>

:STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:NTRansition?

Description

Sets the value of the negative transition filter of the Questionable Bandwidth Limit Channel Status Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:NTR 16"
20   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:BLIM:CHAN{1-16}? on page 712

:STAT:QUES:BLIM:CHAN{1-16}:PTR on page 720

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:BLIM:CHAN{1-16}:PTR

Syntax

:STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:PTRansition <numeric>

:STATus:QUEStionable:BLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:PTRansition?

Description

Sets the value of the positive transition filter of the Questionable Bandwidth Limit Channel Status Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:PTR 16"
20   OUTPUT 717;":STAT:QUES:BLIM:CHAN1:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:BLIM:CHAN{1-16}? on page 712

:STAT:QUES:BLIM:CHAN{1-16}:NTR on page 719

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:BLIM:COND?

Syntax

:STATus:QUEStionable:BLIMit:CONDition?

Description

Reads out the value of the Questionable Bandwidth Limit Status Condition Register. (Query only)

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:COND?"
20   ENTER 717;A
```

Related commands

:STAT:QUES:BLIM:NTR on page 726

:STAT:QUES:BLIM:PTR on page 727

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:BLIM:ELIM?

Syntax :STATus:QUEStionable:BLIMit:ELIMit[:EVENt]?

Description Reads out the value of the Questionable Bandwidth Limit Extra Status Event Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:ELIM?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:BLIM:ELIM:COND?

Syntax :STATus:QUEStionable:BLIMit:ELIMit:CONDition?

Description Reads out the value of the Questionable Bandwidth Limit Extra Status Condition Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:ELIM:COND?"
20   ENTER 717;A
```

Related commands :STAT:QUES:BLIM:ELIM:NTR on page 723

:STAT:QUES:BLIM:ELIM:PTR on page 724

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:BLIM:ELIM:ENAB

Syntax

:STATus:QUEStionable:BLIMit:ELIMit:ENABle <numeric>

:STATus:QUEStionable:BLIMit:ELIMit:ENABle?

Description

Sets the value of the Questionable Bandwidth Limit Extra Status Enable Register.

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:ELIM:ENAB 6"
20   OUTPUT 717;":STAT:QUES:BLIM:ELIM:ENAB?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:BLIM:ENAB on page 725

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:BLIM:ELIM:NTR

Syntax

:STATus:QUEStionable:BLIMit:ELIMit:NTRansition <numeric>

:STATus:QUEStionable:BLIMit:ELIMit:NTRansition?

Description

Sets the value of the negative transition filter of the Questionable Bandwidth Limit Extra Status Register.

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:ELIM:NTR 6"
20   OUTPUT 717;":STAT:QUES:BLIM:ELIM:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:BLIM:ELIM? on page 721

:STAT:QUES:BLIM:ELIM:PTR on page 724

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:BLIM:ELIM:PTR

Syntax

:STATus:QUEStionable:BLIMit:ELIMit:PTRansition <numeric>

:STATus:QUEStionable:BLIMit:ELIMit:PTRansition?

Description

Sets the value of the positive transition filter of the Questionable Bandwidth Limit Extra Status Register.

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:ELIM:PTR 6"
20   OUTPUT 717;":STAT:QUES:BLIM:ELIM:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:BLIM:ELIM? on page 721

:STAT:QUES:BLIM:ELIM:NTR on page 723

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:BLIM:ENAB

Syntax

:STATus:QUEStionable:BLIMit:ENABle <numeric>

:STATus:QUEStionable:BLIMit:ENABle?

Description

Sets the value of the Questionable Bandwidth Limit Status Enable Register.

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:ENAB 16"
20   OUTPUT 717;":STAT:QUES:BLIM:ENAB?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:ENAB on page 729

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:BLIM:NTR

Syntax

:STATus:QUEStionable:BLIMit:NTRansition <numeric>

:STATus:QUEStionable:BLIMit:NTRansition?

Description

Sets the value of the negative transition filter of the Questionable Bandwidth Limit Status Register.

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:NTR 16"
20   OUTPUT 717;":STAT:QUES:BLIM:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:BLIM? on page 712

:STAT:QUES:BLIM:PTR on page 727

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:BLIM:PTR

Syntax

:STATus:QUEStionable:BLIMit:PTRansition <numeric>

:STATus:QUEStionable:BLIMit:PTRansition?

Description

Sets the value of the positive transition filter of the Questionable Bandwidth Limit Status Register.

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:BLIM:PTR 16"
20   OUTPUT 717;":STAT:QUES:BLIM:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:BLIM? on page 712

:STAT:QUES:BLIM:NTR on page 726

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:COND?

Syntax :STATus:QUEStionable:CONDition?

Description Reads out the value of the Questionable Status Condition Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:COND?"
20   ENTER 717;A
```

Related commands :STAT:QUES:NTR on page 746
:STAT:QUES:PTR on page 747

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:ENAB

Syntax

:STATus:QUEStionable:ENABle <numeric>

:STATus:QUEStionable:ENABle?

Description

Sets the value of the Questionable Status Enable Register.

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	0
Resolution	1

Note that bit 0 to bit 9 and bit 12 to bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:ENAB 16"
20   OUTPUT 717;":STAT:QUES:ENAB?"
30   ENTER 717;A
```

Related commands

*SRE on page 290

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:LIM?

Syntax :STATus:QUEStionable:LIMit[:EVENt]?

Description Reads out the value of the Questionable Limit Status Event Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:LIM:CHAN{1-16}?

Syntax :STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:EVENt]?

Description Reads out the value of the Questionable Limit Channel Status Event Register of channel 1 (:CHAN1) to channel 16 (:CHAN16). (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:CHAN1?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:LIM:CHAN{1-16}:COND?

Syntax :STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CONDition?

Description Reads out the value of the Questionable Limit Channel Status Condition Register of channel 1 (:CHAN1) to channel 16 (:CHAN16). (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:CHAN1:COND?"
20   ENTER 717;A
```

Related commands :STAT:QUES:LIM:CHAN{1-16}:NTR on page 737

:STAT:QUES:LIM:CHAN{1-16}:PTR on page 738

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:LIM:CHAN{1-16}:ECH?

Syntax :STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel[:EVENt]?

Description Reads out the value of the Questionable Limit Channel Extra Status Event Register of channel 1 (:CHAN1) to channel 16 (:CHAN16). (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:CHAN1:ECH?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:LIM:CHAN{1-16}:ECH:COND?

Syntax :STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:CONDition?

Description Reads out the value of the Questionable Limit Channel Extra Status Condition Register of channel 1 (:CHAN1) to channel 16 (:CHAN16). (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:CHAN1:ECH:COND?"
20   ENTER 717;A
```

Related commands :STAT:QUES:LIM:CHAN{1-16}:ECH:NTR on page 734

:STAT:QUES:LIM:CHAN{1-16}:ECH:PTR on page 735

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:LIM:CHAN{1-16}:ECH:ENAB

Syntax

:STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:ENABle <numeric>
:STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:ENABle?

Description

Sets the value of the Questionable Limit Channel Extra Status Enable Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:CHAN1:ECH:ENAB 6"
20   OUTPUT 717;":STAT:QUES:LIM:CHAN1:ECH:ENAB?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:LIM:CHAN{1-16}:ENAB on page 736

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:LIM:CHAN{1-16}:ECH:NTR

Syntax

:STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:NTRansition <numeric>
:STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:NTRansition?

Description

Sets the value of the negative transition filter of the Questionable Limit Channel Extra Status Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:CHAN1:ECH:NTR 6"
20   OUTPUT 717;":STAT:QUES:LIM:CHAN1:ECH:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:LIM:CHAN{1-16}:ECH? on page 732

:STAT:QUES:LIM:CHAN{1-16}:ECH:PTR on page 735

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:LIM:CHAN{1-16}:ECH:PTR

Syntax

:STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:PTRansition <numeric>
:STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:PTRansition?

Description

Sets the value of the positive transition filter of the Questionable Limit Channel Extra Status Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:CHAN1:ECH:PTR 6"
20   OUTPUT 717;":STAT:QUES:LIM:CHAN1:ECH:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:LIM:CHAN{1-16}:ECH? on page 732
:STAT:QUES:LIM:CHAN{1-16}:ECH:NTR on page 734

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:LIM:CHAN{1-16}:ENAB

Syntax

:STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ENABle <numeric>

:STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ENABle?

Description

Sets the value of the Questionable Limit Channel Status Enable Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:CHAN1:ENAB 16"
20   OUTPUT 717;":STAT:QUES:LIM:CHAN1:ENAB?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:LIM:ENAB on page 743

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:LIM:CHAN{1-16}:NTR

Syntax

:STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:NTRansition <numeric>

:STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:NTRansition?

Description

Sets the value of the negative transition filter of the Questionable Limit Channel Status Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:CHAN1:NTR 16"
20   OUTPUT 717;":STAT:QUES:LIM:CHAN1:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:LIM:CHAN{1-16}? on page 730

:STAT:QUES:LIM:CHAN{1-16}:PTR on page 738

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:LIM:CHAN{1-16}:PTR

Syntax

:STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:PTRansition <numeric>

:STATus:QUEStionable:LIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:PTRansition?

Description

Sets the value of the positive transition filter of the Questionable Limit Channel Status Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:CHAN1:PTR 16"
20   OUTPUT 717;":STAT:QUES:LIM:CHAN1:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:LIM:CHAN{1-16}? on page 730

:STAT:QUES:LIM:CHAN{1-16}:NTR on page 737

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:LIM:COND?

Syntax :STATus:QUEStionable:LIMit:CONDition?

Description Reads out the value of the Questionable Limit Status Condition Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:COND?"
20   ENTER 717;A
```

Related commands :STAT:QUES:LIM:NTR on page 744

:STAT:QUES:LIM:PTR on page 745

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:LIM:ELIM?

Syntax :STATus:QUEStionable:LIMit:ELIMit[:EVENt]?

Description Reads out the value of the Questionable Limit Extra Status Event Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:ELIM?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:LIM:ELIM:COND?

Syntax :STATus:QUEStionable:LIMit:ELIMit:CONDition?

Description Reads out the value of the Questionable Limit Extra Status Condition Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:ELIM:COND?"
20   ENTER 717;A
```

Related commands :STAT:QUES:LIM:ELIM:NTR on page 741

:STAT:QUES:LIM:ELIM:PTR on page 742

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:LIM:ELIM:ENAB

Syntax :STATus:QUEStionable:LIMit:ELIMit:ENABle <numeric>

:STATus:QUEStionable:LIMit:ELIMit:ENABle?

Description Sets the value of the Questionable Limit Extra Status Enable Register.

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:ELIM:ENAB 6"
20   OUTPUT 717;":STAT:QUES:LIM:ELIM:ENAB?"
30   ENTER 717;A
```

Related commands :STAT:QUES:LIM:ENAB on page 743

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:LIM:ELIM:NTR

Syntax

:STATus:QUEStionable:LIMit:ELIMit:NTRansition <numeric>

:STATus:QUEStionable:LIMit:ELIMit:NTRansition?

Description

Sets the value of the negative transition filter of the Questionable Limit Extra Status Register.

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:ELIM:NTR 6"
20   OUTPUT 717;":STAT:QUES:LIM:ELIM:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:LIM:ELIM? on page 739

:STAT:QUES:LIM:ELIM:PTR on page 742

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:LIM:ELIM:PTR

Syntax

:STATus:QUEStionable:LIMit:ELIMit:PTRansition <numeric>

:STATus:QUEStionable:LIMit:ELIMit:PTRansition?

Description

Sets the value of the positive transition filter of the Questionable Limit Extra Status Register.

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:ELIM:PTR 6"
20   OUTPUT 717;":STAT:QUES:LIM:ELIM:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:LIM:ELIM? on page 739

:STAT:QUES:LIM:ELIM:NTR on page 741

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:LIM:ENAB

Syntax

:STATus:QUEStionable:LIMit:ENABle <numeric>

:STATus:QUEStionable:LIMit:ENABle?

Description

Sets the value of the Questionable Limit Status Enable Register.

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:ENAB 16"
20   OUTPUT 717;":STAT:QUES:LIM:ENAB?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:ENAB on page 729

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:LIM:NTR

Syntax

:STATus:QUEStionable:LIMit:NTRansition <numeric>

:STATus:QUEStionable:LIMit:NTRansition?

Description

Sets the value of the negative transition filter of the Questionable Limit Status Register.

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:CHAN1:NTR 16"
20   OUTPUT 717;":STAT:QUES:LIM:CHAN1:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:LIM? on page 730

:STAT:QUES:LIM:PTR on page 745

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:LIM:PTR

Syntax

:STATus:QUEStionable:LIMit:PTRansition <numeric>

:STATus:QUEStionable:LIMit:PTRansition?

Description

Sets the value of the positive transition filter of the Questionable Limit Status Register.

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:LIM:CHAN1:PTR 16"
20   OUTPUT 717;":STAT:QUES:LIM:CHAN1:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:LIM? on page 730

:STAT:QUES:LIM:NTR on page 744

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:NTR

Syntax

:STATus:QUEStionable:NTRansition <numeric>

:STATus:QUEStionable:NTRansition?

Description

Sets the value of negative transition filter of the Questionable Status Register.

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Note that bit 0 to bit 9 and bit 12 to bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:NTR 16"
20   OUTPUT 717;":STAT:QUES:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES? on page 711

:STAT:QUES:PTR on page 747

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:PTR

Syntax

:STATus:QUEStionable:PTRansition <numeric>

:STATus:QUEStionable:PTRansition?

Description

Sets the value of positive transition filter of the Questionable Status Register.

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	3072
Resolution	1

Note that bit 0 to bit 9 and bit 12 to bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:PTR 16"
20   OUTPUT 717;":STAT:QUES:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES? on page 711

:STAT:QUES:NTR on page 746

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:RLIM?

Syntax :STATus:QUEStionable:RLIMit[:EVENt]?

Description Reads out the value of the Questionable Ripple Limit Status Event Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:RLIM:CHAN{1-16}?

Syntax :STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}[:EVENt]?

Description Reads out the value of the Questionable Ripple Limit Channel Status Event Register of channel 1 (:CHAN1) to channel 16 (:CHAN16). (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:CHAN1?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:RLIM:CHAN{1-16}:COND?

Syntax :STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:CONDition?

Description Reads out the value of the Questionable Ripple Limit Channel Status Condition Register of channel 1 (:CHAN1) to channel 16 (:CHAN16). (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:COND?"
20   ENTER 717;A
```

Related commands :STAT:QUES:RLIM:CHAN{1-16}:NTR on page 755

:STAT:QUES:RLIM:CHAN{1-16}:PTR on page 756

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:RLIM:CHAN{1-16}:ECH?

Syntax :STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel[:EVENt]?

Description Reads out the value of the Questionable Ripple Limit Channel Extra Status Event Register of channel 1 (:CHAN1) to channel 16 (:CHAN16). (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:ECH?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:RLIM:CHAN{1-16}:ECH:COND?

Syntax :STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:CONDition?

Description Reads out the value of the Questionable Ripple Limit Channel Extra Status Condition Register of channel 1 (:CHAN1) to channel 16 (:CHAN16). (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:ECH:COND?"
20   ENTER 717;A
```

Related commands :STAT:QUES:RLIM:CHAN{1-16}:ECH:NTR on page 752

:STAT:QUES:RLIM:CHAN{1-16}:ECH:PTR on page 753

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:RLIM:CHAN{1-16}:ECH:ENAB

Syntax

:STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:ENABle <numeric>

:STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:ENABle?

Description

Sets the value of the Questionable Ripple Limit Channel Extra Status Enable Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:ECH:ENAB 6"
20   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:ECH:ENAB?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:RLIM:CHAN{1-16}:ENAB on page 754

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:RLIM:CHAN{1-16}:ECH:NTR

Syntax

:STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:NTRansition <numeric>

:STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:NTRansition?

Description

Sets the value of the negative transition filter of the Questionable Ripple Limit Channel Extra Status Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:ECH:NTR 6"
20   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:ECH:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:RLIM:CHAN{1-16}:ECH? on page 750

:STAT:QUES:RLIM:CHAN{1-16}:ECH:PTR on page 753

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:RLIM:CHAN{1-16}:ECH:PTR

Syntax

:STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:PTRansition <numeric>

:STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ECHannel:PTRansition?

Description

Sets the value of the positive transition filter of the Questionable Ripple Limit Channel Extra Status Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:ECH:PTR 6"
20   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:ECH:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:RLIM:CHAN{1-16}:ECH? on page 750

:STAT:QUES:RLIM:CHAN{1-16}:ECH:NTR on page 752

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:RLIM:CHAN{1-16}:ENAB

Syntax

:STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ENABle <numeric>

:STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:ENABle?

Description

Sets the value of the Questionable Ripple Limit Channel Status Enable Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:ENAB 16"
20   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:ENAB?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:RLIM:ENAB on page 761

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:RLIM:CHAN{1-16}:NTR

Syntax

:STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:NTRansition <numeric>

:STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:NTRansition?

Description

Sets the value of the negative transition filter of the Questionable Ripple Limit Channel Status Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:NTR 16"
20   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:RLIM:CHAN{1-16}? on page 748

:STAT:QUES:RLIM:CHAN{1-16}:PTR on page 756

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:RLIM:CHAN{1-16}:PTR

Syntax

:STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:PTRansition <numeric>

:STATus:QUEStionable:RLIMit:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}:PTRansition?

Description

Sets the value of the positive transition filter of the Questionable Ripple Limit Channel Status Register of channel 1 (:CHAN1) to channel 16 (:CHAN16).

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:PTR 16"
20   OUTPUT 717;":STAT:QUES:RLIM:CHAN1:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:RLIM:CHAN{1-16}? on page 748

:STAT:QUES:RLIM:CHAN{1-16}:NTR on page 755

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:RLIM:COND?

Syntax

:STATus:QUEStionable:RLIMit:CONDition?

Description

Reads out the value of the Questionable Ripple Limit Status Condition Register. (Query only)

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:COND?"
20   ENTER 717;A
```

Related commands

:STAT:QUES:RLIM:NTR on page 762

:STAT:QUES:RLIM:PTR on page 763

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:RLIM:ELIM?

Syntax :STATus:QUEStionable:RLIMit:ELIMit[:EVENt]?

Description Reads out the value of the Questionable Ripple Limit Extra Status Event Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:ELIM?"
20   ENTER 717;A
```

Related commands *CLS on page 286

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:RLIM:ELIM:COND?

Syntax :STATus:QUEStionable:RLIMit:ELIMit:CONDition?

Description Reads out the value of the Questionable Ripple Limit Extra Status Condition Register. (Query only)

Query response {numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:ELIM:COND?"
20   ENTER 717;A
```

Related commands :STAT:QUES:RLIM:ELIM:NTR on page 759

:STAT:QUES:RLIM:ELIM:PTR on page 760

Equivalent key No equivalent key is available on the front panel.

:STAT:QUES:RLIM:ELIM:ENAB

Syntax

:STATus:QUEStionable:RLIMit:ELIMit:ENABle <numeric>

:STATus:QUEStionable:RLIMit:ELIMit:ENABle?

Description

Sets the value of the Questionable Ripple Limit Extra Status Enable Register.

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:ELIM:ENAB 6"
20   OUTPUT 717;":STAT:QUES:RLIM:ELIM:ENAB?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:RLIM:ENAB on page 761

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:RLIM:ELIM:NTR

Syntax

:STATus:QUEStionable:RLIMit:ELIMit:NTRansition <numeric>

:STATus:QUEStionable:RLIMit:ELIMit:NTRansition?

Description

Sets the value of the negative transition filter of the Questionable Ripple Limit Extra Status Register.

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:ELIM:NTR 6"
20   OUTPUT 717;":STAT:QUES:RLIM:ELIM:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:RLIM:ELIM? on page 757

:STAT:QUES:RLIM:ELIM:PTR on page 760

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:RLIM:ELIM:PTR

Syntax

:STATus:QUEStionable:RLIMit:ELIMit:PTRansition <numeric>

:STATus:QUEStionable:RLIMit:ELIMit:PTRansition?

Description

Sets the value of the positive transition filter of the Questionable Ripple Limit Extra Status Register.

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Bits 0 and 3 to 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:ELIM:PTR 6"
20   OUTPUT 717;":STAT:QUES:RLIM:ELIM:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:RLIM:ELIM? on page 757

:STAT:QUES:RLIM:ELIM:NTR on page 759

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:RLIM:ENAB

Syntax

:STATus:QUEStionable:RLIMit:ENABle <numeric>

:STATus:QUEStionable:RLIMit:ENABle?

Description

Sets the value of the Questionable Ripple Limit Status Enable Register.

Parameters

	<numeric>
Description	Value of the enable register
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:ENAB 16"
20   OUTPUT 717;":STAT:QUES:RLIM:ENAB?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:ENAB on page 729

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:RLIM:NTR

Syntax

:STATus:QUEStionable:RLIMit:NTRansition <numeric>

:STATus:QUEStionable:RLIMit:NTRansition?

Description

Sets the value of the negative transition filter of the Questionable Ripple Limit Status Register.

Parameters

	<numeric>
Description	Value of the negative transition filter
Range	0 to 65535
Preset value	0
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:NTR 16"
20   OUTPUT 717;":STAT:QUES:RLIM:NTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:RLIM? on page 748

:STAT:QUES:RLIM:PTR on page 763

Equivalent key

No equivalent key is available on the front panel.

:STAT:QUES:RLIM:PTR

Syntax

:STATus:QUEStionable:RLIMit:PTRansition <numeric>

:STATus:QUEStionable:RLIMit:PTRansition?

Description

Sets the value of the positive transition filter of the Questionable Ripple Limit Status Register.

Parameters

	<numeric>
Description	Value of the positive transition filter
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for channel/trace number.
Resolution	1

Note that bit 15 cannot be set to 1.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":STAT:QUES:RLIM:PTR 16"
20   OUTPUT 717;":STAT:QUES:RLIM:PTR?"
30   ENTER 717;A
```

Related commands

:STAT:QUES:RLIM? on page 748

:STAT:QUES:RLIM:NTR on page 762

Equivalent key

No equivalent key is available on the front panel.

:SYST:BACK

Syntax

:SYSTem:BACKlight {ON|OFF|1|0}

:SYSTem:BACKlight?

Description

Turns ON/OFF the backlight of the LCD display.

When the backlight is OFF, you cannot read the information on the display.

Parameters

	Description
ON or 1 (preset value)	Turns ON the backlight.
OFF or 0	Turns OFF the backlight.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:BACK OFF"
20   OUTPUT 717;":SYST:BACK?"
30   ENTER 717;A
```

Equivalent key

[System] - Backlight

To turn it ON, press any key on the front panel.

:SYST:BEEP:COMP:IMM

Syntax :SYSTem:BEEPer:COMPlete:IMMediate

Description Generates a beep for the notification of the completion of the operation. (No query)

Example of use

```
10   OUTPUT 717;":SYST:BEEP:COMP:IMM"
```

Related commands :SYST:BEEP:COMP:STAT on page 765

:SYST:BEEP:WARN:IMM on page 766

Equivalent key **[System] - Misc Setup - Beeper - Test Beep Complete**

:SYST:BEEP:COMP:STAT

Syntax :SYSTem:BEEPer:COMPlete:STATe {ON|OFF|1|0}

:SYSTem:BEEPer:COMPlete:STATe?

Description Turns ON/OFF the beeper for the notification of the completion of the operation.

Parameters

	Description
ON or 1 (preset value)	Turns ON the beeper.
OFF or 0	Turns OFF the beeper.

Query response {1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:BEEP:COMP:STAT OFF"
20   OUTPUT 717;":SYST:BEEP:COMP:STAT?"
30   ENTER 717;A
```

Related commands :SYST:BEEP:COMP:IMM on page 765

:SYST:BEEP:WARN:STAT on page 766

Equivalent key **[System] - Misc Setup - Beeper - Beep Complete**

:SYST:BEEP:WARN:IMM

Syntax :SYSTem:BEEPer:WARNing:IMMediate

Description Generates a beep for the notification of warning/limit test result. (No query)

Example of use

```
10   OUTPUT 717;":SYST:BEEP:WARN:IMM"
```

Related commands :SYST:BEEP:WARN:STAT on page 766

:SYST:BEEP:COMP:IMM on page 765

Equivalent key **[System] - Misc Setup - Beeper - Test Beep Warning**

:SYST:BEEP:WARN:STAT

Syntax :SYSTem:BEEPer:WARNing:STATe {ON|OFF|1|0}

:SYSTem:BEEPer:WARNing:STATe?

Description Turns ON/OFF the beeper for the notification of warning/limit test result.

Parameters

	Description
ON or 1 (preset value)	Turns ON the beeper.
OFF or 0	Turns OFF the beeper.

Query response {1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:BEEP:WARN:STAT OFF"
20   OUTPUT 717;":SYST:BEEP:WARN:STAT?"
30   ENTER 717;A
```

Related commands :SYST:BEEP:WARN:IMM on page 766

:SYST:BEEP:COMP:STAT on page 765

Equivalent key **[System] - Misc Setup - Beeper - Beep Warning**

:SYST:COMM:GPIB:PMET:ADDR

Syntax

:SYSTem:COMMunicate:GPIB:PMETer:ADDRess <numeric>

:SYSTem:COMMunicate:GPIB:PMETer:ADDRess?

Description

Sets/reads out the GPIB address of the power meter in use.

Parameters

	<numeric>
Description	The GPIB address of the power meter
Range	0 to 30
Preset value	13
Resolution	1

If the specified parameter is out of the valid setting range, an error occurs and the command is ignored.

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:COMM:GPIB:PMET:ADDR 10"
20   OUTPUT 717;":SYST:COMM:GPIB:PMET:ADDR?"
30   ENTER 717;A
```

Equivalent key

[System] - Misc Setup - GPIB Setup - Power Meter Address

:SYST:COMM:GPIB:SGEN:ADDR

Syntax

:SYSTem:COMMunicate:GPIB:SGENerator:ADDRess <numeric>

:SYSTem:COMMunicate:GPIB:SGENerator:ADDRess?

Description

Sets/reads out the GPIB address of the external signal source.

Parameters

	<value>
Description	The GPIB address of the external signal source
Range	0 to 30
Preset value	19
Resolution	1

If the specified parameter is out of the valid setting range, an error occurs and the command is ignored.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:COMM:GPIB:SGEN:ADDR 19"
20   OUTPUT 717;":SYST:COMM:GPIB:SGEN:ADDR?"
30   ENTER 717;A
```

Equivalent key

[System] - Misc Setup - GPIB Setup - Signal Generator Address - Address

:SYST:COMM:GPIB:SGEN:CCOM:FREQ

Syntax

:SYSTem:COMMunicate:GPIB:SGENerator:CCOMmand:FREQuency <string>

:SYSTem:COMMunicate:GPIB:SGENerator:CCOMmand:FREQuency?

Description

Sets/reads out the command string of the output frequency setting of the external signal source.

This command is available when 1: User-defined is selected as the type of the external signal source. To select the type of the external signal source, use :SYST:COMM:GPIB:SGEN:TYPE command on page 774. If another type of external signal source is selected, the selected external signal source command is used and this command is ignored.

Parameters

	<string>
Description	Output frequency setting command for the external signal source
Range	254 characters or less
Preset value	"FR %f% HZ"

NOTE

Writes a variable as "%f%" in the command string to be set. The E5070B/E5071B sends the command string to the external signal source with the frequency setting value of the external signal source that may be changed for each measurement point set in the variable.

Query response

{string}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:COMM:GPIB:SGEN:CCOM:FREQ ""FREQ %f%HZ"""
20   OUTPUT 717;":SYST:COMM:GPIB:SGEN:CCOM:FREQ?"
30   ENTER 717;A$
```

Related commands

:SYST:COMM:GPIB:SGEN:TYPE on page 774

:SYST:COMM:GPIB:SGEN:CCOM:POW on page 770

:SYST:COMM:GPIB:SGEN:CCOM:PRES on page 771

:SYST:COMM:GPIB:SGEN:CCOM:RFON on page 772

:SYST:COMM:GPIB:SGEN:DWEL on page 773

Equivalent key

[System] - Misc Setup - GPIB Setup - Signal Generator Address - Custom Commands - Set Frequency

:SYST:COMM:GPIB:SGEN:CCOM:POW

Syntax

:SYSTem:COMMunicate:GPIB:SGENerator:CCOMmand:POWer <string>

:SYSTem:COMMunicate:GPIB:SGENerator:CCOMmand:POWer?

Description

Sets/reads out the command string of the power level setting of the external signal source.

This command is available when 1: User-defined is selected as the type of the external signal source. To select the type of the external signal source, use :SYST:COMM:GPIB:SGEN:TYPE command on page 774. If another type of external signal source is selected, the selected external signal source command is used and this command is ignored.

Parameters

	<string>
Description	Power level setting command for the external signal source
Range	254 characters or less
Preset value	"AP %p% DM"

NOTE

Writes a variable as "%p%" in the command string to be set. The E5070B/E5071B sends the command string to the external signal source with the setting value of the power level of the external signal source that may be changed for each measurement point set in the variable.

Query response

{string}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:COMM:GPIB:SGEN:CCOM:POW ""AMPL %p%DBM"""
20   OUTPUT 717;":SYST:COMM:GPIB:SGEN:CCOM:POW?"
30   ENTER 717;A$
```

Related commands

:SYST:COMM:GPIB:SGEN:TYPE on page 774

:SYST:COMM:GPIB:SGEN:CCOM:FREQ on page 769

:SYST:COMM:GPIB:SGEN:CCOM:PRES on page 771

:SYST:COMM:GPIB:SGEN:CCOM:RFON on page 772

:SYST:COMM:GPIB:SGEN:DWEL on page 773

Equivalent key

[System] - Misc Setup - GPIB Setup - Signal Generator Address - Custom Commands - Set Power Level

:SYST:COMM:GPIB:SGEN:CCOM:PRES

Syntax

:SYSTem:COMMunicate:GPIB:SGENerator:CCOMmand:PRESet <string>

:SYSTem:COMMunicate:GPIB:SGENerator:CCOMmand:PRESet?

Description

Sets/reads out the preset command string for the external signal source.

This command is available when 1: User-defined is selected as the type of the external signal source. To select the type of the external signal source, use :SYST:COMM:GPIB:SGEN:TYPE command on page 774. If another type of external signal source is selected, the selected external signal source command is used and this command is ignored.

Parameters

	<string>
Description	Preset command for the external signal source
Range	254 characters or less
Preset value	"" (not defined)

Query response

{string}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:COMM:GPIB:SGEN:CCOM:PRES ""*RST"""
20   OUTPUT 717;":SYST:COMM:GPIB:SGEN:CCOM:PRES?"
30   ENTER 717;A$
```

Related commands

:SYST:COMM:GPIB:SGEN:TYPE on page 774

:SYST:COMM:GPIB:SGEN:CCOM:FREQ on page 769

:SYST:COMM:GPIB:SGEN:CCOM:POW on page 770

:SYST:COMM:GPIB:SGEN:CCOM:RFON on page 772

:SYST:COMM:GPIB:SGEN:DWEL on page 773

Equivalent key

[System] - Misc Setup - GPIB Setup - Signal Generator Address - Custom Commands - Preset

:SYST:COMM:GPIB:SGEN:CCOM:RFON

Syntax

:SYSTem:COMMunicate:GPIB:SGENerator:CCOMmand:RFON <string>

:SYSTem:COMMunicate:GPIB:SGENerator:CCOMmand:RFON?

Description

Sets/reads out the command string of the RF output on of the external signal source.

This command is available when 1: User-defined is selected as the type of the external signal source. To select the type of the external signal source, use :SYST:COMM:GPIB:SGEN:TYPE command on page 774. If another type of external signal source is selected, the selected external signal source command is used and this command is ignored.

Parameters

	<string>
Description	RF output on command for the external signal source
Range	254 characters or less
Preset value	"R3"

Query response

{string}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:COMM:GPIB:SGEN:CCOM:RFON ""AMPL:STATE ON"""
20   OUTPUT 717;":SYST:COMM:GPIB:SGEN:CCOM:RFON?"
30   ENTER 717;A$
```

Related commands

:SYST:COMM:GPIB:SGEN:TYPE on page 774

:SYST:COMM:GPIB:SGEN:CCOM:FREQ on page 769

:SYST:COMM:GPIB:SGEN:CCOM:POW on page 770

:SYST:COMM:GPIB:SGEN:CCOM:PRES on page 771

:SYST:COMM:GPIB:SGEN:DWEL on page 773

Equivalent key

[System] - Misc Setup - GPIB Setup - Signal Generator Address - Custom Commands - Turn RF Out On

:SYST:COMM:GPIB:SGEN:DWEL

Syntax

:SYSTem:COMMunicate:GPIB:SGENerator:DWELl <numeric>

:SYSTem:COMMunicate:GPIB:SGENerator:DWELl?

Description

Sets/reads out a wait time after setting the output frequency and the power level of the external signal source.

Parameters

	<value>
Description	Wait time after setting the output frequency and the power level of the external signal source
Range	0 to 1
Preset value	0.1
Unit	Sec.
Resolution	0.001

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:COMM:GPIB:SGEN:DWEL 0.2"
20   OUTPUT 717;":SYST:COMM:GPIB:SGEN:DWEL?"
30   ENTER 717;A
```

Related commands

:SYST:COMM:GPIB:SGEN:CCOM:FREQ on page 769

:SYST:COMM:GPIB:SGEN:CCOM:POW on page 770

Equivalent key

[System] - Misc Setup - GPIB Setup - Signal Generator Address - Switching Time

:SYST:COMM:GPIB:SGEN:TYPE

Syntax

:SYSTem:COMMunicate:GPIB:SGENerator:TYPE <numeric>

:SYSTem:COMMunicate:GPIB:SGENerator:TYPE?

Description

Sets/reads out the type of the external signal source.

Parameters

	<value>
Description	Type of the external signal source
Range	1 to 3
Preset value	3
Resolution	1

	Description of types
1	Controls the external signal source with the user-defined command.*1
2	8643A, 8644B, 8664A, 8665A/B
3 (preset value)	8648A/B/C/D, ESG Series, PSG Series

*1. When 1: User-defined is specified as the type, the output frequency setting (:SYST:COMM:GPIB:SGEN:CCOM:FREQ command on page 769) and the power level setting (:SYST:COMM:GPIB:SGEN:CCOM:POW command on page 770) are necessary.

Query response

{value}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:COMM:GPIB:SGEN:TYPE 2"
20   OUTPUT 717;":SYST:COMM:GPIB:SGEN:TYPE?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:OFFS:LOC:CONT on page 656

:SYST:COMM:GPIB:SGEN:CCOM:FREQ on page 769

:SYST:COMM:GPIB:SGEN:CCOM:POW on page 770

Equivalent key

[System] - Misc Setup - GPIB Setup - Signal Generator Address - Custom Commands|8643A,8644B,8664A,8665A/B|8648A/B/C/D,ESG Series,PSG Series

:SYST:CORR

Syntax

:SYSTem:CORRection[:STATe] {ON|OFF|1|0}

:SYSTem:CORRection[:STATe]?

Description

Turns ON/OFF the system error correction. Changing this state clears the calibration coefficients.

Parameters

	Description
ON or 1 (preset value)	Turns ON the system error correction.
OFF or 0	Turns OFF the system error correction.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:CORR OFF"
20   OUTPUT 717;":SYST:CORR?"
30   ENTER 717;A
```

Equivalent key

[System] - Service Menu - System Correction

:SYST:DATE

Syntax

:SYSTem:DATE <numeric 1>,<numeric 2>,<numeric 3>

:SYSTem:DATE?

Description

Sets the date of the clock built in the E5070B/E5071B.

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Year	Month	Day
Range	1980 to 2099	1 to 12	1 to 31
Resolution	1	1	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric 1},{numeric 2},{numeric 3}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:DATE 2002,1,1"
20   OUTPUT 717;":SYST:DATE?"
30   ENTER 717;A,B,C
```

Related commands

:SYST:UPR on page 786

:DISP:CLOC on page 449

Equivalent key

[System] - Misc Setup - Clock Setup - Set Date and Time

:SYST:ERR?

Syntax

:SYSTem:ERRor?

Description

Reads out the oldest error of the errors stored in the error queue of the E5070B/E5071B. The read-out error is deleted from the error queue. The size of the error queue is 100.

Executing the *CLS command clears the errors stored in the error queue. (Query only)

NOTE

This command can not return an error that occurs by the manual operation or the COM object used in controlling the E5070B/E5071B from the VBA Macro.

Query response

{numeric},{string}<newline><^END>

{numeric}: Error number

{string}: Error message (a character string with double quotation marks (""))

If no error is stored in the error queue, 0 and "No error" are read out as the error number and the error message.

Example of use

```
10   OUTPUT 717;":SYST:ERR?"
20   ENTER 717;A,B$
```

Related commands

*CLS on page 286

Equivalent key

No equivalent key is available on the front panel.

:SYST:ISPC:PORT

Syntax

:SYSTem:ISPControl:PORT <numeric>

:SYSTem:ISPControl:PORT?

Description

Specifies a test port to be selected for stimulus destination when the Initial Source Port Control feature is on.

Parameters

	<numeric>
Description	(preset value: 1) Specifies a test port for stimulus destination.
Range	1 to 4

Query response

{1-4}<newline><^END>

Example of use

```
10   :INIT:CONT OFF
20   :SYSTem:ISPControl[:STATe] ON
30   :SYSTem:ISPControl:PORT 1
```

Related commands

:SYST:ISPC:STAT on page 778

Equivalent key

[System] - Service - Init Src Port [1|2|3|4]

:SYST:ISPC:STAT

Syntax

:SYSTem:ISPControl [:STATe] {ON|OFF|1|0}

:SYSTem:ISPControl [:STATe] ?

Description

Turns on/off the Initial Source Port Control feature (to switch the stimulus output in the trigger hold state to a test port).

Parameters

	Description
ON or 1 (preset value)	Turns on the Initial Source Port Control feature.
OFF or 0	Turns off the Initial Source Port Control feature.

Query response

{1|0}<newline><^END>

Example of use

```
10   :INIT:CONT OFF
20   :SYSTem:ISPControl[:STATe] ON
30   :SYSTem:ISPControl:PORT 1
```

Related commands

:SYST:ISPC:PORT on page 777

Equivalent key

[System] - Service - Init Src Ctrl [ON]

:SYST:KLOC:KBD

Syntax

:SYSTem:KLOCk:KBD {ON|OFF|1|0}

:SYSTem:KLOCk:KBD?

Description

Sets whether to lock the operation of the front panel (key and rotary knob) and keyboard.

Parameters

	Description
ON or 1	Specifies lock.
OFF or 0 (preset value)	Specifies unlock.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:KLOC:KBD ON"
20   OUTPUT 717;":SYST:KLOC:KBD?"
30   ENTER 717;A
```

Related commands

:SYST:KLOC:MOUS on page 780

Equivalent key

[System] - Misc Setup - Key Lock - Front Panel & Keyboard Lock

:SYST:KLOC:MOUS

Syntax

:SYSTem:KLOCk:MOUSe {ON|OFF|1|0}

:SYSTem:KLOCk:MOUSe?

Description

Sets whether to lock the operation of the mouse and touch screen.

Parameters

	Description
ON or 1	Specifies lock.
OFF or 0 (preset value)	Specifies unlock.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:KLOC:MOUS ON"
20   OUTPUT 717;":SYST:KLOC:MOUS?"
30   ENTER 717;A
```

Related commands

:SYST:KLOC:KBD on page 779

Equivalent key

[System] - Misc Setup - Key Lock - Mouse Lock

:SYST:POFF

Syntax :SYSTem:POFF

Description Turns OFF the E5070B/E5071B. (No query)

Example of use

```
10   OUTPUT 717;":SYST:POFF"
```

Equivalent key Standby switch

:SYST:PRES

Syntax :SYSTem:PRESet

Description Performs preset.

There is the following difference from the setting state preset with the *RST command. (No query)

- The continuous initiation mode of channel 1 is set to ON.

Example of use

```
10   OUTPUT 717;":SYST:PRES"
```

Related commands *RST on page 289

Equivalent key **[Preset] - OK**

:SYST:SEC:LEV

Syntax

:SYSTem:SECurity:LEVel {NON|LOW|HIGH}

:SYSTem:SECurity:LEVel?

Description

Sets/Reads the security level.

Parameters

	Description
NON (preset value)	Turns OFF the security level.
LOW	Turns ON and specifies LOW level to the security level.
HIGH	Turns ON and specifies HIGH level to the security level.

When the setting of security level is LOW, it is able to change to NON or HIGH. But when this setting is HIGH, it is not able to change NON or LOW.

The setting of security level can be turned NON by executing the preset or recalling when the setting of security level is HIGH.

Even if the setting of security level is ON, the command that reads out the frequency is not influenced.

Query response

{NON|LOW|HIGH}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:SEC:LEV LOW"
20   OUTPUT 717;":SYST:SEC:LEV?"
30   ENTER 717;A$
```

Equivalent key

[System] - Service Menu - Security Level - None|Low|High

:SYST:SERV?

Syntax :SYSTem:SERVice?

Description Reads out whether to be in the service mode. (Query only)

Query response {1|0}<newline><^END>

	Description
1	In the service mode.
0	Not in the service mode.

Example of use

```
10   OUTPUT 717;":SYST:SERV?"
30   ENTER 717;A
```

Equivalent key Displayed on the instrument status bar (at the bottom of the LCD display).

:SYST:TEMP

Syntax :SYSTem:TEMPerature[:STATe]?

Description Reads out whether warm-up to satisfy the specifications of the E5070B/E5071B is enough. (Query only)

Query response {1|0}<newline><^END>

	Description
1	Enough warm-up.
0	Not enough warm-up.

Example of use

```
10   OUTPUT 717;":SYST:TEMP?"
30   ENTER 717;A
```

Equivalent key Displayed on the instrument status bar (at the bottom of the LCD display).

:SYST:TEMP:HIGH

Syntax :SYSTem:TEMPerature:HIGH {ON|OFF|1|0}

:SYSTem:TEMPerature:HIGH?

Description Turns ON/OFF the high temperature measurement mode.

Parameters

	Description
ON or 1	Turns ON the high temperature measurement mode.
OFF or 0 (preset value)	Turns OFF the high temperature measurement mode.

Query response {1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:TEMP:HIGH ON"
20   OUTPUT 717;":SYST:TEMP:HIGH?"
30   ENTER 717;A
```

Equivalent key **[System] - Service Menu - High Temperature**

:SYST:TIME

Syntax

:SYSTem:TIME <numeric 1>,<numeric 2>,<numeric 3>

:SYSTem:TIME?

Description

Sets the time of the clock built in the E5070B/E5071B.

Parameters

	<numeric 1>	<numeric 2>	<numeric 3>
Description	Hour (24-hour basis)	Minute	Second
Range	0 to 23	0 to 59	0 to 59
Resolution	1	1	1

If the specified parameter is out of the allowable setup range, the minimum value (if the lower limit of the range is not reached) or the maximum value (if the upper limit of the range is exceeded) is set.

Query response

{numeric 1},{numeric 2},{numeric 3}<newline><^END>

Example of use

```
10   OUTPUT 717;":SYST:TIME 17,30,0"
20   OUTPUT 717;":SYST:TIME?"
30   ENTER 717;A,B,C
```

Related commands

:SYST:DATE on page 775

:DISP:CLOC on page 449

Equivalent key

[System] - Misc Setup - Clock Setup - Set Date and Time

:SYST:UPR

Syntax

:SYSTem:UPReset

Description

Performs presets with the user settings.

The command is executed regardless of the operation mode in preset state.

(No query)

If you try to specify a file for a preset (D:\UserPreset.sta) that does not exist, a warning message is displayed and SYST:PRES will be executed.

Sample of use

```
10   OUTPUT 717;":SYST:UPR"
```

Related commands

*RST on page 289

:SYST:PRES on page 781

Equivalent key

[Preset] - **OK**

:TRIG

Syntax

:TRIGger[:SEQuence][:IMMediate]

Description

Regardless of the setting of the trigger mode, generates a trigger immediately and executes a measurement.

There is the following difference from the trigger with the :TRIG:SING command.

- The execution of the command finishes at the time of a trigger.

If you execute this command when the trigger system is not in the trigger wait state (trigger event detection state), an error occurs and the command is ignored.

For details about the trigger system, refer to “Trigger System” on page 128. (No query)

Example of use

```
10   OUTPUT 717;":TRIG"
```

Related commands

:TRIG:SING on page 792

Equivalent key

No equivalent key is available on the front panel.

:TRIG:AVER

Syntax

:TRIGger[:SEQuence]:AVERage {ON|OFF|1|0}

:TRIGger[:SEQuence]:AVERage?

Description

Turns ON/OFF the averaging trigger feature.

The sweep averaging feature must be set to on when turning on the averaging trigger feature.

Parameters

	Description
ON or 1	Turns on the averaging trigger feature.
OFF or 0 (preset value)	Turns off the averaging trigger feature.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":TRIG:AVER ON"
20   OUTPUT 717;":TRIG:AVER?"
30   ENTER 717;A
```

Related commands

:SENS{1-16}:AVER on page 532

Equivalent key

[Ave] - Ave Trigger

:TRIG:EXT:DEL

Syntax

:TRIGger[:SEQuence]:EXTernal:DELay <numeric>

:TRIGger[:SEQuence]:EXTernal:DELay?

Description

When the trigger source is external, sets the time that it takes from receiving the trigger to starting measurement.

Parameter

	<numeric>
Description	External trigger delay time
Range	0 to 1
Preset value	0
Unit	s (second)
Resolution	10 μ

Query response

{numeric}<newline><^END>

Example of use

```
10   OUTPUT 717;":TRIG:EXT:DEL 0.05"
20   OUTPUT 717;":TRIG:EXT:DEL?"
30   ENTER 717;A
```

Related commands

:TRIG:EXT:LLAT on page 790

:TRIG:POIN on page 791

Equivalent key

[Trigger] - Ext Trig Delay

:TRIG:EXT:LLAT

Syntax

:TRIGger[:SEQuence]:EXTernal:LLATency[:STATe] {ON|OFF|1|0}

:TRIGger[:SEQuence]:EXTernal:LLATency[:STATe]?

Description

Turns ON/OFF the low-latency external trigger feature.

When turning on the low-latency external trigger feature, the point trigger feature must be set to on and the trigger source must be set to external trigger.

NOTE

When the point trigger feature is set to off, or the trigger source is set to one other than the external trigger, the change is ignored.

Parameter

	Description
ON or 1	Turns on the low-latency external trigger feature.
OFF or 0 (preset value)	Turns off the low-latency external trigger feature.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":TRIG:EXT:LLAT ON"
20   OUTPUT 717;":TRIG:EXT:LLAT?"
30   ENTER 717;A
```

Related commands

:TRIG:EXT:DEL on page 789

:TRIG:POIN on page 791

:TRIG:SOUR on page 793

Equivalent key

[Trigger] - Low Latency

:TRIG:POIN

Syntax

:TRIGger[:SEQuence]:POINt {ON|OFF|1|0}

:TRIGger[:SEQuence]:POINt?

Description

Turns on/off of the point trigger feature.

The sweep mode is changed to "Stepped" when the point trigger feature is turned on.

NOTE

When the trigger source is set to the internal trigger (Internal), the change is ignored.

Parameters

	Description
ON or 1	Turns on the point trigger feature.
OFF or 0 (preset value)	Turns off the point trigger feature.

Query response

{1|0}<newline><^END>

Example of use

```
10   OUTPUT 717;":TRIG:POIN ON"
20   OUTPUT 717;":TRIG:POIN?"
30   ENTER 717;A
```

Related commands

:TRIG:SOUR on page 793

Equivalent key

[Trigger] - Trigger Event

:TRIG:SING

Syntax

:TRIGger[:SEQuence]:SINGle

Description

Regardless of the setting of the trigger mode, generates a trigger immediately and executes a measurement.

There is the following difference from the trigger with the :TRIG command.

- The execution of the command finishes when the measurement (all sweeps) initiated with this command finishes. In other words, you can wait for the end of the measurement using the *OPC? command.

If you execute this command when the trigger system is not in the trigger wait state (trigger event detection state), an error occurs and the command is ignored.

For details about the trigger system, refer to “Trigger System” on page 128. (No query)

Example of use

```
10   OUTPUT 717;":TRIG:SING"
20   OUTPUT 717;"*OPC?"
30   ENTER 717;A
```

Related commands

:TRIG on page 787

*OPC? on page 288

Equivalent key

No equivalent key is available on the front panel.

:TRIG:SOUR

Syntax

:TRIGger[:SEQuence]:SOURce {INTernal|EXTernal|MANual|BUS}

:TRIGger[:SEQuence]:SOURce?

Description

Selects the trigger source from the following 4 types.

Internal	Uses the internal trigger to generate continuous triggers automatically.
External	Generates a trigger when the trigger signal is inputted externally via the Ext Trig connector or the handler interface.
Manual	Generates a trigger when the key operation of **[Trigger]** - **Trigger** is executed from the front panel.
Bus	Generates a trigger when the *TRG command is executed.

When you change the trigger source during sweep, the sweep is canceled.

Parameters

	Description
INTernal (preset value)	Specifies internal.
EXTernal	Specifies external.
MANual	Specifies manual.
BUS	Specifies bus.

Query response

{BUS|EXT|INT|MAN}<newline><^END>

Example of use

```
10   OUTPUT 717;":TRIG:SOUR BUS"
20   OUTPUT 717;":TRIG:SOUR?"
30   ENTER 717;A$
```

Related commands

*TRG on page 291

Equivalent key

[Trigger] - **Trigger Source** - **Internal**|**External**|**Manual**|**Bus**

Command list

List by function

Table 14-1 shows the SCPI command list by function.

Table 14-1 SCPI command list by function

Function	Setting/execution item				Command
Measurement conditions	Preset				*RST on page 289 :SYST:PRES on page 781 :SYST:UPR on page 786
	Selecting the active channel				:DISP:WIND{1-16}:ACT on page 464
	Checking the active channel				:SERV:CHAN:ACT? on page 682
	Selecting the active trace				:CALC{1-16}:PAR{1-16}:SEL on page 418
	Checking the active trace				:SERV:CHAN{1-16}:TRAC:ACT? on page 683
	Number of traces				:CALC{1-16}:PAR:COUN on page 415
	Measurement parameter				:CALC{1-16}:PAR{1-16}:DEF on page 416
	Data format				:CALC{1-16}:FORM on page 318
	ON/OFF of the stimulus signal output				:OUTP on page 521
	Power level	Power level for all port			:SOUR{1-16}:POW on page 689
		Power level for each port			:SOUR{1-16}:POW:PORT{1-4} on page 695
		ON/OFF of port coupling			:SOUR{1-16}:POW:PORT:COUP on page 694
	Power range				:SOUR{1-16}:POW:ATT on page 690
	Auto Power range set function ON/OFF				:SOUR{1-16}:POW:ATT:AUTO on page 691
	Power slope	ON/OFF			:SOUR{1-16}:POW:SLOP:STAT on page 703
		Coefficient			:SOUR{1-16}:POW:SLOP on page 702
	Fixed frequency (CW frequency)				:SENS{1-16}:FREQ on page 639
	Sweep	Range	Frequency sweep	Start	:SENS{1-16}:FREQ:STAR on page 643
				Stop	:SENS{1-16}:FREQ:STOP on page 644
				Center	:SENS{1-16}:FREQ:CENT on page 640
				Span	:SENS{1-16}:FREQ:SPAN on page 642
			Power sweep	Start	:SOUR{1-16}:POW:STAR on page 705
				Stop	:SOUR{1-16}:POW:STOP on page 706
				Center	:SOUR{1-16}:POW:CENT on page 693
				Span	:SOUR{1-16}:POW:SPAN on page 704
		Number of measurement points			:SENS{1-16}:SWE:POIN on page 679
		Time	ON/OFF of the auto setting		:SENS{1-16}:SWE:TIME:AUTO on page 681
			Setting		:SENS{1-16}:SWE:TIME on page 680
		Delay time			:SENS{1-16}:SWE:DEL on page 677
		Type			:SENS{1-16}:SWE:TYPE on page 682
		Sweep mode			:SENS{1-16}:SWE:GEN on page 678

Table 14-1 SCPI command list by function

Function	Setting/execution item			Command
Measurement conditions (Continued)	Segment Sweep	Table creation		:SENS{1-16}:SEGM:DATA on page 674
		Reading out the total number of measurement points		:SENS{1-16}:SEGM:SWE:POIN? on page 676
		Reading out the total sweep time		:SENS{1-16}:SEGM:SWE:TIME? on page 676
		Horizontal axis display method (frequency based/order based)		:DISP:WIND{1-16}:X:SPAC on page 479
	IF bandwidth			:SENS{1-16}:BAND on page 534 :SENS{1-16}:BWID on page 535
	Averaging	ON/OFF		:SENS{1-16}:AVER on page 532
		Factor		:SENS{1-16}:AVER:COUN on page 533
		Clearing the count		:SENS{1-16}:AVER:CLE on page 532
	Smoothing	ON/OFF		:CALC{1-16}:SMO on page 427
		Smoothing aperture		:CALC{1-16}:SMO:APER on page 428
	Absolute	Setting the measurement parameter		:CALC{1-16}:PAR{1-16}:DEF on page 416
		Selecting the stimulus port		:CALC{1-16}:PAR{1-16}:SPOR on page 419
	Setting the x-axsis frequency	In case of the frequency offset is ON		:CALC{1-16}:MIX:XAX on page 411
		In case of the frequency offset is OFF		:CALC{1-16}:OFFS:XAX on page 414
	ON/OFF of the avoid spurious			:SENS{1-16}:OFFS:ASP on page 655
	External signal source	ON/OFF of control		:SENS{1-16}:OFFS:LOC:CONT on page 656
		Reading out the frequency data		:SENS{1-16}:OFFS:LOC:DATA? on page 657
		Setting the frequency	ON/OFF of the frequency offset	:SENS{1-16}:OFFS:LOC:STAT on page 666
			Multiplier	:SENS{1-16}:OFFS:LOC:MULT on page 659
			Divisor	:SENS{1-16}:OFFS:LOC:DIV on page 658
			Offset	:SENS{1-16}:OFFS:LOC:OFFS on page 660
			Start	:SENS{1-16}:OFFS:LOC:STAR on page 661
			Stop	:SENS{1-16}:OFFS:LOC:STOP on page 662
		Setting the power	Power level	:SENS{1-16}:OFFS:LOC:POW on page 663
			Power slope	:SENS{1-16}:OFFS:LOC:POW:SLOP on page 664
			ON/OFF of the power slope	:SENS{1-16}:OFFS:LOC:POW:SLOP:STAT on page 665
	Frequency offset	ON/OFF of the frequency offset		:SENS{1-16}:OFFS on page 654
		Reading out the frequency data of ports		:SENS{1-16}:OFFS:PORT{1-4}:DATA? on page 667
		Setting the frequency	Multiplier	:SENS{1-16}:OFFS:PORT{1-4}:MULT on page 669
			Divisor	:SENS{1-16}:OFFS:PORT{1-4}:DIV on page 668
			Offset	:SENS{1-16}:OFFS:PORT{1-4}:OFFS on page 670
			Start	:SENS{1-16}:OFFS:PORT{1-4}:STAR on page 671
			Stop	:SENS{1-16}:OFFS:PORT{1-4}:STOP on page 672

Table 14-1 SCPI command list by function

Function	Setting/execution item		Command
Screen display	Window layout		:DISP:SPL on page 460
	Selecting the active channel		:DISP:WIND{1-16}:ACT on page 464
	Checking the active channel		:SERV:CHAN:ACT? on page 682
	Maximizing the active channel window		:DISP:MAX on page 459
	Number of traces		:CALC{1-16}:PAR:COUN on page 415
	Measurement parameter		:CALC{1-16}:PAR{1-16}:DEF on page 416
	Data format		:CALC{1-16}:FORM on page 318
	Graph layout		:DISP:WIND{1-16}:SPL on page 469
	Selecting the active trace		:CALC{1-16}:PAR{1-16}:SEL on page 418
	Checking the active trace		:SERV:CHAN{1-16}:TRAC:ACT? on page 683
	Active trace maximization		:DISP:WIND{1-16}:MAX on page 468
	ON/OFF of the backlight		:SYST:BACK on page 764
	ON/OFF of the display update		:DISP:ENAB on page 456
	Executing the display update		:DISP:UPD on page 464
	Clearing the error message display		:DISP:CCL on page 448
	Data trace	ON/OFF of the display	:DISP:WIND{1-16}:TRAC{1-16}:STAT on page 475
		Data math	:CALC{1-16}:MATH:FUNC on page 409
	Memory trace	ON/OFF of the display	:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:X on page 472
		Copying the measurement data	:CALC{1-16}:MATH:MEM on page 410
	ON/OFF of the graticule label display		:DISP:WIND{1-16}:LAB on page 467
	ON/OFF of the clock display		:DISP:CLOC on page 449
	ON/OFF of the frequency display		:DISP:ANN:FREQ on page 448
	ON/OFF of the softkey label display		:DISP:SKEY on page 459
	Title display	ON/OFF	:DISP:WIND{1-16}:TITL on page 470
		Title label setting	:DISP:WIND{1-16}:TITL:DATA on page 471

Table 14-1 SCPI command list by function

Function	Setting/execution item		Command
Screen display (Continued)	Table display	ON/OFF	:DISP:TABL on page 462
		Selection	:DISP:TABL:TYPE on page 463
	Echo window	Data output	:DISP:ECHO on page 455
		Clearing the displayed data	:DISP:ECHO:CLE on page 455
	Display type (normal/inverse)		:DISP:IMAG on page 458
	Display color	Data trace	:DISP:COL{1-2}:TRAC{1-16}:DATA on page 453
		Memory trace	:DISP:COL{1-2}:TRAC{1-16}:MEM on page 454
		Graph	:DISP:COL{1-2}:GRAT{1-2} on page 451
		Limit test	:DISP:COL{1-2}:LIM{1-2} on page 452
		Background	:DISP:COL{1-2}:BACK on page 450
		Resetting color settings	:DISP:COL{1-2}:RES on page 452
	Horizontal axis display method for segment sweep (frequency based/order based)		:DISP:WIND{1-16}:X:SPAC on page 479
	Electrical delay time		:CALC{1-16}:CORR:EDEL:TIME on page 304
	Selecting the media type to calculate the electrical delay time.		:CALC{1-16}:CORR:EDEL:MED on page 303
	Setting the cut-off frequency for the electrical delay when the waveguide is selected as the media type.		:CALC{1-16}:CORR:EDEL:WGC on page 305
	Velocity factor		:SENS{1-16}:CORR:RVEL:COAX on page 635
	Phase offset		:CALC{1-16}:CORR:OFFS:PHAS on page 306
	Scale	Auto scale execution	:DISP:WIND{1-16}:TRAC{1-16}:Y:AUTO on page 475
		Number Of Divisions	:DISP:WIND{1-16}:Y:DIV on page 480
		Scale per division	:DISP:WIND{1-16}:TRAC{1-16}:Y:PDIV on page 476
		Specifying the reference graticule line	:DISP:WIND{1-16}:TRAC{1-16}:Y:RPOS on page 478
		Value of the reference graticule line	:DISP:WIND{1-16}:TRAC{1-16}:Y:RLEV on page 477
		Full scale value (when the data format is the Smith chart format or the polar format)	:DISP:WIND{1-16}:TRAC{1-16}:Y:PDIV on page 476

Table 14-1 SCPI command list by function

Function	Setting/execution item		Command
Calibration	ON/OFF		:SENS{1-16}:CORR:STAT on page 636
	Selecting the calibration kit		:SENS{1-16}:CORR:COLL:CKIT on page 548
	Selecting the calibration type	Response calibration (open)	:SENS{1-16}:CORR:COLL:METH:OPEN on page 589
		Response calibration (short)	:SENS{1-16}:CORR:COLL:METH:SHOR on page 589
		Response calibration (thru)	:SENS{1-16}:CORR:COLL:METH:THRU on page 592
		1-port calibration	:SENS{1-16}:CORR:COLL:METH:SOLT1 on page 590
		Full 2-port calibration	:SENS{1-16}:CORR:COLL:METH:SOLT2 on page 590
		Full 3-port calibration	:SENS{1-16}:CORR:COLL:METH:SOLT3 on page 591
		Full 4-port calibration	:SENS{1-16}:CORR:COLL:METH:SOLT4 on page 591
		Enhanced response calibration	:SENS{1-16}:CORR:COLL:METH:ERES on page 588
		Specified 2-port TRL calibration	:SENS{1-16}:CORR:COLL:METH:TRL2 on page 593
		Specified 3-port TRL calibration	:SENS{1-16}:CORR:COLL:METH:TRL3 on page 594
		Specified 4-port TRL calibration	:SENS{1-16}:CORR:COLL:METH:TRL4 on page 595
	Reading out the calibration type		:SENS{1-16}:CORR:COLL:METH:TYPE? on page 596
	Reading out the applied calibration type of each trace		:SENS{1-16}:CORR:TYPE{1-16}? on page 638
	Setting the subclass of the standard for the calibration		:SENS{1-16}:CORR:COLL:SUBC on page 601
	Measuring the THRU standard of the calibration kit		:SENS{1-16}:CORR:COLL:TRLT on page 605
	Selecting the standard used for the two specified ports		:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLT on page 557
	Executing the reflection measurement of the TRL calibration for the selected calibration kit.		:SENS{1-16}:CORR:COLL:TRLR on page 604
	Selecting the standard for the measurement		:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLR on page 556
	Executing the line measurement of the TRL calibration for the selected calibration kit.		:SENS{1-16}:CORR:COLL:TRLL on page 603
	Selecting the standard used for the specified two ports		:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLL on page 555
	Setting the multiple calibration kit		:SENS{1-16}:CORR:COLL:CKIT:ORD on page 550
	Selecting the reference impedance for the TRL calibration		:SENS{1-16}:CORR:COLL:CKIT:TRL:IMP on page 576
	Selecting the measurement data to calculate the reference plane for the calibration		:SENS{1-16}:CORR:COLL:CKIT:TRL:RPL on page 577

Table 14-1 SCPI command list by function

Function	Setting/execution item			Command
Calibration (Continued)	Defining the calibration kit	Reset		:SENS{1-16}:CORR:COLL:CKIT:RES on page 558
		Calibration kit name		:SENS{1-16}:CORR:COLL:CKIT:LAB on page 549
		Defining the standard	label	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:LAB on page 572
			Standard type	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE on page 574
			C0	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C0 on page 560
			C1	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C1 on page 561
			C2	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C2 on page 562
			C3	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C3 on page 563
			L0	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L0 on page 568
			L1	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L1 on page 569
			L2	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L2 on page 570
			L3	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L3 on page 571
			Sets the max. frequency of the standard	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMAX on page 566
			Sets the min. frequency of the standard	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMIN on page 567
			Sets the media type of the standard	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:CHAR on page 564
			Offset delay	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:DEL on page 565
			Offset Loss	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:LOSS on page 573
			Offset Z0	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:Z0 on page 575
			Arbitrary impedance	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:ARB on page 559
		Setting the class	Open	:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN on page 552
			Short	:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR on page 553
			Load	:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD on page 551
			Thru	:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU on page 554
	Measuring the calibration data	Open standard		:SENS{1-16}:CORR:COLL:OPEN on page 597
		Short standard		:SENS{1-16}:CORR:COLL:SHOR on page 599
		Load standard		:SENS{1-16}:CORR:COLL:LOAD on page 587
		Thru standard		:SENS{1-16}:CORR:COLL:THRU on page 602
		Isolation		:SENS{1-16}:CORR:COLL:ISOL on page 586
	Clearing the calibration data (measured values of standards)			:SENS{1-16}:CORR:COLL:CLE on page 578
	Clearing the calibration coefficients			:SENS{1-16}:CORR:CLE on page 536
	Calculating the calibration coefficients			:SENS{1-16}:CORR:COLL:SAVE on page 599
	ON/OFF of the calibration property display			:SENS{1-16}:CORR:PROP on page 632

Table 14-1 SCPI command list by function

Function	Setting/execution item		Command
Calibration (Continued)	ECal	Executing the 1-port calibration	:SENS{1-16}:CORR:COLL:ECAL:SOLT1 on page 582
		Executing the full 2-port calibration	:SENS{1-16}:CORR:COLL:ECAL:SOLT2 on page 582
		Executing the full 3-port calibration	:SENS{1-16}:CORR:COLL:ECAL:SOLT3 on page 583
		Executing the full 4-port calibration	:SENS{1-16}:CORR:COLL:ECAL:SOLT4 on page 583
		Executing the response calibration (thru)	:SENS{1-16}:CORR:COLL:ECAL:THRU on page 584
		Executing the enhanced response calibration	:SENS{1-16}:CORR:COLL:ECAL:ERES on page 580
		ON/OFF of the isolation measurement	:SENS{1-16}:CORR:COLL:ECAL:ISOL on page 581
		Selecting the characterization (factory/user1-5)	:SENS{1-16}:CORR:COLL:ECAL:UCH on page 585
		Executing the confidence check of the applied calibration coefficients	:SENS{1-16}:CORR:COLL:ECAL:CCH on page 579
		Checking the connected port	:SENS:CORR:COLL:ECAL:PATH on page 525
		Port connection	:SENS:CORR:COLL:ECAL:PATH on page 525
		ON/OFF the auto-detect function	:SENS:CORR:COLL:ECAL:ORI on page 524
	Port extension	ON/OFF	:SENS{1-16}:CORR:EXT on page 606
		Correction value	:SENS{1-16}:CORR:EXT:AUTO:PORT{1-4} on page 611
	DC loss	Correction value	:SENS{1-16}:CORR:EXT:PORT{1-4}:LDC on page 618
	Loss value	Correction value	:SENS{1-16}:CORR:EXT:PORT{1-4}:LOSS{1-2} on page 619
		Frequency	:SENS{1-16}:CORR:EXT:PORT{1-4}:FREQ{1-2} on page 616
		ON/OFF	:SENS{1-16}:CORR:EXT:PORT{1-4}:INCL{1-2} on page 617
	Auto port extension	Frequency	:SENS{1-16}:CORR:EXT:AUTO:CONF on page 607
		ON/OFF loss correction	:SENS{1-16}:CORR:EXT:AUTO:LOSS on page 609
		ON/OFF DC offset	:SENS{1-16}:CORR:EXT:AUTO:DCOF on page 608
		Measuring the OPEN/SHORT standard	:SENS{1-16}:CORR:EXT:AUTO:MEAS on page 610
		ON/OFF the specified port	:SENS{1-16}:CORR:EXT:AUTO:PORT{1-4} on page 611
		Delete the finished measurement data	:SENS{1-16}:CORR:EXT:AUTO:RESet on page 612
		Start frequency	:SENS{1-16}:CORR:EXT:AUTO:STAR on page 613
		Stop frequency	:SENS{1-16}:CORR:EXT:AUTO:STOP on page 614
	Velocity factor		:SENS{1-16}:CORR:RVEL:COAX on page 635
	Set Z0		:SENS:CORR:IMP on page 526

Table 14-1 SCPI command list by function

Function	Setting/execution item			Command
Power calibration	ON/OFF			:SOUR{1-16}:POW:PORT{1-4}:CORR on page 696
	Power calibration data	Measurement		:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL on page 696
		Number of power measurements at one measurement point		:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:AVER on page 697
		Reading out/writing		:SOUR{1-16}:POW:PORT{1-4}:CORR:DATA on page 701
	Power sensor calibration factor settings	Reference calibration factor	Channel A	:SOUR:POW:PORT:CORR:COLL:ASEN:RCF on page 685
			Channel B	:SOUR:POW:PORT:CORR:COLL:BSEN:RCF on page 686
		Calibration factor table	Channel A	:SOUR:POW:PORT:CORR:COLL:TABL:ASEN:DATA on page 687
			Channel B	:SOUR:POW:PORT:CORR:COLL:TABL:BSEN:DATA on page 688
	Loss compensation	ON/OFF		:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS on page 699
		Settings the Loss compensation table		:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS:DATA on page 700
	Settings the power meter GPIB address			:SYST:COMM:GPIB:PMET:ADDR on page 767
Scalar-mixer calibration	Clearing the calibration data			:SENS{1-16}:CORR:OFFS:COLL:CLE on page 621
	Clearing the calibration coefficients			:SENS{1-16}:CORR:OFFS:CLE on page 620
	Calculating the calibration coefficients			:SENS{1-16}:CORR:OFFS:COLL:SAVE on page 629
	Measuring the calibration data	Open standard		:SENS{1-16}:CORR:OFFS:COLL:OPEN on page 627
		Short standard		:SENS{1-16}:CORR:OFFS:COLL:SHOR on page 630
		Load standard		:SENS{1-16}:CORR:OFFS:COLL:LOAD on page 624
		Thru standard		:SENS{1-16}:CORR:OFFS:COLL:THRU on page 631
		Power calibration		:SENS{1-16}:CORR:OFFS:COLL:PMET on page 628
	Specifying the ports	2-port (SMIX2)		:SENS{1-16}:CORR:OFFS:COLL:METH:SMIX2 on page 625
		1-port (SOLT1)		:SENS{1-16}:CORR:OFFS:COLL:METH:SOLT1 on page 626
	ECal	Executing the scalar-mixer calibration (SMIX2)		:SENS{1-16}:CORR:OFFS:COLL:ECAL:SMIX2 on page 622
		Executing the 1-port calibration (SOLT1)		:SENS{1-16}:CORR:OFFS:COLL:ECAL:SOLT1 on page 623
Receiver calibration	ON/OFF			:SENS{1-16}:CORR:REC{1-4} on page 633
	Calculating the calibration coefficients			:SENS{1-16}:CORR:REC{1-4}:COLL:ACQ on page 634
Measurement	Sweep abort			:ABOR on page 292
	Trigger system (Sweep mode)	Single startup (Single)		:INIT{1-16} on page 484
		ON/OFF of the continuous initiation mode (Continuous/Hold)		:INIT{1-16}:CONT on page 485
	Generating a trigger when the trigger source setting is BUS			*TRG on page 291
	Generating a trigger regardless of the trigger source setting	Impossible to wait for the end of the sweep using the *OPC? command		:TRIG on page 787
		Possible to wait for the end of the sweep using the *OPC? command		:TRIG:SING on page 792
	Selecting the trigger source			:TRIG:SOUR on page 793
	ON/OFF of the point trigger			:TRIG:POIN on page 791

Table 14-1 SCPI command list by function

Function	Setting/execution item			Command
Reading out/ writing the result	Transfer format	Format		:FORM:DATA on page 482
		Byte order		:FORM:BORD on page 481
	Reading out/writing formatted data array			:CALC{1-16}:DATA:FDAT on page 307
	Reading out/writing formatted memory array			:CALC{1-16}:DATA:FMEM on page 308
	Reading out/writing the corrected data array			:CALC{1-16}:DATA:SDAT on page 309
	Reading out/writing the corrected memory array			:CALC{1-16}:DATA:SMEM on page 310
	Reading out the stimulus (frequency) array			:SENS{1-16}:FREQ:DATA? on page 641
	Reading out/writing the power calibration data array			:SOUR{1-16}:POW:PORT{1-4}:CORR:DATA on page 701
	Calibration coefficient array data	Enabling the calibration coefficient array data		:SENS{1-16}:CORR:COEF:SAVE on page 547
		Reading out/Writing		:SENS{1-16}:CORR:COEF on page 537
		Selecting the calibration type at the reading out/ writing the data array	Enhanced response calibration	:SENS{1-16}:CORR:COEF:METH:ERES on page 539
			Response calibration (open)	:SENS{1-16}:CORR:COEF:METH:OPEN on page 540
			Response calibration (short)	:SENS{1-16}:CORR:COEF:METH:SHOR on page 541
			Response calibration (thru)	:SENS{1-16}:CORR:COEF:METH:THRU on page 546
			1-port calibration	:SENS{1-16}:CORR:COEF:METH:SOLT1 on page 542
			full 2-port calibration	:SENS{1-16}:CORR:COEF:METH:SOLT2 on page 543
			full 3-port calibration	:SENS{1-16}:CORR:COEF:METH:SOLT3 on page 544
			full 4-port calibration	:SENS{1-16}:CORR:COEF:METH:SOLT4 on page 545
Limit test	ON/OFF of the limit test			:CALC{1-16}:LIM on page 377
	ON/OFF of the limit line display			:CALC{1-16}:LIM:DISP on page 379
	ON/OFF of the “Fail” display			:DISP:FSIG on page 457
	Creating the limit table			:CALC{1-16}:LIM:DATA on page 378
	Offset	Setting the marker value at the offset along the Y-axis		:CALC{1-16}:LIM:OFFS:MARK on page 382
		Along the X-axis		:CALC{1-16}:LIM:OFFS:STIM on page 383
		Along the Y-axis		:CALC{1-16}:LIM:OFFS:AMPL on page 381
	Reading out the test result	Judgment result for each trace		:CALC{1-16}:LIM:FAIL? on page 380
		Frequency values of all fail measurement points		:CALC{1-16}:LIM:REP? on page 384
		Number of measurement points that failed		:CALC{1-16}:LIM:REP:POIN? on page 386
		Point information		:CALC{1-16}:LIM:REP:ALL? on page 385

Table 14-1 SCPI command list by function

Function	Setting/execution item	Command
Ripple test	ON/OFF of the ripple test	:CALC{1-16}:RLIM on page 420
	ON/OFF of the ripple limit line display	:CALC{1-16}:RLIM:DISP:LINE on page 422
	ON/OFF of the “Fail” display	:DISP:FSIG on page 457
	Ripple limit line editing	:CALC{1-16}:RLIM:DATA on page 421
	ON/OFF of the ripple value display and Selecting the type of ripple value	:CALC{1-16}:RLIM:DISP:VAL on page 424
	Selecting the ripple limit line number to display the ripple value	:CALC{1-16}:RLIM:DISP:SEL on page 423
	Reading out the results of each ripple limit lines	:CALC{1-16}:RLIM:REP? on page 426
	Reading out the results of the ripple test (pass/fail)	:CALC{1-16}:RLIM:FAIL? on page 425
Bandwidth test	ON/OFF of the bandwidth test	:CALC{1-16}:BLIM on page 293
	ON/OFF of the bandwidth display	:CALC{1-16}:BLIM:DISP:VAL on page 296
	ON/OFF of the “Fail” display	:DISP:FSIG on page 457
	ON/OFF of the marker display	:CALC{1-16}:BLIM:DISP:MARK on page 295
	Specifying the upper limit value for the test	:CALC{1-16}:BLIM:MAX on page 298
	Specifying the lower limit value for the test	:CALC{1-16}:BLIM:MIN on page 299
	Specifying the bandwidth threshold value (attenuation from the peak)	:CALC{1-16}:BLIM:DB on page 294
	Reading the bandwidth value	:CALC{1-16}:BLIM:REP? on page 300
	Reading the results (pass/fail)	:CALC{1-16}:BLIM:FAIL? on page 297

Table 14-1 SCPI command list by function

Function	Setting/execution item			Command
Marker	Selecting the active marker			:CALC{1-16}:MARK{1-10}:ACT on page 395
	ON/OFF of the marker			:CALC{1-16}:MARK{1-10} on page 394
	ON/OFF of the marker coupling between traces			:CALC{1-16}:MARK:COUP on page 388
	ON/OFF of the discrete mode			:CALC{1-16}:MARK{1-10}:DISC on page 398
	ON/OFF of the reference marker mode			:CALC{1-16}:MARK:REF on page 393
	Reading out marker value	Response value		:CALC{1-16}:MARK{1-10}:Y? on page 408
		Stimulus value		:CALC{1-16}:MARK{1-10}:X on page 407
	Setting the stimulus value of the marker			
	Marker search	Search execution		:CALC{1-16}:MARK{1-10}:FUNC:EXEC on page 399
		Search type		:CALC{1-16}:MARK{1-10}:FUNC:TYPE on page 405
		Search range	ON/OFF of the range coupling between traces	:CALC{1-16}:MARK:FUNC:DOM:COUP on page 390
			Partial Search ON/OFF	:CALC{1-16}:MARK:FUNC:DOM on page 389
			Partial Search Start	:CALC{1-16}:MARK:FUNC:DOM:STAR on page 391
			Partial Search Stop	:CALC{1-16}:MARK:FUNC:DOM:STOP on page 392
		Peak definition	Lower limit for the peak excursion value	:CALC{1-16}:MARK{1-10}:FUNC:PEXC on page 400
			Polarity	:CALC{1-16}:MARK{1-10}:FUNC:PPOL on page 401
		Target definition	Target value	:CALC{1-16}:MARK{1-10}:FUNC:TARG on page 402
			Polarity	:CALC{1-16}:MARK{1-10}:FUNC:TTR on page 404
		ON/OFF of the tracking		:CALC{1-16}:MARK{1-10}:FUNC:TRAC on page 403
	Bandwidth search	ON/OFF of the result display		:CALC{1-16}:MARK:BWID on page 387
		Bandwidth definition value		:CALC{1-16}:MARK{1-10}:BWID:THR on page 397
		Reading out the result		:CALC{1-16}:MARK{1-10}:BWID:DATA? on page 396
	Setting the start value/stop value/center value/ reference line value/electrical delay value using a marker			:CALC{1-16}:MARK{1-10}:SET on page 406
	Statistic analysis of trace	ON/OFF of the result display		:CALC{1-16}:MST on page 412
		Reading out the result		:CALC{1-16}:MST:DATA? on page 413
	Display position of marker information			:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:X on page 472
				:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:Y on page 473
	Display setting of marker information for each trace			:DISP:WIND{1-16}:ANN:MARK:ALIG on page 465
	Setting which contents are displayed for marker information			:DISP:WIND{1-16}:ANN:MARK:SING on page 466

Table 14-1 SCPI command list by function

Function	Setting/execution item			Command
Analysis	Analysis execution			:CALC{1-16}:FUNC:EXEC on page 370
	Analysis type			:CALC{1-16}:FUNC:TYPE on page 376
	Range	ON/OFF of the range coupling between traces		:CALC{1-16}:FUNC:DOM:COUP on page 368
		Partial range	ON/OFF	:CALC{1-16}:FUNC:DOM on page 367
			Start	:CALC{1-16}:FUNC:DOM:STAR on page 369
			Stop	:CALC{1-16}:FUNC:DOM:STOP on page 370
	Peak definition	Lower limit for the peak excursion value		:CALC{1-16}:FUNC:PEXC on page 371
		Polarity		:CALC{1-16}:FUNC:PPOL on page 373
	Target definition	Target value		:CALC{1-16}:FUNC:TARG on page 374
		Polarity		:CALC{1-16}:FUNC:TTR on page 375
	Reading out the analysis result	Data of result		:CALC{1-16}:FUNC:DATA? on page 366
		Number of data pairs of result		:CALC{1-16}:FUNC:POIN? on page 372
Fixture simulator	ON/OFF of the fixture simulator function			:CALC{1-16}:FSIM:STAT on page 365
	Topology	Balance device type		:CALC{1-16}:FSIM:BAL:DEV on page 324
		Port assignment	Unbalance-balance	:CALC{1-16}:FSIM:BAL:TOP:SBAL on page 342
			Balance-balance	:CALC{1-16}:FSIM:BAL:TOP:BBAL on page 340
			Unbalance-unbalance-balance	:CALC{1-16}:FSIM:BAL:TOP:SSB on page 343
		ON/OFF of the property display		:CALC{1-16}:FSIM:BAL:TOP:PROP:STAT on page 341
	Balance-unbalance conversion	ON/OFF		:CALC{1-16}:FSIM:BAL:PAR{1-16}:STAT on page 339
		Setting the measurement parameter	Unbalance-balance	:CALC{1-16}:FSIM:BAL:PAR{1-16}:SBAL on page 337
			Balance-balance	:CALC{1-16}:FSIM:BAL:PAR{1-16}:BBAL on page 336
			Unbalance-unbalance-balance	:CALC{1-16}:FSIM:BAL:PAR{1-16}:SSB on page 338
	Matching circuit embedding	ON/OFF		:CALC{1-16}:FSIM:SEND:PMC:STAT on page 360
		Circuit type		:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4} on page 354
		Circuit constant	C	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:C on page 355
			G	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:G on page 356
			L	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:L on page 357
			R	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:R on page 358
		User file		:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:USER:FIL on page 359
	Port impedance conversion	ON/OFF		:CALC{1-16}:FSIM:SEND:ZCON:STAT on page 364
		Z0		:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:Z0 on page 363
		Imaginary part		:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:IMAG on page 361
		Real part		:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:REAL on page 362

Table 14-1 SCPI command list by function

Function	Setting/execution item				Command
Fixture simulator	Network de-embedding	ON/OFF			:CALC{1-16}:FSIM:SEND:DEEM:STAT on page 353
		Type			:CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4} on page 351
		User file			:CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4}:USER:FIL on page 352
	4-port network embedding/ de-embedding	ON/OFF			:CALC{1-16}:FSIM:EMB:STAT on page 346
		Topology	Type		:CALC{1-16}:FSIM:EMB:TYPE on page 350
			Port assign me-nt	A	:CALC{1-16}:FSIM:EMB:TOP:A:PORT on page 347
				B	:CALC{1-16}:FSIM:EMB:TOP:B:PORT on page 348
				C	:CALC{1-16}:FSIM:EMB:TOP:C:PORT on page 349
		Network	Type		:CALC{1-16}:FSIM:EMB:NETW{1-2}:TYPE on page 345
			File		:CALC{1-16}:FSIM:EMB:NETW{1-2}:FIL on page 344
	Differential matching circuit embedding	ON/OFF			:CALC{1-16}:FSIM:BAL:DMC:STAT on page 331
		Circuit type			:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2} on page 325
		Circuit constant	C		:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:C on page 326
			G		:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:G on page 327
			L		:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:L on page 328
			R		:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:R on page 329
		User file			:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:USER:FIL on page 330
	Differential port impedance conversion	ON/OFF			:CALC{1-16}:FSIM:BAL:DZC:STAT on page 335
		Z0			:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:Z0 on page 334
		Imaginary part			:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:IMAG on page 332
		Real part			:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:REAL on page 333
	Common port impedance conversion	ON/OFF			:CALC{1-16}:FSIM:BAL:CZC:STAT on page 323
		Z0			:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:Z0 on page 322
		Imaginary part			:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:IMAG on page 320
		Real part			:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:REAL on page 321

Table 14-1 SCPI command list by function

Function	Setting/execution item			Command
Time domain	Transform	ON/OFF		:CALC{1-16}:TRAN:TIME:STAT on page 435
		Transformation type		:CALC{1-16}:TRAN:TIME on page 429
		Stimulus type		:CALC{1-16}:TRAN:TIME:STIM on page 437
		Changing the frequency range to match with the low-pass type		:CALC{1-16}:TRAN:TIME:LPFR on page 433
		Window setup	β	:CALC{1-16}:TRAN:TIME:KBES on page 432
			Impulse width	:CALC{1-16}:TRAN:TIME:IMP:WIDT on page 431
			Rise time of step signal	:CALC{1-16}:TRAN:TIME:STEP:RTIM on page 436
		Display range after time domain transformation	Start value	:CALC{1-16}:TRAN:TIME:STAR on page 434
			Stop value	:CALC{1-16}:TRAN:TIME:STOP on page 438
			Center value	:CALC{1-16}:TRAN:TIME:CENT on page 430
			Span value	:CALC{1-16}:TRAN:TIME:SPAN on page 433
	Gating	ON/OFF		:CALC{1-16}:FILT:TIME:STAT on page 316
		Gate type		:CALC{1-16}:FILT:TIME on page 311
		Gate shape		:CALC{1-16}:FILT:TIME:SHAP on page 313
		Gate range	Start value	:CALC{1-16}:FILT:TIME:STAR on page 315
			Stop value	:CALC{1-16}:FILT:TIME:STOP on page 317
			Center value	:CALC{1-16}:FILT:TIME:CENT on page 312
			Span value	:CALC{1-16}:FILT:TIME:SPAN on page 314
Parameter conversion	ON/OFF			:CALC{1-16}:CONV on page 301
	Selecting the conversion parameter			:CALC{1-16}:CONV:FUNC on page 302
Handler I/O control	Data output of port A			:CONT:HAND:A on page 439
	Data output of port B			:CONT:HAND:B on page 439
	Port C	Input/output of data		:CONT:HAND:C on page 440
		Selecting the input/output direction		:CONT:HAND:C:MODE on page 441
	Port D	Input/output of data		:CONT:HAND:D on page 442
		Selecting the input/output direction		:CONT:HAND:D:MODE on page 443
	Data input/output of port E (port C + port D)			:CONT:HAND:E on page 444
	Data input/output of port F (port A + port B)			:CONT:HAND:F on page 445
	Setting/reading out OUTPUT1/OUTPUT2			:CONT:HAND:OUTP{1-2} on page 446
	ON/OFF of the INDEX signal output			:CONT:HAND:IND:STAT on page 446
	ON/OFF of the READY FOR TRIGGER signal output			:CONT:HAND:RTR:STAT on page 447

Table 14-1 SCPI command list by function

Function	Setting/execution item		Command
Controlling the E5091A	Displaying the name of test set.		:SENS:MULT:CAT? on page 527
	Selecting the name of test set.		:SENS:MULT{1-2}:NAME on page 530
	ON/OFF of control		:SENS:MULT{1-2}:STAT on page 531
	ON/OFF of the E5091A property display		:SENS:MULT{1-2}:DISP on page 528
	Reading out number of ports		:SENS:MULT{1-2}:COUN? on page 528
	Reading out the input port number		:SENS:MULT{1-2}:INC? on page 529
	Reading out the assigning port number.		:SENS{1-16}:MULT{1-2}:PORT{1-20}:CAT? on page 648
	Assigning a port	Selecting a assgning port.	:SENS{1-16}:MULT{1-2}:PORT{1-20} on page 646
		Port 1	:SENS{1-16}:MULT{1-2}:TSET9:PORT1 on page 650
		Port 2	:SENS{1-16}:MULT{1-2}:TSET9:PORT2 on page 651
		Port 3	:SENS{1-16}:MULT{1-2}:TSET9:PORT3 on page 652
		Port 4	:SENS{1-16}:MULT{1-2}:TSET9:PORT4 on page 653
	Setting up control lines		:SENS{1-16}:MULT{1-2}:OUTP on page 645 :SENS{1-16}:MULT{1-2}:TSET9:OUTP on page 649

Table 14-1 SCPI command list by function

Function	Setting/execution item				Command
Save, Recall, and File handling	Save	Instrument Setting	Entire instrument state (file)		:MMEM:STOR on page 500
			State for each channel (register)		:MMEM:STOR:CHAN on page 503
			Selects contents		on page 519
			Selects target channels/traces		:MMEM:STOR:SALL on page 511
		Formatted data array			:MMEM:STOR:FDAT on page 505
		Image on the LCD display			:MMEM:STOR:IMAG on page 506
		Segment sweep table			:MMEM:STOR:SEGM on page 512
		Limit table			:MMEM:STOR:LIM on page 507
		Ripple limit			:MMEM:STOR:RLIM on page 510
		Power sensor calibration factor table		A	:MMEM:STOR:ASCF on page 501
				B	:MMEM:STOR:BSCF on page 502
		Loss compensation table			:MMEM:STOR:PLOS{1-4} on page 508
		VBA project			:MMEM:STOR:PROG on page 509
		Cal kit definition table			:MMEM:STOR:CKIT{1-20} on page 504
	Recall	Instrument Setting	Entire instrument state (file)		:MMEM:LOAD on page 489
			State for each channel (register)		:MMEM:LOAD:CHAN on page 492
		Segment sweep table			:MMEM:LOAD:SEGM on page 498
		Limit table			:MMEM:LOAD:LIM on page 494
		Ripple limit			:MMEM:LOAD:RLIM on page 497
		Power sensor calibration factor table		A	:MMEM:LOAD:ASCF on page 490
				B	:MMEM:LOAD:BSCF on page 491
		Loss compensation table			:MMEM:LOAD:PLOS{1-4} on page 495
		VBA project			:MMEM:LOAD:PROG on page 496
		Cal kit definition table			:MMEM:LOAD:CKIT{1-20} on page 493
	Clearing registers				:MMEM:STOR:CHAN:CLE on page 503
	Directory (folder) creation				:MMEM:MDIR on page 499
	Copying a file				:MMEM:COPY on page 487
	File transfer between the remote controller and the E5070B/E5071B				:MMEM:TRAN on page 520
	Deleting a directory (folder)				:MMEM:DEL on page 488
	Reading out the file information in a directory				:MMEM:CAT? on page 486

Table 14-1 SCPI command list by function

Function	Setting/execution item		Command
Status report system	Clearing the event registers		*CLS on page 286
	Reading out the Status Byte Register		*STB? on page 291
	Setting the Service Request Enable Register		*SRE on page 290
	Standard Event Status Register	Reading out the register	*ESR? on page 287
		Setting the enable register	*ESE on page 287
		Setting the OPC bit	*OPC on page 288
	Operation Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:OPER:COND? on page 707
		Setting the enable register	:STAT:OPER:ENAB on page 708
		Reading out the event register	:STAT:OPER? on page 707
		Setting the positive transition filter	:STAT:OPER:PTR on page 710
		Setting the negative transition filter	:STAT:OPER:NTR on page 709
	Questionable Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:QUES:COND? on page 728
		Setting the enable register	:STAT:QUES:ENAB on page 729
		Reading out the event register	:STAT:QUES? on page 711
		Setting the positive transition filter	:STAT:QUES:PTR on page 747
		Setting the negative transition filter	:STAT:QUES:NTR on page 746
	Questionable Limit Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:QUES:LIM:COND? on page 739
		Setting the enable register	:STAT:QUES:LIM:ENAB on page 743
		Reading out the event register	:STAT:QUES:LIM? on page 730
		Setting the positive transition filter	:STAT:QUES:LIM:PTR on page 745
		Setting the negative transition filter	:STAT:QUES:LIM:NTR on page 744
	Questionable Limit Extra Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:QUES:LIM:ELIM:COND? on page 740
		Setting the enable register	:STAT:QUES:LIM:ENAB on page 743
		Reading out the event register	:STAT:QUES:LIM:ELIM? on page 739
		Setting the positive transition filter	:STAT:QUES:LIM:ELIM:PTR on page 742
		Setting the negative transition filter	:STAT:QUES:LIM:ELIM:NTR on page 741
	Questionable Limit Channel{1-16} Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:QUES:LIM:CHAN{1-16}:COND? on page 730
		Setting the enable register	:STAT:QUES:LIM:CHAN{1-16}:ENAB on page 736
		Reading out the event register	:STAT:QUES:LIM:CHAN{1-16}? on page 730
		Setting the positive transition filter	:STAT:QUES:LIM:CHAN{1-16}:PTR on page 738
		Setting the negative transition filter	:STAT:QUES:LIM:CHAN{1-16}:NTR on page 737

Table 14-1 SCPI command list by function

Function	Setting/execution item		Command
Status report system (Continued)	Questionable Limit Channel{1-16} Extra Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:QUES:LIM:CHAN{1-16}:ECH:COND? on page 732
		Setting the enable register	:STAT:QUES:LIM:CHAN{1-16}:ECH:ENAB on page 733
		Reading out the event register	:STAT:QUES:LIM:CHAN{1-16}:ECH? on page 732
		Setting the positive transition filter	:STAT:QUES:LIM:CHAN{1-16}:ECH:PTR on page 735
		Setting the negative transition filter	:STAT:QUES:LIM:CHAN{1-16}:ECH:NTR on page 734
	Questionable Ripple Limit Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:QUES:RLIM:COND? on page 756
		Setting the enable register	:STAT:QUES:RLIM:ENAB on page 761
		Reading out the event register	:STAT:QUES:RLIM? on page 748
		Setting the positive transition filter	:STAT:QUES:RLIM:PTR on page 763
		Setting the negative transition filter	:STAT:QUES:RLIM:NTR on page 762
	Questionable Ripple Limit Extra Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:QUES:RLIM:ELIM:COND? on page 757
		Setting the enable register	:STAT:QUES:RLIM:ELIM:ENAB on page 758
		Reading out the event register	:STAT:QUES:RLIM:ELIM? on page 757
		Setting the positive transition filter	:STAT:QUES:RLIM:ELIM:PTR on page 760
		Setting the negative transition filter	:STAT:QUES:RLIM:ELIM:NTR on page 759
	Questionable Ripple Limit Channel{1-16} Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:QUES:RLIM:CHAN{1-16}:COND? on page 748
		Setting the enable register	:STAT:QUES:RLIM:CHAN{1-16}:ENAB on page 754
		Reading out the event register	:STAT:QUES:RLIM:CHAN{1-16}? on page 748
		Setting the positive transition filter	:STAT:QUES:RLIM:CHAN{1-16}:PTR on page 756
		Setting the negative transition filter	:STAT:QUES:RLIM:CHAN{1-16}:NTR on page 755
	Questionable Ripple Limit Channel{1-16} Extra Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:QUES:RLIM:CHAN{1-16}:ECH:COND? on page 750
		Setting the enable register	:STAT:QUES:RLIM:CHAN{1-16}:ECH:ENAB on page 751
		Reading out the event register	:STAT:QUES:RLIM:CHAN{1-16}:ECH? on page 750
		Setting the positive transition filter	:STAT:QUES:RLIM:CHAN{1-16}:ECH:PTR on page 753
		Setting the negative transition filter	:STAT:QUES:RLIM:CHAN{1-16}:ECH:NTR on page 752
	Questionable Bandwidth Limit Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:QUES:BLIM:COND? on page 720
		Setting the enable register	:STAT:QUES:BLIM:ENAB on page 725
		Reading out the event register	:STAT:QUES:BLIM? on page 712
		Setting the positive transition filter	:STAT:QUES:BLIM:PTR on page 727
		Setting the negative transition filter	:STAT:QUES:BLIM:NTR on page 726

Table 14-1 SCPI command list by function

Function	Setting/execution item		Command
Status report system (Continued)	Questionable Bandwidth Limit Extra Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:QUES:BLIM:ELIM:COND? on page 721
		Setting the enable register	:STAT:QUES:BLIM:ELIM:ENAB on page 722
		Reading out the event register	:STAT:QUES:BLIM:ELIM? on page 721
		Setting the positive transition filter	:STAT:QUES:BLIM:ELIM:PTR on page 724
		Setting the negative transition filter	:STAT:QUES:BLIM:ELIM:NTR on page 723
	Questionable Bandwidth Limit Channel{1-16} Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:QUES:BLIM:CHAN{1-16}:COND? on page 712
		Setting the enable register	:STAT:QUES:BLIM:CHAN{1-16}:ENAB on page 718
		Reading out the event register	:STAT:QUES:BLIM:CHAN{1-16}? on page 712
		Setting the positive transition filter	:STAT:QUES:BLIM:CHAN{1-16}:PTR on page 720
		Setting the negative transition filter	:STAT:QUES:BLIM:CHAN{1-16}:NTR on page 719
	Questionable Bandwidth Limit Channel{1-16} Extra Status Register	Reset	:STAT:PRES on page 711
		Reading out the condition register	:STAT:QUES:BLIM:CHAN{1-16}:ECH:COND? on page 714
		Setting the enable register	:STAT:QUES:BLIM:CHAN{1-16}:ECH:ENAB on page 715
		Reading out the event register	:STAT:QUES:BLIM:CHAN{1-16}:ECH? on page 714
		Setting the positive transition filter	:STAT:QUES:BLIM:CHAN{1-16}:ECH:PTR on page 717
		Setting the negative transition filter	:STAT:QUES:BLIM:CHAN{1-16}:ECH:NTR on page 716
Controlling VBA macro	Reading out the list of executable macro names		:PROG:CAT? on page 521
	Selecting the macro to be controlled		:PROG:NAME on page 522
	Controlling macro		:PROG:STAT on page 523
Printer output	Printer output execution		:HCOP on page 483
	Aborting printer output during execution		:HCOP:ABOR on page 483
	Selecting the print color		:HCOP:IMAG on page 484
Locking Input Devices	Locking the front panel and keyboard		:SYST:KLOC:KBD on page 779
	Locking the mouse and touch screen		:SYST:KLOC:MOUS on page 780
Beeper	For notification of the completion of operation	ON/OFF	:SYST:BEEP:COMP:STAT on page 765
		Beep generation	:SYST:BEEP:COMP:IMM on page 765
	For notification of warning/limit test result	ON/OFF	:SYST:BEEP:WARN:STAT on page 766
		Beep generation	:SYST:BEEP:WARN:IMM on page 766
Built-in clock	Setting the date		:SYST:DATE on page 775
	Setting the time		:SYST:UPR on page 786
	ON/OFF of the clock display		:DISP:CLOC on page 449

Table 14-1 SCPI command list by function

Function	Setting/execution item		Command
External signal generator	Setting the GPIB address		:SYST:COMM:GPIB:SGEN:ADDR on page 768
	Setting the type of the external signal generator		:SYST:COMM:GPIB:SGEN:TYPE on page 774
	Setting the GPIB commands when type 1 (custom commands) is chosen	Setting the frequency	:SYST:COMM:GPIB:SGEN:CCOM:FREQ on page 769
		Setting the power level	:SYST:COMM:GPIB:SGEN:CCOM:POW on page 770
		Setting the preset	:SYST:COMM:GPIB:SGEN:CCOM:PRES on page 771
		Setting the RF power ON	:SYST:COMM:GPIB:SGEN:CCOM:RFON on page 772
	Setting the waiting time after setting the frequency and power level to an external signal generator		:SYST:COMM:GPIB:SGEN:DWEL on page 773
Others	Shutdown		:SYST:POFF on page 781
	Reading the upper limits of the number of channels		:SERV:CHAN:COUN? on page 683
	Reading the upper limits of the number of traces		:SERV:CHAN:TRAC:COUN? on page 683
	Reading the number of test ports		:SERV:PORT:COUN? on page 684
	Reading the system version		:SERV:SREV? on page 684
	Reading out the product information		*IDN? on page 288
	Reading out the option information		*OPT? on page 289
	Waiting for the completion of command execution		*WAI on page 291
	Reading out 1 at the completion of command execution		*OPC? on page 288
	Reading out an error that occurred		:SYST:ERR? on page 776
	Checking whether the external reference signal is inputted		:SENS{1-16}:ROSC:SOUR? on page 673
	ON/OFF of the spurious avoid mode		:SENS{1-16}:SWE:ASP on page 677
	ON/OFF of the system error correction		:SYST:CORR on page 775
	Checking whether warm-up to satisfy		:SYST:TEMP on page 784
	ON/OFF of the high temperature mode		:SYST:TEMP:HIGH on page 784
	Checking whether to be in the service mode		:SYST:SERV? on page 783
	Settings the power meter GPIB address		:SYST:COMM:GPIB:PMET:ADDR on page 767
	Initial Source Port selection feature		:SYST:ISPC:PORT on page 777
	Initial Source Port Control feature ON/OFF		:SYST:ISPC:STAT on page 778
	Setting/Reading the security level		:SYST:SEC:LEV on page 782

List by front panel key

Table 14-2 shows the SCPI commands that correspond to the front panel keys (in alphabetical order).

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)					Corresponding GPIB command
[Analysis]	Bandwidth Limit	BW Display			:CALC{1-16}:BLIM:DISP:VAL on page 296
		BW Marker			:CALC{1-16}:BLIM:DISP:MARK on page 295
		BW Test			:CALC{1-16}:BLIM on page 293
		Fail Sign			:DISP:FSIG on page 457
		Max Bandwidth			:CALC{1-16}:BLIM:MAX on page 298
		Min Bandwidth			:CALC{1-16}:BLIM:MIN on page 299
		N dB Points			:CALC{1-16}:BLIM:DB on page 294
	Conversion	Conversion			:CALC{1-16}:CONV on page 301
		Function			:CALC{1-16}:CONV:FUNC on page 302
	Fixture Simulator	BalUn			:CALC{1-16}:FSIM:BAL:PAR{1-16}:STAT on page 339
		Balun OFF All Traces			N/A
		Balun ON All Traces			N/A
		Cmn ZConversion	Cmn ZConversion		:CALC{1-16}:FSIM:BAL:CZC:STAT on page 323
			Port n (bal) Imag		:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:IMAG on page 320
			Port n (bal) Real		:CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:REAL on page 321 :CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:Z0 on page 322
		De-Embedding	De- Embedding		:CALC{1-16}:FSIM:SEND:DEEM:STAT on page 353
			Select Port		:CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4} on page 351
			Select Type		
			User File		:CALC{1-16}:FSIM:SEND:DEEM:PORT{1-4}:USER:FIL on page 352
		De-Embedding S4P	De-Embedding S4P		:CALC{1-16}:FSIM:EMB:STAT on page 346
			Topology	Ports	:CALC{1-16}:FSIM:EMB:TOP:A:PORT on page 347 :CALC{1-16}:FSIM:EMB:TOP:B:PORT on page 348 :CALC{1-16}:FSIM:EMB:TOP:C:PORT on page 349
				Select Topology	:CALC{1-16}:FSIM:EMB:TYPE on page 350
				Type (nwk1)	:CALC{1-16}:FSIM:EMB:NETW{1-2}:TYPE on page 345
				Type (nwk2)	
				User File (nwk1)	:CALC{1-16}:FSIM:EMB:NETW{1-2}:FIL on page 344
				User File (nwk2)	
		Diff Matching	C		:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:C on page 326
			Diff Matching		:CALC{1-16}:FSIM:BAL:DMC:STAT on page 331
			G		:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:G on page 327
			L		:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:L on page 328
			R		:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:PAR:R on page 329
			Select Bal Port		:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2} on page 325
			Select Circuit		
			User File		:CALC{1-16}:FSIM:BAL:DMC:BPOR{1-2}:USER:FIL on page 330

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)				Corresponding GPIB command
[Analysis] (Continued)	**Fixture Simulator** (Continued)	**Diff ZConv-ersion**	**Diff ZConversion**	:CALC{1-16}:FSIM:BAL:DZC:STAT on page 335
			Port n (bal) Imag	:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:IMAG on page 332
			Port n (bal) Real	:CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:REAL on page 333 :CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:Z0 on page 334
		Measurement		:CALC{1-16}:PAR{1-16}:DEF on page 416 :CALC{1-16}:FSIM:BAL:PAR{1-16}:SBAL on page 337 :CALC{1-16}:FSIM:BAL:PAR{1-16}:BBAL on page 336 :CALC{1-16}:FSIM:BAL:PAR{1-16}:SSB on page 338
		Fixture Simulator		:CALC{1-16}:FSIM:STAT on page 365
		Port Matching	**C**	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:C on page 355
			G	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:G on page 356
			L	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:L on page 357
			Port Matching	:CALC{1-16}:FSIM:SEND:PMC:STAT on page 360
			R	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:PAR:R on page 358
			Select Port	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4} on page 354
			Select Circuit	
			User File	:CALC{1-16}:FSIM:SEND:PMC:PORT{1-4}:USER:FIL on page 359
		Port ZConv-ersion	**Port ZConversion**	:CALC{1-16}:FSIM:SEND:ZCON:STAT on page 364
			Port n Z0 Imag	:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:IMAG on page 361
			Port n Z0 Real	:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:REAL on page 362 :CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:Z0 on page 363
		Topology	**Device**	:CALC{1-16}:FSIM:BAL:DEV on page 324
			Port n (se) **Port n (bal)**	:CALC{1-16}:FSIM:BAL:TOP:SSB on page 343 :CALC{1-16}:FSIM:BAL:TOP:SBAL on page 342 :CALC{1-16}:FSIM:BAL:TOP:BBAL on page 340
			Property	:CALC{1-16}:FSIM:BAL:TOP:PROP:STAT on page 341
	Gating	**Center**		:CALC{1-16}:FILT:TIME:CENT on page 312
		Gating		:CALC{1-16}:FILT:TIME:STAT on page 316
		Shape		:CALC{1-16}:FILT:TIME:SHAP on page 313
		Span		:CALC{1-16}:FILT:TIME:SPAN on page 314
		Start		:CALC{1-16}:FILT:TIME:STAR on page 315
		Stop		:CALC{1-16}:FILT:TIME:STOP on page 317
		Type		:CALC{1-16}:FILT:TIME on page 311

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)				Corresponding GPIB command
[Analysis] (Continued)	Limit Test	Edit Limit Line	Add / Delete / Clear Limit Table	:CALC{1-16}:LIM:DATA on page 378
			Export to CSV File	:MMEM:STOR:LIM on page 507
			Import from CSV File	:MMEM:LOAD:LIM on page 494
		Fail Sign		:DISP:FSIG on page 457
		Limit Line		:CALC{1-16}:LIM:DISP on page 379
		Limit Line Offsets	Amplitude Offset	:CALC{1-16}:LIM:OFFS:AMPL on page 381
			Marker -> Amplitude Offset	:CALC{1-16}:LIM:OFFS:MARK on page 382
			Stimulus Offset	:CALC{1-16}:LIM:OFFS:STIM on page 383
		Limit Test		:CALC{1-16}:LIM on page 377
	Ripple Limit	Edit Ripple Limit	Add / Delete / Clear Ripple Limit Table	:CALC{1-16}:RLIM:DATA on page 421
			Export to CSV File	:MMEM:STOR:RLIM on page 510
			Import from CSV File	:MMEM:LOAD:RLIM on page 497
		Fail Sign		:DISP:FSIG on page 457
		Ripple Limit		:CALC{1-16}:RLIM:DISP:LINE on page 422
		Ripple Limit Test		:CALC{1-16}:RLIM on page 420
		Ripple Value		:CALC{1-16}:RLIM:DISP:VAL on page 424
		Ripple Band		:CALC{1-16}:RLIM:DISP:SEL on page 423
	Transform	Center		:CALC{1-16}:TRAN:TIME:CENT on page 430
		Set Freq Low Pass		:CALC{1-16}:TRAN:TIME:LPFR on page 433
		Span		:CALC{1-16}:TRAN:TIME:SPAN on page 433
		Start		:CALC{1-16}:TRAN:TIME:STAR on page 434
		Stop		:CALC{1-16}:TRAN:TIME:STOP on page 438
		Transform		:CALC{1-16}:TRAN:TIME:STAT on page 435
		Type		:CALC{1-16}:TRAN:TIME on page 429 :CALC{1-16}:TRAN:TIME:STIM on page 437
		Window	Impulse Width	:CALC{1-16}:TRAN:TIME:IMP:WIDT on page 431
			Kaiser Beta	:CALC{1-16}:TRAN:TIME:KBES on page 432
			Maximum	
			Minimum	
			Normal	
			Step Rise	:CALC{1-16}:TRAN:TIME:STEP:RTIM on page 436
[Avg]	Ave Trigger			:TRIG:AVER on page 788
	Averaging			:SENS{1-16}:AVER on page 532
	Averaging Restart			:SENS{1-16}:AVER:CLE on page 532
	Avg Factor			:SENS{1-16}:AVER:COUN on page 533
	Smo Aperture			:CALC{1-16}:SMO:APER on page 428
	Smoothing			:CALC{1-16}:SMO on page 427
	IF Bandwidth			:SENS{1-16}:BAND on page 534 :SENS{1-16}:BWID on page 535

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)					Corresponding GPIB command
[Cal]	Cal Kit				:SENS{1-16}:CORR:COLL:CKIT on page 548
	Cal Trigger Source				:SENS{1-16}:CORR:TRIG:FREE on page 637
	Calibrate	1-Port Cal	Cancel	OK	:SENS{1-16}:CORR:COLL:CLE on page 578
			Done		:SENS{1-16}:CORR:COLL:SAVE on page 599
			Load		:SENS{1-16}:CORR:COLL:LOAD on page 587
			Open		:SENS{1-16}:CORR:COLL:OPEN on page 597
			Select Port		:SENS{1-16}:CORR:COLL:METH:SOLT1 on page 590
			Short		:SENS{1-16}:CORR:COLL:SHOR on page 599
		2-Port Cal 3-Port Cal 4-Port Cal	Cancel	OK	:SENS{1-16}:CORR:COLL:CLE on page 578
			Done		:SENS{1-16}:CORR:COLL:SAVE on page 599
			Isolation (Optional)		:SENS{1-16}:CORR:COLL:ISOL on page 586
			Overwrite		:SENS{1-16}:CORR:COLL:PART:SAVE on page 598
			Reflection	Port n Load	:SENS{1-16}:CORR:COLL:LOAD on page 587
				Port n Open	:SENS{1-16}:CORR:COLL:OPEN on page 597
				Port n Short	:SENS{1-16}:CORR:COLL:SHOR on page 599
			Select Ports	(2-Port Cal)	:SENS{1-16}:CORR:COLL:METH:SOLT2 on page 590
				(3-Port Cal)	:SENS{1-16}:CORR:COLL:METH:SOLT3 on page 591
				(4-Port Cal)	:SENS{1-16}:CORR:COLL:METH:SOLT4 on page 591
			Transmission		:SENS{1-16}:CORR:COLL:THRU on page 602
		2-Port TRL 3-Port TRL 4-Port TRL	Cancel	OK	:SENS{1-16}:CORR:COLL:CLE on page 578
			Done		:SENS{1-16}:CORR:COLL:SAVE on page 599
			Line/Match		:SENS{1-16}:CORR:COLL:TRLL on page 603
			Reflect	Port x Reflect	:SENS{1-16}:CORR:COLL:TRLR on page 604
			Select Ports	(2-Port TRL)	:SENS{1-16}:CORR:COLL:METH:TRL2 on page 593
				(3-Port TRL)	:SENS{1-16}:CORR:COLL:METH:TRL3 on page 594
				(4-Port TRL)	:SENS{1-16}:CORR:COLL:METH:TRL4 on page 595
			Thru/Line		:SENS{1-16}:CORR:COLL:TRLT on page 605
		Enhanced Response	Cancel	OK	:SENS{1-16}:CORR:COLL:CLE on page 578
			Done		:SENS{1-16}:CORR:COLL:SAVE on page 599
			Isolation (Optional)		:SENS{1-16}:CORR:COLL:ISOL on page 586
			Load		:SENS{1-16}:CORR:COLL:LOAD on page 587
			Open		:SENS{1-16}:CORR:COLL:OPEN on page 597
			Select Port		:SENS{1-16}:CORR:COLL:METH:ERES on page 588
			Short		:SENS{1-16}:CORR:COLL:SHOR on page 599
			Thru		:SENS{1-16}:CORR:COLL:THRU on page 602
		Response (Open)	Cancel	OK	:SENS{1-16}:CORR:COLL:CLE on page 578
			Done		:SENS{1-16}:CORR:COLL:SAVE on page 599
			Load (Optional)		:SENS{1-16}:CORR:COLL:LOAD on page 587
			Open		:SENS{1-16}:CORR:COLL:OPEN on page 597
			Select Port		:SENS{1-16}:CORR:COLL:METH:OPEN on page 589

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)					Corresponding GPIB command
[Cal] (Continued)	**Calibrate** (Continued)	**Response (Short)**	**Cancel**	**OK**	:SENS{1-16}:CORR:COLL:CLE on page 578
			Done		:SENS{1-16}:CORR:COLL:SAVE on page 599
			Load (Optional)		:SENS{1-16}:CORR:COLL:LOAD on page 587
			Select Port		:SENS{1-16}:CORR:COLL:METH:SHOR on page 589
			Short		:SENS{1-16}:CORR:COLL:SHOR on page 599
		Response (Thru)	**Cancel**	**OK**	:SENS{1-16}:CORR:COLL:CLE on page 578
			Done		:SENS{1-16}:CORR:COLL:SAVE on page 599
			Isolation (Optional)		:SENS{1-16}:CORR:COLL:ISOL on page 586
			Select Ports		:SENS{1-16}:CORR:COLL:METH:THRU on page 592
			Thru		:SENS{1-16}:CORR:COLL:THRU on page 602
	Clear	**OK**			:SENS{1-16}:CORR:CLE on page 536
	Correction				:SENS{1-16}:CORR:STAT on page 636
	ECal	**1-Port Cal**			:SENS{1-16}:CORR:COLL:ECAL:SOLT1 on page 582
		2-Port Cal			:SENS{1-16}:CORR:COLL:ECAL:SOLT2 on page 582
		3-Port Cal			:SENS{1-16}:CORR:COLL:ECAL:SOLT3 on page 583
		4-Port Cal			:SENS{1-16}:CORR:COLL:ECAL:SOLT4 on page 583
		Characterization			:SENS{1-16}:CORR:COLL:ECAL:UCH on page 585
		Characterization Info			N/A
		Confidence Check			:SENS{1-16}:CORR:COLL:ECAL:CCH on page 579
		Enhanced Response			:SENS{1-16}:CORR:COLL:ECAL:ERES on page 580
		Isolation			:SENS{1-16}:CORR:COLL:ECAL:ISOL on page 581
		Orientation			:SENS:CORR:COLL:ECAL:ORI on page 524
			Port n	**Port n**	:SENS:CORR:COLL:ECAL:PATH on page 525
		Thru Cal			:SENS{1-16}:CORR:COLL:ECAL:THRU on page 584

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)					Corresponding GPIB command
[Cal] (Continued)	**Mixer / Converter Calibration**	**Clear**	**OK**		:SENS{1-16}:CORR:OFFS:CLE on page 620
		Scalar Cal (Manual)	**Cancel**	**OK**	:SENS{1-16}:CORR:OFFS:COLL:CLE on page 621
			Done		:SENS{1-16}:CORR:OFFS:COLL:SAVE on page 629
			Power Meter	**Port x1 @ Freq y1** to **Port x2 @ Freq y2**	:SENS{1-16}:CORR:OFFS:COLL:PMET on page 628
				:	
			Reflection	**Port x @ Freq y (Broadband)**	:SENS{1-16}:CORR:OFFS:COLL:LOAD on page 624
				:	
				Port x @ Freq y (Open)	:SENS{1-16}:CORR:OFFS:COLL:OPEN on page 627
				:	
				Port x @ Freq y (Short)	:SENS{1-16}:CORR:OFFS:COLL:SHOR on page 630
				:	
			Select Ports	**2-1 (fwd)**	:SENS{1-16}:CORR:OFFS:COLL:METH:SMIX2 on page 625
				:	
				Port 1	:SENS{1-16}:CORR:OFFS:COLL:METH:SOLT1 on page 626
				:	
			Transmission	**Thru x-y @ Freq z (Thru)**	:SENS{1-16}:CORR:OFFS:COLL:THRU on page 631
				:	
		Scalar Cal (ECal)	**Cancel**	**OK**	:SENS{1-16}:CORR:OFFS:COLL:CLE on page 621
			ECal & Done		:SENS{1-16}:CORR:OFFS:COLL:ECAL:SMIX2 on page 622 :SENS{1-16}:CORR:OFFS:COLL:ECAL:SOLT1 on page 623
			Power Meter	**Port x1 @ Freq y1** to **Port x2 @ Freq y2**	N/A
				:	
			Select Ports	**2-1 (fwd)**	N/A
				:	
				Port 1	N/A
				:	

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)					Corresponding GPIB command
[Cal] (Continued)	**Modify Cal Kit**	**Define STDs**	**1. XXXX** to **21. XXXX**	**Label**	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:LAB on page 572
				STD Type	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE on page 574
				C0	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C0 on page 560
				C1	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C1 on page 561
				C2	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C2 on page 562
				C3	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C3 on page 563
				L0	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L0 on page 568
				L1	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L1 on page 569
				L2	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L2 on page 570
				L3	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:L3 on page 571
				Offset Delay	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:DEL on page 565
				Offset Z0	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:Z0 on page 575
				Offset Loss	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:LOSS on page 573
				Arb. Impedance	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:ARB on page 559
				Min. Frequency	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMIN on page 567
				Max. Frequency	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMAX on page 566
				Media	:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:CHAR on page 564
		Export Cal Kit...			:MMEM:STOR:CKIT{1-20} on page 504
		Import Cal Kit...			:MMEM:LOAD:CKIT{1-20} on page 493
		Label Kit			:SENS{1-16}:CORR:COLL:CKIT:LAB on page 549
		Specify CLSs	**Load**		:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD on page 551
			Open		:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN on page 552
			Short		:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR on page 553
			Sub Class		:SENS{1-16}:CORR:COLL:CKIT:ORD on page 550
			Thru		:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU on page 554
			TRL Line/Match		:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLL on page 555
			TRL Reflect		:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLR on page 556
			TRL Thru		:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLT on page 557

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)					Corresponding GPIB command
[Cal] (Continued)	**Modify Cal Kit** (Continued)	**Auto Port Extension**	**Adjust Mismatch**		:SENS{1-16}:CORR:EXT:AUTO:DCOF on page 608
			Include Loss		:SENS{1-16}:CORR:EXT:AUTO:LOSS on page 609
			Measure OPEN	**All**	:SENS{1-16}:CORR:EXT:AUTO:MEAS on page 610
				Port 1	
				Port 2	
				Port 3	
				Port 4	
			Measure Short	**All**	:SENS{1-16}:CORR:EXT:AUTO:MEAS on page 610
				Port 1	
				Port 2	
				Port 3	
				Port 4	
			Method	**Active Marker**	:SENS{1-16}:CORR:EXT:AUTO:CONF on page 607
				Current Span	
				User Span	
				User Span Start	
				User Span Stop	
			Select Ports	**Port 1**	:SENS{1-16}:CORR:EXT:AUTO:PORT{1-4} on page 611
				Port 2	
				Port 3	
				Port 4	
	Port Extensions	**Extension Port 1**			:SENS{1-16}:CORR:EXT:AUTO:PORT{1-4} on page 611
		Extension Port 2			
		Extension Port 3			
		Extension Port 4			
		Extensions			:SENS{1-16}:CORR:EXT on page 606
		Loss	**Freq1**		:SENS{1-16}:CORR:EXT:PORT{1-4}:FREQ{1-2} on page 616
			Freq2		
			Loss at DC		:SENS{1-16}:CORR:EXT:PORT{1-4}:LDC on page 618
			Loss1		:SENS{1-16}:CORR:EXT:PORT{1-4}:LOSS{1-2} on page 619
			Loss2		
			Select Port	**Port 1**	N/A
				Port 2	
				Port 3	
				Port 4	

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)				Corresponding GPIB command
[Cal] (Continued)	Power Calibration	Abort		:ABOR on page 292
		Correction		:SOUR{1-16}:POW:PORT{1-4}:CORR on page 696
		Loss Compen	Add / Delete / Clear Loss Table	:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS:DATA on page 700
			Compensation	:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS on page 699
			Export to CSV File	:MMEM:STOR:PLOS{1-4} on page 508
			Import from CSV File	:MMEM:LOAD:PLOS{1-4} on page 495
		Num of Readings		:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:AVER on page 697
		Select Port		N/A
		Sensor A Settings	Add / Delete / Clear Factor Table	:SOUR:POW:PORT:CORR:COLL:TABL:ASEN:DATA on page 687
			Export to CSV File	:MMEM:STOR:ASCF on page 501
			Import from CSV File	:MMEM:LOAD:ASCF on page 490
			Ref Cal Factor	:SOUR:POW:PORT:CORR:COLL:ASEN:RCF on page 685
		Sensor B Settings	Add / Delete / Clear Factor Table	:SOUR:POW:PORT:CORR:COLL:TABL:BSEN:DATA on page 688
			Export to CSV File	:MMEM:STOR:BSCF on page 502
			Import from CSV File	:MMEM:LOAD:BSCF on page 491
			Ref Cal Factor	:SOUR:POW:PORT:CORR:COLL:BSEN:RCF on page 686
		Take Cal Sweep		:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL on page 696
		Tolerance		:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:NTOL on page 698
		Use Sensor		N/A
	Property			:SENS{1-16}:CORR:PROP on page 632
	Receiver Calibration	Correction		:SENS{1-16}:CORR:REC{1-4} on page 633
		Take Cal Sweep		:SENS{1-16}:CORR:REC{1-4}:COLL:ACQ on page 634
	Set Z0			:SENS:CORR:IMP on page 526
	Velocity Factor			:SENS{1-16}:CORR:RVEL:COAX on page 635
[Center]				:SENS{1-16}:FREQ:CENT on page 640 :SOUR{1-16}:POW:CENT on page 693
[Channel Prev]				:DISP:WIND{1-16}:ACT on page 464
[Channel Max]				:DISP:MAX on page 459
[Channel Next]				:DISP:WIND{1-16}:ACT on page 464

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)			Corresponding GPIB command
[Display]	Allocate Channels		:DISP:SPL on page 460
	Allocate Traces		:DISP:WIND{1-16}:SPL on page 469
	Data - > Mem		:CALC{1-16}:MATH:MEM on page 410
	Data Math		:CALC{1-16}:MATH:FUNC on page 409
	Display		:DISP:WIND{1-16}:TRAC{1-16}:STAT on page 475 :DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:X on page 472
	Edit Title Label		:DISP:WIND{1-16}:TITL:DATA on page 471
	Frequency		:DISP:ANN:FREQ on page 448
	Graticule Label		:DISP:WIND{1-16}:LAB on page 467
	Invert Color		:DISP:IMAG on page 458
	Num of Traces		:CALC{1-16}:PAR:COUN on page 415
	Title Label		:DISP:WIND{1-16}:TITL on page 470
	Update		:DISP:ENAB on page 456
[Format]			:CALC{1-16}:FORM on page 318
[Macro Break]			:PROG:STAT on page 523
[Macro Run]			N/A
[Macro Setup]	Clear Echo		:DISP:ECHO:CLE on page 455
	Close Editor		N/A
	Continue		N/A
	Echo Window		:DISP:TABL on page 462 :DISP:TABL:TYPE on page 463
	Load & Run		N/A
	Load Project		:MMEM:LOAD:PROG on page 496
	New Project		N/A
	Preset User Menu		N/A
	Save Project		:MMEM:STOR:PROG on page 509
	Select Macro		:PROG:NAME on page 522 :PROG:STAT on page 523
	Stop		:PROG:STAT on page 523
	User Menu		N/A
	VBA Editor		N/A
[Marker]	Clear Marker Menu		:CALC{1-16}:MARK{1-10} on page 394
	Marker 1 to Marker 4		:CALC{1-16}:MARK{1-10} on page 394 :CALC{1-16}:MARK{1-10}:ACT on page 395 :CALC{1-16}:MARK{1-10}:X on page 407
	Marker - > Ref Marker		N/A
	More Markers	Marker 5 to Marker 9	:CALC{1-16}:MARK{1-10} on page 394 :CALC{1-16}:MARK{1-10}:ACT on page 395 :CALC{1-16}:MARK{1-10}:X on page 407
	Ref Marker		:CALC{1-16}:MARK{1-10} on page 394 :CALC{1-16}:MARK{1-10}:ACT on page 395 :CALC{1-16}:MARK{1-10}:X on page 407 :CALC{1-16}:MARK:REF on page 393
	Ref Marker Mode		:CALC{1-16}:MARK:REF on page 393

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)			Corresponding GPIB command
[Marker Func]	Annotation Options	Active Only	:DISP:WIND{1-16}:ANN:MARK:SING on page 466
		Align	:DISP:WIND{1-16}:ANN:MARK:ALIG on page 465
		Marker Info X Pos	:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:X on page 472
		Marker Info Y Pos	:DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:Y on page 473
	Couple		:CALC{1-16}:MARK:COUP on page 388
	Discrete		:CALC{1-16}:MARK{1-10}:DISC on page 398
	Marker Table		:DISP:TABL on page 462 :DISP:TABL:TYPE on page 463
	Marker - > Center		:CALC{1-16}:MARK{1-10}:SET on page 406
	Marker - > Delay		
	Marker - > Reference		
	Marker - > Start		
	Marker - > Stop		
	Statistics		:CALC{1-16}:MST on page 412 :CALC{1-16}:MST:DATA? on page 413
[Marker Search]	Bandwidth		:CALC{1-16}:MARK:BWID on page 387 :CALC{1-16}:MARK{1-10}:BWID:DATA? on page 396
	Bandwidth Value		:CALC{1-16}:MARK{1-10}:BWID:THR on page 397
	Max		:CALC{1-16}:MARK{1-10}:FUNC:TYPE on page 405 :CALC{1-16}:MARK{1-10}:FUNC:EXEC on page 399
	Min		
	Peak	Peak Excursion	:CALC{1-16}:MARK{1-10}:FUNC:PEXC on page 400
		Peak Polarity	:CALC{1-16}:MARK{1-10}:FUNC:PPOL on page 401
		Search Left	:CALC{1-16}:MARK{1-10}:FUNC:TYPE on page 405 :CALC{1-16}:MARK{1-10}:FUNC:EXEC on page 399
		Search Peak	
		Search Right	
	Search Range	Couple	:CALC{1-16}:MARK:FUNC:DOM:COUP on page 390
		Search Range	:CALC{1-16}:MARK:FUNC:DOM on page 389
		Start	:CALC{1-16}:MARK:FUNC:DOM:STAR on page 391
		Stop	:CALC{1-16}:MARK:FUNC:DOM:STOP on page 392
	Target	Search Left	:CALC{1-16}:MARK{1-10}:FUNC:TYPE on page 405 :CALC{1-16}:MARK{1-10}:FUNC:EXEC on page 399
		Search Right	
		Search Target	
		Target Transition	:CALC{1-16}:MARK{1-10}:FUNC:TTR on page 404
		Target Value	:CALC{1-16}:MARK{1-10}:FUNC:TARG on page 402
	Tracking		:CALC{1-16}:MARK{1-10}:FUNC:TRAC on page 403

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)			Corresponding GPIB command
[Meas]	S11 to S44		:CALC{1-16}:PAR{1-16}:DEF on page 416
	SSS11 to CMRR2		:CALC{1-16}:FSIM:BAL:PAR{1-16}:SBAL on page 337 :CALC{1-16}:FSIM:BAL:PAR{1-16}:BBAL on page 336 :CALC{1-16}:FSIM:BAL:PAR{1-16}:SSB on page 338
	Absolute	A(1)	:CALC{1-16}:PAR{1-16}:SPOR on page 419 :CALC{1-16}:PAR{1-16}:DEF on page 416
		A(2)	
		:	
		R4(3)	
		R4(4)	
[Preset]	OK		:SYST:PRES on page 781 :SYST:UPR on page 786
[Save/ Recall]	Channel/Trace		:MMEM:STOR:SALL on page 511
	Explorer		N/A
	Recall by File Name		:MMEM:LOAD on page 489
	Recall Channel		:MMEM:LOAD:CHAN on page 492
	Recall State		:MMEM:LOAD on page 489
	Save Channel	Clear States	:MMEM:STOR:CHAN:CLE on page 503
		State A - State D	:MMEM:STOR:CHAN on page 503
	Save Snp	Snp Format	:MMEM:STOR:SNP:FORM on page 514
		S1p	:MMEM:STOR:SNP:TYPE:S1P on page 515 :MMEM:STOR:SNP on page 513
		S2p	:MMEM:STOR:SNP:TYPE:S2P on page 516 :MMEM:STOR:SNP on page 513
		S3p	:MMEM:STOR:SNP:TYPE:S3P on page 517 :MMEM:STOR:SNP on page 513
		S4p	:MMEM:STOR:SNP:TYPE:S4P on page 518 :MMEM:STOR:SNP on page 513
	Save State		:MMEM:STOR on page 500
	Save Trace Data		:MMEM:STOR:FDAT on page 505
	Save Type		on page 519
[Scale]	Auto Scale		:DISP:WIND{1-16}:TRAC{1-16}:Y:AUTO on page 475
	Auto Scale All		N/A
	Divisions		:DISP:WIND{1-16}:Y:DIV on page 480
	Electrical Delay	Electrical Delay	:CALC{1-16}:CORR:EDEL:TIME on page 304
		Cutoff	:CALC{1-16}:CORR:EDEL:WGC on page 305
		Media	:CALC{1-16}:CORR:EDEL:MED on page 303
	Marker - > Reference		:CALC{1-16}:MARK{1-10}:SET on page 406
	Phase Offset		:CALC{1-16}:CORR:OFFS:PHAS on page 306
	Reference Position		:DISP:WIND{1-16}:TRAC{1-16}:Y:RPOS on page 478
	Reference Value		:DISP:WIND{1-16}:TRAC{1-16}:Y:RLEV on page 477
	Scale/Div		:DISP:WIND{1-16}:TRAC{1-16}:Y:PDIV on page 476
[Softkey On/Off]			:DISP:SKEY on page 459
[Span]			:SENS{1-16}:FREQ:SPAN on page 642 :SOUR{1-16}:POW:SPAN on page 704

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)				Corresponding GPIB command
[Start]				:SENS{1-16}:FREQ:STAR on page 643 :SOUR{1-16}:POW:STAR on page 705
[Stop]				:SENS{1-16}:FREQ:STOP on page 644 :SOUR{1-16}:POW:STOP on page 706
[Sweep Setup]	Edit Segment Table			:SENS{1-16}:SEGM:DATA on page 674
	Edit Segment Table	Export to CSV File		:MMEM:STOR:SEGM on page 512
		Import from CSV File		:MMEM:LOAD:SEGM on page 498
	Frequency Offset	Avoid Spurious		:SENS{1-16}:OFFS:ASP on page 655
		External Source	Control	:SENS{1-16}:OFFS:LOC:CONT on page 656
			Divisor	:SENS{1-16}:OFFS:LOC:DIV on page 658
			LO Frequency	:SENS{1-16}:OFFS:LOC:STAT on page 666
			Multiplier	:SENS{1-16}:OFFS:LOC:MULT on page 659
			Offset	:SENS{1-16}:OFFS:LOC:OFFS on page 660
			Start	:SENS{1-16}:OFFS:LOC:STAR on page 661
			Stop	:SENS{1-16}:OFFS:LOC:STOP on page 662
			Power	:SENS{1-16}:OFFS:LOC:POW on page 663
			Slope [x dB/GHz]	:SENS{1-16}:OFFS:LOC:POW:SLOP on page 664
			Slope [ON/OFF]	:SENS{1-16}:OFFS:LOC:POW:SLOP:STAT on page 665
		Frequency Offset		:SENS{1-16}:OFFS on page 654
		Port 1	Divisor	:SENS{1-16}:OFFS:PORT{1-4}:DIV on page 668
			Multiplier	:SENS{1-16}:OFFS:PORT{1-4}:MULT on page 669
			Offset	:SENS{1-16}:OFFS:PORT{1-4}:OFFS on page 670
			Start	:SENS{1-16}:OFFS:PORT{1-4}:STAR on page 671
			Stop	:SENS{1-16}:OFFS:PORT{1-4}:STOP on page 672
		:		
		X-Axis	Base / Stimulus / Response / Normal / RF+LO / RF-LO / LO-RF	:CALC{1-16}:OFFS:XAX on page 414 :CALC{1-16}:MIX:XAX on page 411
	Points			:SENS{1-16}:SWE:POIN on page 679
	Power	Auto Range		:SOUR{1-16}:POW:ATT:AUTO on page 691
		CW Freq		:SENS{1-16}:FREQ on page 639
		Port Couple		:SOUR{1-16}:POW:PORT:COUP on page 694
		Port Power		:SOUR{1-16}:POW:PORT{1-4} on page 695
		Power		:SOUR{1-16}:POW on page 689
		Power Ranges		:SOUR{1-16}:POW:ATT on page 690
		RF Out		:OUTP on page 521
		Slope [ON/OFF]		:SOUR{1-16}:POW:SLOP:STAT on page 703
		Slope [xx dB/GHz]		:SOUR{1-16}:POW:SLOP on page 702
	Segment Display			:DISP:WIND{1-16}:X:SPAC on page 479
	Sweep Delay			:SENS{1-16}:SWE:DEL on page 677
	Sweep Mode			:SENS{1-16}:SWE:GEN on page 678
	Sweep Time			:SENS{1-16}:SWE:TIME on page 680 :SENS{1-16}:SWE:TIME:AUTO on page 681
	Sweep Type			:SENS{1-16}:SWE:TYPE on page 682

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)						Corresponding GPIB command
[System]	Abort Printing					:HCOP:ABOR on page 483
	Backlight					:SYST:BACK on page 764
	Dump Screen Image					:MMEM:STOR:IMAG on page 506
	Firmware Revision					*IDN? on page 288
	Invert Image					:HCOP:IMAG on page 484
	Misc Setup	Beeper	Beep Complete			:SYST:BEEP:COMP:STAT on page 765
			Beep Warning			:SYST:BEEP:WARN:STAT on page 766
			Test Beep Complete			:SYST:BEEP:COMP:IMM on page 765
			Test Beep Warning			:SYST:BEEP:WARN:IMM on page 766
		Channel/Trace Setup				N/A
		Clock Setup	Set Date and Time			:SYST:DATE on page 775 :SYST:UPR on page 786
			Show Clock			:DISP:CLOC on page 449
		Color Setup				:DISP:COL{1-2}:TRAC{1-16}:DATA on page 453 :DISP:COL{1-2}:TRAC{1-16}:MEM on page 454 :DISP:COL{1-2}:GRAT{1-2} on page 451 :DISP:COL{1-2}:LIM{1-2} on page 452 :DISP:COL{1-2}:BACK on page 450 :DISP:COL{1-2}:RES on page 452
		Control Panel...				N/A
		GPIB Setup	Power Meter Address			:SYST:COMM:GPIB:PMET:ADDR on page 767
			Signal Generator Address	Address		:SYST:COMM:GPIB:SGEN:ADDR on page 768
				Custom Command	Set Frequency	:SYST:COMM:GPIB:SGEN:CCOM:FREQ on page 769
					Preset	:SYST:COMM:GPIB:SGEN:CCOM:PRES on page 771
					Set Power Level	:SYST:COMM:GPIB:SGEN:CCOM:POW on page 770
					Turn RF Out On	:SYST:COMM:GPIB:SGEN:CCOM:RFON on page 772
				8643A, 8644B, 8664A, 8665A/B		:SYST:COMM:GPIB:SGEN:TYPE on page 774
				8648A/B/C/D, ESG Series, PSG Series		
				Switching Time		:SYST:COMM:GPIB:SGEN:DWEL on page 773
			System Controller Configuration			N/A
			Talker/Listener Address			N/A

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)					Corresponding GPIB command
[System] (Continued)	Misc Setup (Continued)	Key Lock	Front Panel & Keyboard Lock		:SYST:KLOC:KBD on page 779
			Touch Screen & Mouse Lock		:SYST:KLOC:MOUS on page 780
		Network Setup			N/A
		Preset Setup	Confirm		N/A
			State	Factory	N/A
				User	
	Multiport Test Set Setup	Test Set 1	Control		:SENS:MULT{1-2}:STAT on page 531
			Control Lines		:SENS{1-16}:MULT{1-2}:OUTP on page 645 :SENS{1-16}:MULT{1-2}:TSET9:OUTP on page 649
			Port 1		:SENS{1-16}:MULT{1-2}:PORT{1-20} on page 646
			Port 2		
			Port 3		
			Port 4		
			Port 5*1		
			Port 6*1		
			Port 7*1		
			Property		:SENS:MULT{1-2}:DISP on page 528
			Select Test Set		:SENS:MULT{1-2}:NAME on page 530
		Test Set 2			Displays the model selected for test set 2.
	Print				:HCOP on page 483
	Printer Setup				N/A
	Service Menu	Avoid Spurious			:SENS{1-16}:SWE:ASP on page 677
		Channel/Trace Setup			N/A
		Enable Options			N/A
		High Temperature			:SYST:TEMP:HIGH on page 784
		Init Src Port			:SYST:ISPC:PORT on page 777
		Init Src Ctrl			:SYST:ISPC:STAT on page 778
		Security Level			:SYST:SEC:LEV on page 782
		System Correction			:SYST:CORR on page 775
		Test Menu	Adjust Touch Screen		N/A
			Display		N/A
			Front Panel		N/A
			Power On Test		N/A
		Restart Firmware			N/A
		Service Functions			N/A
		Update Firmware			N/A
[Trace Prev]					:CALC{1-16}:PAR{1-16}:SEL on page 418
[Trace Max]					:DISP:WIND{1-16}:MAX on page 468
[Trace Next]					:CALC{1-16}:PAR{1-16}:SEL on page 418

Table 14-2 Front panel key tree vs. SCPI commands correspondence table

Key (operation)		Corresponding GPIB command
[Trigger]	Continuous	:INIT{1-16}:CONT on page 485
	Continuous Disp Channels	N/A
	Ext Trig Delay	:TRIG:EXT:DEL on page 789
	Hold	:ABOR on page 292 :INIT{1-16}:CONT on page 485
	Hold All Channels	N/A
	Low Latency	:TRIG:EXT:LLAT on page 790
	Restart	:ABOR on page 292
	Single	:ABOR on page 292 :INIT{1-16}:CONT on page 485 :INIT{1-16} on page 484
	Trigger Event	:TRIG:POIN on page 791
	Trigger Source	:TRIG:SOUR on page 793
	Trigger	:TRIG on page 787

*1. E5091A-016 only

Command tree

Table 14-3 shows the SCPI command tree of the E5070B/E5071B.

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
ABORt		[No query]
CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:FSIMulator		
:BALun		
:CZConversion		
:BPORt{[1]|2}		
:IMAGinary	<numeric>	
:REAL	<numeric>	
:Z0		
[:R]	<numeric>	
:STATe	{ON|OFF|1|0}	
:DEVice	{SBALanced|BBALanced|SSBalanced}	
:DMCircuit		
:BPORt{[1]|2}		
:PARameters		
:C	<numeric>	
:G	<numeric>	
:L	<numeric>	
:R	<numeric>	
[:TYPE]	{NONE|PLPC|USER}	
:USER		
:FILename	<string>	
:STATe	{ON|OFF|1|0}	
:DZConversion		
:BPORt{[1]|2}		
:IMAGinary	<numeric>	
:REAL	<numeric>	
:Z0		
[:R]	<numeric>	
:STATe	{ON|OFF|1|0}	
:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:BBALanced		
[:DEFine]	{SCC11|SCC21|SCC12|SCC22|SDC11|SDC21|SDC12|SDC22|SCD11|SCD21|SCD12|SCD22|SDD11|SDD21|SDD12|SDD22|IMB1|IMB2|CMRR}	
:SBALanced		
[:DEFine]	{SSS11|SCS21|SSC12|SDS21|SSD12|SCC22|SDC22|SCD22|SDD22|IMB|CMRR|CMRR2}	
:SSBalanced		
[:DEFine]	{SSS11|SSS21|SSS12|SSS22|SCS31|SCS32|SSC13|SSC23|SDS31|SDS32|SSD13|SSD23|SCC33|SDC33|SCD33|SDD33|IMB1|IMB2|IMB3|IMB4|CMRR1|CMRR2}	
:STATe	{ON|OFF|1|0}	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:FSIMulator		
:BALun		
:TOPology		
:BBALanced		
[:PPORts]	<numeric>,<numeric>,<numeric>,<numeric>	
:PROPerty		
:STATe	{ON|OFF|1|0}	
:SBALanced		
[:PPORts]	<numeric>,<numeric>,<numeric>	
:SSBalanced		
[:PPORts]	<numeric>,<numeric>,<numeric>,<numeric>	
:EMBed		
:NETWork{[1]|2}		
:FILename	<string>	
:TYPE	{NONE|ENBed|DEEMbed}	
:STATe	{ON|OFF|1|0}	
:TOPology		
:A		
:PORTs	<numeric>,<numeric>	
:B		
:PORTs	<numeric>,<numeric>,<numeric>	
:C		
:PORTs	<numeric>,<numeric>,<numeric>,<numeric>	
:TYPE	{A|B|C}	
:SENDed		
:DEEMbed		
:PORT{[1]|2|3|4}		
[:TYPE]	{NONE|USER}	
:USER		
:FILename	<string>	
:STATe	{ON|OFF|1|0}	
:PMCircuit		
:PORT{[1]|2|3|4}		
:PARameters		
:C	<numeric>	
:G	<numeric>	
:L	<numeric>	
:R	<numeric>	
[:TYPE]	{NONE|SLPC|PCSL|PLSC|SCPL|PLPC|USER}	
:USER		
:FILename	<string>	
:STATe	{ON|OFF|1|0}	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:FSIMulator		
:SENDed		
:ZCONversion		
:PORT{[1]|2|3|4}		
:IMAGinary	<numeric>	
:REAL	<numeric>	
:Z0		
[:R]	<numeric>	
:STATe	{ON|OFF|1|0}	
:STATe	{ON|OFF|1|0}	
:PARameter		
:COUNt	<numeric>	
:PARameter{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:DEFine	{S11|S21|S31|S41|S12|S22|S32|S42|S13|S23|S33|S43|S14|S24|S34|S44|A|B|C|D|R1|R2|R3|R4}	
:SELect		[No query]
:SPORt	<numeric>	
[:SELected]		
:BLIMit		
:DB	<numeric>	
:DISPlay		
:MARKer	{ON|OFF|1|0}	
:VALue	{ON|OFF|1|0}	
:FAIL?		[Query only]
:MAXimum	<numeric>	
:MINimum	<numeric>	
:REPort		
[:DATA]?		[Query only]
[:STATe]	{ON|OFF|1|0}	
:CONVersion		
:FUNCtion	{ZREFlection|ZTRansmit|YREFlection|YTRansmit|INVersion|ZTSHunt|YTSHunt|CONJugation}	
[:STATe]	{ON|OFF|1|0}	
:CORRection		
:EDELay		
:MEDium	{COAXial|WAVeguide}	
:TIME	<numeric>	
:WGCutoff	<numeric>	
:OFFSet		
:PHASe	<numeric>	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
[:SELected]		
:DATA		
:FDATa	<numeric>,…,<numeric> (number of measurement points × 2 parameters)	
:FMEMory	<numeric>,…,<numeric> (number of measurement points × 2 parameters)	
:SDATa	<numeric>,…,<numeric> (number of measurement points × 2 parameters)	
:SMEMory	<numeric>,…,<numeric> (number of measurement points × 2 parameters)	
:FILTer		
[:GATE]		
:TIME		
:CENTer	<numeric>	
:SHAPe	{MAXimum|WIDE|NORMal|MINimum}	
:SPAN	<numeric>	
:STARt	<numeric>	
:STATe	{ON|OFF|1|0}	
:STOP	<numeric>	
[:TYPE]	{BPASs|NOTCh}	
:FORMat	{MLOGarithmic|PHASe|GDELay|SLINear|SLOGarithmic| SCOMplex|SMITh|SADMittance|PLINear|PLOGarithmic| POLar|MLINear|SWR|REAL|IMAGinary|UPHase|PPHase}	
:FUNCtion		
:DOMain		
:COUPle	{ON|OFF|1|0}	
:STARt	<numeric>	
[:STATe]	{ON|OFF|1|0}	
:STOP	<numeric>	
:EXECute		[No query]
:PEXCursion	<numeric>	
:POINts?		[Query only]
:PPOLarity	{POSitive|NEGative|BOTH}	
:TARGet	<numeric>	
:TTRansition	{POSitive|NEGative|BOTH}	
:TYPE	{PTPeak|STDEV|MEAN|MAXimum|MINimum|PEAK|APEak|ATARget}	
:LIMit		
:DATA	<numeric>,…,<numeric> (1 + number of lines × 5 parameters)	
:DISPlay		
[:STATe]	{ON|OFF|1|0}	
:FAIL?		[Query only]
:OFFSet		
:AMPLitude	<numeric>	
:MARKer?		[Query only]
:STIMulus	<numeric>	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
[:SELected]		
:LIMit		
:REPort		
:ALL?		[Query only]
[:DATA]?		[Query only]
:POINts?		[Query only]
[:STATe]	{ON|OFF|1|0}	
:MARKer		
:BWIDth		
[:STATe]	{ON|OFF|1|0}	
:COUPle	{ON|OFF|1|0}	
:DISCrete	{ON|OFF|1|0}	
:FUNCtion		
:DOMain		
:COUPle	{ON|OFF|1|0}	
:STARt	<numeric>	
[:STATe]	{ON|OFF|1|0}	
:STOP	<numeric>	
:REFerence		
[:STATe]	{ON|OFF|1|0}	
:MARKer{[1]|2|3|4|5|6|7|8|9|10}		
:ACTivate		[No query]
:BWIDth		
:DATA?		[Query only]
:THReshhold	<numeric>	
:FUNCtion		
:EXECute		[No query]
:PEXCursion	<numeric>	
:PPOLarity	{POSitive|NEGative|BOTH}	
:TARGet	<numeric>	
:TRACking	{ON|OFF|1|0}	
:TTRansition	{POSitive|NEGative|BOTH}	
:TYPE	{MAXimum|MINimum|PEAK|LPEak|RPEak|TARGet|LTARget|RTARget}	
:SET	{STARt|STOP|CENTer|RLEVel|DELay}	[No query]
[:STATe]	{ON|OFF|1|0}	
:X	<numeric>	
:Y?		[Query only]
:MATH		
:FUNCtion	{NORMal|SUBTract|DIVide|ADD|MULTiply}	
:MEMorize		[No query]
:MIXer		
:XAXis	{NORMal|RFPLo|RFMLo|LOMRf}	
:MSTatistics		
:DATA?		[Query only]
[:STATe]	{ON|OFF|1|0}	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
CALCulate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
[:SELected]		
:OFFSet		
:XAXis	{BASE|STIMulus|RESPonse}	
:RLIMit		
:DATA	<numeric>,…,<numeric> (1 + number of lines × 4 parameters)	
:DISPlay		
:LINE	{ON|OFF|1|0}	
:SELect	<numeric>	
:VALue	{OFF|ABSolute|MARgin}	
:FAIL?		[Query only]
:REPort		
[:DATA]?		[Query only]
[:STATe]	{ON|OFF|1|0}	
:SMOothing		
:APERture	<numeric>	
[:STATe]	{ON|OFF|1|0}	
:TRANsform		
:TIME		
:CENTer	<numeric>	
:IMPulse		
:WIDTh	<numeric>	
:KBESsel	<numeric>	
:LPFRequency		[No query]
:SPAN	<numeric>	
:STARt	<numeric>	
:STATe	{ON|OFF|1|0}	
:STEP		
:RTIMe	<numeric>	
:STIMulus	{IMPulse|STEP}	
:STOP	<numeric>	
[:TYPE]	{BPASs|LPASs}	
CONTrol		
:HANDler		
:A		
[:DATA]	<numeric>	[No query]
:B		
[:DATA]	<numeric>	[No query]
:C		
[:DATA]	<numeric>	
:MODE	{INPut|OUTPut}	
:D		
[:DATA]	<numeric>	
:MODE	{INPut|OUTPut}	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
CONTrol		
:HANDler		
:E		
[:DATA]	<numeric>	
[:EXTension]		
:INDex		
:STATe	{ON|OFF|1|0}	
:RTRigger		
:STATe	{ON|OFF|1|0}	
:F		
[:DATA]	<numeric>	[No query]
:OUTPut{[1]|2}		
[:DATA]	<numeric>	
DISPlay		
:ANNotation		
:FREQuency		
[:STATe]	{ON|OFF|1|0}	
:CLOCk	{ON|OFF|1|0}	
:COLor{[1]|2}		
:BACK	<numeric>,<numeric>,<numeric>	
:GRATicule{[1]|2}	<numeric>,<numeric>,<numeric>	
:LIMit{[1]|2}	<numeric>,<numeric>,<numeric>	
:RESet		[No query]
:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:DATA	<numeric>,<numeric>,<numeric>	
:MEMory	<numeric>,<numeric>,<numeric>	
:ECHO		
:CLEar		[No query]
[:DATA]	<string>	[No query]
:ENABle	{ON|OFF|1|0}	
:FSIGn	{ON|OFF|1|0}	
:IMAGe	{NORMal|INVert}	
:MAXimize	{ON|OFF|1|0}	
:SKEY		
[:STATe]	{ON|OFF|1|0}	
:SPLit	{D1|D12|D1_2|D112|D1_1_2|D123|D1_2_3|D12_33|D11_23|D13_23|D12_13|D1234|D1_2_3_4|D12_34|D123_456|D12_34_56|D1234_5678|D12_34_56_78|D123_456_789|D1234__9ABC|D123__ABC|D1234__DEFG}	
:TABLe		
[:STATe]	{ON|OFF|1|0}	
:TYPE	{MARKer|LIMit|SEGMent|ECHO|PLOSs|SCFactor|RLIMit}	
:UPDate		
[:IMMediate]		[No query]

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
DISPlay		
:WINDow{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:ACTivate		[No query]
ÅFANNotation		
:MARKer		
:ALIGn		
[:STATe]	{ON|OFF|1|0}	
:SINGle		
[:STATe]	{ON|OFF|1|0}	
:LABel	{ON|OFF|1|0}	
:MAXimize	{ON|OFF|1|0}	
:SPLit	{D1|D12|D1_2|D112|D1_1_2|D123|D1_2_3|D12_33|D11_23|D13_23|D12_13|D1234|D1_2_3_4|D12_34|D123_456|D12_34_56|D1234_5678|D12_34_56_78|D123_456_789|D1234__9ABC|D123__ABC|D1234__DEFG}	
:TITLe		
:DATA	<string>	
[:STATe]	{ON|OFF|1|0}	
:TRACe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:ANNotation		
:MARKer		
:POSition		
:X	<numeric>	
:Y	<numeric>	
:MEMory		
[:STATe]	{ON|OFF|1|0}	
:STATe	{ON|OFF|1|0}	
:Y		
[:SCALe]		
:AUTO		[No query]
:PDIVision	<numeric>	
:RLEVel	<numeric>	
:RPOSition	<numeric>	
:X		
:SPACing	{LINear|OBASe}	
:Y		
[:SCALe]		
:DIVisions	<numeric>	
FORMat		
:BORDer	{NORMal|SWAPped}	
:DATA	{ASCii|REAL|REAL32}	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
HCOPy		
:ABORt		[No query]
:IMAGe	{NORMal|INVert}	
[:IMMediate]		[No query]
INITiate{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:CONTinuous	{ON|OFF|1|0}	
[:IMMediate]		[No query]
MMEMory		
:CATalog?	<string>	[Query only]
:COPY	<string>,<string>	[No query]
:DELete	<string>	[No query]
:LOAD		
:ASCFactor	<string>	[No query]
:BSCFactor	<string>	[No query]
:CHANnel		
[:STATe]	{A|B|C|D}	[No query]
:CKIT{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20}	<string>	[No query]
:LIMit	<string>	[No query]
:PROSs	<string>	[No query]
:PROGram	<string>	[No query]
:RLIMit	<string>	[No query]
:SEGMent	<string>	[No query]
[:STATe]	<string>	[No query]
:MDIRectory	<string>	[No query]
:STORe		
:ASCFactor	<string>	[No query]
:BSCFactor	<string>	[No query]
:CHANnel		
:CLEar		[No query]
[:STATe]	{A|B|C|D}	[No query]
:CKIT{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20}	<string>	[No query]
:FDATa	<string>	[No query]
:IMAGe	<string>	[No query]
:LIMit	<string>	[No query]
:PLOSs	<string>	[No query]
:PROGram	<string>	[No query]
:RLIMit	<string>	[No query]
:SALL	{ON|OFF|1|0}	
:SEGMent	<string>	[No query]
:SNP		
[:DATA]	<string>	[No query]
:FORMat	{AUTO|MA|DB|RI}	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
MMEMory		
:STORe		
:SNP		
:TYPE		
:S1P	<numeric>	
:S2P	<numeric>,<numeric>	
:S3P	<numeric>,<numeric>,<numeric>	
:S4P	<numeric>,<numeric>,<numeric>,<numeric>	
[:STATe]	<string>	[No query]
:STYPe	{STATe|CSTate|DSTate|CDSTate}	
:TRANsfer	<string>,<block>	[No query]
OUTPut		
[:STATe]	{ON|OFF|1|0}	
PROGram		
:CATalog?		[Query only]
[:SELected]		
:NAME	<string>	
:STATe	{STOP|RUN}	
SENSe		
:CORRection		
:COLLect		
:ECAL		
:ORIentation		
[:STATe]	{ON|OFF|1|0}	
:PATH	<numeric>,<numeric>	[No query]
:PATH?		[Query only]
:IMP		
:MULTiplexer		
:CATalog?		[Query only]
:MULTiplexer{[1]|2}		
:COUNt?		[Query only]
:DISPlay		
[:STATe]	{ON|OFF|1|0}	
:INCount?	<numeric>	[Query only]
:NAME	{E5091_9|E5091_16}	
:STATe	{ON|OFF|1|0}	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:AVERage		
:CLEar		[No query]
:COUNt	<numeric>	
[:STATe]	{ON|OFF|1|0}	
:BANDwidth		
[:RESolution]	<numeric>	
:BWIDth		
[:RESolution]	<numeric>	
:CORRection		
:CLEar		[No query]
:COEFficient		
[:DATA]	{ES|ER|ED|EL|ET|EX},<numeric>,<numeric>,<real 1>,<imag 1>,...,<real n>,<imag n> (n is number of points)	
:METHod		
:ERESponse	<numeric>,<numeric>	[No query]
[:RESPonse]		
:OPEN	<numeric>	[No query]
:SHORt	<numeric>	[No query]
:THRU	<numeric>,<numeric>	[No query]
:SOLT1	<numeric>	[No query]
:SOLT2	<numeric>,<numeric>	[No query]
:SOLT3	<numeric>,<numeric>,<numeric>	[No query]
:SOLT4	<numeric>,<numeric>,<numeric>,<numeric>	[No query]
:SAVE		[No query]
:COLLect		
[:ACQuire]		
:ISOLation	<numeric>,<numeric>	[No query]
:LOAD	<numeric>	[No query]
:OPEN	<numeric>	[No query]
:SHORt	<numeric>	[No query]
:SUBClass	<numeric>	
:THRU	<numeric>,<numeric>	[No query]
:TRLLine	<numeric>,<numeric>	[No query]
:TRLReflect	<numeric>	[No query]
:TRLThru	<numeric>,<numeric>	[No query]
:CKIT		
:LABel	<string>	
:ORDer		
:LOAD	<numeric>,<numeric>	
:OPEN	<numeric>,<numeric>	
[:SELect]	<numeric>	
:SHORt	<numeric>,<numeric>	
:THRU	<numeric>,<numeric>,<numeric>	
:TRLLine	<numeric>,<numeric>,<numeric>	
:TRLReflect	<numeric>	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:CORRection		
:COLLect		
:CKIT		
:ORDer		
:TRLThru	<numeric>,<numeric>,<numeric>	
:RESet		[No query]
[:SELect]	<numeric>	
:STAN{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21}		
:ARBitrary	<numeric>	
:C0	<numeric>	
:C1	<numeric>	
:C2	<numeric>	
:C3	<numeric>	
:CHARacter	{COAXial|WAVeguide}	
:DELay	<numeric>	
:FMAXimum	<numeric>	
:FMINimum	<numeric>	
:L0	<numeric>	
:L1	<numeric>	
:L2	<numeric>	
:L3	<numeric>	
:LABel	<string>	
:LOSS	<numeric>	
:TYPE	{OPEN|SHORt|LOAD|THRU|ARBI|NONE}	
:Z0	<numeric>	
:TRLoption		
:IMPedance	{LINE|SYSTem}	[Query only]
:RPLane	{THRU|REFLect}	
:CLEar		[No query]
:ECAL		
:CCHeck		
[:ACQuire]		[No query]
:ERESponse	<numeric>,<numeric>	[No query]
:ISOLation		
[:STATe]	{ON|OFF|1|0}	
:ORIentation		
[:STATe]	{ON|OFF|1|0}	
:PATH	<numeric>,<numeric>	[No query]
:SOLT1	<numeric>	[No query]
:SOLT2	<numeric>,<numeric>	[No query]
:SOLT3	<numeric>,<numeric>,<numeric>	[No query]
:SOLT4	<numeric>,<numeric>,<numeric>,<numeric>	[No query]
:THRU	<numeric>,<numeric>	[No query]
:UCHar	{CHAR0|CHAR1|CHAR2|CHAR3|CHAR4|CHAR5}	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:CORRection		
:COLLect		
:METHod		
:ERESponse	<numeric>,<numeric>	[No query]
[:RESPonse]		
:OPEN	<numeric>	[No query]
:SHORt	<numeric>	[No query]
:THRU	<numeric>,<numeric>	[No query]
:SOLT1	<numeric>	[No query]
:SOLT2	<numeric>,<numeric>	[No query]
:SOLT3	<numeric>,<numeric>,<numeric>	[No query]
:SOLT4	<numeric>,<numeric>,<numeric>,<numeric>	[No query]
:TRL2	<numeric>,<numeric>	[No query]
:TRL3	<numeric>,<numeric>,<numeric>	[No query]
:TRL4	<numeric>,<numeric>,<numeric>,<numeric>	[No query]
:TYPE?		[Query only]
:PARTial		
:SAVE		[No query]
:SAVE		[No query]
:SIMPlified		
:SAVE		[No query]
:EXTension		
:AUTO		
:CONFig	{CSPN|AMKR|USPN}	
:DCOFfset	{ON|OFF|1|0}	
:LOSS	{ON|OFF|1|0}	
:MEASure	{OPEN|SHORt}	
:PORT{[1]|2|3|4}	{ON|OFF|1|0}	
:RESet		[No query]
:STARt	<numeric>	
:STOP	<numeric>	
:PORT{[1]|2|3|4}		
:FREQuency{[1]|2}	<numeric>	
:INCLude{[1]|2}		
[:STATe]	{ON|OFF|1|0}	
:LDC	<numeric>	
:LOSS{[1]|2}	<numeric>	
[:TIME]	<numeric>	
[:STATe]	{ON|OFF|1|0}	
:OFFSet		
:CLEar		[No query]
:COLLect		
[:ACQuire]		
:LOAD	<numeric>,<numeric>	[No query]
:OPEN	<numeric>,<numeric>	[No query]

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:CORRection		
:OFFSet		
:COLLect		
[:ACQuire]		
:PMETer	<numeric>,<numeric>,{ASENsor|BSENsor}	[No query]
:SHORt	<numeric>,<numeric>	[No query]
:THRU	<numeric>,<numeric>	[No query]
:CLEar		[No query]
:ECAL		
:SMIX2	<numeric>,<numeric>	[No query]
:SOLT1	<numeric>	[No query]
:METH		
:SMIX2	<numeric>,<numeric>	[No query]
:SOLT1	<numeric>	[No query]
:SAVE		[No query]
:PROPerty	{ON|OFF|1|0}	
:RECeiver{[1]|2|3|4}		
:COLLect		
:ACQuire	<numeric>	[No query]
[:STATe]	{ON|OFF|1|0}	
:RVELocity		
:COAX	<numeric>	
:STATe	{ON|OFF|1|0}	
:TRIGger		
:FREE	{ON|OFF|1|0}	
:TYPE{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}?		[Query only]
:FREQuency		
:CENTer	<numeric>	
:[CW|FIXed]	<numeric>	
:DATA?		[Query only]
:SPAN	<numeric>	
:STARt	<numeric>	
:STOP	<numeric>	
:MULTiplexer{[1]|2}		
:OUTPut		
[:DATA}	<numeric>	
PORT{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20}		
CATalog?		[Query only]
[:SELect]	<string>	
:TSET9		
:OUTPut		
[:DATA]	<numeric>	
:PORT1	{A|T1}	
:PORT2	{T1|T2}	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:MULTiplexer{[1]|2}		
:TSET9		
:PORT3	{R1|R2|R3}	
:PORT4	{R1|R2|R3}	
:OFFSet		
:ASPurious	{ON|OFF|1|0}	
:LOCal		
:CONTrol		
[:STATe]	{ON|OFF|1|0}	
[:FREQuency]		
:DATA?		[Query only]
:DIVisor	<numeric>	
:MULTiplier	<numeric>	
:OFFSet	<numeric>	
:STARt	<numeric>	
:STOP	<numeric>	
:POWer		
[:LEVel]		
[:IMMediate]		
[:AMPLitude]	<numeric>	
:SLOPe		
[:DATA]	<numeric>	
:STATe	{ON|OFF|1|0}	
:STATe	{ON|OFF|1|0}	
:PORT{[1]|2|3|4}		
[:FREQuency]		
:DATA?		[Query only]
:DIVisor	<numeric>	
:MULTiplier	<numeric>	
:OFFSet	<numeric>	
:STARt	<numeric>	
:STOP	<numeric>	
[:STATe]	{ON|OFF|1|0}	
:ROSCillator		
:SOURce?		[Query only]
:SEGMent		
:DATA	<numeric>,…,<numeric>	
:SWEep		
:POINts?		[Query only]
:TIME		
[:DATA]?		[Query only]

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
SENSe{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:SWEep		
:ASPurious	{ON|OFF|1|0}	
:DELay	<numeric>	
:GENeration	{STEPped|ANALog}	
:POINts	<numeric>	
:TIME		
:AUTO	{ON|OFF|1|0}	
[:DATA]	<numeric>	
:TYPE	{LINear|LOGarithmic|SEGMent|POWer}	
SERVice		
:CHANnel		
:ACTive?		[Query only]
:COUNt?		[Query only]
:TRACe		
:COUNt?		[Query only]
:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:TRACe		
:ACTive?		[Query only]
:PORT		
:COUNt?		[Query only]
:SREVision?		[Query only]
SOURce		
:POWer		
:PORT		
:CORRection		
:COLLect		
:ASENsor		
:RCFactor	<numeric>	
:BSENsor		
:RCFactor	<numeric>	
:TABLe		
:ASENsor		
:DATA	<numeric>,…,<numeric> (1 + number of segments × 2 parameters)	
:BSENsor		
:DATA	<numeric>,…,<numeric> (1 + number of segments × 2 parameters)	
SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:POWer		
:ATTenuation		
[:DATA]	<numeric>	
:AUTO	{ON|OFF|1|0}	
:CENTer	<numeric>	
[:LEVel]		
[:IMMediate]		
[:AMPLitude]	<numeric>	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
SOURce{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:POWer		
[:LEVel]		
:SLOPe		
[:DATA]	<numeric>	
:STATe	{ON|OFF|1|0}	
:PORT		
:COUPle	{ON|OFF|1|0}	
:PORT{[1]|2|3|4}		
:CORRection		
:COLLect		
[:ACQuire]	{ASENsor|BSENsor}	[No query]
:AVERage		
[:COUNt]	<numeric>	
:NTOLerance	<numeric>	
:TABLe		
:LOSS		
:DATA	<numeric>,…,<numeric> (1 + number of segments × 2 parameters)	
[:STATe]	{ON|OFF|1|0}	
:DATA	<numeric>,…,<numeric> (number of measurement points)	
[:STATe]	{ON|OFF|1|0}	
[:LEVel]		
[:IMMediate]		
[:AMPLitude]	<numeric>	
:SPAN	<numeric>	
:STARt	<numeric>	
:STOP	<numeric>	
STATus		
:OPERation		
:CONDition?		[Query only]
:ENABle	<numeric>	
[:EVENt]?		[Query only]
:NTRansition	<numeric>	
:PTRansition	<numeric>	
:PRESet		[No query]
:QUEStionable		
:BLIMit		
:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:CONDition?		[Query only]
:ECHannel		
:CONDition?		[Query only]
:ENABle	<numeric>	
[:EVENt]?	<numeric>	[Query only]
:NTRansition	<numeric>	
:PTRansition	<numeric>	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
STATus		
:QUEStionable		
:BLIMit		
:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:ENABle	<numeric>	
[:EVENt]?		[Query only]
:NTRansition	<numeric>	
:PTRansition	<numeric>	
:CONDition?		[Query only]
:ELIMit		
:CONDition?		[Query only]
:ENABle	<numeric>	
[:EVENt]?		[Query only]
:NTRansition	<numeric>	
:PTRansition	<numeric>	
:ENABle	<numeric>	
[:EVENt]?		[Query only]
:NTRansition	<numeric>	
:PTRansition	<numeric>	
:CONDition?		[Query only]
:ENABle	<numeric>	
[:EVENt]?		[Query only]
:LIMit		
:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:CONDition?		[Query only]
:ECHannel		
:CONDition?		[Query only]
:ENABle	<numeric>	
[:EVENt]?	<numeric>	[Query only]
:NTRansition	<numeric>	
:PTRansition	<numeric>	
:ENABle	<numeric>	
[:EVENt]?		[Query only]
:NTRansition	<numeric>	
:PTRansition	<numeric>	
:CONDition?		[Query only]
:ELIMit		
:CONDition?		[Query only]
:ENABle	<numeric>	
[:EVENt]?		[Query only]
:NTRansition	<numeric>	
:PTRansition	<numeric>	
:ENABle	<numeric>	
[:EVENt]?		[Query only]

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
STATus		
:QUEStionable		
:LIMit		
:NTRansition	<numeric>	
:PTRansition	<numeric>	
:NTRansition	<numeric>	
:PTRansition	<numeric>	
:RLIMit		
:CHANnel{[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16}		
:CONDition?		[Query only]
:ECHannel		
:CONDition?		[Query only]
:ENABle	<numeric>	
[:EVENt]?	<numeric>	[Query only]
:NTRansition	<numeric>	
:PTRansition	<numeric>	
:ENABle	<numeric>	
[:EVENt]?		[Query only]
:NTRansition	<numeric>	
:PTRansition	<numeric>	
:CONDition?		[Query only]
:ELIMit		
:CONDition?		[Query only]
:ENABle	<numeric>	
[:EVENt]?		[Query only]
:NTRansition	<numeric>	
:PTRansition	<numeric>	
:ENABle	<numeric>	
[:EVENt]?		[Query only]
:NTRansition	<numeric>	
:PTRansition	<numeric>	
SYSTem		
:BACKlight	{ON|OFF|1|0}	
:BEEPer		
:COMPlete		
:IMMediate		
:STATe	{ON|OFF|1|0}	
:WARNing		
:IMMediate		
:STATe	{ON|OFF|1|0}	
:COMMunicate		
:GPIB		
:PMETer		
:ADDRess	<numeric>	

Table 14-3 E5070B/E5071B SCPI command tree

Command	Parameters	Note
SYSTem		
:COMMunicate		
:GPIB		
:SGENerator		
:ADDRess	<numeric>	
:CCOMmand		
:FREQuency	<string>	
:POWer	<string>	
:PRESet	<string>	
:RFON	<string>	
:DWELl	<numeric>	
:TYPE	<numeric>	
:CORRection		
[:STATe]	{ON|OFF|1|0}	
:DATE	<numeric>,<numeric>,<numeric>	
:ERRor?		[Query only]
:ISPControl		
:PORT	<numeric>	
:STATe	{ON|OFF|1|0}	
:KLOCk		
:KBD	{ON|OFF|1|0}	
:MOUSe	{ON|OFF|1|0}	
:POFF		[No query]
:PRESet		[No query]
:SECurity		
[:LELel]	{NONE|LOW|HIGH}	
:SERVice?		[Query only]
:TEMPerature		
:HIGH	{ON|OFF|1|0}	
[:STATe]?		[Query only]
:TIME	<numeric>,<numeric>,<numeric>	
:UPReset		[No query]
TRIGger		
:AVERage	{ON|OFF|1|0}	
:EXTernal		
:DELay	<numeric>	
:LLATency	{ON|OFF|1|0}	
:[SEQuence]		
[:IMMediate]		[No query]
:POINt	{ON|OFF|1|0}	
:SINGle		[No query]
:SOURce	{INTernal|EXTernal|MANual|BUS}	

A Manual Changes

This appendix contains the information required to adapt this manual to earlier versions or configurations of the Agilent E5070B/E5071B than that indicated by the current printing date of this manual. The information in this manual applies directly to the E5070B/E5071B model that has the serial number prefix listed on the title page of this manual.

Manual Changes

To adapt this manual to your Agilent E5070B/E5071B, refer to Table A-1 and Table A-2.

Table A-1 Manual Changes by Serial Number

Serial Prefix or Number	Make Manual Changes
MY423	Change 6

Table A-2 Manual Changes by Firmware Version

Version	Make Manual Changes
A.03.0x	Change 1
A.03.53	Change 2
A.03.54	Change 3
A.03.62	Change 4
A.04.00	Change 5
A.05.00	Change 7
A.06.00	Change 8

Agilent Technologies uses a two-part, ten-character serial number that is stamped on the serial number plate (Figure A-1). The first five characters are the serial prefix and the last five digits are the suffix.

Execute the *IDN? command on page 288 to check the firmware version.

Figure A-1 Serial Number Plate (Example)

Change 8

The firmware revision A.06.00 and below does not support the following SCPI commands. Please delete their descriptions in this manual.

- :TRIG:EXT:DEL on page 789
- :TRIG:EXT:LLAT on page 790
- :TRIG:AVER on page 788
- :SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:NTOL on page 698
- :SENS{1-16}:CORR:TRIG:FREE on page 637
- :MMEM:STOR:SNP on page 513
- :MMEM:STOR:SNP:FORM on page 514
- :MMEM:STOR:SNP:TYPE:S1P on page 515
- :MMEM:STOR:SNP:TYPE:S2P on page 516
- :MMEM:STOR:SNP:TYPE:S3P on page 517
- :MMEM:STOR:SNP:TYPE:S4P on page 518
- :SENS{1-16}:CORR:COLL:PART:SAVE on page 598

The firmware rivision A.06.00 or lower does not support the following functions. Please delete the descriptions about these functions from this manual.

- ❑ Low latency external trigger function
- ❑ Averaging trigger function
- ❑ Function of tolerance setting at power calibration
- ❑ Function of trigger source setting at calibration
- ❑ Function of data saving in touchstone format by using front panel
- ❑ Function of simplified full 3/4 port calibration by using front panel
- ❑ Simplified 3/4 port TRL calibration function
- ❑ Partial overwrite function

Change 7

The firmware revision A.05.00 and below does not support the following SCPI commands. Please delete their descriptions in this manual.

- :CALC{1-16}:CORR:EDEL:MED on page 303
- :CALC{1-16}:CORR:EDEL:WGC on page 305
- :CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:IMAG on page 320
- :CALC{1-16}:FSIM:BAL:CZC:BPOR{1-2}:REAL on page 321
- :CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:IMAG on page 332
- :CALC{1-16}:FSIM:BAL:DZC:BPOR{1-2}:REAL on page 333
- :CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:IMAG on page 361

- :CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:REAL on page 362
- :DISP:WIND{1-16}:ANN:MARK:ALIG on page 465
- :DISP:WIND{1-16}:ANN:MARK:SING on page 466
- :DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:X on page 472
- :DISP:WIND{1-16}:TRAC{1-16}:ANN:MARK:POS:Y on page 473
- :MMEM:LOAD:CKIT{1-20} on page 493
- :MMEM:STOR:CKIT{1-20} on page 504
- :SENS:CORR:COLL:ECAL:ORI on page 524
- :SENS:CORR:COLL:ECAL:PATH on page 525
- :SENS:MULT:CAT? on page 527
- :SENS:MULT{1-2}:INC? on page 529
- :SENS:MULT{1-2}:NAME on page 530
- :SENS{1-16}:CORR:COLL:CKIT:ORD on page 550
- :SENS{1-16}:CORR:COLL:CKIT:ORD:TRLL on page 555
- :SENS{1-16}:CORR:COLL:CKIT:ORD:TRLR on page 556
- :SENS{1-16}:CORR:COLL:CKIT:ORD:TRLT on page 557
- :SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:CHAR on page 564
- :SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMAX on page 566
- :SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMIN on page 567
- :SENS{1-16}:CORR:COLL:CKIT:TRL:IMP on page 576
- :SENS{1-16}:CORR:COLL:CKIT:TRL:RPL on page 577
- :SENS{1-16}:CORR:COLL:METH:TRL2 on page 593
- :SENS{1-16}:CORR:COLL:METH:TRL3 on page 594
- :SENS{1-16}:CORR:COLL:METH:TRL4 on page 595
- :SENS{1-16}:CORR:COLL:SUBC on page 601
- :SENS{1-16}:CORR:COLL:TRLL on page 603
- :SENS{1-16}:CORR:COLL:TRLR on page 604
- :SENS{1-16}:CORR:COLL:TRLT on page 605
- :SENS{1-16}:CORR:EXT:AUTO:CONF on page 607
- :SENS{1-16}:CORR:EXT:AUTO:DCOF on page 608
- :SENS{1-16}:CORR:EXT:AUTO:LOSS on page 609
- :SENS{1-16}:CORR:EXT:AUTO:MEAS on page 610
- :SENS{1-16}:CORR:EXT:AUTO:PORT{1-4} on page 611
- :SENS{1-16}:CORR:EXT:AUTO:RESet on page 612
- :SENS{1-16}:CORR:EXT:AUTO:STAR on page 613
- :SENS{1-16}:CORR:EXT:AUTO:STOP on page 614

- :SENS{1-16}:CORR:EXT:PORT{1-4}:FREQ{1-2} on page 616
- :SENS{1-16}:CORR:EXT:PORT{1-4}:INCL{1-2} on page 617
- :SENS{1-16}:CORR:EXT:PORT{1-4}:LDC on page 618
- :SENS{1-16}:CORR:EXT:PORT{1-4}:LOSS{1-2} on page 619
- :SENS{1-16}:MULT{1-2}:OUTP on page 645
- :SENS{1-16}:MULT{1-2}:PORT{1-20} on page 646
- :SENS{1-16}:MULT{1-2}:PORT{1-20}:CAT? on page 648
- :SYST:UPR on page 786

The following SCPI commands include parameters, which cannot be chosen with the firmware revision A.05.00 and below.

- :DISP:SPL on page 460
- :DISP:WIND{1-16}:SPL on page 469
- :SENS:MULT{1-2}:COUN? on page 528
- :SENS{1-16}:CORR:COLL:CKIT on page 548
- :SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD on page 551
- :SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN on page 552
- :SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR on page 553
- :SENS{1-16}:CORR:COLL:CKIT:ORD:THRU on page 554
- :SENS{1-16}:CORR:COLL:METH:TYPE? on page 596

The firmware revision A.05.00 or below does not support the following functions. Please delete the descriptions about these functions in this manual.

- ❑ User preset function
- ❑ Function to display the marker value for non-active traces.
- ❑ Function to the display position where the marker value are displayed.
- ❑ Function to align the marker value.
- ❑ TRL calibration by softkeys
- ❑ User recovery function*1
- ❑ Function to set the Waveguide for the media type.
- ❑ Loss correction.
- ❑ Auto port extension and auto loss value calculation.
- ❑ Function to turn off the auto-detect function of the Ecal module (Manual setting is available).
- ❑ Conversion function of differential/common port reference impedance of the fixture simulator in complex format.
- ❑ Function to have the E5091A-016 multiport test set correspond to this instrument.

*1. This function is available when the volume label on the C-drive is CP600 or higher.

- ❑ Function to select the 85052C for the calibration kit.
- ❑ Function to specify up to eight calibration standards for each calibration class.
- ❑ Reading/Writing of the calibration standard files.
- ❑ Function to set the measurement point to a maximum of 20001.*1

Change 6

The serial prefix MY423 or below dose not support the USB(USBTMC) interface port. Please delete the discription in this manual.

Change 5

The firmware revision A.04.00 and below does not support the following SCPI commands. Please delete their descriptions in this manual.

- :CALC{1-16}:BLIM on page 293
- :CALC{1-16}:BLIM:DB on page 294
- :CALC{1-16}:BLIM:DISP:MARK on page 295
- :CALC{1-16}:BLIM:DISP:VAL on page 296
- :CALC{1-16}:BLIM:FAIL? on page 297
- :CALC{1-16}:BLIM:MAX on page 298
- :CALC{1-16}:BLIM:MIN on page 299
- :CALC{1-16}:BLIM:REP? on page 300
- :CALC{1-16}:LIM:REP:ALL? on page 385
- :CALC{1-16}:LIM:OFFS:AMPL on page 381
- :CALC{1-16}:LIM:OFFS:MARK on page 382
- :CALC{1-16}:LIM:OFFS:STIM on page 383
- :CALC{1-16}:RLIM on page 420
- :CALC{1-16}:RLIM:DATA on page 421
- :CALC{1-16}:RLIM:DISP:SEL on page 423
- :CALC{1-16}:RLIM:DISP:VAL on page 424
- :CALC{1-16}:RLIM:DISP:LINE on page 422
- :CALC{1-16}:RLIM:FAIL? on page 425
- :CALC{1-16}:RLIM:REP? on page 426
- :MMEM:LOAD:RLIM on page 497
- :MMEM:STOR:RLIM on page 510
- :SENS{1-16}:CORR:COEF on page 537
- :SENS{1-16}:CORR:COEF:METH:ERES on page 539

*1. This function is available when the channel/trace is set to Ch 1 / Tr 4 20001 Points.

- :SENS{1-16}:CORR:COEF:METH:OPEN on page 540
- :SENS{1-16}:CORR:COEF:METH:SHOR on page 541
- :SENS{1-16}:CORR:COEF:METH:SOLT1 on page 542
- :SENS{1-16}:CORR:COEF:METH:SOLT2 on page 543
- :SENS{1-16}:CORR:COEF:METH:SOLT3 on page 544
- :SENS{1-16}:CORR:COEF:METH:SOLT4 on page 545
- :SENS{1-16}:CORR:COEF:METH:THRU on page 546
- :SENS{1-16}:CORR:COEF:SAVE on page 547
- :SENS{1-16}:CORR:COLL:ECAL:ERES on page 580
- :SENS{1-16}:CORR:COLL:METH:ERES on page 588
- :STAT:QUES:BLIM? on page 712
- :STAT:QUES:BLIM:CHAN{1-16}? on page 712
- :STAT:QUES:BLIM:CHAN{1-16}:COND? on page 712
- :STAT:QUES:BLIM:CHAN{1-16}:ECH? on page 714
- :STAT:QUES:BLIM:CHAN{1-16}:ECH:COND? on page 714
- :STAT:QUES:BLIM:CHAN{1-16}:ECH:ENAB on page 715
- :STAT:QUES:BLIM:CHAN{1-16}:ECH:NTR on page 716
- :STAT:QUES:BLIM:CHAN{1-16}:ECH:PTR on page 717
- :STAT:QUES:BLIM:CHAN{1-16}:ENAB on page 718
- :STAT:QUES:BLIM:CHAN{1-16}:NTR on page 719
- :STAT:QUES:BLIM:CHAN{1-16}:PTR on page 720
- :STAT:QUES:BLIM:COND? on page 720
- :STAT:QUES:BLIM:ELIM? on page 721
- :STAT:QUES:BLIM:ELIM:COND? on page 721
- :STAT:QUES:BLIM:ELIM:ENAB on page 722
- :STAT:QUES:BLIM:ELIM:NTR on page 723
- :STAT:QUES:BLIM:ELIM:PTR on page 724
- :STAT:QUES:BLIM:ENAB on page 725
- :STAT:QUES:BLIM:NTR on page 726
- :STAT:QUES:BLIM:PTR on page 727
- :STAT:QUES:RLIM? on page 748
- :STAT:QUES:RLIM:CHAN{1-16}? on page 748
- :STAT:QUES:RLIM:CHAN{1-16}:COND? on page 748
- :STAT:QUES:RLIM:CHAN{1-16}:ECH? on page 750
- :STAT:QUES:RLIM:CHAN{1-16}:ECH:COND? on page 750
- :STAT:QUES:RLIM:CHAN{1-16}:ECH:ENAB on page 751

- :STAT:QUES:RLIM:CHAN{1-16}:ECH:NTR on page 752
- :STAT:QUES:RLIM:CHAN{1-16}:ECH:PTR on page 753
- :STAT:QUES:RLIM:CHAN{1-16}:ENAB on page 754
- :STAT:QUES:RLIM:CHAN{1-16}:NTR on page 755
- :STAT:QUES:RLIM:CHAN{1-16}:PTR on page 756
- :STAT:QUES:RLIM:COND? on page 756
- :STAT:QUES:RLIM:ELIM? on page 757
- :STAT:QUES:RLIM:ELIM:COND? on page 757
- :STAT:QUES:RLIM:ELIM:ENAB on page 758
- :STAT:QUES:RLIM:ELIM:NTR on page 759
- :STAT:QUES:RLIM:ELIM:PTR on page 760
- :STAT:QUES:RLIM:ENAB on page 761
- :STAT:QUES:RLIM:NTR on page 762
- :STAT:QUES:RLIM:PTR on page 763
- :SYST:SEC:LEV on page 782

The following SCPI commands include parameters, which cannot be chosen with the firmware revision A.04.00 and below.

- :DISP:TABL:TYPE on page 463
- :SENS{1-16}:CORR:COLL:METH:TYPE? on page 596
- :SENS{1-16}:CORR:TYPE{1-16}? on page 638

The firmware revision A.04.00 and below does not support the following function. Please delete the descriptions about this function in this manual.

- ❑ Offset limit line function
- ❑ Ripple test function
- ❑ Bandwidth test function
- ❑ Enhanced response calibration
- ❑ Frequency information appearing as asterisks
- ❑ Disable USB mass storage devices

Change 4

The firmware revision A.03.62 and below does not support the following SCPI commands. Please delete their descriptions in this manual.

- :CALC{1-16}:PAR{1-16}:SPOR on page 419
- :CALC{1-16}:MIX:XAX on page 411
- :CALC{1-16}:OFFS:XAX on page 414
- :SENS{1-16}:CORR:CLE on page 536

- :SENS{1-16}:CORR:COLL:CLE on page 578
- :SENS{1-16}:CORR:OFFS:CLE on page 620
- :SENS{1-16}:CORR:OFFS:COLL:LOAD on page 624
- :SENS{1-16}:CORR:OFFS:COLL:OPEN on page 627
- :SENS{1-16}:CORR:OFFS:COLL:PMET on page 628
- :SENS{1-16}:CORR:OFFS:COLL:SHOR on page 630
- :SENS{1-16}:CORR:OFFS:COLL:THRU on page 631
- :SENS{1-16}:CORR:OFFS:COLL:CLE on page 621
- :SENS{1-16}:CORR:OFFS:COLL:ECAL:SMIX2 on page 622
- :SENS{1-16}:CORR:OFFS:COLL:ECAL:SOLT1 on page 623
- :SENS{1-16}:CORR:OFFS:COLL:METH:SMIX2 on page 625
- :SENS{1-16}:CORR:OFFS:COLL:METH:SOLT1 on page 626
- :SENS{1-16}:CORR:OFFS:COLL:SAVE on page 629
- :SENS{1-16}:CORR:REC{1-4}:COLL:ACQ on page 634
- :SENS{1-16}:CORR:REC{1-4} on page 633
- :SENS{1-16}:OFFS:ASP on page 655
- :SENS{1-16}:OFFS:LOC:CONT on page 656
- :SENS{1-16}:OFFS:LOC:DATA? on page 657
- :SENS{1-16}:OFFS:LOC:DIV on page 658
- :SENS{1-16}:OFFS:LOC:MULT on page 659
- :SENS{1-16}:OFFS:LOC:OFFS on page 660
- :SENS{1-16}:OFFS:LOC:STAR on page 661
- :SENS{1-16}:OFFS:LOC:STOP on page 662
- :SENS{1-16}:OFFS:LOC:POW on page 663
- :SENS{1-16}:OFFS:LOC:POW:SLOP on page 664
- :SENS{1-16}:OFFS:LOC:POW:SLOP:STAT on page 665
- :SENS{1-16}:OFFS:LOC:STAT on page 666
- :SENS{1-16}:OFFS:PORT{1-4}:DATA? on page 667
- :SENS{1-16}:OFFS:PORT{1-4}:DIV on page 668
- :SENS{1-16}:OFFS:PORT{1-4}:MULT on page 669
- :SENS{1-16}:OFFS:PORT{1-4}:OFFS on page 670
- :SENS{1-16}:OFFS:PORT{1-4}:STAR on page 671
- :SENS{1-16}:OFFS:PORT{1-4}:STOP on page 672
- :SENS{1-16}:OFFS on page 654
- :SYST:COMM:GPIB:SGEN:ADDR on page 768
- :SYST:COMM:GPIB:SGEN:CCOM:FREQ on page 769

- :SYST:COMM:GPIB:SGEN:CCOM:POW on page 770
- :SYST:COMM:GPIB:SGEN:CCOM:PRES on page 771
- :SYST:COMM:GPIB:SGEN:CCOM:RFON on page 772
- :SYST:COMM:GPIB:SGEN:DWEL on page 773
- :SYST:COMM:GPIB:SGEN:TYPE on page 774
- :TRIG:POIN on page 791

The following SCPI commands include parameters, which cannot be chosen with the firmware revision A.03.62 and below.

- :CALC{1-16}:FSIM:BAL:PAR{1-16}:SSB on page 338
- :CALC{1-16}:PAR{1-16}:DEF on page 416
- :CALC{1-16}:CONV:FUNC on page 302
- :SENS{1-16}:CORR:TYPE{1-16}? on page 638

The firmware revision A.03.62 and below does not support the following function. Please delete the descriptions about this function in this manual.

- ❑ Scalar-mixer calibration
- ❑ Vector-mixer calibration
- ❑ Absolute measurement function and receiver calibration
- ❑ Frequency offset function (including the avoid spurious function)
- ❑ External signal generator control function
- ❑ Point tirgger function
- ❑ Z/Y Transmission-Shunt conversion
- ❑ Imbalance 3 and 4 parameters for SE-SE-Bal measurement (Fixture simulator)
- ❑ Assignable x-axis such as RF+LO, RF-LO, and LO-RF frequencies for each active trace
- ❑ Conjugation for converting vector mixer measurement parameters
- ❑ 7 mm calibration kits such as 85031B and 85050C/D
- ❑ Calibration data and calibration coefficient clear functions

Change 3

The firmware revision A.03.54 and below does not support the following SCPI commands. Please delete their descriptions in this manual.

- :SERV:SREV? on page 684
- :SOUR{1-16}:POW:ATT:AUTO on page 691

The firmware revision A.03.54 and below does not support the following function. Please delete the descriptions about this function in this manual

- ❑ Auto Power Range set function

Change 2

The firmware revision A.03.53 and below does not support the following SCPI commands. Please delete their descriptions in this manual.

- :SYST:ISPC:PORT on page 777
- :SYST:ISPC:STAT on page 778

The firmware revision A.03.53 and below does not support the following function. Please delete the descriptions about this function in this manual

❑ Initial Source Port Control function

Change 1

The firmware revision A.03.0x does not support the following SCPI commands. Please delete their descriptions in this manual.

- :CALC{1-16}:FSIM:EMB:NETW{1-2}:FIL on page 344
- :CALC{1-16}:FSIM:EMB:NETW{1-2}:TYPE on page 345
- :CALC{1-16}:FSIM:EMB:STAT on page 346
- :CALC{1-16}:FSIM:EMB:TOP:A:PORT on page 347
- :CALC{1-16}:FSIM:EMB:TOP:B:PORT on page 348
- :CALC{1-16}:FSIM:EMB:TOP:C:PORT on page 349
- :CALC{1-16}:FSIM:EMB:TYPE on page 350
- :SENS{1-16}:CORR:COLL:ECAL:CCH on page 579
- :SENS{1-16}:CORR:COLL:ECAL:UCH on page 585
- :SENS{1-16}:CORR:COLL:SIMP:SAVE on page 600

The firmware revision A.03.0x does not support the following function. Please delete the descriptions about this function in this manual

❑ Simplified full 3/4 port calibration

Manual Changes

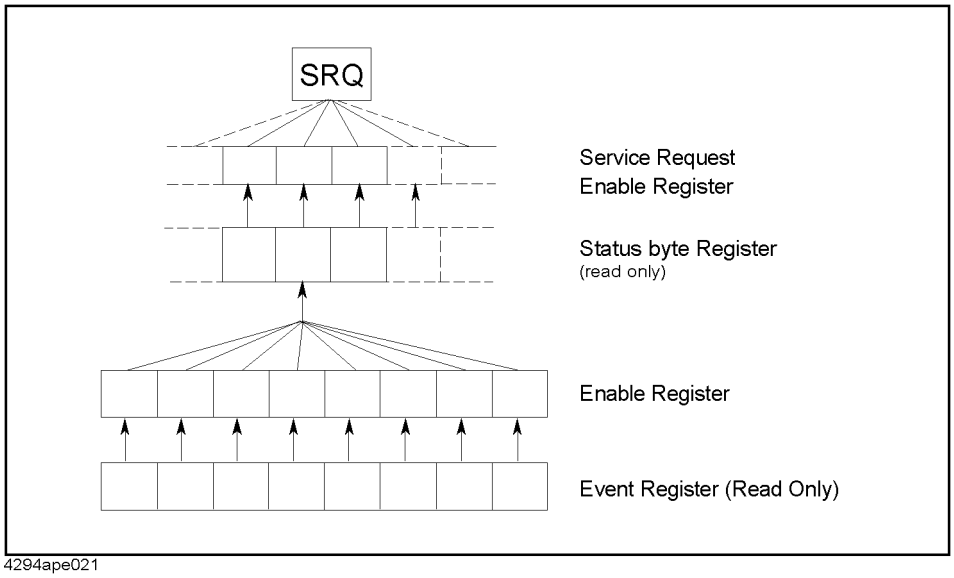
B Status Reporting System

This appendix describes the status reporting system of the Agilent E5070B/E5071B.

General Status Register Model

The Agilent E5070B/E5071B has a status reporting system to report the condition of the instrument.

Figure B-1 **General status register model**



4294ape021

The status reporting system has a hierarchical structure as shown in Figure B-1. When the instrument satisfies a particular condition, the corresponding bit of the event register is set to 1. Therefore, you can check the instrument status by reading the event register.

When the event register bit is set to “1” and a corresponding enable register bit (a bit marked with an arrow in Figure B-1) is also “1,” the summary bit of the status byte register is set to “1.” You can read the status byte register by using the serial poll.

If the bit of the service request enable register is “1,” a service request (SRQ) is generated by the positive transition of the corresponding status byte register bit. By generating SRQ, you can notify the controller that the E5070B/E5071B is requesting service. In other words, interruption by SRQ can be programmed. For more information on using SRQ, see “Using the status register” on page 132 in Chapter 5, “Making a Measurement,” or “Using the status reporting system” on page 230 in Chapter 11, “Working with Automatic Test Systems.”

Event Register

Reflects the corresponding condition of the E5070B/E5071B (e.g., occurrence of an event) as a bit status. These bits continuously monitor changes in the E5070B/E5071B's state and change the bit status when the condition (e.g., change bit status to "1" if a specific event occurs) for each bit is met. You cannot change the bit status by issuing a SCPI command.

Enable Register

Setting the enable register allows you to specify event register bits that can set "1" to the summary bit of the status byte register when an event occurs. The register bits work as mask bits; setting "1" to an enable register will enable a corresponding bit in the event register.

For example, when you want to set "1" as the summary bit in the status byte register by a specific register condition, set the corresponding enable register to "1."

Status Byte Register

If the enabled event register is set to "1," a corresponding bit of the status byte register is also set to "1." This register also indicates the output queue and SRQ status.

The value of the status byte register can be read by using the *STB? command on page 291 command or serial poll (SPOLL statement in HTBasic) from the controller.

Reading the status byte register by using the ***STB?** command does not affect the contents of the status byte register. However, reading it with the SPOLL statement of HTBasic will clear the RQS bit in the status byte register.

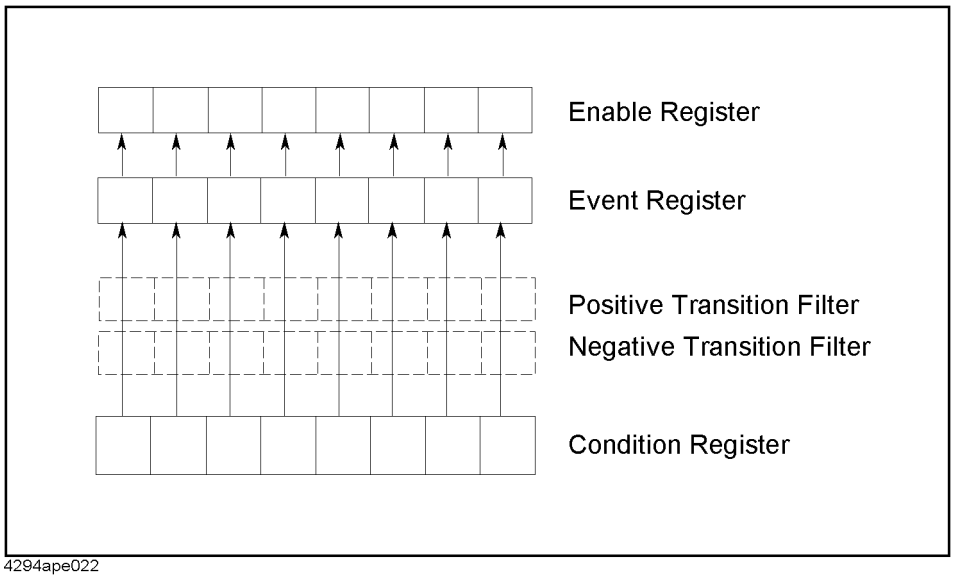
Also, setting the service request enable register using the *SRE command on page 290 command can generate a service request synchronously with the status byte register.

Condition Register and Transition Filter

When the status register has a transition filter, there is a lower register called a condition register under the event register. The transition filter is between the event register and the condition register.

The transition filter enables you to select a positive and/or negative transition of the condition register bit in order to set a bit in the corresponding event register. For example, using the negative transition filter to set bit 3 to “1” causes bit 3 of the event register to be set to “1” when bit 3 of the condition register makes a negative transition, that is, changes from 1 to 0.

Figure B-2 **Transition filter and condition register**



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In the E5070B/E5071B, the following registers provide a condition register and transition filter:

- Operation status register
- Questionable status register
- Questionable limit status register
- Questionable limit extra status register
- Questionable limit channel {1-16} status register
- Questionable limit channel {1-16} extra status register
- Questionable bandwidth limit status register
- Questionable bandwidth limit extra status register
- Questionable bandwidth limit channel {1-16} status register
- Questionable bandwidth limit channel {1-16} extra status register
- Questionable ripple limit status register
- Questionable ripple limit extra status register
- Questionable ripple limit channel {1-16} status register
- Questionable ripple limit channel {1-16} extra status register

Status Register Structure

The status reporting system has a hierarchical structure as shown in Figure B-3 through Figure B-12. The status byte register is a summary of registers in the lower level. This section describes the E5070B/E5071B's status registers in each hierarchy. Each bit of the status register is described in Table B-1 through Table B-17.

Figure B-3 Status Register Structure (1 of 10)

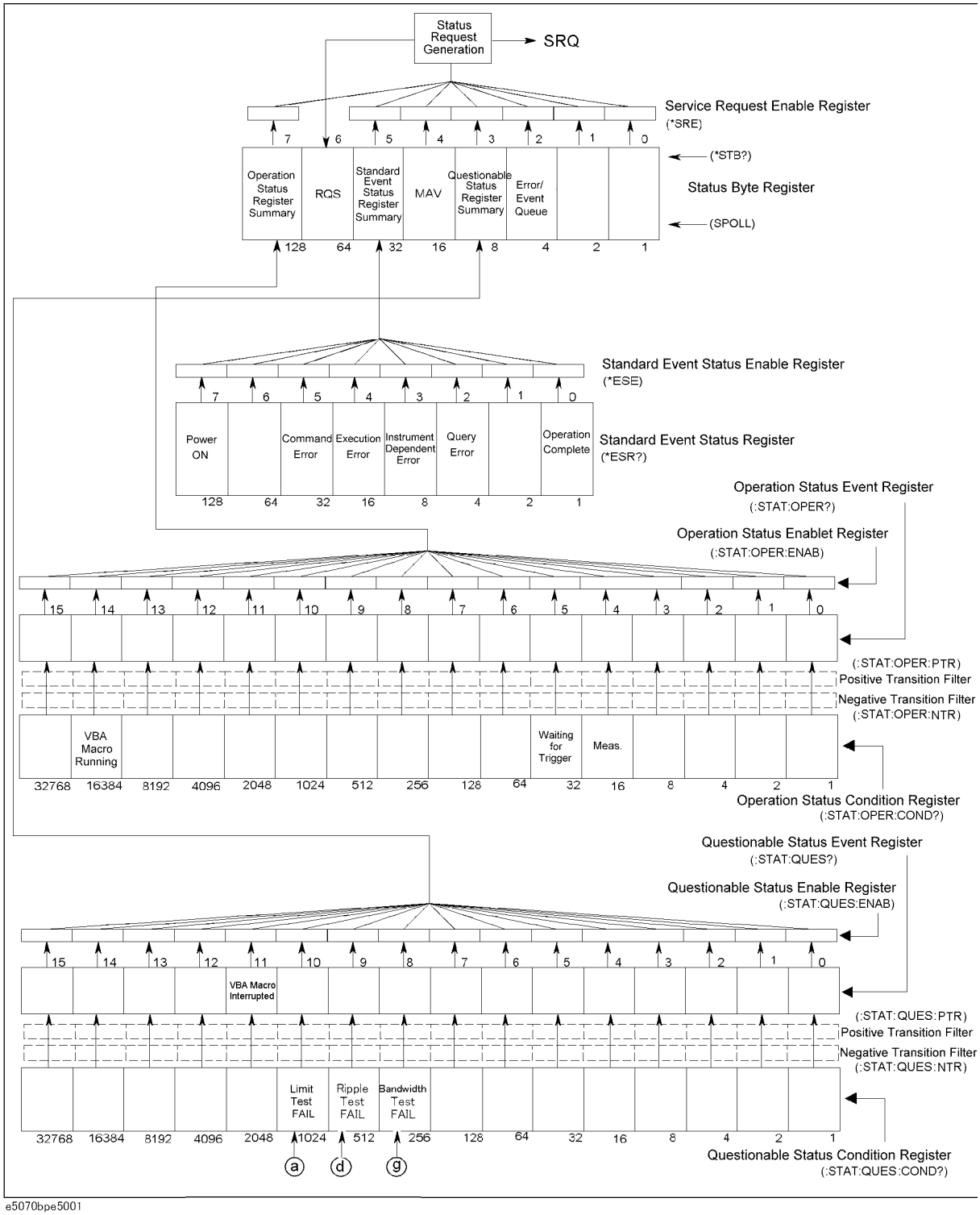

Figure B-4 Status Register Structure (2 of 10)

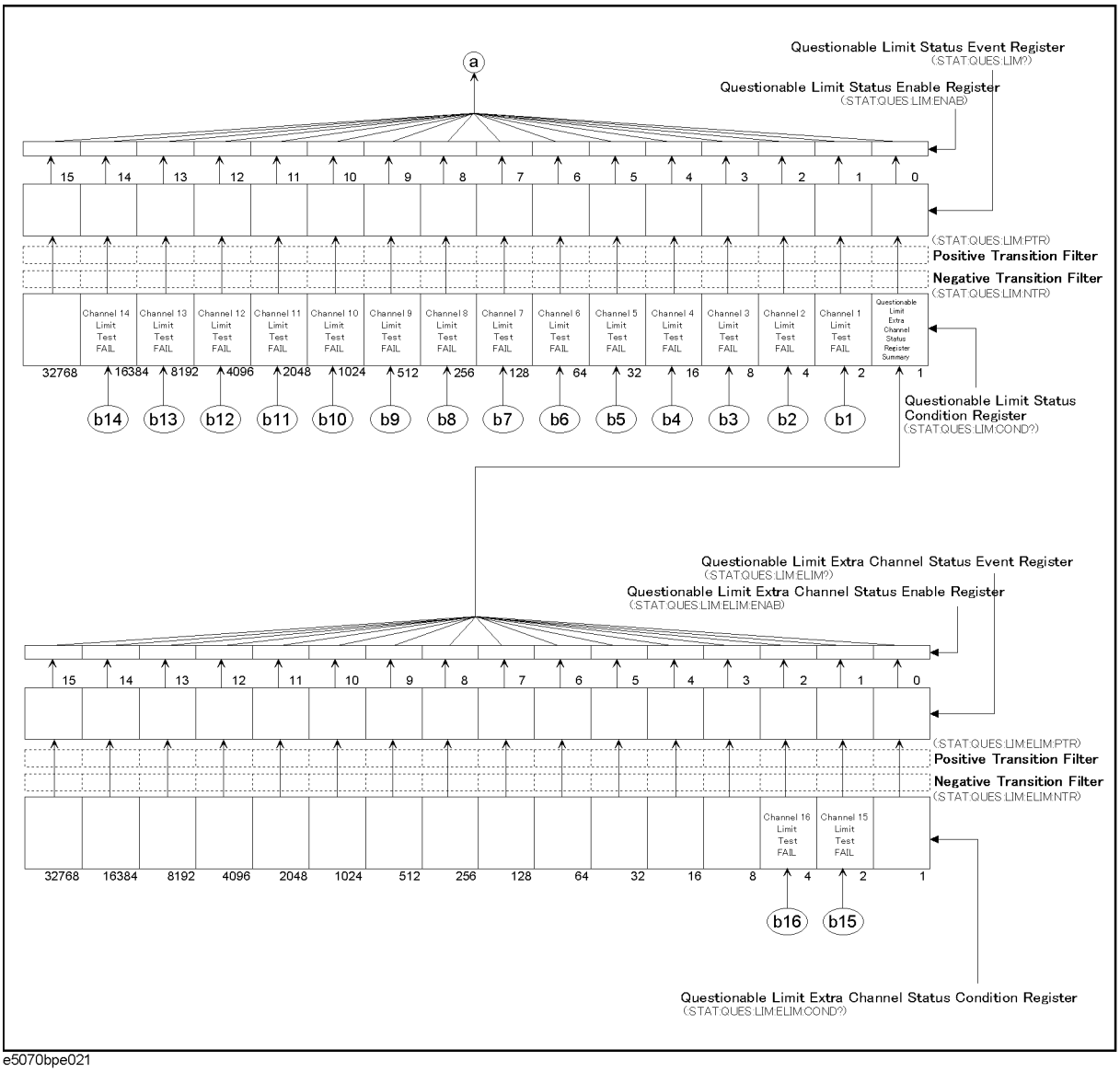

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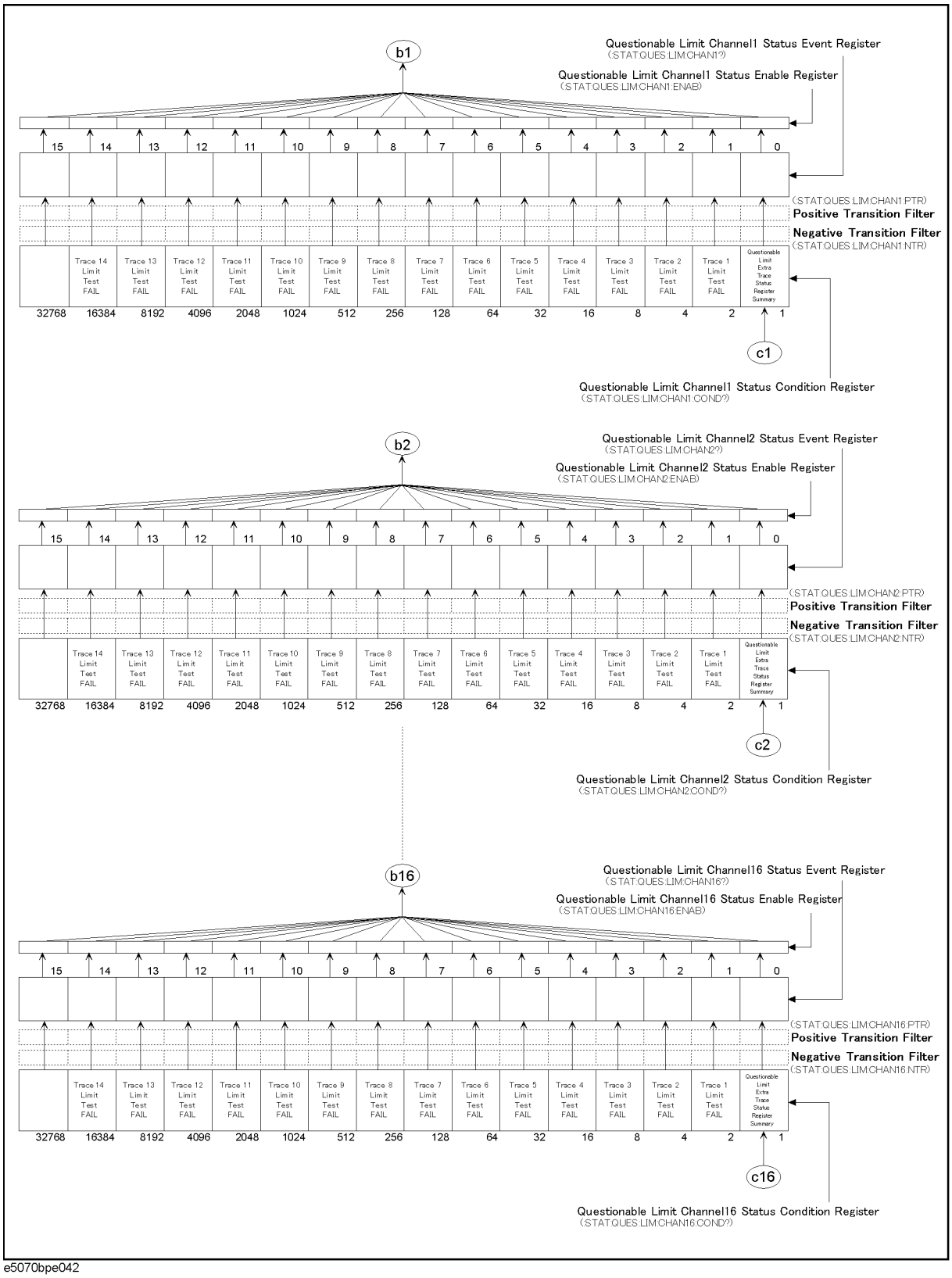
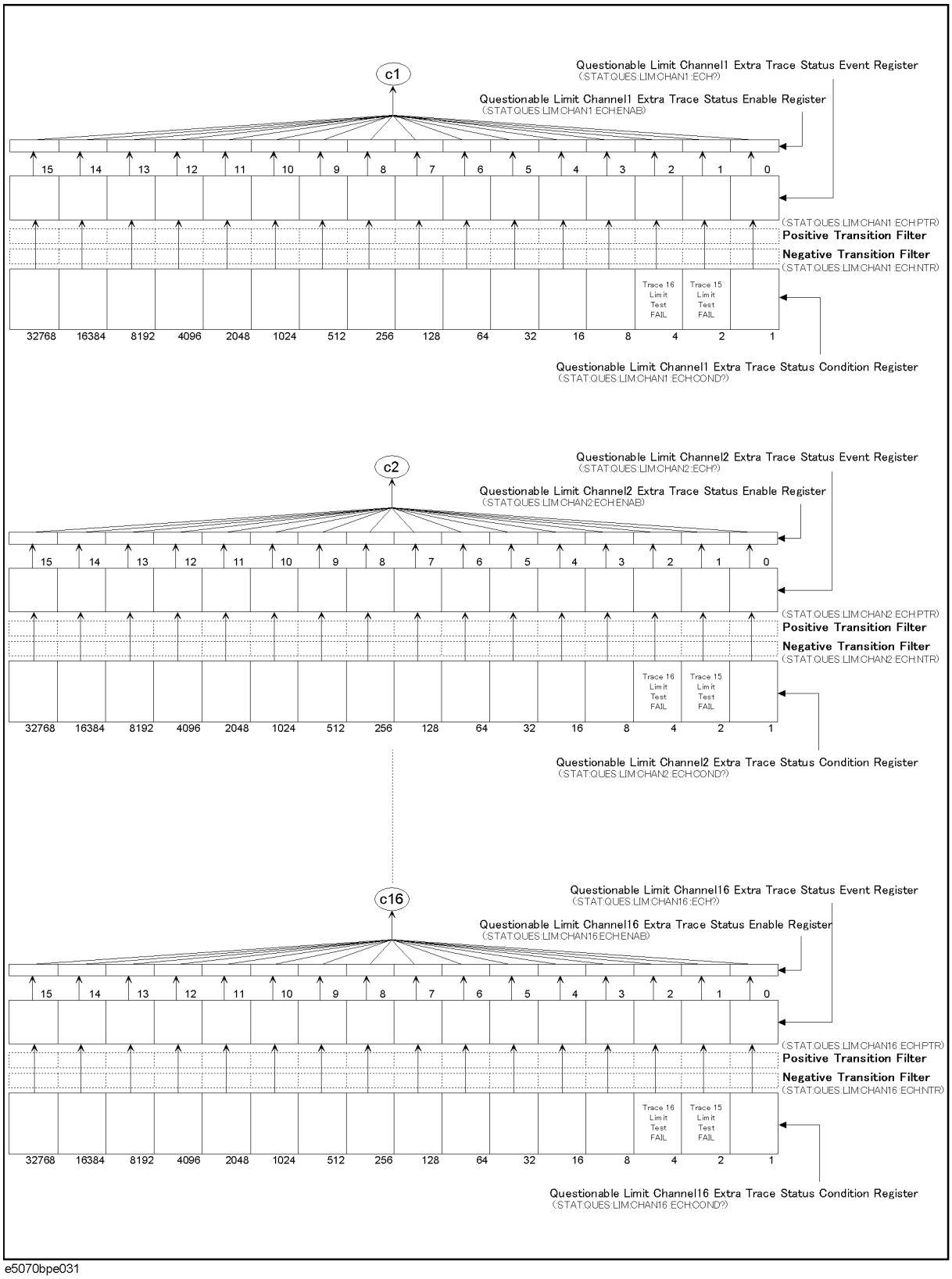
Figure B-5 Status Register Structure (3 of 10)



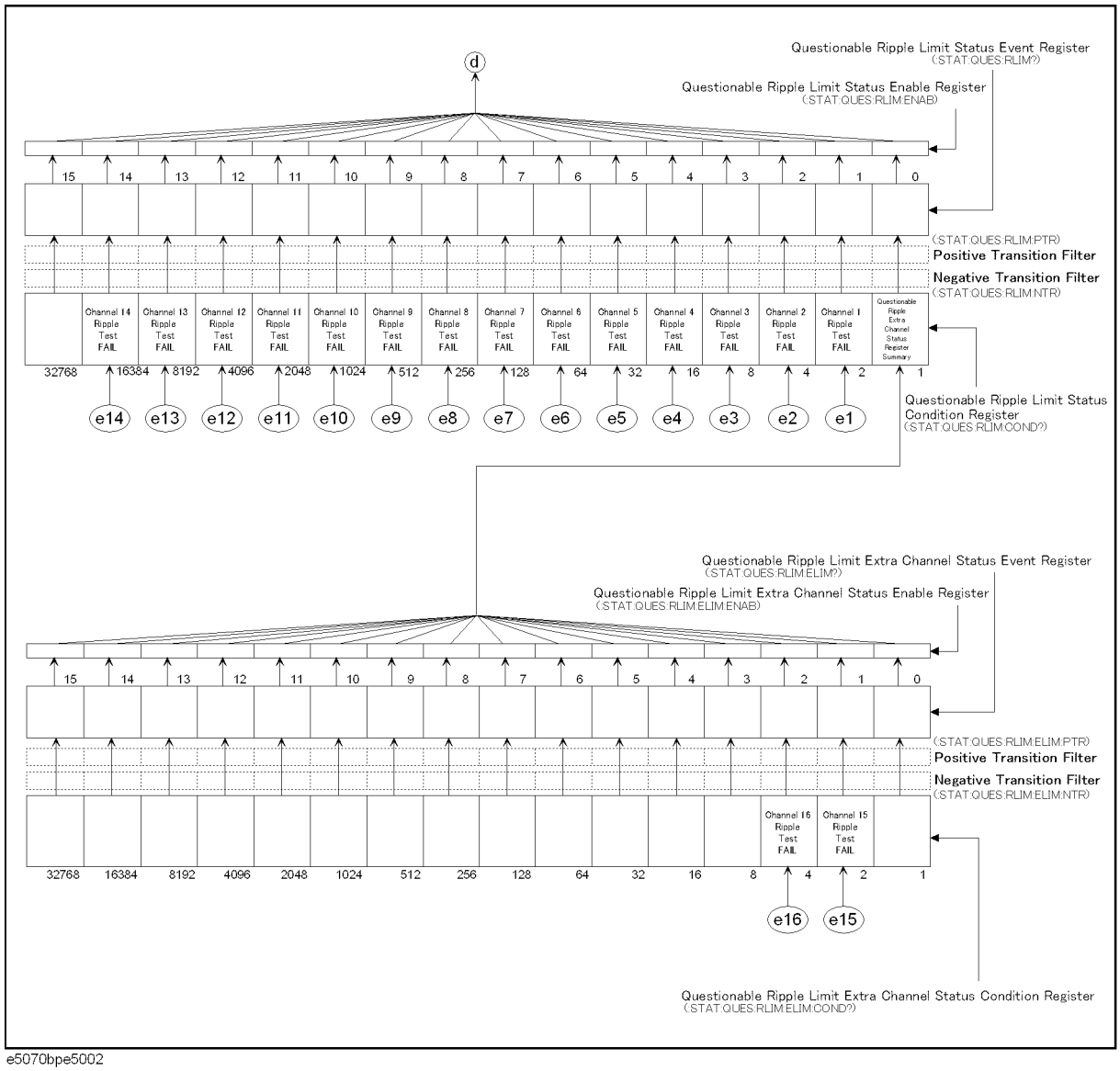
e5070bpe042

Figure B-6 Status Register Structure (4 of 10)



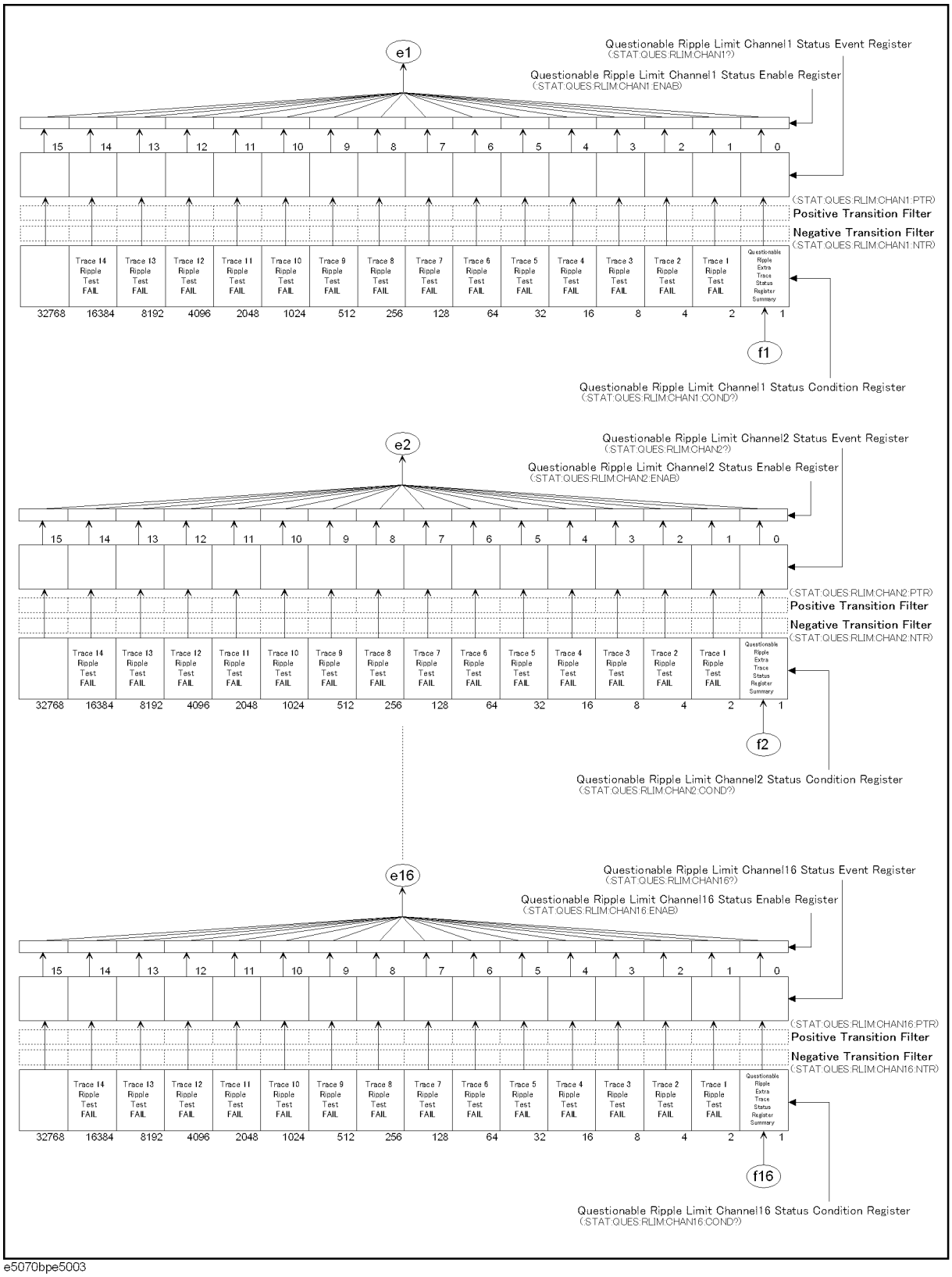
e5070bpe031

Figure B-7 Status Register Structure (5 of 10)



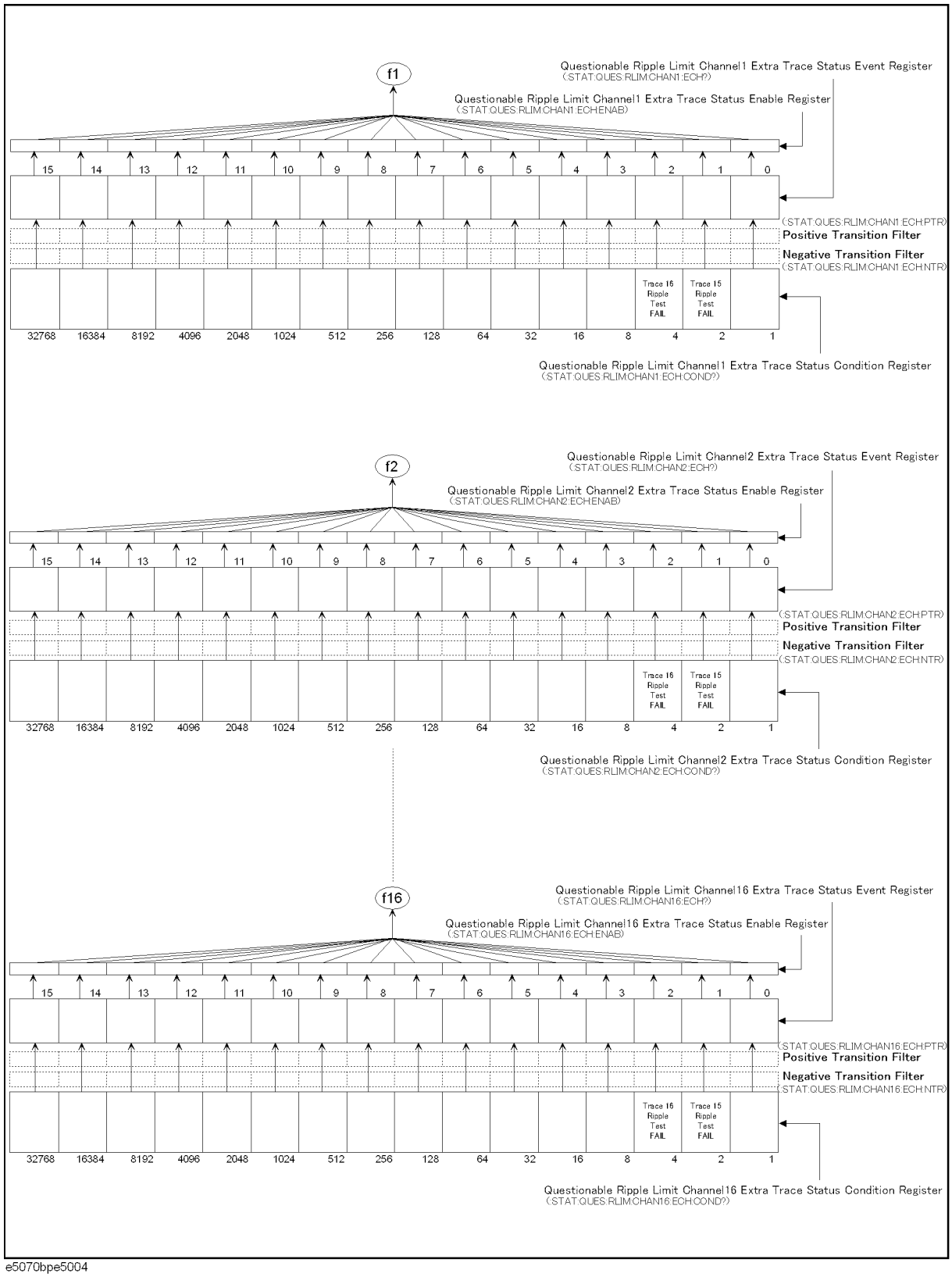
e5070bpe5002

Figure B-8 Status Register Structure (6 of 10)



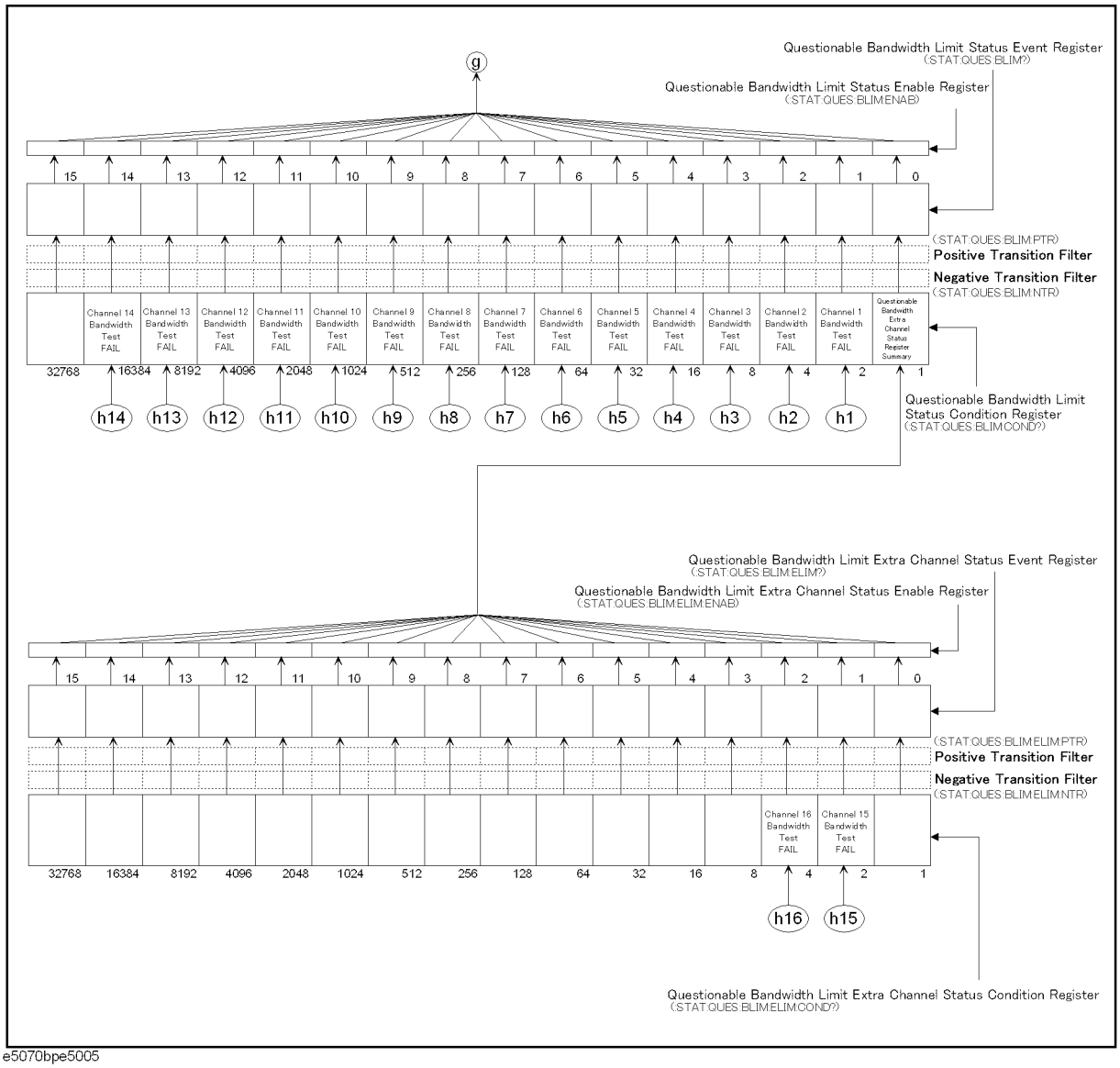
e5070bpe5003

Figure B-9 Status Register Structure (7 of 10)



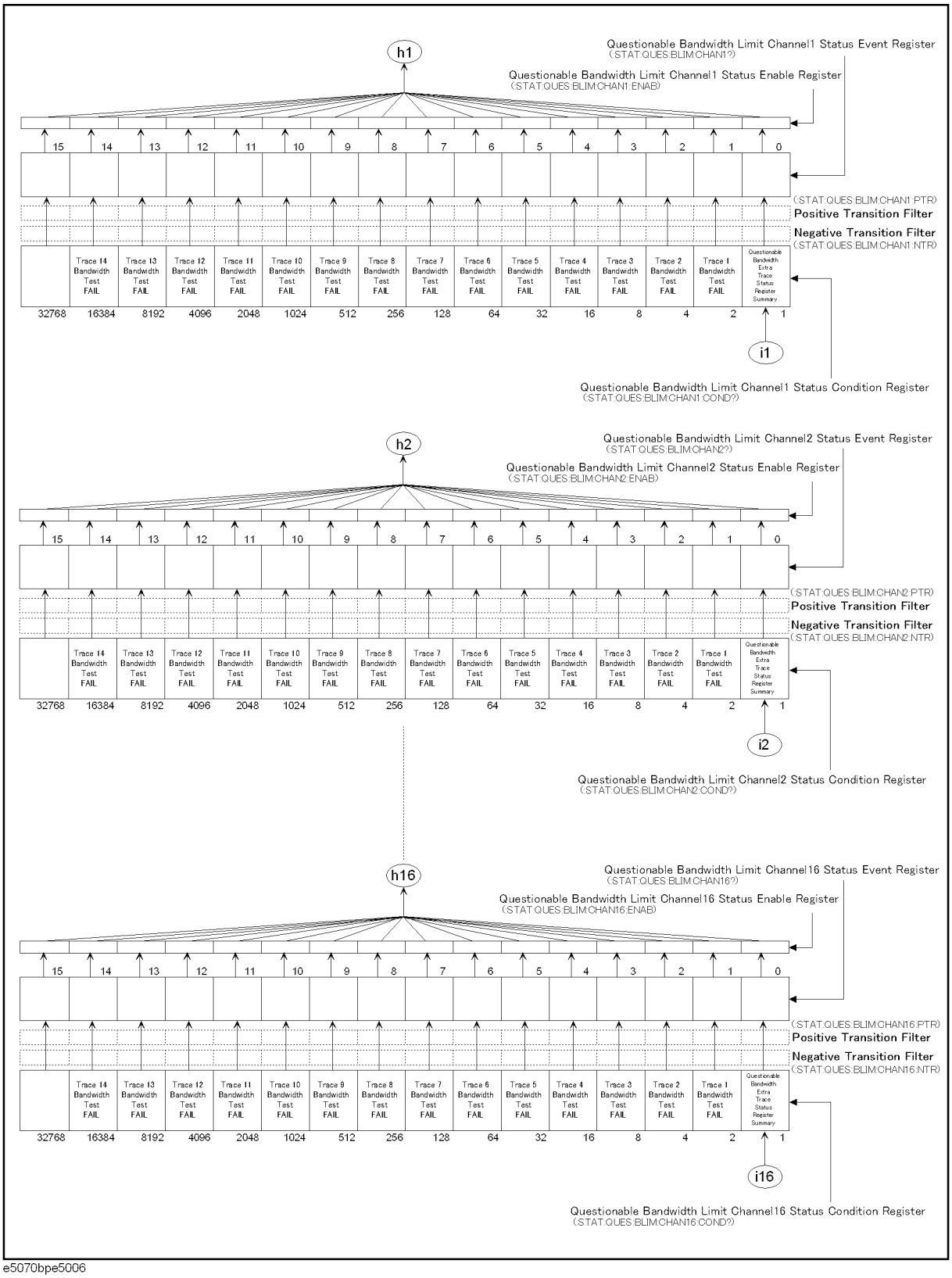
e5070bpe5004

Figure B-10 Status Register Structure (8 of 10)



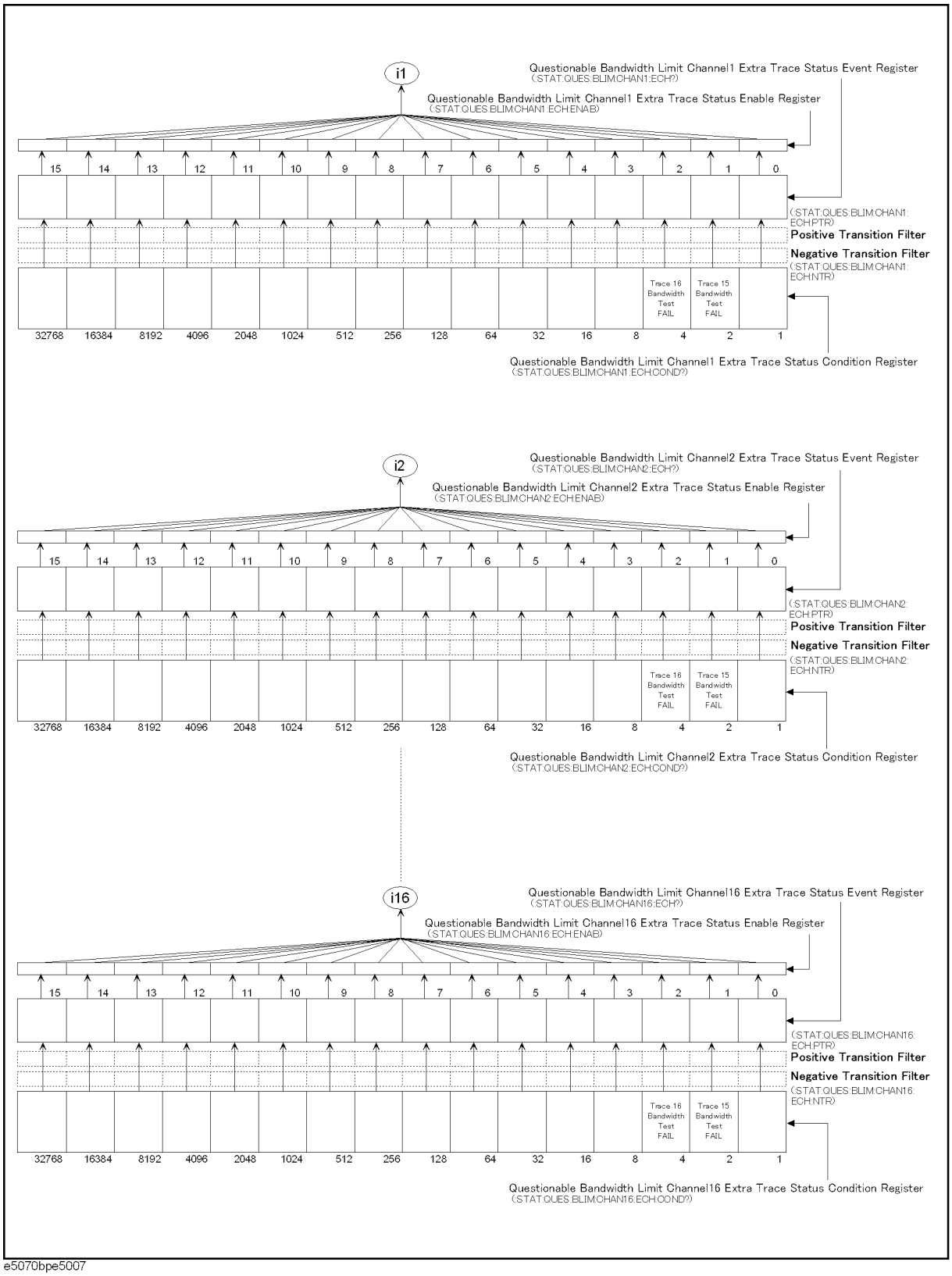
e5070bpe5005

Figure B-11 Status Register Structure (9 of 10)



e5070bpe5006

Figure B-12 Status Register Structure (10 of 10)



e5070bpe5007

Table B-1 Status Bit Definitions of Status Byte Register

Bit Position	Name	Description
0, 1	Not used	Always 0
2	Error/Event Queue	Set to “1” if the error/event queue contains data; reset to “0” when all the data has been retrieved.
3	Questionable Status Register Summary	Set to “1” when one of the enabled bits in the status event status register is set to “1.”
4	MAV (Message Available)	Set to “1” when the output queue contains data; reset to “0” when all the data has been retrieved.
5	Standard Event Status Register Summary	Set to “1” when one of the enabled bits in the status event status register is set to “1.”
6	RQS	Set to “1” when any of the status byte register bits enabled by the service request enable register is set to “1”; reset to “0” when all the data has been retrieved through serial polling.
7	Operation Status Register Summary	Set to “1” when one of the enabled bits in the operational status register is set to “1.”

Issuing the ***CLS** command will clear all bits from the status byte register.

Table B-2 Status Bit Definitions of Event Status Register (ESR)

Bit Position	Name	Description
0	Operation Complete	Set to "1" upon completion of all operations done by commands that precede the *OPC? command on page 288 command.
1	Not used	Always 0
2	Query Error	1. Set to "1" when the E5070B/E5071B receives a data output request but there is no data to output. 2. Set to "1" when the data of the E5070B/E5071B's output queue has been cleared because of a new message received before the completion of data output.
3	Instrument Dependent Error	Set to "1" when an error has occurred and the error is not a command, query, or execution error.
4	Execution Error	1. Set to "1" when any parameter in an SCPI command exceeds its input range or is inconsistent with the E5070B/E5071B's capabilities. 2. Set to "1" when an SCPI command cannot be properly executed due to some condition of the E5070B/E5071B.
5	Command Error	1. Set to "1" when an IEEE 488.2 syntax error occurs (a command sent to the E5070B/E5071B does not follow the IEEE 488.2 syntax). Possible violations include the command parameter violating the E5070B/E5071B listening formats or being unacceptable. 2. Set to "1" when a semantic error occurs. Possible causes include a command containing misspellings being sent to the E5070B/E5071B or an IEEE 488.2 command not supported by the E5070B/E5071B being sent. 3. Set to "1" when GET (Group Execution Trigger) is input while a program message is being received.
6	Not used	Always 0
7	Power ON	Set to "1" when the E5070B/E5071B is powered ON, or when the firmware is restarted.

Issuing the ***CLS** command will clear all bits from the standard event status register.

Table B-3 Status Bit Definitions of the Operation Status Condition Register

Bit Position	Name	Description
0 - 3	Not used	Always 0
4	Measurement	Set to "1" during measurement*1.
5	Waiting for Trigger*2	Set to "1" while the instrument is waiting for a trigger*3.
6 - 13	Not used	Always 0
14	VBA Macro Running	Set to "1" while a VBA macro is running.
15	Not used	Always 0

*1. This is the time from the beginning of the first sweep to the end of the last sweep when several sweeps are executed for one measurement.

*2. When the point trigger function is on and the low-latency external trigger mode is on, set to 1 while the instrument is waiting for the trigger of the first measurement point. Set to 0 when the instrument is point-triggered for the first time, and set to 1 again when the measurement of the last measurement point is completed and the instrument is ready for the next sweep.

*3. This is when the trigger system is in "Waiting for Trigger" state. For more information on the trigger system, refer to "Trigger System" on page 128.

Issuing the ***CLS** command will clear all bits from the operation status event register.

Table B-4 Status Bit Definitions of the Questionable Status Condition Register

Bit Position	Name	Description
0 - 7	Not used	Always 0
8	Bandwidth Test Fail (Questionable bandwidth limit status register summary)	Set to "1" while one of the enabled bits in the questionable bandwidth limit status event register is set to "1."
9	Ripple Test Fail (Questionable ripple limit status register summary)	Set to "1" while one of the enabled bits in the questionable ripple limit status event register is set to "1."
10	Limit Test Fail (Questionable limit status register summary)	Set to "1" while one of the enabled bits in the questionable limit status event register is set to "1."
11 - 15	Not used	Always 0

Table B-5 Status Bit Definitions of the Questionable Status Event Register

Bit Position	Name	Description
0 - 7	Not used	Always 0
8	Bandwidth Test Fail (Questionable bandwidth limit status register summary)	Set to "1" when a transition of the condition register occurs if the transition filters are set as valid values.
9	Ripple Test Fail (Questionable ripple limit status register summary)	Set to "1" when a transition of the condition register occurs if the transition filters are set as valid values.
10	Limit Test Fail (Questionable limit status register summary)	Set to "1" when a transition of the condition register occurs if the transition filters are set as valid values.
11	VBA Macro Interrupted	Set to "1" when a VBA macro is interrupted by one of the following reasons.*1 • Occurrence of an execution error • Executing "End" statement in the VBA Macro • Executing **:PROG:STAT STOP** • Operating **[Ctrl]**+**[Break]** using the keyboard • Operating **[Macro Break]** or **[Macro Setup]** - **Stop** using the front panel
12 - 15	Not used	Always 0

*1. This setting is made after you click the **End** button in the dialog box displayed when the VBA macro is interrupted.

Issuing the ***CLS** command will clear all bits from the questionable status event register.

Table B-6 Status Bit Definitions of the Questionable Limit Status Condition Register

Bit Position	Name	Description
0	Channel 15, 16 Limit Test summary (questionable limit extra status register summary)	Set to “1” while one of the enabled bits in the questionable limit extra status event register is set to “1.”
1	Channel 1 Limit Test Fail (questionable limit channel 1 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 1 status event register is set to “1.”
2	Channel 2 Limit Test Fail (questionable limit channel 2 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 2 status event register is set to “1.”
3	Channel 3 Limit Test Fail (questionable limit channel 3 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 3 status event register is set to “1.”
4	Channel 4 Limit Test Fail (questionable limit channel 4 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 4 status event register is set to “1.”
5	Channel 5 Limit Test Fail (questionable limit channel 5 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 5 status event register is set to “1.”
6	Channel 6 Limit Test Fail (questionable limit channel 6 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 6 status event register is set to “1.”
7	Channel 7 Limit Test Fail (questionable limit channel 7 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 7 status event register is set to “1.”
8	Channel 8 Limit Test Fail (questionable limit channel 8 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 8 status event register is set to “1.”
9	Channel 9 Limit Test Fail (questionable limit channel 9 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 9 status event register is set to “1.”
10	Channel 10 Limit Test Fail (questionable limit channel 10 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 10 status event register is set to “1.”
11	Channel 11 Limit Test Fail (questionable limit channel 11 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 11 status event register is set to “1.”
12	Channel 12 Limit Test Fail (questionable limit channel 12 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 12 status event register is set to “1.”
13	Channel 13 Limit Test Fail (questionable limit channel 13 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 13 status event register is set to “1.”
14	Channel 14 Limit Test Fail (questionable limit channel 14 status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel 14 status event register is set to “1.”
15	Not used	Always 0

Issuing the ***CLS** command will clear all bits from the questionable limit status event register.

Table B-7 Status Bit Definitions of the Questionable Limit Extra Status Condition Register

Bit Position	Name	Description
0	Not used	Always 0
1	Channel 15 Limit Test Fail (questionable limit channel 15 status register summary)	Set to "1" while one of the enabled bits in the questionable limit channel 15 status event register is set to "1."
2	Channel 16 Limit Test Fail (questionable limit channel 16 status register summary)	Set to "1" while one of the enabled bits in the questionable limit channel 16 status event register is set to "1."
3 - 15	Not used	Always 0

Issuing the ***CLS** command will clear all bits from the questionable limit extra status event register.

Table B-8 **Status Bit Definitions of the Questionable Limit Channel {1-16} Status Condition Register**

Bit Position	Name	Description
0	Trace 15, 16 Limit Test summary (questionable limit channel {1-16} extra status register summary)	Set to “1” while one of the enabled bits in the questionable limit channel {1-16} extra status event register is set to “1.”
1	Trace 1 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 1.
2	Trace 2 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 2.
3	Trace 3 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 3.
4	Trace 4 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 4.
5	Trace 5 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 5.
6	Trace 6 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 6.
7	Trace 7 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 7.
8	Trace 8 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 8.
9	Trace 9 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 9.
10	Trace 10 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 10.
11	Trace 11 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 11.
12	Trace 12 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 12.
13	Trace 13 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 13.
14	Trace 14 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 14.
15	Not used	Always 0

Issuing the ***CLS** command will clear all the bits in the questionable limit channel {1-16}

status event register.

Table B-9 Status Bit Definitions of the Questionable Limit Channel {1-16} Extra Status Condition Register

Bit Position	Name	Description
0	Not used	Always 0
1	Trace 15 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 15.
2	Trace 16 Limit Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the limit test result for trace 16.
3 - 15	Not used	Always 0

Issuing the ***CLS** command will clear all the bits in the questionable limit channel {1-16} extra status event register.

Table B-10 Status Bit Definitions of the Questionable Bandwidth Limit Status Condition Register

Bit Position	Name	Description
0	Channel 15, 16 Limit Test summary (questionable bandwidth limit extra status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit extra status event register is set to “1.”
1	Channel 1 Bandwidth Test Fail (questionable bandwidth limit channel 1 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 1 status event register is set to “1.”
2	Channel 2 Bandwidth Test Fail (questionable bandwidth limit channel 2 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 2 status event register is set to “1.”
3	Channel 3 Bandwidth Test Fail (questionable bandwidth limit channel 3 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 3 status event register is set to “1.”
4	Channel 4 Bandwidth Test Fail (questionable bandwidth limit channel 4 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 4 status event register is set to “1.”
5	Channel 5 Bandwidth Test Fail (questionable bandwidth limit channel 5 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 5 status event register is set to “1.”
6	Channel 6 Bandwidth Test Fail (questionable bandwidth limit channel 6 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 6 status event register is set to “1.”
7	Channel 7 Bandwidth Test Fail (questionable bandwidth limit channel 7 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 7 status event register is set to “1.”
8	Channel 8 Bandwidth Test Fail (questionable bandwidth limit channel 8 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 8 status event register is set to “1.”
9	Channel 9 Bandwidth Test Fail (questionable bandwidth limit channel 9 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 9 status event register is set to “1.”
10	Channel 10 Bandwidth Test Fail (questionable bandwidth limit channel 10 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 10 status event register is set to “1.”
11	Channel 11 Bandwidth Test Fail (questionable bandwidth limit channel 11 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 11 status event register is set to “1.”
12	Channel 12 Bandwidth Test Fail (questionable bandwidth limit channel 12 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 12 status event register is set to “1.”
13	Channel 13 Bandwidth Test Fail (questionable bandwidth limit channel 13 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 13 status event register is set to “1.”
14	Channel 14 Bandwidth Test Fail (questionable bandwidth limit channel 14 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 14 status event register is set to “1.”
15	Not used	Always 0

Issuing the ***CLS** command will clear all bits from the questionable bandwidth limit status

event register.

Table B-11 Status Bit Definitions of the Questionable Bandwidth Limit Extra Status Condition Register

Bit Position	Name	Description
0	Not used	Always 0
1	Channel 15 Bandwidth Test Fail (questionable bandwidth limit channel 15 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 15 status event register is set to “1.”
2	Channel 16 Bandwidth Test Fail (questionable bandwidth limit channel 16 status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel 16 status event register is set to “1.”
3 - 15	Not used	Always 0

Issuing the ***CLS** command will clear all bits from the questionable bandwidth limit extra status event register.

Table B-12 **Status Bit Definitions of the Questionable Bandwidth Limit Channel {1-16} Status Condition Register**

Bit Position	Name	Description
0	Trace 15, 16 Bandwidth Test summary (questionable bandwidth limit channel {1-16} extra status register summary)	Set to “1” while one of the enabled bits in the questionable bandwidth limit channel {1-16} extra status event register is set to “1.”
1	Trace 1 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 1.
2	Trace 2 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 2.
3	Trace 3 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 3.
4	Trace 4 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 4.
5	Trace 5 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 5.
6	Trace 6 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 6.
7	Trace 7 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 7.
8	Trace 8 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 8.
9	Trace 9 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 9.
10	Trace 10 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 10.
11	Trace 11 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 11.
12	Trace 12 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 12.
13	Trace 13 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 13.
14	Trace 14 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 14.
15	Not used	Always 0

Issuing the ***CLS** command will clear all the bits in the questionable bandwidth limit

channel {1-16} status event register.

Table B-13 Status Bit Definitions of the Questionable Bandwidth Limit Channel {1-16} Extra Status Condition Register

Bit Position	Name	Description
0	Not used	Always 0
1	Trace 15 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 15.
2	Trace 16 Bandwidth Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the bandwidth test result for trace 16.
3 - 15	Not used	Always 0

Issuing the ***CLS** command will clear all the bits in the questionable bandwidth limit channel {1-16} extra status event register.

Table B-14 Status Bit Definitions of the Questionable Ripple Limit Status Condition Register

Bit Position	Name	Description
0	Channel 15, 16 Limit Test summary (questionable ripple limit extra status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit extra status event register is set to “1.”
1	Channel 1 Ripple Test Fail (questionable ripple limit channel 1 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 1 status event register is set to “1.”
2	Channel 2 Ripple Test Fail (questionable ripple limit channel 2 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 2 status event register is set to “1.”
3	Channel 3 Ripple Test Fail (questionable ripple limit channel 3 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 3 status event register is set to “1.”
4	Channel 4 Ripple Test Fail (questionable ripple limit channel 4 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 4 status event register is set to “1.”
5	Channel 5 Ripple Test Fail (questionable ripple limit channel 5 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 5 status event register is set to “1.”
6	Channel 6 Ripple Test Fail (questionable ripple limit channel 6 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 6 status event register is set to “1.”
7	Channel 7 Ripple Test Fail (questionable ripple limit channel 7 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 7 status event register is set to “1.”
8	Channel 8 Ripple Test Fail (questionable ripple limit channel 8 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 8 status event register is set to “1.”
9	Channel 9 Ripple Test Fail (questionable ripple limit channel 9 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 9 status event register is set to “1.”
10	Channel 10 Ripple Test Fail (questionable ripple limit channel 10 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 10 status event register is set to “1.”
11	Channel 11 Ripple Test Fail (questionable ripple limit channel 11 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 11 status event register is set to “1.”
12	Channel 12 Ripple Test Fail (questionable ripple limit channel 12 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 12 status event register is set to “1.”
13	Channel 13 Ripple Test Fail (questionable ripple limit channel 13 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 13 status event register is set to “1.”
14	Channel 14 Ripple Test Fail (questionable ripple limit channel 14 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 14 status event register is set to “1.”
15	Not used	Always 0

Issuing the ***CLS** command will clear all bits from the questionable ripple limit status

event register.

Table B-15 Status Bit Definitions of the Questionable Ripple Limit Extra Status Condition Register

Bit Position	Name	Description
0	Not used	Always 0
1	Channel 15 Ripple Test Fail (questionable ripple limit channel 15 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 15 status event register is set to “1.”
2	Channel 16 Ripple Test Fail (questionable ripple limit channel 16 status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel 16 status event register is set to “1.”
3 - 15	Not used	Always 0

Issuing the ***CLS** command will clear all bits from the questionable ripple limit extra status event register.

Table B-16 **Status Bit Definitions of the Questionable Ripple Limit Channel {1-16} Status Condition Register**

Bit Position	Name	Description
0	Trace 15, 16 Ripple Test summary (questionable ripple limit channel {1-16} extra status register summary)	Set to “1” while one of the enabled bits in the questionable ripple limit channel {1-16} extra status event register is set to “1.”
1	Trace 1 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 1.
2	Trace 2 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 2.
3	Trace 3 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 3.
4	Trace 4 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 4.
5	Trace 5 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 5.
6	Trace 6 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 6.
7	Trace 7 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 7.
8	Trace 8 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 8.
9	Trace 9 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 9.
10	Trace 10 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 10.
11	Trace 11 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 11.
12	Trace 12 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 12.
13	Trace 13 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 13.
14	Trace 14 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 14.
15	Not used	Always 0

Issuing the ***CLS** command will clear all the bits in the questionable ripple limit channel

{1-16} status event register.

Table B-17 Status Bit Definitions of the Questionable Ripple Limit Channel {1-16} Extra Status Condition Register

Bit Position	Name	Description
0	Not used	Always 0
1	Trace 15 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 15.
2	Trace 16 Ripple Test Fail	Set to “0” when a measurement cycle begins; set to “1” when the measurement cycle finishes and returns “fail” as the ripple test result for trace 16.
3 - 15	Not used	Always 0

Issuing the ***CLS** command will clear all the bits in the questionable ripple limit channel {1-16} extra status event register.

Using the Status Reporting System

You can manage the status report system using the following commands in any combination:

- *CLS on page 286
- *SRE on page 290
- *STB? on page 291
- *ESE on page 287
- *ESR? on page 287
- :STAT:PRES on page 711
- :STAT:OPER:ENAB on page 708
- :STAT:OPER:COND? on page 707
- :STAT:OPER? on page 707
- :STAT:OPER:PTR on page 710
- :STAT:OPER:NTR on page 709
- :STAT:QUES:ENAB on page 729
- :STAT:QUES:COND? on page 728
- :STAT:QUES? on page 711
- :STAT:QUES:PTR on page 747
- :STAT:QUES:NTR on page 746
- :STAT:QUES:LIM:ENAB on page 743
- :STAT:QUES:LIM:COND? on page 739
- :STAT:QUES:LIM? on page 730
- :STAT:QUES:LIM:PTR on page 745
- :STAT:QUES:LIM:NTR on page 744
- :STAT:QUES:LIM:ELIM:ENAB on page 740
- :STAT:QUES:LIM:ELIM:COND? on page 740
- :STAT:QUES:LIM:ELIM? on page 739
- :STAT:QUES:LIM:ELIM:PTR on page 742
- :STAT:QUES:LIM:ELIM:NTR on page 741
- :STAT:QUES:LIM:CHAN{1-16}:ENAB on page 736
- :STAT:QUES:LIM:CHAN{1-16}:COND? on page 730
- :STAT:QUES:LIM:CHAN{1-16}? on page 730
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- :STAT:QUES:LIM:CHAN{1-16}:ECH:ENAB on page 733
- :STAT:QUES:LIM:CHAN{1-16}:ECH:COND? on page 732
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- :STAT:QUES:BLIM:ELIM:ENAB on page 722
- :STAT:QUES:BLIM:ELIM:COND? on page 721
- :STAT:QUES:BLIM:ELIM? on page 721
- :STAT:QUES:BLIM:ELIM:PTR on page 724
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- :STAT:QUES:BLIM:CHAN{1-16}:ENAB on page 718
- :STAT:QUES:BLIM:CHAN{1-16}:COND? on page 712
- :STAT:QUES:BLIM:CHAN{1-16}? on page 712
- :STAT:QUES:BLIM:CHAN{1-16}:PTR on page 720
- :STAT:QUES:BLIM:CHAN{1-16}:NTR on page 719
- :STAT:QUES:BLIM:CHAN{1-16}:ECH:ENAB on page 715
- :STAT:QUES:BLIM:CHAN{1-16}:ECH:COND? on page 714
- :STAT:QUES:BLIM:CHAN{1-16}:ECH? on page 714
- :STAT:QUES:BLIM:CHAN{1-16}:ECH:PTR on page 717
- :STAT:QUES:BLIM:CHAN{1-16}:ECH:NTR on page 716
- :STAT:QUES:RLIM:ENAB on page 761
- :STAT:QUES:RLIM:COND? on page 756
- :STAT:QUES:RLIM? on page 748
- :STAT:QUES:RLIM:PTR on page 763
- :STAT:QUES:RLIM:NTR on page 762
- :STAT:QUES:RLIM:ELIM:ENAB on page 758
- :STAT:QUES:RLIM:ELIM:COND? on page 757
- :STAT:QUES:RLIM:ELIM? on page 757
- :STAT:QUES:RLIM:ELIM:PTR on page 760
- :STAT:QUES:RLIM:ELIM:NTR on page 759
- :STAT:QUES:RLIM:CHAN{1-16}:ENAB on page 754
- :STAT:QUES:RLIM:CHAN{1-16}:COND? on page 748
- :STAT:QUES:RLIM:CHAN{1-16}? on page 748
- :STAT:QUES:RLIM:CHAN{1-16}:PTR on page 756
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- :STAT:QUES:RLIM:CHAN{1-16}:ECH:COND? on page 750
- :STAT:QUES:RLIM:CHAN{1-16}:ECH? on page 750
- :STAT:QUES:RLIM:CHAN{1-16}:ECH:PTR on page 753
- :STAT:QUES:RLIM:CHAN{1-16}:ECH:NTR on page 752

For sample programs that demonstrate the use of the commands listed above, refer to “Using the status register” on page 132 in Chapter 5 or “Obtaining Test Results” on page 181 in Chapter 8.

C Comparing Commands on the 8753ES and E5070B/E5071B

The following table presents a comparison of commands on the Agilent 8753ES and Agilent E5070B/E5071B, listed alphabetically by function.

8753ES vs. E5070B/E5071B Command Correspondence (by function)

Function	Item to be specified/executed		Command (For footnotes, see page 928.)		Remarks
			8753ES	E5070B/E5071B	
Measurement	Reset		**PRES**	**:SYST:PRES**	After execution, the ***RST** on the E5070B/E5071B set the trigger state to Hold.
			RST	***RST**	
	Setting up the active channel	Channel 1	**CHAN1**	**:DISP:WIND{1-16}:ACT** (Setting up the active channel) or **:CALC{1-16}:PAR{1-16}:SEL** (Setting up an active trace on each channel)	The outline of channels and traces on the E5070B/E5071B is described in the "User's Guide."
		Channel 2	**CHAN2**		
		Channel 3	**CHAN3**		
		Channel 4	**CHAN4**		
	Reading the active channel		**OUTPCHAN**	**:DISP:WIND{1-16}:ACT?** (Reading the active channel) or **:CALC{1-16}:PAR{1-16}:SEL?** (Reading the active trace on each channel)	
	Selection of measurement parameters	S11	**S11**[*1]	**:CALC{1-16}:PAR{1-16}:DEF S11**[*2]	
			RFLP[*1]		
		S21	**S21**[*1]	**:CALC{1-16}:PAR{1-16}:DEF S21**[*2]	
			TRAP[*1]		
		S12	**S12**[*1]	**:CALC{1-16}:PAR{1-16}:DEF S12**[*2]	
		S22	**S22**[*1]	**:CALC{1-16}:PAR{1-16}:DEF S22**[*2]	
		Aux Input	**ANAI**[*1]	Not available	E5070B/E5071B can select S-parameters and absolute measurement parameters.
		A/R	**AR**[*1]		
		B/R	**BR**[*1]		
		A/B	**AB**[*1]		
		A	**MEASA**[*1]		
		B	**MEASB**[*1]		
		R	**MEASR**[*1]		
		Designates a test port when parameters other than S-parameters are selected.	**TSTP**[*1]		
	S-parameters conversion	Turning off the transformation function	**CONVOFF**[*1]	**:CALC{1-16}:CONV**[*3]	
		Impedance (reflection)	**CONVZREF**[*1]	**:CALC{1-16}:CONV:FUNC ZREF**[*3]	
		Impedance (transmission)	**CONVZTRA**[*1]	**:CALC{1-16}:CONV:FUNC ZTR**[*3]	
		Admittance (reflection)	**CONVYREF**[*1]	**:CALC{1-16}:CONV:FUNC YREF**[*3]	
		Admittance (transmission)	**CONVYTRA**[*1]	**:CALC{1-16}:CONV:FUNC YTR**[*3]	
		1/S	**CONV1DS**[*1]	**:CALC{1-16}:CONV:FUNC INV**[*3]	

Function	Item to be specified/executed		Command (For footnotes, see page 928.)		Remarks
			8753ES	E5070B/E5071B	
Measurement (cont'd.)	Setting up display formats (data formats)	Log magnitude format	**LOGM**[*1]	**:CALC{1-16}:FORM MLOG**[*3]	When the data format for the E5070B/E5071B is defined in Smith chart or polar format, the format for reading marker values is defined at the same time.
		Phase format	**PHAS**[*1]	**:CALC{1-16}:FORM PHAS**[*3]	
		Group delay format	**DELA**[*1]	**:CALC{1-16}:FORM GDEL**[*3]	
		Smith chart format	**SMIC**[*1]	**:CALC{1-16}:FORM SLIN**[*3] **:CALC{1-16}:FORM SLOG** **:CALC{1-16}:FORM SCOM** **:CALC{1-16}:FORM SMI** **:CALC{1-16}:FORM SADM**	
		Polar format	**POLA**[*1]	**:CALC{1-16}:FORM PLIN**[*3] **:CALC{1-16}:FORM PLOG** **:CALC{1-16}:FORM POL**	
		Linear magnitude format	**LINM**[*1]	**:CALC{1-16}:FORM MLIN**[*3]	
		SWR format	**SWR**[*1]	**:CALC{1-16}:FORM SWR**[*3]	
		Real format	**REAL**[*1]	**:CALC{1-16}:FORM REAL**[*3]	
		Imaginary format	**IMAG**[*1]	**:CALC{1-16}:FORM IMAG**[*3]	
	Sweep type selection	Linear sweep	**LINFREQ**[*1*4]	**:SENS{1-16}:SWE:TYPE LIN**[*5]	With the E5070B/E5071B, you cannot select the CW TIME seep.
		Log sweep	**LOGFREQ**[*1*4]	**:SENS{1-16}:SWE:TYPE LOG**[*5]	
		List sweep	**LISFREQ**[*1*4]	**:SENS{1-16}:SWE:TYPE SEGM**[*5]	
		Power sweep	**POWS**[*1*4]	**:SENS{1-16}:SWE:TYPE POW**[*5]	
		CW TIME sweep	**CWTIME**[*1*4]	Not available	
	Setting up the sweep range	Start value	**STAR**[*1*4]	**:SENS{1-16}:FREQ:STAR**[*5] **:SOUR{1-16}:POW:STAR**[*5]	
		Stop value	**STOP**[*1*4]	**:SENS{1-16}:FREQ:STOP**[*5] **:SOUR{1-16}:POW:STOP**[*5]	
		Center value	**CENT**[*1*4]	**:SENS{1-16}:FREQ:CENT**[*5] **:SOUR{1-16}:POW:CENT**[*5]	
		Span value	**SPAN**[*1*4]	**:SENS{1-16}:FREQ:SPAN**[*5] **:SOUR{1-16}:POW:SPAN**[*5]	
	Sweep time	Setting up the sweep time	**SWET**[*1*4]	**:SENS{1-16}:SWE:TIME**[*5]	
		Automatic setting to the shortest time	**SWEA**[*1*4]	**:SENS{1-16}:SWE:TIME:AUTO ON**[*5]	
	Specifying the number of points		**POIN**[*1*4]	**:SENS{1-16}:SWE:POIN**[*5]	
	Specifying the IF bandwidth		**IFBW**[*1*4]	**:SENS{1-16}:BAND**[*5]	
	Averaging	On/Off setting	**AVERO**[*1*4]	**:SENS{1-16}:AVER**[*5]	
		Specifying the number of times	**AVERFACT**[*1*4]	**:SENS{1-16}:AVER:COUN**[*5]	
		Restart	**AVERREST**[*1*4]	**:SENS{1-16}:AVER:CLE**[*5]	
	Specifying the power level		**POWE**[*1*4]	**:SOUR{1-16}:POW**[*5]	When the power range setting in one channel differs from that in another channel on the 8753ES, a sweep is not performed on channels whose settings are different from those on the active channel.

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Measurement (cont'd.)	Setting the power range	Setting the range		**POWR**[*1*4]	**:SOUR{1-16}:POW:ATT**[*5] (attenuator settings)	The E5070B/E5071B is compatible with Options 214, 314, and 414 only. When the power range setting in one channel differs from that in another channel on the 8753ES, a sweep is not performed on channels whose settings are different from those on the active channel.
				PRAN[*1*4]		
		Auto/Manual setting for range changeover		**PWRR**[*1*4]	Not available	
	Attenuator settings	Port 1		**ATTP1**[*1*4]	**:SOUR{1-16}:POW:ATT**[*5]	
		Port 2		**ATTP2**[*1*4]		
	Power slope	On/Off		**SLOPO**[*1*4]	**:SOUR{1-16}:POW:SLOP:STAT**[*5]	
		Specifying values		**SLOPE**[*1*4]	**:SOUR{1-16}:POW:SLOP**[*5]	
	Couple/Uncouple setting for the power level	Between ports		**PORTP**[*1*4]	**:SOUR{1-16}:POW:PORT:COUP**[*5]	On the E5070B/E5071B, coupling does not work between channels.
		Between channels		**COUP**	Not available	
	Turning the signal source output On/Off			**POWT**	**:OUTP**	The 8753ES and E5070B/E5071B are both effective on all channels.
				SOUP		
	Editing the list frequency sweep table	Start of editing		**EDITLIST**	**:SENS{1-16}:SEGM:DATA**[*5]	The E5070B/E5071B uses one command to edit segments. A segment table also exists for each channel. The 8753ES uses more than one command to set up a segment. Two types of segments can be set up: one for channels 1 and 3 and the other for channels 2 and 4.
		End of editing		**EDITDONE**		
		Deleting an entire table		**CLEL**		
				CLEAL		
		Editing segments	Selection	**SEDI**		
			End	**SDON**		
			Addition	**SADD**		
			Deletion	**SDEL**		
			Start value	**STAR**		
			Stop value	**STOP**		
			Center value	**CENT**		
			Span value	**SPAN**		
			Number of points	**POIN**		
			Sweep step value	**STPSIZE**		
			IFBW settings are Valid/Not valid.	**LISIFBWM**		
			IFBW settings	**SEGIFBW**		
			Power settings are Valid/Not valid.	**LISPWRM**		
			Power	**SEGPOWER**		

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Measurement (cont'd.)	Selecting list mode	Stepped mode		**LISTTYPELSTP**	**:SENS{1-16}:SWE:GEN STEP**	On the E5070B/E5071B, the IF bandwidth and power level can be set segment by segment even in swept mode.In addition, you can select stepped/swept mode for the linear sweep.
		Swept mode		**LISTTYPELSWP**	**:SENS{1-16}:SWE:GEN ANAL**	
	Setting up segments for the list frequency sweep	All segments are used.		**ASEG**	Not available	In its segment sweep operation, the E5070B/E5071B sweeps all segments.
		Only designated segments are used.		**SSEG**	Not available	
	Smoothing	On/Off setting		**SMOOO**[*1]	**:CALC{1-16}:SMO**[*3]	
		Setting up the smoothing aperture		**SMOOAPER**[*1]	**:CALC{1-16}:SMO:APER**[*3]	
		Reading the smoothing aperture	%	**SMOOAPER?**[*1]	**:CALC{1-16}:SMO:APER?**[*3]	
			Unit for stimulus values	**OUTPAPER**[*1]	Not available	
	Setting the electrical delay	Setting values		**ELED**[*1]	**:CALC{1-16}:CORR:EDEL:TIME**[*3]	
		Setting types	Coaxial cable	**COAD**[*1]	Not available	The E5070B/E5071B is compatible with coaxial cables only.
			A waveguide is selected and the cut-off frequency is specified.	**WAVD**[*1]	Not available	
	Specifying the phase offset			**PHAO**[*1]	**:CALC{1-16}:CORR:OFFS:PHAS**[*3]	
	Setting sweep conditions at Couple/Uncouple between channels			**COUC**	Traces are coupled on the same channel and not coupled between channels.	On the 8753ES, coupling between channels 1 and 2 is set at On/Off. Channels 1 and 3 and channels 2 and 4 are always coupled.
	Setting the trigger mode	Continuous sweep		**CONT**[*1*4]	**:INIT{1-16}:CONT ON**[*5]	On the E5070B/E5071B, the number of triggers required for the specified number of sweeps differs.
				FRER[*1*4]		
		Single sweep		**SING**[*1*4]	**:ABOR** **:INIT{1-16}:CONT OFF**[*5] **:INIT{1-9}** (These commands must be sent.)	
		specifying number of sweeps		**NUMG**[*1*4]	**:TRIG:AVER ON**	
		Hold		**HOLD**[*1*4]	**:INIT{1-16}:CONT OFF**[*5]	
		Setting up external trigger	Per sweep	**EXTTON**	**:TRIG:SOUR EXT**[*5] **:TRIG:POIN OFF**	On the E5070B/E5071B, the per-sweep setting is valid when the external trigger mode is ON. A manual trigger at each point is not available. The external trigger line is set to Low.
			Per point	**EXTTPOIN**	**:TRIG:POIN ON**	
			Off	**EXTTOFF**	In **:TRIG:SOUR**, setting the parameter to **EXT** causes external trigger mode to automatically turn OFF.	
			Trigger line High	**EXTTHIGH**	Not available	
			Trigger line Low	**EXTTLOW**	Not available	
		Manual (at each point)		**MANTRIG**	Not available	
	Suspend sweep and then resume.			**REST**	Not available	
	Specifying the signal source frequency for the power level sweep or CW TIME sweep			**CWFREQ**[*1*4]	**:SENS{1-16}:FREQ**	

Function	Item to be specified/executed		Command (For footnotes, see page 928.)		Remarks
			8753ES	E5070B/E5071B	
Screen display	Setting up the active channel	Channel 1	**CHAN1**	**:DISP:WIND{1-16}:ACT** (Setting up the active channel) or **:CALC{1-16}:PAR{1-16}:SEL** (Setting up the active trace)	The concepts of a channel and a trace on the E5070B/E5071B are different. For more information, refer to the individual Userís Guides.
		Channel 2	**CHAN2**		
		Channel 3	**CHAN3**		
		Channel 4	**CHAN4**		
	Reading the active channel		**OUTPCHAN**	**:DISP:WIND{1-16}:ACT?** (Reading the active channel) or **:CALC{1-16}:PAR{1-16}:SEL?** (Reading the active trace)	
	Channel memory	Copying a data trace into the channel memory.	**DATI**[*1]	**:CALC{1-16}:MATH:MEM**[*3]	
		Display a data trace only.	**DISPDATA**[*1]	**:DISP:WIND{1-16}:TRAC{1-16}:STAT ON**[*2] **:DISP:WIND{1-16}:TRAC{1-16}:MEM OFF**[*2] **:CALC{1-16}:MATH:FUNC NORM**[*3] (All three commands above must be sent.)	The last command to be sent by the E5070B/E5071B is the one effective for the active trace. This requires the trace in question to be made the active one before being sent.
		The data trace and memory trace are displayed at the same time.	**DISPDATM**[*1]	**:DISP:WIND{1-16}:TRAC{1-16}:STAT ON**[*2] **:DISP:WIND{1-16}:TRAC{1-16}:MEM ON**[*2] **:CALC{1-16}:MATH:FUNC NORM**[*3] (All three commands above must be sent.)	
		Display the result of dividing the data trace by the memory trace.	**DISPDDM**[*1] **DIVI**[*1]	**:DISP:WIND{1-16}:TRAC{1-16}:STAT ON**[*2] **:DISP:WIND{1-16}:TRAC{1-16}:MEM OFF**[*2] **:CALC{1-16}:MATH:FUNC DIV**[*3] (All three commands above must be sent.)	
		Display the result of dividing the data trace by the memory trace.	**DISPDMM**[*1] **MINU**[*1]	**:DISP:WIND{1-16}:TRAC{1-16}:STAT ON**[*2] **:DISP:WIND{1-16}:TRAC{1-16}:MEM OFF**[*2] **:CALC{1-16}:MATH:FUNC SUBT**[*3] (All three commands above must be sent.)	
		Display the memory trace only.	**DISPMEMO**[*1]	**:DISP:WIND{1-16}:TRAC{1-16}:STAT OFF**[*2] **:DISP:WIND{1-16}:TRAC{1-16}:MEM ON**[*2] (Both commands above must be sent.)	
		Sending the title to the memory trace	**TITTMEM**[*1]	Not available	

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Screen display (cont'd.)	Turns off the frequency display on the LCD.			**FREO**	**:DISP:ANN:FREQ OFF**	The 8753ES and E5070B/E5071B are both effective on all channels.
	Display channel 2 data/channel 1 data in channel 2.			**D1DIVD2**	Not available	
	On/Off setting for Channels 3 and 4			**AUXC**	**:CALC{1-16}:PAR{1-16}:COUN** (Specifying the number of traces) enables you to perform the equivalent.	
	On/Off setting for simultaneous display of two channels			**DUAC**	**:DISP:SPL** (Setting up a window array in a channel) and **:DISP:WIND{1-16}:SPL** (Setting up an array of trace graphs) are combined to perform the equivalent.	
	Graph layout	On/Off setting for display splitting		**SPLD**	**:DISP:SPL** (Setting up a window array in a channel) and **:DISP:WIND{1-16}:SPL** (Setting up an array of trace graphs) are combined to perform the equivalent.	
		Specifying the number of screens	1	**SPLID1**		
			2	**SPLID2**		
			4	**SPLID4**		
		Upper screen (Channels 1 and 2) and lower screen (Channels 3 and 4)		**D2XUPCH2**	Not available	
		Upper screen (Channels 1 and 3) and lower screen (Channels 2 and 4)		**D2XUPCH3**	**:DISP:SPL** (Setting up a window array in a channel) and **:DISP:WIND{1-16}:SPL** (Setting up an array of trace graphs) are combined to perform the equivalent.	
		Upper left (Channel 1), upper right (Channel 2), lower left (Channel 3), lower right (Channel 4)		**D4XUPCH2**		
		Upper left (Channel 1), upper right (Channel 3), lower left (Channel 2), lower right (Channel 4)		**D4XUPCH3**	Not available	
	Setting up a scale	Executing autoscale		**AUTO**[*1]	**:DISP:WIND{1-16}:TRAC{1-16}:Y:AUTO**[*2]	
		Setting values		**SCAL**[*1]	**:DISP:WIND{1-16}:TRAC{1-16}:Y:PDIV**[*2]	
	Setting the reference line	Position		**REFP**[*1]	**:DISP:WIND{1-16}:TRAC{1-16}:Y:RLEV**[*2]	On the 8753ES, reference lines are set at graticule lines 1 to 10. The E5070B/E5071B allows the number of graticule lines to be changed; you can place as many graticule lines as you need, from zero to the specified number of lines.
		Value		**REFV**[*1]	**:DISP:WIND{1-16}:TRAC{1-16}:Y:RPOS**[*2]	

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Screen display (cont'd.)	List display		Start	**LISV**[*1]	Not available	The E5070B/E5071B does not have a list display function.
			To next page	**NEXP**[*1]		
			To previous page	**PREP**[*1]		
			Return to the display of measurement results.	**RESD**[*1]		
	Displaying the softkey area		On	**MENUON**	**:DISP:SKEY ON**	
			Off	**MENUOFF**	**:DISP:SKEY OFF**	
	Title		Read	**OUTPTITL**	**:DISP:WIND{1-16}:TITL:DATA?**[*5]	
			Setup	**TITL**	**:DISP:WIND{1-16}:TITL:DATA**[*5]	
	Display the Instrument State status list.			**OPEP**	Not available	The E5070B/E5071B does not have the function of displaying the Instrument State status list.
	Return the color settings to the initial state.			**DEFC**	**:DISP:COL{1-2}:RES**	
	Selecting the object for which colors are set up	Data trace Limit line	Channel 1	**COLOCH1D**	**:DISP:COL{1-2}:TRAC{1-16}:DATA** **:DISP:COL{1-2}:TRAC{1-16}:MEM** **:DISP:COL{1-2}:LIM{1-2}** **:DISP:COL{1-2}:GRAT{1-2}** **:DISP:COL{1-2}:BACK**	
			Channel 2	**COLOCH2D**		
			Channel 3	**COLOCH3D**		
			Channel 4	**COLOCH4D**		
		Memory trace	Channel 1	**COLOCH1M**		
			Channel 2	**COLOCH2M**		
			Channel 3	**COLOCH3M**		
			Channel 4	**COLOCH4M**		
		Others	Graticule lines	**COLOGRAT**		
			Reference line	**COLOLREF**		
			Character string	**COLOTEXT**		
			Warning message	**COLOWARN**		
	Changing colors		Returning to initial values	**RSCO**		
			Tint	**TINT**		
			Color saturation	**COLOR**		
			Brightness	**CBRI**		
	Specifying the screen brightness			**BACI**	Not available	The E5070B/E5071B allows On/Off setting for backlighting only.
				INTE		
	On/Off setting for the LCD displaying.			**BLAD**	**:SYST:BACK** (On/Off setting for the backlighting)	When the E5070B/E5071B is turned ON, the 8753ES is turned OFF, and vice versa.

Function	Item to be specified/executed		Command (For footnotes, see page 928.)		Remarks
			8753ES	E5070B/E5071B	
Calibration	Displaying the softkeys in the calibration menu		**CAL1**	Not available	
	Selecting a calibration kit	2.4 mm Calibration Kit (85056A/D)	**CALK24MM**[*6]	**:SENS{1-16}:CORR:COLL:CKIT**[*5]	
		2.92 mm Calibration Kit	**CALK292MM**[*6]		
		2.92 mm Calibration Kit (85056K)	**CALK292S**[*6]		
		3.5 mm Calibration Kit (85033C)	**CALK35MC**[*6]		
		3.5 mm Calibration Kit (85033D)	**CALK35MD**[*6]		
		7-16 Calibration Kit (85038)	**CALK716**[*6]		
		7 mm Calibration Kit (85031B)	**CALK7MM**[*6]		
		N-type 50 Calibration Kit (85032B/E)	**CALKN50**[*6]		
		N-type 75 Calibration Kit (85036B/E)	**CALKN75**[*6]		
		TRL 3.5 mm Calibration Kit (85052C)	**CALKTRLK**[*6]		
		User-defined calibration kit	**CALKUSED**[*6]		
	Starting the calibration	Forward enhanced response calibration	**CALIERC**[*1]	**:SENS{1-16}:CORR:COLL:METH:ERES**[*5]	
		Reverse enhanced response calibration	**CALIRERC**[*1]		
		Response calibration	**CALIRESP**[*1]	**:SENS{1-16}:CORR:COLL:METH:OPEN**[*5] **or** **:SENS{1-16}:CORR:COLL:METH:SHOR**[*5] **or** **:SENS{1-16}:CORR:COLL:METH:THRU**[*5]	The E5070B/E5071B uses different commands depending on the standard used. Isolation can be performed optionally. Calibration type can be set after measuring standard on the E5070B/E5071B
		Response & isolation calibration	**CALIRAI**[*1]		
		S11 1-port calibration	**CALIS111**[*1]	**:SENS{1-16}:CORR:COLL:METH:SOLT1**[*5]	The E5070B/E5071B requires a port to be assigned to a command parameter.
		S22 1-port calibration	**CALIS221**[*1]		
		Full 2-port calibration	**CALIFUL2**[*1]	**:SENS{1-16}:CORR:COLL:METH:SOLT2**[*5]	
		TRL*/LRM* Calibration	**CALITRL2**[*1]	**:SENS{1-16}:CORR:COLL:METH:TRL2**[*5]	VBA also supports the TRL calibration function.

Function	Item to be specified/executed		Command (For footnotes, see page 928.)		Remarks
			8753ES	E5070B/E5071B	
Calibration (cont'd.)	Finishing the calibration and calculating the calibration coefficients.	Forward enhanced response calibration	**ERCDONE**[*1]	**:SENS{1-16}:CORR:COLL:SAVE**[*5]	The E5070B/E5071B allows you to use the same command to finish calibration regardless of the type of calibration.
			SAVERC[*1]		
		Reverse enhanced response calibration	**RERCDONE**[*1]		
			SAVRERC[*1]		
		Response calibration	**RESPDONE**[*1]		
		Response & isolation calibration	**RAID**[*1]		
		S11 1-port calibration or S22 1-port calibration	**SAV1**[*1]		
		Full 2-port calibration	**SAV2**[*1]		
		TRL*/LRM* calibration	**SAVT**[*1]		VBA also supports the TRL calibration function
	Starting calibration data measurement	Reflection measurement (Enhanced response calibration)	**REFOP**[*1]	**:SENS{1-16}:CORR:COLL:OPEN**[*5] (Open) or **:SENS{1-16}:CORR:COLL:SHOR**[*5] (Short)	The E5070B/E5071B uses different commands depending on the standard used.
		Reflection measurement (2-port calibration)	**REFL**[*1]	Not available	
		Transmission measurement (enhanced response calibration)	**TRAOP**[*1]	**:SENS{1-16}:CORR:COLL:THRU**[*5]	The E5070B/E5071B performs both transmission and match measurements.
		Transmission measurement (2-port calibration)	**TRAN**[*1]	Not available	
		Forward transmission measurement (2-port calibration)	**FWDT**[*1]	**:SENS{1-16}:CORR:COLL:THRU**[*5]	The E5070B/E5071B performs both transmission and match measurements.
		Forward match measurement (2-port calibration)	**FWDM**[*1]		
		Reverse transmission measurement (2-port calibration)	**REVT**[*1]		
		Forward match measurement (2-port calibration)	**REVM**[*1]		
		Response measurement (response & isolation calibration)	**RAIRESP**[*1]	**:SENS{1-16}:CORR:COLL:OPEN**[*5] (Open) **:SENS{1-16}:CORR:COLL:SHOR**[*5] (Thru) **:SENS{1-16}:CORR:COLL:THRU**[*5] (Thru)	The E5070B/E5071B uses different commands depending on the standard used.
		Isolation measurement (response Åïisolation calibration)	**RAIISOL**[*1]	**:SENS{1-16}:CORR:COLL:ISOL**[*5]	
		Isolation measurement (enhanced response calibration)	**ISOOP**[*1]	**:SENS{1-16}:CORR:COLL:ISOL**[*5]	

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Calibration (cont'd.)	Starting calibration data measurement (cont'd.)	Isolation measurement (2-port calibration)		**ISOL**[*1]	Not available	
		Forward isolation measurement (2-port calibration)		**FWDI**[*1]	**:SENS{1-16}:CORR:COLL:ISOL**[*5]	
		Reverse isolation measurement (2-port calibration)		**REVI**[*1]	**:SENS{1-16}:CORR:COLL:ISOL**[*5]	
		S11A (OPEN) Measurement		**CLASS11A**[*1]	**:SENS{1-16}:CORR:COLL:OPEN**[*5]	
		S11B (SHORT) Measurement		**CLASS11B**[*1]	**:SENS{1-16}:CORR:COLL:SHOR**[*5]	
		S11C (LOAD) Measurement		**CLASS11C**[*1]	**:SENS{1-16}:CORR:COLL:LOAD**[*5]	
		S22A (OPEN) Measurement		**CLASS22A**[*1]	**:SENS{1-16}:CORR:COLL:OPEN**[*5]	
		S22B (SHORT) Measurement		**CLASS22B**[*1]	**:SENS{1-16}:CORR:COLL:SHOR**[*5]	
		S22C (LOAD) Measurement		**CLASS22C**[*1]	**:SENS{1-16}:CORR:COLL:LOAD**[*5]	
		Offset and LOAD measurement	Measurement without offset	**LOAN**[*1]	Not available	The E5070B/E5071B handles LOAD as a fixed load.
			Measurement with offset	**LOAO**[*1]		
		Sliding LOAD measurement	Measurement after sliding	**SLIS**[*1]	Not available	
			End	**SLID**[*1]		
		Selecting the standard to be measured (corresponding to the softkeys)	1st from the top	**STANA**[*1]	**:SENS{1-16}:CORR:COLL:SUBC{1-8}**	The E5070B/E5071B has eight different standards that can be registered in each calibration class.
			2nd from the top	**STANB**[*1]		
			3rd from the top	**STANC**[*1]		
			4th from the top	**STAND**[*1]		
			5th from the top	**STANE**[*1]		
			6th from the top	**STANF**[*1]		
			7th from the top	**STANG**[*1]		
		THRU measurement		**TRLT**[*1]	**:SENS{1-16}:CORR:COLL:TRLT**[*5]	VBA also supports the TRL calibration function.
		S11 Reflection measurement		**TRLR1**[*1]	**:SENS{1-16}:CORR:COLL:TRLR**[*5]	
		S22 Reflection measurement		**TRLR2**[*1]	**:SENS{1-16}:CORR:COLL:TRLL**[*5]	

Function	Item to be specified/executed		Command (For footnotes, see page 928.)		Remarks
			8753ES	E5070B/E5071B	
Calibration (cont'd.)	Starting calibration data measurement (cont'd.)	Port 1 Line/Match measurement	**TRLL1**[*1]	Not available	The E5070B/E5071B supports the TRL calibration function using VBA.
		Port 2 Line/Match measurement	**TRLL2**[*1]		
		Finishing measuring the standard	**DONE**[*1]	Not available	The 8753ES requires this to be executed when two or more standards exist in the calibration class.
	Finishing measuring calibration data	Reflection measurement	**REFD**[*1]	Not available	The E5070B/E5071B has no similar commands.
		Transmission measurement	**TRAD**[*1]	Not available	
		Isolation measurement	**ISOD**[*1]	Not available	
		Offset and LOAD measurement	**OFLD**[*1]	Not available	The E5070B/E5071B does not handle offset and LOAD.
	Setting error correction On/Off	On/Off setting	**CORR**[*1*4]	**:SENS{1-16}:CORR:STAT**[*5]	
		Setting to OFF	**CALN**[*1*4]	**:SENS{1-16}:CORR:STAT OFF**[*5]	
	On/Off setting for error correction by interpolation of calibration coefficients		**CORI**[*1*4]	Not available	Always On on the E5070B/E5071B
	Omitting the isolation measurement		**OMII**[*1]	Not available	On the E5070B/E5071B, isolation measurement is optional.
	Setting up the characteristic impedance of the measurement system		**SETZ**[*6]	**:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}:Z0**[*5] (Fixture simulator)	The E5070B/E5071B enables you to do the equivalent by using the fixture simulator.
	Specifying the velocity factor		**VELOFACT**[*6]	**:SENS{1-16}:CORR:RVEL:COAX**[*5]	
	Setting up port extension correction	On/Off	**PORE**[*6]	**:SENS{1-16}:CORR:EXT**[*5]	
		Corrected value for port 1	**PORT1**[*6]	**:SENS{1-16}:CORR:EXT:PORT**[*5]	
		Corrected value for port 2	**PORT2**[*6]		
		Corrected value for input A	**PORTA**[*6]	Not available	The E5070B/E5071B does not have the input port extension function.
		Corrected value for input B	**PORTB**[*6]		

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Calibration (cont'd.)	Adapter removal	Calling data	Port 1	**CALSPORT1**[*6]	Not available	
			Port 2	**CALSPORT2**[*6]		
		Setting the electrical delay for the adapter		**ADAP1**[*6]	Not available	
		Selecting the adapter	Coaxial cable	**ADPTCOAX**[*6]	Not available	
			Wave guide	**ADPTWAVE**[*6]	Not available	
		Calculating the calibration set		**MODS**[*6]	Not available	
	Selecting between alternate sweep and chop sweep	Alternate sweep		**ALTAB**[*6]	Not available	On the E5070B/E5071B, traces in the same channel are measured by the same method as the chop sweep. When traces belong to different channels, they are measured by the same method as the alternate sweep.
		Chop sweep		**CHOPAB**[*6]	Not available	
	Take4 mode	Turning Take4 mode On/Off		**TAKE4**	Not available	The E5070B/E5071B does not have the Take4 mode.
		Turning offset correction for the sampler and attenuator On/Off		**RAWOFFS**		
		Turning sampler correction On/Off		**SAMC**		
		Turning spur avoidance On/Off		**SM8**		
		Executing a sweep in Take4 mode		**SWPSTART**		
	Calibrating the receiver	Setting the power reference		**REIC**[*1]	Not available	
		Executing the receiver calibration		**TAKRS**[*1]	**:SENS{1-16}:CORR:REC{1-4}:COLL:ACQ**[*5]	
	Power meter calibration	Display the softkey for the power meter calibration to specify the power level.		**PWRMCAL**	Not available	
		Selecting a power meter		**POWM**	Not available	
		Starting a data sweep for power meter calibration		**TAKCS**[*1]	**:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL**[*5]	
		Editing the calibration coefficients table	Editing start	Sensor A	**CALFSENA**	Sensor A **:SOUR:POW:PORT:CORR:COLL:ASEN:RCF** **:SOUR:POW:PORT:CORR:COLL:TABL:ASEN:DATA**
				Sensor B	**CALFSENB**	
			Deleting the entire list		**CLEL**	
					CLEAL	
			Editing segments	Selection	**SEDI**	Sensor B **:SOUR:POW:PORT:CORR:COLL:BSEN:RCF** **:SOUR:POW:PORT:CORR:COLL:TABL:BSEN:DATA**
				Addition	**SADD**	
				Deletion	**SDEL**	
				End	**SDON**	
				Frequency	**CALFCALF**	
				Calibration coefficients	**CALFFREQ**	

Function	Item to be specified/executed				Command (For footnotes, see page 928.)		Remarks
					8753ES	E5070B/E5071B	
Calibration (cont'd.)	Power meter calibration (cont'd.)	Power loss list editing	Start		**POWLLIST**	**:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS:DATA**[*5]	
			Deleting the entire list		**CLEL**		
					CLEAL		
			Editing segments	Selection	**SEDI**		
				Addition	**SADD**		
				Deletion	**SDEL**		
				End	**SDON**		
				Frequency	**POWLFREQ**		
				Loss	**POWLLOSS**		
		Specifying the number of measurements per point			**NUMR**	**:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:AVER**[*5]	
		Defining the GPIB reading from the power meter as the title			**PMTRTTIT**	Not available	
		Selecting a power sensor		Sensor A	**USESENSA**[*1*4]	Not available	
				Sensor B	**USESENSB**[*1*4]		
		Executing a calibration	Per sweep		**PWMCEACS**[*1]	Not available	The E5070B/E5071B does not have per sweep mode.
			One time		**PWMCONES**[*1]	**:SOUR{1-16}:POW:PORT{1-4}:CORR**[*5]	
			Off		**PWMCOFF**[*1]		
		Specifying to Use/Not Use the power loss list			**PWRLOSS**[*1*4]	**:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS**[*5]	
	Defining the calibration kit	Start of defining the calibration kit			**MODI1**	Not available	The E5070B/E5071B has no command for starting/ending kit definition. The calibration kit assigned for each channel is already defined.
		End of defining the calibration kit			**STDD**	Not available	
		Setting up the calibration kit label			**LABK**	**:SENS{1-16}:CORR:COLL:CKIT:LAB**	
		Defining the selected calibration kit as a user calibration kit			**SAVEUSEK**	Not available	On the E5070B/E5071B, Any calibration kit numbers can be assigned as user calibration kits.
		Defining the calibration class	S11A (OPEN)		**SPECS11A**	**:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN**	The E5070B/E5071B uses a parameter to specify a port.
					SPECTRFM		
			S11B (SHORT)		**SPECS11B**	**:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR**	
					SPECTLFM		
			S11C (LOAD)		**SPECS11C**	**:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD**	
					SPECTLFT		
			S22A (OPEN)		**SPECS22A**	**:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN**	
					SPECTRRM		
			S22B (SHORT)		**SPECS22B**	**:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR**	
					SPECTLRM		
			S22C (LOAD)		**SPECS22C**	**:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD**	
					SPECTLRT		

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Calibration (cont'd.)	Defining the calibration kit (cont'd.)	Defining the calibration class (cont'd.)	Forward match	**SPECFWDM**	**:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU** (definition of the calibration class THRU)	Registering a standard in the THRU calibration class on the E5070B/E5071B is equivalent to registering one standard in four types of calibration classes on the 8753ES.
				SPECTTFM		
			Forward transmission	**SPECFWDT**		
				SPECTTFT		
			Reverse match	**SPECREVM**		
				SPECTTRM		
			Reverse transmission	**SPECREVT**		
				SPECTTRT		
			Response	**SPECRESP**	Not available	The E5070B/E5071B is not provided with any response class.
			Response & isolation	**SPECRESI**		
			TRL line/match	**SPECTRLL**	**:SENS{1-16}:CORR:COLL:CKIT:ORD;TRLL**	VBA also supports the TRL calibration function.
			TRL thru	**SPECTRLT**	**:SENS{1-16}:CORR:COLL:CKIT:ORD;TRLT**	
			TRL reflection	**SPECTRLR**	**:SENS{1-16}:CORR:COLL:CKIT:ORD;TRLR**	
			End of definitions	**CLAD**	Not available	
		Editing the calibration class label	S11A (OPEN)	**LABES11A**	Not available	The E5070B/E5071B does not allow you to edit the calibration class label.
				LABETRFM		
			S11B (SHORT)	**LABES11B**		
				LABETLFM		
			S11C (LOAD)	**LABES11C**		
				LABETLFT		
			S22A (OPEN)	**LABES22A**		
				LABETRRM		
			S22B (SHORT)	**LABES22B**		
				LABETLRM		
			S22C (LOAD)	**LABES22C**		
				LABETLRT		
			Forward match	**LABEFWDM**		
				LABETTFM		
			Forward transmission	**LABEFWDT**		
				LABETTFT		
			Reverse match	**LABEREVM**		
				LABETTRM		
			Reverse transmission	**LABEREVT**		
				LABETTRT		
			Response	**LABERESP**		
			Response & isolation	**LABERESI**		
			TRL line/match	**LABETRLL**		
			TRL thru	**LABETRLT**		
			TRL reflection	**LABETRLR**		
		Setting up the reference for the TRL*/LRM* calibration	Reflect	**SETRREFL**	**:SENS{1-16}:CORR:COLL:CKIT:TRL:RPL**	VBA also supports the TRL calibration function.
			Thru	**SETRTHRU**		
		Designating the number of the standard to be defined and starting definition of the standards		**DEFS**	Not available	

Function	Item to be specified/executed				Command (For footnotes, see page 928.)		Remarks
					8753ES	E5070B/E5071B	
Calibration (cont'd.)	Defining the calibration kit (cont'd.)	End of defining the standards			**KITD**	Not available	
		Setting up the standard label			**LABS**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:LAB**	
		Setting up the type of standard	OPEN standard		**STDTOPEN**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE OPEN**	
			SHORT standard		**STDTSHOR**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE SHOR**	
			LOAD standard		**STDTLOAD**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE LOAD**	
			THRU standard		**STDTDELA**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE THRU**	
			Arbitrary impedance		**STDTARBI**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE ARBI**	
		Specifying the calibrated value of a standard	Offset delay		**OFSD**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:DEL**	Setup items of the calibrated value are the same as standard type items.
			Offset loss		**OFSL**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:LOS**	
			Offset impedance		**OFSZ**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:Z0**	
			C0		**C0**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C0**	Setup is effective for the OPEN standard only. (8753ES/E5070B/E5071B Common)
			C1		**C1**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C1**	
			C2		**C2**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C2**	
			C3		**C3**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C3**	
			Terminal impedance		**TERI**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:ARB**	Setup can be performed only when Arbitrary Impedance is used for setup. (8753ES/E5070B/E5071B Common)
			Types of LOAD standards	Fixed	**FIXE**	Not available	The E5070B/E5071B handles all as fixed load.
				Sliding	**SLIL**		
				Offset	**OFLS**		
			Frequency range	Minimum	**MINF**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMIN**	The E5070B/E5071B does not allow you to set the frequency range.
				Maximum	**MAXF**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMAX**	
			Setting up the offset type	Coaxial cable	**COAX**	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:CHAR**	The E5070B/E5071B treats the offset type as a coaxial cable.
				Wave guide	**WAVE**		
		End of defining standards			**STDO**	Not available	The E5070B/E5071B does not have the command for ending definition.
		Options for TRL*/LRM* calibration.	Specifying the characteristic impedance	Standard	**CALZLINE**	**:SENS{1-16}:CORR:COLL:CKIT:TRL:IMP**	VBA also supports the TRL calibration function.
				System	**CALZSYST**		

Function	Item to be specified/executed				Command (For footnotes, see page 928.)		Remarks
					8753ES	E5070B/E5071B	
Calibration (cont'd.)	ECal	Setting up the active module		A	**ECALMODSELA**	Not available	E5070B/E5071B activate the ECal module connected first.
				B	**ECALMODSELB**		
		Executing calibration	Forward enhanced response calibration		**ECALERC**	**:SENS{1-16}:CORR:COLL:ECAL:ERES**	
			Reverse enhanced response calibration		**ECALRERC**		
			1-port calibration	S11	**ECALS11**	**:SENS{1-16}:CORR:COLL:ECAL:SOLT1 1**	
				S22	**ECALS22**	**:SENS{1-16}:CORR:COLL:ECAL:SOLT1 2**	
			Full 2-port calibration		**ECALS22**	**:SENS{1-16}:CORR:COLL:ECAL:SOLT2**	
			Turning the omission of isolation On/Off		**ECALOMII**	**:SENS{1-16}:CORR:COLL:ECAL:ISOL**	When the E5070B/E5071B is turned on, the 8753ES is turned off, and vice versa.
			Designating the averaging factor for isolation		**ECALISOAVG**	Not available	
		Module information	Reading the selected module		**ECALAB?**	Not available	
			Reading the product number and serial number		**ECALMODID**		
		Calibration frequency array	Reading the frequency array		**ECALFREQS**	Not available	
			Designating the size of the frequency array to be read		**ECALNFREQS**		
		Interruption	Turning Manual THRU Measurement On/Off		**ECALMANTHRU**	Not available	E5070B/E5071B can not pause the ECal.
			Reading during Interruption/Execution		**ECALPAUSED**		
			Resuming a suspended ECal		**ECALCONT**		

Function	Item to be specified/executed				Command (For footnotes, see page 928.)		Remarks
					8753ES	E5070B/E5071B	
Reading/Writing data	Transfer format designation		Intra-device binary format		**FORM1**	Not available	
			IEEE 32-bit floating point format		**FORM2**	**:FORM:DATA REAL32** **:FORM:BORD NORM**	
			IEEE 64-bit floating point format		**FORM3**	**:FORM:DATA REAL** **:FORM:BORD NORM**	
			ASCII format		**FORM4**	**:FORM:DATA ASC**	
			PC-DOS 32-bit floating point format		**FORM5**	**:FORM:DATA REAL32** **:FORM:BORD SWAP**	
	Raw data array	Array 1 (S11)	Read		**OUTPRAW1**[*1]	Not available	The E5070B/E5071B does not allow you to read/write the raw data array.
					OUTPRAF1[*1]		
			Write		**INPURAW1**[*1]		
		Array 2 (S21)	Read		**OUTPRAW2**[*1]		
					OUTPRAF2[*1]		
			Write		**INPURAW2**[*1]		
		Array 3 (S12)	Read		**OUTPRAW3**[*1]		
					OUTPRAF3[*1]		
			Write		**INPURAW3**[*1]		
		Array 4 (S22)	Read		**OUTPRAW4**[*1]		
					OUTPRAF4[*1]		
			Write		**INPURAW4**[*1]		
	Calibration coefficient array data		Before interpolating	Read	**OUTPCALC**[*1]	**:SENS{1-16}:CORR:COEF?**	You need to specify the calibration type with "**:SENS{1-16}:CORR:COEF:METH:xxxx**" in E5070B/E5071B before writing the calibration coefficient array. In E5070B/E5071B, the calibration coefficient array reads/writes the array after it interpolates it. Please refer to each command's explanation for details.
				Write	**INPUCALC**[*1]	**:SENS{1-16}:CORR:COEF**	
				End of writing	**SAVC**[*1]	**:SENS{1-16}:CORR:COEF:SAVE**	
			After interpolating	Read	**OUTPICAL{01-12}**[*1]	**:SENS{1-16}:CORR:COEF?**	
	Corrected data array		Read		**OUTPDATA**[*1]	**:CALC{1-16}:DATA:SDAT?**	The E5070B/E5071B does not have any high-speed data transfer command.
			Read (high-speed data transfer)		**OUTPDATF**[*1]		
			Write		**INPUDATA**[*1]	**:CALC{1-16}:DATA:SDAT**	
	Memory trace		Read		**OUTPMEMO**[*1]	**:CALC{1-16}:DATA:SMEM?**	The E5070B/E5071B does not have any high-speed data transfer command.
			Read (high-speed data transfer)		**OUTPMEMF**[*1]		
	Formatted data array		Read		**OUTPFORM**[*1]	**:CALC{1-16}:DATA:FDAT?**[*3]	The E5070B/E5071B does not have any high-speed data transfer command.
			Read (high-speed data transfer)		**OUTPFORF**[*1]		
			Write		**INPUFORM**[*1]	**:CALC{1-16}:DATA:FDAT**[*3]	

Function	Item to be specified/executed				Command (For footnotes, see page 928.)		Remarks
					8753ES	E5070B/E5071B	
Reading/Writing data (cont'd.)	Reading trace data at a designated point		Designating the point		**SELPT**[*1]	Not available	The E5070B/E5071B does not allow you to read trace data in a range that you have limited.
			Read		**OUTPDATP**[*1]		
	Reading trace data for a designated measurement range		Specifying the range	Upper limit value	**SELMAXPT**[*1]		
				Lower limit value	**SELMINPT**[*1]		
			Read		**OUTPDATR**[*1]		
	Reading a Pre-Raw Data Array (in Take4 mode)				**OUTPPRE**[*1]	Not available	The E5070B/E5071B does not allow you to read/write pre-raw data array.
	Calibration kit array data		Read		**OUTPCALK**	Not available	The E5070B/E5071B does not allow you to read/write the calibration kit array.
			Write		**INPUCALK**		
	Power meter calibration coefficient array	Port 1	Before interpolating	Read	**OUTPPMCAL1**	Not available	
				Write	**INPUPMCAL1**	Not available	
			After interpolating	Read	**OUTPIPMCL1**	**:SOUR{1-16}:POW:PORT1:CORR:DATA?**	
				Write	Not available	**:SOUR{1-16}:POW:PORT1:CORR:DATA**	
		Port 2	Before interploating	Read	**OUTPPMCAL2**	Not available	
				Write	**INPUPMCAL2**	Not available	
			After interpolating	Read	**OUTPIPMCL2**	**:SOUR{1-16}:POW:PORT2:CORR:DATA?**	
				Write	Not available	**:SOUR{1-16}:POW:PORT2:CORR:DATA**	
	Reading the entry area display				**OUTPACTI**	Not available	
	Reading error information from the error cue				**OUTPERRO**	**:SYST:ERR?**	
	All lists at the time when the lists are displayed				**OUTPPRINALL**	Not available	
	Learn string		Designating revisions		**SELL**	Not available	The E5070B/E5071B does not allow you to read/write the learn string.
			Read		**OUTPLEAS**		
					LRN?		
			Write		**INPULEAS**		
					LRN		
	Reading product information				**OUTPIDEN**	***IDN?**	
	Reading a product's serial number				**OUTPSERN**	Included in the value read from ***IDN?**	
	Reading the firmware revision				**SOFR**		
	Reading the installed options				**OUTPOPTS**	***OPT?**	

Function	Item to be specified/executed		Command (For footnotes, see page 928.)		Remarks
			8753ES	E5070B/E5071B	
Markers	Activate the marker and move it to the designated stimulus value.	Marker 1	**MARK1**[*1]	**:CALC{1-16}:MARK{1-10}:ACT**[*7] (Setting up the active marker) **:CALC{1-16}:MARK{1-10}:X**[*7] (Specifying the stimulus value of the marker) These two commands enables you to perform the equivalent.	
		Marker 2	**MARK2**[*1]		
		Marker 3	**MARK3**[*1]		
		Marker 4	**MARK4**[*1]		
		Marker 5	**MARK5**[*1]		
	Move to the designated point		**MARKBUCK** [*8]	Not available	
	Setting up the marker move mode	Continuous mode	**MARKCONT**[*8]	**:CALC{1-16}:MARK{1-10}:DISC OFF**[*5]	
		Discrete mode	**MARKDISC**[*8]	**:CALC{1-16}:MARK{1-10}:DISC ON**[*5]	
	Specifying Couple/Uncouple between channels	Couple	**MARKCOUP**[*8]	**:CALC{1-16}:MARK{1-10}:COUP ON**[*5]	On the E5070B/E5071B, Couple/Uncouple between traces in the same channel is specified.
		Uncouple	**MARKCOUP**[*8]	**:CALC{1-16}:MARK{1-10}:COUP OFF**[*5]	
	On/Off setting for all marker value displays		**DISM**[*1]	Not available	The E5070B/E5071B always displays all marker values.
	Turning off all markers and the marker function		**MARKOFF**[*1]	**:CALC{1-16}:MARK{1-10}**[*7] can be used to turn off the marker display but the function remains turned on)	
	Delta marker(Reference marker)	Turning off the delta marker	**DELO**[*1]	**:CALC{1-16}:MARK:REF OFF**[*3]	The E5070B/E5071B assigns marker 10 as the delta marker.
		Designating a delta marker	**DELR**[*1]	Not available	
	Designating the position of a fixed marker	Auxiliary measured value	**MARKFAUV**[*1]	Not available	The E5070B/E5071B does not have the fixed marker function.
		Stimulus value	**MARKFSTI**[*1]		
		Designated point	**MARKFVAL**[*1]		
		Position of the active marker	**MARKZERO**[*1]		
		Designating a fixed marker as the reference marker	**DELRFIXM**[*1]		
	Selecting readout format on a Smith chart	Admittance	**SMIMGB**	Not available	On the E5070B/E5071B, readout format is specified when setting up data format.
		Linear magnitude	**SMIMLIN**		
		Log magnitude	**SMIMLOG**		
		Real/Imaginary	**SMIMRI**		
		Impedance	**SMIMRX**		
	Selecting readout format on a polar display	Linear magnitude	**POLMLIN**		
		Log magnitude	**POLMLOG**		
		Real/Imaginary	**POLMRI**		

Function	Item to be specified/executed		Command (For footnotes, see page 928.)		Remarks
			8753ES	E5070B/E5071B	
Markers (cont'd.)	Setting the marker value at a different value	Starting value for the sweep range	**MARKSTAR**[*8]	**:CALC{1-16}:MARK{1-10}:SET STAR**[*7]	
		Ending value for the sweep range	**MARKSTOP**[*8]	**:CALC{1-16}:MARK{1-10}:SET STOP**[*7]	
		Center value of the sweep range	**MARKCENT**[*8]	**:CALC{1-16}:MARK{1-10}:SET CENT**[*7]	
		Span value of the sweep range	**MARKSPAN**[*8]	Not available	
		Reference value	**MARKREF**[*8]	**:CALC{1-16}:MARK{1-10}:SET RLEV**[*7]	
		CW frequency value	**MARKCW**[*8]	Not available	
	Reading the marker value of hte active marker		**OUTPMARK**[*8]	**:CALC{1-16}:MARK{1-10}:X?**[*7] (stimulus value) **:CALC{1-16}:MARK{1-10}:Y?**[*7] (stimulus value) allows you to read the marker value of any marker.	The retrurn value from 8753ES includes the both of stimulus value and response value
	Specify the electrical length so that the group delay becomes zero at the position of the active marker.		**MARKDELA**[*8]	**:CALC{1-16}:MARK{1-10}:SET DEL**[*7]	
	Marker search	Turning off the search function	**SEAOFF**[*8]	Not available	The E5070B/E5071B requires you to send two commands, one for designating the search type and the other for executing the search.
		Maximum	**MARKMAXI**[*8]	**:CALC{1-16}:MARK{1-10}:FUNC:TYPE MAX**[*7] **:CALC{1-16}:MARK{1-10}:FUNC:EXEC**[*7]	
			SEAMAX[*8]		
		Minimum	**MARKMINI**[*8]	**:CALC{1-16}:MARK{1-10}:FUNC:TYPE MIN**[*7] **:CALC{1-16}:MARK{1-10}:FUNC:EXEC**[*7]	
			SEAMIN[*8]		
		Target search: Left side	**SEAL**[*8]	**:CALC{1-16}:MARK{1-10}:FUNC:TYPE LTAR**[*7] **:CALC{1-16}:MARK{1-10}:FUNC:EXEC**[*7]	
		Target search: Right side	**SEAR**[*8]	**:CALC{1-16}:MARK{1-10}:FUNC:TYPE RTAR**[*7] **:CALC{1-16}:MARK{1-10}:FUNC:EXEC**[*7]	
		Target search: Specifying the search value	**SEATARG**[*8]	**:CALC{1-16}:MARK{1-10}:FUNC:TARG**[*7]	
		Bandwidth search: On/Off	**WIDT**[*8]	**:CALC{1-16}:MARK:BWID**[*7]	
		Bandwidth search: Specifying parameters	**WIDV**[*8]	**:CALC{1-16}:MARK{1-10}:BWID:THRU**[*7]	
		Turning the tracking On/Off	**TRACK**[*8]	**:CALC{1-16}:MARK{1-10}:FUNC:TRAC**[*7]	
	Statistics analysis	On/Off	**MEASTAT**[*8]	**:CALC{1-16}:MST**[*3]	
		Reading the results	**OUTPMSTA**[*8]	**:CALC{1-16}:MST:DATA?**[*3]	

Function	Item to be specified/executed				Command (For footnotes, see page 928.)		Remarks
					8753ES	E5070B/E5071B	
Device test	Limit test	Turning the limit test On/Off			**LIMITEST**[*1]	**:CALC{1-16}:LIM**[*3]	
		Turning the limit line display On/Off			**LIMILINE**[*1]	**:CALC{1-16}:LIM:DISP**[*3]	
		Limit Editing the test list	Start of editing		**EDITLIML**	**:CALC{1-16}:LIM:DATA**[*3] is used to set up the limit test table.	
			End of editing		**EDITDONE**		
			Deleting the entire list		**CLEL**	**:CALC{1-16}:LIM:DATA 0**[*3]	
					CLEAL		
			Setting the marker value at the offset along the Y-axis		**LIMIMAOF**	**:CALC{1-16}:LIM:OFFS:MARK**	
			Editing segments	Selection	**SEDI**	**:CALC{1-16}:LIM:DATA**[*3] is used to set up the limit test table.	
				Addition	**SADD**		
				Deletion	**SDEL**		
				End	**SDON**		
				Boundary value	**LIMS**		
				Upper limit value	**LIMU**		
				Lower limit value	**LIML**		
				Delta value	**LIMD**		
				Center valuer	**LIMM**		
				Sloping line	**LIMTSL**		
				Flat line	**LIMTFL**		
				Single point	**LIMTSP**		
				Setting the boundary value at the active marker's response value	**MARKSTIM**		
				Setting the center value at the active marker's response value	**MARKMIDD**		
		Specifying the offset	Along the X-axis		**LIMISTIO**	**:CALC{1-16}:LIM:OFFS:STIM**	
			Along the Y-axis		**LIMIAMPO**	**:CALC{1-16}:LIM:OFFS:AMPL**	
		Turning the function On/Off that records the maximum and minimum for each segment			**MINMAX**	Not available	

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Device test (cont'd.)	Limit test (cont'd.)	Reading the results	Reading the pass/fail of a channel	**OUTPLIM{1-4}**	**:CALC{1-16}:LIM:FAIL?**[*3] (Reading the pass/fail of a active trace)	The E5070B/E5071B has a different returned value.
			Intra-segment maximum measured value	**OUTPAMAX**	Not available	The E5070B/E5071B does not allow you to read data for each segment/each point.
			Intra-segment minimum measured value	**OUTPAMIN**	Not available	
			Number of valid segments and results for each segment	**OUTPSEGAF**	Not available	
			Maximum/minimum in all segments	**OUTPSEGAM**	Not available	
			Designating the segment to be read by **OUTPSEGF** and **OUTPSEGM**	**SELSEG**	Not available	
			Pass/Fail of the designated segment	**OUTPSEGF**	Not available	
			Maximum/Minimum of the designated segment	**OUTPSEGM**	Not available	
			Point information	**OUTPLIML**	**:CALC{1-16}:LIM:REP:ALL?**	
			Information on the position of the active marker	**OUTPLIMM**	Not available	
			Information on a failed point and the number of failed points	**OUTPLIMF**	Not available	The E5070B/E5071B allows you to read the number of points by using **:CALC{1-16}:LIM:REP:POIN?**, and the stimulus value by using **:CALC{1-16}:LIM:REP?**, but other values cannot be read.
			Number of failed points, and the stimulus and measured values of the failed points	**OUTPFAIP**	Not available	
	Ripple test	Turning the ripple test On/Off		**RLIMTEST**	**:CALC{1-16}:RLIM**	
		Turning the limit line display On/Off		**RLIMLINE**	**:CALC{1-16}:RLIM:DISP:LINE**	
		Ripple limit editing	Start of editing	**EDITRLIM**	**:CALC{1-16}:RLIM:DATA**	
			End of editing	**EDITDONE**	Not available	
			Deleting all of the limits	**CLEL**		
				CLEAL		
			Clear the limits of ripple test	**CLER**	**:CALC{1-16}:RLIM:DATA**	

Function	Item to be specified/executed				Command (For footnotes, see page 928.)		Remarks
					8753ES	E5070B/E5071B	
Device test (cont'd.)	Ripple test (cont'd.)	Ripple limit editing (cont'd.)	Editing the band	Selection	**SEDI**	Not available	
				Addition	**SADD**		
				Deletion	**SDEL**		
				End	**SDON**		
				Upper limit value	**RLIMM**	**:CALC{1-16}:RLIM:DATA**	
				Start value	**RLIMSTR**		
				Stop value	**RLIMSTP**		
			Displaying the ripple value	Absolute value	**RLIMVALABS**	**:CALC{1-16}:RLIM:DISP:VAL**	
				Margin	**RLIMVALMAR**		
				Off	**RLIMVALOFF**		
		Reading the results	Information on failed points		**OUTPFARPLPT**	**:CALC{1-16}:RLIM:REP?**	
			Magnitude of ripples in all valid bands		**OUTPRPLBNDALL**		
			Designated band results		**OUTPRPLBNDPF**		
			Magnitude of designated bands ripples		**OUTPRPLBNDVAL**		
	Bandwidth test	Turning the bandwidth test On/Off			**BWLIMTEST**[*1]	**:CALC{1-16}:BLIM**	
		Turning the bandwidth display On/Off			**BWLIMDISP**[*1]	**:CALC{1-16}:BLIM:DISP:VAL**	
		Specifying the bandwidth threshold value (attenuation from the peak)			**BWLIMDB**[*1]	**:CALC{1-16}:BLIM:DB**	
		Specifying the upper limit value for the test			**BWLIMMAX**[*1]	**:CALC{1-16}:BLIM:MAX**	
		Specifying the lower limit value for the test			**BWLIMMIN**[*1]	**:CALC{1-16}:BLIM:MIN**	
		Reading the results	Bandwidth, center value, Q value		**OUTPMWID**[*1]	Not available	
			Bandwidth, center value, Q value, loss		**OUTPMWIL**[*1]	**:CALC{1-16}:MARK{1-10}:BWID:DATA?**[*7]	
			Reading the bandwidth value		**BWLIMVAL**[*1]	**:CALC{1-16}:BLIM:REP?**	
			Reading the results (pass/fail)		**BWLIMSTAT**[*1]	**:CALC{1-16}:BLIM:FAIL?**	
Status report	Clearing the status byte register, event status register, and valid register.				**CLES**	***CLS**	
					CLS		
	Reading the status byte register				**OUTPSTAT**	***STB?**	
					STB?	***STB?**	
	Setting up the service request valid register				**SRE**	***SRE**	
	Reading the event status register				**ESR?**	***ESR?**	
	Setting up the event status valid register				**ESE**	***ESE**	

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Status report (cont'd.)	Event status register B		Read	**ESB?**	Not available	The E5070B/E5071B have questionable channel limit fail registers, which report result of llimit test.
			Setting up valid registers	**ESNB**	Not available	
	When all operations on standby have been completed, bit 0 of the event status register is set.			**OPC**	***OPC**	8753ES reports the completion of the next command. E5070B/E5071B reports the completion when all commands being executed have been completed.
Save /Recall	Instrument State	Save	Internal register	**SAVE**	**:MMEM:STOR**	On the E5070B/E5071B, the same command is used regardless of the type of media.
				SAVEREG		
			Internal disk	**STOR**		
		Call	Internal register	**RECA**	**:MMEM:LOAD**	
				RECAREG		
			Internal disk	**LOAD**		
	Naming a file to be saved			**TITF**	Designated by using parameters before the file is saved.	
	Selecting the format of the Instrument State file.		ASCII format	**SAVUASCI**	Not availabler	On the E5070B/E5071B, the instrument state file is stored as binary format file.
			Binary format	**SAVUBINA**		
	Selecting the data to be saved in a file		Corrected data array	**EXTMDATA**[*1]	**:MMEM:STOR:STYP**[*3]	The E5070B/E5071B can save the Instrument State plus corrected data array and calibration data. (The 8753ES Instrument State file contains calibration data.)
			Raw data array	**EXTMRAW**[*1]	Not available	
			Trace data	**EXTMFORM**[*1]	Not available	
			LCD screen display	**EXTMGRAP**	Not available	
			Measurement data only	**EXTMDATO**[*1]	Not available	
	Test sequence		Save	**STORSEQ**	Not available	The E5070B/E5071B uses VBA for creating internal programs.
			Load Floppy disk	**LOADSEQ**		
	LCD screen image		Save	**SAVEJPG**	**:MMEM:STOR:IMAG**	Image files on the E5070B/E5071B are stored in Windows® Bitmap or PNG firmat, while the 8753ES saves files in JPEG format.
	Measurement data (CSV format)		Save	**SAVECSV**[*1]	**:MMEM:STOR:FDAT**[*3]	
	Saving color settings		Save	**SVCO**	Not available	
			Load	**RECO**	Not available	

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Save/Recall (cont'd.)	Selecting media for saving files	Internal memory		**INTM**	Not available	The E5070B/E5071B allows the media to be selected by designating the drive name at the time the file is saved. A file can be saved on either the internal hard disk drive or to the floppy disk drive.
		Floppy disk drive		**INTD**	Not available	
		External disk drive		**EXTD**	Not available	
		Designating the external disk number		**DISCUNIT**	Not available	
		Partition on the external disk to be designated		**DISCVOLU**	Not available	
	Designating the storage format		DOS	**FORMATDOS**	Not available	The E5070B/E5071B is compatible with the DOS format only.
			LIF	**FORMATLIF**		
	Initializing the storage medium	Floppy disk		**INID**	Not available	On the E5070B/E5071B, the starage media can be initialized using a mouse.
		Specifying the size of the LIF directory		**DIRS**	Not available	The E5070B/E5071B is compatible with the DOS format only.
		External disk		**INIE**	Not available	
	Save/Recall register	Giving a title		**TITR**	Not available	The E5070B/E5071B stores all data on the hard disk or to a floppy disk.
				TITREG	Not available	
		Clear	Clearing the designated number	**CLEA**	Not available	
				CLEARREG	Not available	
			All clear	**CLEARALL**	Not available	
	File manipulation	Deletion		**PURG**	**:MMEM:DEL**	
	Reading the file title from the disk			**REFT**	Not available	
Test sequence	Creating/Revising a new sequence			**NEWSEQ**	Not available	The E5070B/E5071B does not have the test sequence function. Macros are created using VBA.
	Selecting a test sequence			**Q**	**:PROG:NAME** (Selecting a VBA program)	
				SEQ		
	Reading a test sequence			**OUTPSEQ**	Not available	
	Executing the selected sequence			**DOSEQ**	**:PROG:STAT RUN** (Executing the selected VBA program)	
	Stopping the selected sequence			**PTOS**	**:PROG:STAT STOP** (Stopping the selected VBA program)	
	Resuming a stopped test sequence			**CONS**	Not available	
	Executing another sequence from the test sequence			**GOSUB**	Not available	
	Naming the test sequence	Name		**TITSEQ**	Not available	
		Displaying the softkey menu for setup		**TITSQ**	Not available	
	Specifying waiting time in the test sequence			**SEQWAIT**	Not available	
	Displaying the softkey menu while the test sequence is in progress.			**SHOM**	Not available	
	Specifying the status bit in the event status register			**ASSS**	Not available	

Function	Item to be specified/executed		Command (For footnotes, see page 928.)		Remarks
			8753ES	E5070B/E5071B	
Test sequence (cont'd.)	GPIO	Designating the bit number of the input port to be used for branching	**PARAIN**	Not available	The E5070B/E5071B does not have a test sequence function. Macros are created using VBA.
		Setting the designated bit	**SETBIT**	Not available	
		Clearing the designated bit	**CLEABIT**	Not available	
		Setting all bits	**PARAOUT**	Not available	
	TTL output	Set to High after ending sweep	**TTLHPULS**	Not available	
		Set to Low after ending sweep	**TTLLPULS**	Not available	
		Always set to High	**TTLOH**	Not available	
		Always set to Low	**TTLOL**	Not available	
	Loop counter	Setting values	**LOOC**	Not available	
		Subtract one.	**DECRLOOC**	Not available	
		Add one.	**INCRLOOC**	Not available	
	Branching	Executes the sequence when the designated GPIO bit is set to High.	**IFBIHIGH**	Not available	
		Executes the sequence when the designated GPIO bit is set to Low.	**IFBILOW**	Not available	
		Executes the sequence when the loop counter is at zero.	**IFLCEQZE**	Not available	
		Executes the sequence when the loop counter is not at zero.	**IFLCNEZE**	Not available	
		Executes the sequence when the limit test fails.	**IFLTFAIL**	Not available	
		Limit test passes, and the sequence executes.	**IFLTPASS**	Not available	
	Specifying the bit for selecting the attenuator in the test set.	Forward	**TSTIOFWD**	Not available	
		Reverse	**TSTIOREV**	Not available	
	Clearing the designated sequence from the register		**CLEASEQ**	Not available	
	Ending editing of the test sequence		**DONM**	Not available	
	Copying the test sequence		**DUPLSEQ**	Not available	

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
System	Reset			**PRES**	**:SYST:PRES**	After execution, the ***RST** on the E5070B/E5071B set the trigger state to Hold.
				RST	***RST**	
	Executes a self-test and returns the results.			**TST?**	Not available	
	Internal clock		Setting the date	**SETDATE**	**:SYST:DATE**	
			Reading the date	**READDATE**	**:SYST:DATE?**	
			Setting the time	**SETTIME**	**:SYST:TIME**	
			Reading the time	**READTIME**	**:SYST:TIME?**	
	Setting up the beep sound		On/Off operations at the time an action is completed	**BEEPDONE**	**:SYST:BEEP:COMP:STAT**	
			On/Off at the time the limit test fails	**BEEPFAIL**	Not available	On the E5070B/E5071B, the beep sound for a failed limit test is set up based on the beeper setup for the warning sound.
			On/Off at the time a warning occurs	**BEEPWARN**	**:SYST:BEEP:WARN:STAT**	
			Sounds the beep sound.	**EMIB**	**:SYST:BEEP:COMP:IMM** (Beep sound when an action completes) or **:SYST:BEEP:WARN:IMM** (Beep sound when a warning occurs)	
	Selecting the measurement mode		Standard network analyzer	**INSMNETA**	Not available	The E5070B/E5071B is always considered a standard network analyzer.
			External source (automatic)	**INSMEXSA**		
			External source (manual)	**INSMEXSM**		
			Tuned receiver	**INSMTUNR**		
Printer/Plotter output	Printing	Plotter		**PLOT**	Not available	
		Printer	LCD screen	**PRINALL**	**:HCOP**	
			Test sequence	**PRINSEQ**	Not available	The E5070B/E5071B does not have the test sequence function.
			List display	**PRINTALL**	Not available	The E5070B/E5071B does not have the list display function.
	Output the LCD screen to the printer by using a PCL raster dump.			**OUTPPRIN**	**:HCOP**	
	The LCD screen in the HP-GL is output from the GPIB port.			**OUTPPLOT**	Not available	The E5070B/E5071B does not allow output from the GPIB.
	Setting the line type			**LINTDATA**	Not available	The E5070B/E5071B always gives the data trace in a solid line.
			Memory trace	**LINTMEMO**		
	Setting up the printer	Return to the initial state		**DEFLPRINT**	Not available	On the E5070B/E5071B, the printer setup is executed by using the front panel.
		Setting up for printing	Color	**PRIC**	Not available	
			Monochrome	**PRIS**		

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Printer/Plotter output (cont'd.)	Setting up the printer (cont'd.)	Color	Trace data	**PCOLDATA**	Not available	On the E5070B/E5071B, color setup is allowed only for turning highlighting of the entire screen On/Off.
			Graticule lines	**PCOLGRAT**		
			Memory trace	**PCOLMEMO**		
			Reference line	**PCOLREFL**		
			Text	**PCOLTEXT**		
			Warning message	**PCOLWARN**		
		Setting the printer port	GPIB	**PRNPRTHPIB**	Not available	On the E5070B/E5071B, the printer setup is executed by using the front panel.
			Parallel port	**PRNPRTPARA**		
			Serial port	**PRNPRTSERI**		
		Setting the printer type	HP DeskJet 540/850C	**PRNTYP540**	Not available	On the E5070B/E5071B, the printer setup is executed by using the front panel.
			HP DeskJet	**PRNTYPDJ**		
			Epson ESC/P2	**PRNTYPEP**		
			HP LaserJet	**PRNTYPLJ**		
			HP PaintJet	**PRNTYPPJ**		
			HP ThinkJet	**PRNTYPTJ**		
		Handshake mode		**PRNHNDSHK**	Not available	
		Turning the automatic feed On/Off		**PRNTRAUTF**	Not available	
		Serial port baud rate		**PRNTRBAUD**	Not available	
		Sending a form feed		**PRNTRFORF**	Not available	
	Plotter setup	Returning to the initial state		**DFLT**	Not available	The E5070B/E5071B does not support plotters.
		Setting the print scope	Entire sheet	**FULP**		
			Lower-left 1/4 of a sheet	**LEFL**		
			Upper-left 1/4 of a sheet	**LEFU**		
			Lower-right 1/4 of a sheet	**RIGL**		
			Upper-right 1/4 of a sheet	**RIGU**		
		Turning the plot On/Off	Trace data	**PDATA**		
			Graticule lines	**PGRAT**		
			Memory trace	**PMEM**		
			Marker	**PMKR**		
			Softkey	**PSOFT**		
			Text	**PTEXT**		
		Pen number	Trace data	**PENNDATA**		
			Graticule lines	**PENNGRAT**		
			Memory trace	**PENNMARK**		
			Marker	**PENNMEMO**		
			Text	**PENNTEXT**		
		Pen speed	High speed	**PLOSSLOW**		
			Low speed	**PLOSFAST**		
		Setting up the scale	FULL	**SCAPFULL**		
			GRAT	**SCAPGRAT**		

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Printer/Plotter output (cont'd.)	Plotter setup (cont'd.)	Plotter port	Disk	**PLTPRTDISK**	Not available	The E5070B/E5071B does not support plotters.
			GPIB	**PLTPRTHPIB**		
			Parallel port	**PLTPRTPARA**		
			Serial port	**PLTPRTSERI**		
		Plotter type	PCL5-compatible	**PLTTYPHPGL**		
			Plotter	**PLTTYPPLTR**		
		Handshake mode		**PLTHNDSHK**		
		Turning the automatic feed On/Off		**PLTTRAUTF**		
		Serial port baud rate		**PLTTRBAUD**		
		Sending a form feed		**PLTTRFORF**		
	Setting up printing	Initialization		**DEFLTCPIO**	Not available	
	Turning the timestamp print On/Off			**TIMESTAM**	Not available	On the E5070B/E5071B, always display the timestamp on LCD.
	Naming a file to receive plot output.			**TITP**	Not available	
Test set	Confirming the test set connection			**TESS**	Not available	
	Switching the changeover for the test set	Setting up Continuous/Stop		**CSWI**	Not available	On the E5070B/E5071B, always continuous.
		Specifying the number of times to change over.		**TSSWI**		
Time domain transformation	Turning the transformation On/Off			**TIMDTRAN**	**:CALC{1-16}:TRAN:TIME:STAT**	
	Selecting the mode	Low-pass impulse		**LOWPIMPU**	**:CALC{1-16}:TRAN:TIME**	
		Low-pass step		**LOWPSTEP**	**:CALC{1-16}:TRAN:TIME:STIM**	
		Bandpass		**BANDPASS**		
	Display the softkeys for setting up the gate			**SPEG**	Not available	
	Turning the time-domain gate On/Off			**GATEO**	**:CALC{1-16}:FILT:TIME:STAT**	
	Time-domain gate time	Start		**GATESTAR**	**:CALC{1-16}:FILT:TIME:STAR**	
		Stop		**GATESTOP**	**:CALC{1-16}:FILT:TIME:STOP**	
		Center		**GATECENT**	**:CALC{1-16}:FILT:TIME:CENT**	
		Span		**GATESPAN**	**:CALC{1-16}:FILT:TIME:SPAN**	
	Form of the time-domain gate	Minimum		**GATSMINI**	**:CALC{1-16}:FILT:TIME:SHAP**	
		Normal		**GATSNORM**		
		Wide		**GATSWIDE**		
		Maximum		**GATSMAXI**		
	Demodulation function	Off		**DEMOOFF**	Not available	
		AM modulation		**DEMOAMPL**	Not available	
		Phase modulation		**DEMOPHAS**	Not available	
	Setting up the display	Maximum		**WINDMAXI**	**:CALC{1-16}:TRAN:TIME:KBES**	
		Minimum		**WINDMINI**		
		Normal		**WINDNORM**		
		Specifying values		**WINDOW**		
	Turning use of the memory trace On/Off			**WINDUSEM**	Not available	
	Freq low-pass measurement			**SETF**	**:CALC{1-16}:TRAN:TIME:LPFR**	

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Others (cont'd.)	Mixer measurement	Turning the frequency offset mode On/Off		**FREQOFFS**	Not available	The E5070B/E5071B does not have the mixer measuring function.
		Selecting the down conversion.		**DCONV**		
		Selecting the up conversion.		**UCONV**		
		Reading the frequency of the external RF signal source.		**OUTPRFFR**		
		Specifying LO	Turning control On/Off	**LOCONT**		
			Frequency	**LOFREQ**		
			Setting the frequency in sweep mode	**LOFSWE**		
			Starting frequency	**LOFSTAR**		
			Stop frequency	**LOFSTOP**		
			Power	**LOPOWER**		
			Setting the power in sweep mode	**LOPSTAR**		
			Start power	**LOPSTOP**		
			Stop power	**LOPSWE**		
		Setting the signal source	RF > LO	**RFGTLO**		
			RF < LO	**RFLTLO**		
		Setting up the display	Setup screen	**VIEMOFF**		
			Measurement screen	**VIEMON**		
		LO frequency is used in the offset mode.		**VOFF**		
	Harmonics measurement mode		Turning off the measurement mode.	**HARMOFF**	Not available	The E5070B/E5071B does not have the harmonics measurement mode.
			2nd harmonics measurement	**HARMSEC**		
			3rd harmonics measurement	**HARMTHIR**		
	Key manipulation related commands	Performing the same processing as with the front panel key designated.		**KEY**	Not available	
		Performs the same processing as with the [↑] key on the front panel.		**UP**	Not available	
		Performs the same processing as with the [↓] key on the front panel.		**DOWN**	Not available	
		Returns the code of the last key manipulated on the front panel.		**KOR?**	Not available	
				OUTPKEY	Not available	
		Displaying the softkey menu corresponding to the front panel key.	[Avg]	**MENUAVG**	Not available	
			[Cal]	**MENUCAL**	Not available	
			[Copy]	**MENUCOPY**	Not available	
			[Display]	**MENUDISP**	Not available	
			[Format]	**MENUFORM**	Not available	
			[Marker]	**MENUMARK**	Not available	
			[Meas]	**MENUMEAS**	Not available	

Function	Item to be specified/executed			Command (For footnotes, see page 928.)		Remarks
				8753ES	E5070B/E5071B	
Others (cont'd.)	Key manipulation related commands (cont'd.)	Displaying the softkey menu corresponding to the front panel key. (cont'd.)	[Marker Fctn]	**MENUMRKF**	Not available	
			[Power]	**MENUPOWE**	Not available	
			[Save/Recall]	**MENURECA**	Not available	
			[Save/Recall]	**MENUSAVE**	Not available	
			[Scale Ref]	**MENUSCAL**	Not available	
			[Seq]	**MENUSEQU**	Not available	
			[Marker Search]	**MENUSRCH**	Not available	
			[Sweep Setup]	**MENUSTIM**	Not available	
			[Sweep Setup]	**MENUSWEE**	Not available	
			[System]	**MENUSYST**	Not available	
		Performing the same processing as with the designated softkey.		**SOFT{1-8}**	Not available	
		Editing softkey labels		**WRSK**	Not available	
	GPIB	Turning the debug mode On/Off		**DEBU**	Not available	
		Setting to talker/listener mode		**TALKLIST**	Not available	
		Sending the title character string	Peripherals	**TITTPERI**	Not available	
			Power meter	**TITTPMTR**		
			Printer	**TITTPRIN**		
		pass control		**USEPASC**	Not available	
		Setting the GPIB address	Controller	**ADDRCONT**	Not available	The E5070B/E5071B does not allow these GPIB addresses to be specified.
				PCB		
			External disk drive	**ADDRDISC**	Not available	
			LO source	**ADDRLSRC**		
			Peripheral	**ADDRPERI**		
			Plotter	**ADDRPLOT**		
			Printer	**ADDRPRIN**		
			Power meter	**ADDRPOWM**	**:SYST:COMM:GPIB:PMET:ADDR**	
	Specifying uses of the parallel port		GPIO use	**PARALGPIO**	Not available	The E5070B/E5071B uses the GPIO for the printer.
			Printer use	**PARALCPY**		
	Service mode		ALC control	**ALC**	Not available	
			Setting the analog bus On/Off	**ANAB**	Not available	

*1. Effective for the active channel (8753ES)
*2. Effective for channels and traces designated in the command. (E5070B/E5071B)
*3. Effective for the active trace designated in the command (E5070B/E5071B)
*4. Effective both for the main and auxiliary channels. (8753ES)
*5. Effective for the channels designated in the command. (E5070B/E5071B)
*6. Effective for all channels (8753ES)
*7. Effective command for the marker number, designated within that command, on the active trace in the channel having the channel number also designated in that command. (E5070B/E5071B)
*8. Effective command for the active marker (8753ES)

8753ES vs. E5070B/E5071B Command Comparison (8753ES-only commands excluded)

8753ES	Function overview	E5070B/E5071B
	[A]	
AB	Select A/B measurement and display the traces.	Not available (A/B measurement not available.)
ADAP1	Set up the electrical delay in the adapter removal calibration.	Not available
ADDRCONT	Specify the controller GPIB address.	Not available
ADDRDISC	Specify the GPIB address of the external disk drive.	Not available
ADDRLSRC	Specify the GPIB address of the LO source.	Not available
ADDRPERI	Specify the GPIB addresses of peripherals.	Not available
ADDRPLOT	Specify the GPIB address of the plotter.	Not available
ADDRPOWM	Specify the GPIB address of the power meter.	**:SYST:COMM:GPIB:PMET:ADDR**
ADDRPRIN	Specify the GPIB address of the printer.	Not available (Not compatible with a GPIB printer.)
ADPTCOAX	Select the adapter-coaxial in the adapter removal calibration.	Not available
ADPTWAVE	Select the adapter-waveguide in the adapter removal calibration.	Not available
ALC	Control ALC (for service use).	Not available
ALTAB	Set to an alternate measurement mode.	Not available (The sweeping of traces on the same channel is performed in chop measurement mode, while traces between different channels is performed in alternate mode.)
ANAB	On/Off setting for the analog bus (for service use)	Not available
ANAI	Select the measurement of the signal input to the AUX Input and display the trace.	Not available (Measurement parameters are selected S-parameters and absolute measurement parameters.)
AR	Select the A/R measurement and display the traces.	Not available (Measurement parameters are selected S-parameters and absolute measurement parameters.)
ASEG	All segments are used during the list frequency sweep.	Not available (All segments are always used.)
ASSS	Specify the sequence bit of the event status register.	Not available
ATTP1	Specify the value for the attenuator at port 1.	**:SOUR{1-16}:POW:ATT** (Channels are used for setup.)
ATTP2	Specify the value for the attenuator at port 2.	
AUTO	Perform autoscale.	**:DISP:WIND{1-16}:TRAC{1-16}:Y:AUTO**
AUXC	Set channels 3 and 4 On/Off.	Using the command **:CALC{1-16}:PAR{1-16}:COUN** enables you to do the equivalent.
AVERFACT	Specify the averaging factor.	**:SENS{1-16}:AVER:COUN**
AVERO	Set the averaging On/Off.	**:SENS{1-16}:AVER**
AVERREST	Restart the averaging.	**:SENS{1-16}:AVER:CLE**
	[B]	
BACI	Specify the screen brightness.	**:SYST:BACK** (On/Off setting for the backlight only allowed)
BANDPASS	Select the BANDPASS mode in the time-domain transformation.	**:CALC{1-16}:TRAN:TIME BPAS**
BEEPDONE	Set the beep (n) sound at the end of an action On/Off.	**:SYST:BEEP:COMP:STAT**
BEEPFAIL	Set the beep (n) sound for the limit test FAIL On/Off.	Not available (Setting is the same as for the warning beep sound.)
BEEPWARN	Set the warning beep (n) sound On/Off.	**:SYST:BEEP:WARN:STAT**
BLAD	Set the display On/Off.	**:SYST:BACK** (Set the LCD backlight On/Off) The On/Off relation on the 8753ES is opposite that on the E5070B/E5071B.

8753ES vs. E5070B/E5071B Command Comparison (8753ES-only commands excluded)

8753ES	Function overview	E5070B/E5071B
BR	Select the B/R measurement and display the traces.	Not available (Measurement parameters are selected S-parameters and absolute measurement parameters.)
BWLIMDB	Specify the value indicating the position of the bandwidth (attenuation from the peak) in the bandwidth test.	**:CALC{1-16}:BLIM:DB**
BWLIMDISP	Set the bandwidth value display in the bandwidth test On/Off.	**:CALC{1-16}:BLIM:DISP:VAL**
BWLIMMAX	Specify the upper limit value in the bandwidth test.	**:CALC{1-16}:BLIM:MAX**
BWLIMMIN	Specify the lower limit value for the bandwidth test.	**:CALC{1-16}:BLIM:MIN**
BWLIMSTAT	Read the results of the bandwidth test.	**:CALC{1-16}:BLIM:FAIL?**
BWLIMTEST	Set the bandwidth test On/Off.	**:CALC{1-16}:BLIM**
BWLIMVAL	Read the bandwidth value during the bandwidth test.	**:CALC{1-16}:BLIM:REP?**
[C]		
C0	Specify the CO value of the OPEN standard.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C0**
C1	Specify the C1 value of the OPEN standard.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C1**
C2	Specify the C2 value of the OPEN standard.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C2**
C3	Specify the C3 value of the OPEN standard.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:C3**
CAL1	Cause the softkey for the calibration menu.	Not available (Can be ignored in the case of replacement)
CALFCALF	Specify the calibration coefficients while editing the calibration coefficients table for the power sensor to be used in power meter calibration.	Not available
CALFFREQ	Specify the frequency while editing the calibration coefficients table for the power sensor to be used for power meter calibration.	
CALFSENA	Start editing the calibration coefficients table for power sensor A to be used for power meter calibration.	
CALFSENB	Start editing the calibration coefficients table for power sensor B to be used for power meter calibration.	
CALIERC	Start measuring data in forward enhanced response calibration.	**:SENS{1-16}:CORR:COLL:METH:ERES**
CALIFUL2	Start measuring data in full 2-port calibration.	**:SENS{1-16}:CORR:COLL:METH:SOLT1**
CALIRAI	Start measuring data in response & isolation calibration.	**:SENS{1-16}:CORR:COLL:METH:OPEN** **:SENS{1-16}:CORR:COLL:METH:SHOR** **:SENS{1-16}:CORR:COLL:METH:THRU** (The commands differ depending on the standard used in the isolation calibration.)
CALIRERC	Start measuring data in reverse enhanced response calibration.	**:SENS{1-16}:CORR:COLL:METH:ERES**
CALIRESP	Start measuring data in response calibration.	**:SENS{1-16}:CORR:COLL:METH:OPEN** or **:SENS{1-16}:CORR:COLL:METH:SHOR** or **:SENS{1-16}:CORR:COLL:METH:THRU** (The commands differ depending on the standard used in the isolation calibration.)
CALIS111	Start measuring data in S11 1-port calibration.	**:SENS{1-16}:CORR:COLL:METH:SOLT1** (You must designate a port with the parameter.)
CALIS221	Start measuring data in S22 1-port calibration.	
CALITRL2	Start measuring data in TRL*/LRM* 2-port calibration.	**:SENS{1-16}:CORR:COLL:METH:TRL2**

8753ES	Function overview	E5070B/E5071B
CALK24MM	Select 2.4 mm Calibration Kit (85056A/D) as the default calibration kit.	**:SENS{1-16}:CORR:COLL:CKIT**
CALK292MM	Select 2.92 mm Calibration Kit as the default calibration kit.	
CALK292S	Select 2.92 mm Calibration Kit (85056K) as the default calibration kit.	
CALK35MC	Select 3.5 mm Calibration Kit (85033C) as the default calibration kit.	
CALK35MD	Select 3.5 mm Calibration Kit (85033D) as the default calibration kit.	
CALK716	Select 7-16 Calibration Kit (85038) as the default calibration kit.	
CALK7MM	Select 7 mm Calibration Kit (85031B) as the default calibration kit.	
CALKN50	Select N-type 50 Calibration Kit (85032B/E) as the default calibration kit.	
CALKN75	Select N-type 75 Calibration Kit (85036B/E) as the default calibration kit.	
CALKTRLK	Select TRL 3.5 mm Calibration Kit (85052C) as the default calibration kit.	
CALKUSED	Select a user-defined calibration kit as the default calibration kit.	
CALN	Set the error correction to Off.	**:SENS{1-16}:CORR:STAT OFF**
CALSPORT1	Call the data on port 1 for adapter removal calibration.	Not available
CALSPORT2	Call the data on port 2 for adapter removal calibration.	
CALZLINE	Set the characteristic impedance for TRL*/LRM* 2-port calibration at the impedance value of the standard.	**:SENS{1-16}:CORR:COLL:CKIT:TRL:IMP LINE**
CALZSYST	Set the characteristic impedance for TRL*/LRM* 2-port calibration at the characteristic impedance value of the measurement system.	**:SENS{1-16}:CORR:COLL:CKIT:TRL:IMP SYST**
CBRI	Specify the display color brightness for the items selected.	Not available (Color setup is allowed only for turning highlighting of the entire screen On/Off.)
CENT	Specify the center value of the sweep range.	**:SENS{1-16}:FREQ:CENT** (Cannot be used for segment editing.) **:SOUR{1-16}:POW:CENT**
CHAN1	Specify channel 1 as the active channel.	**:DISP:WIND{1-16}:ACT** (Specifying the active channel) or **:CALC{1-16}:PAR{1-16}:SEL** (Specifying the active channel) For an outline of channels and traces, refer to the "Users' Guide."
CHAN2	Specify channel 2 as the active channel.	
CHAN3	Specify channel 3 as the active channel.	
CHAN4	Specify channel 4 as the active channel.	
CHOPAB	Set the system to chop measurement mode.	Not available (Traces on the same channel are measured using the same method as the chop sweep. When traces belong to different channels, they are measured using the same method as the alternate sweep.)
CLAD	Complete the class designation in defining the calibration kits.	Not available (Can be ignored in the case of replacement.)
CLASS11A	Measure S11A.	**:SENS{1-16}:CORR:COLL:OPEN**
CLASS11B	Measure S11B.	**:SENS{1-16}:CORR:COLL:SHOR**
CLASS11C	Measure S11C.	**:SENS{1-16}:CORR:COLL:LOAD**
CLASS22A	Measure S22A.	**:SENS{1-16}:CORR:COLL:OPEN**
CLASS22B	Measure S22B.	**:SENS{1-16}:CORR:COLL:SHOR**
CLASS22C	Measure S22C.	**:SENS{1-16}:CORR:COLL:LOAD**
CLEA	Clear the register for saving/recalling the designated number.	Not available
CLEABIT	Clear the designated GPIO bit.	Not available (No GPIO interface)

8753ES vs. E5070B/E5071B Command Comparison (8753ES-only commands excluded)

8753ES	Function overview	E5070B/E5071B
CLEAL	Clear the entire list.	Not available (Define the editing of each list by using one command.)
CLEARALL	Clear all registers for saving/recalling.	Not available (**:MMEM:DEL** can be used to erase files stored on the internal hard disk.)
CLEAREG	Clear the register for saving/recalling the designated number.	
CLEASEQ	Clear the designated sequence.	Not available (Test sequence function not available.)
CLEL	Clear the lists designated.	Not available (The editing of each table is defined by using one command.)
CLER	Clear all limits for the ripple test.	**:CALC{1-16}:RLIM:DATA**
CLES	Clear the status byte register, event status register, and enable register.	***CLS**
CLS		
COAD	Select coaxial as the type of electrical delay.	Not available (Always treated as coaxial.)
COAX	Select coaxial in specifying the offset when defining a standard.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:CHAR COAX**
COLOCH1D	Select the data trace and limit in channel 1 to specify their colors.	**:DISP:COL{1-2}:TRAC{1-16}:DATA** **:DISP:COL{1-2}:TRAC{1-16}:MEM** **:DISP:COL{1-2}:LIM{1-2}** **:DISP:COL{1-2}:GRAT{1-2}** **:DISP:COL{1-2}:BACK**
COLOCH1M	Select the memory trace in channel 1 to specify its color.	
COLOCH2D	Select the data trace and limit line in channel 2 to specify their colors.	
COLOCH2M	Select the memory trace in channel 2 to specify its color.	
COLOCH3D	Select the data trace and limit line in channel 3 to specify their colors.	
COLOCH3M	Select the memory trace in channel 3 to specify its color.	
COLOCH4D	Select the data trace and limit line in channel 4 to specify their colors.	
COLOCH4M	Select the memory trace in channel 4 to specify its color.	
COLOGRAT	Select a graticule line to specify its color.	
COLOTEXT	Select a character string to specify its color.	
COLOR	Specify the saturation of the display colors for the selected items.	
COLOLREF	Select the reference line to specify its color.	
COLOWARN	Select a warning message to specify its color.	
CONS	Resume execution of a suspended test sequence.	Not available (Test sequence function not available.)
CONT	Set the trigger mode to continuous mode.	**:INIT{1-16}:CONT ON**
CONV1DS	Transform the S-parameter measurement data into inverted S-parameters.	**:CALC{1-16}:CONV:FUNC INV** **:CALC{1-16}:CONV ON**
CONVOFF	Set the S-parameter transformation function to Off.	**:CALC{1-16}:CONV OFF**
CONVYREF	Transform the S-parameter measurement data into impedances (refrections).	**:CALC{1-16}:CONV:FUNC YREF** **:CALC{1-16}:CONV ON**
CONVYTRA	Transform the S-parameter measurement data into impedances (transmissions).	**:CALC{1-16}:CONV:FUNC YTR** **:CALC{1-16}:CONV ON**
CONVZREF	Transform the S-parameter measurement data into impedances (refrections).	**:CALC{1-16}:CONV:FUNC ZREF** **:CALC{1-16}:CONV ON**
CONVZTRA	Transform the S-parameter measurement data into impedances (transmissions).	**:CALC{1-16}:CONV:FUNC ZTR** **:CALC{1-16}:CONV ON**
COPYFRFT	Copy a label from the file title.	Not available
COPYFRRT	Copy a label from the register title.	Not available
CORI	Set the error correction by interpolation of calibration coefficients to On/Off.	Not available (Always On)
CORR	Set the error correction On/Off.	**:SENS{1-16}:CORR:STAT**

8753ES	Function overview	E5070B/E5071B
COUC	Set the sweep condition at Couple/Uncouple between channels.	The sweep condition is not coupled between channels. The sweep condition for traces on the same channel is coupled.
COUP	Set the power level at Couple/Uncouple between channels.	You can do the same thing in the channel and trace setup.
CSWI	Set the switch changeover in the test set to Continuous/Stop.	Not available
CWFREQ	Specify the signal source frequency for the power level sweep or CW TIME sweep.	**:SENS{1-16}:FREQ**
CWTIME	Set the sweep type to CW TIME.	Not available (CW TIME sweep function not available.)
[D]		
D1DIVD2	Display on channel 2 the result of dividing the measurement on channel 2 by that on channel 1.	Not available
D2XUPCH2	Places two graphs on the LCD screen: an upper one (for channels 1 and 2) and a lower one (for channels 3 and 4).	Not available
D2XUPCH3	Places two graphs on the LCD screen: an upper one (for channels 1 and 3) and a lower one (for channels 2 and 4).	**:DISP:SPL** (Sets up the channel window layout.) and **:DISP:WIND{1-16}:SPL** (Sets up the trace graph layout.) are combined to enable you to perform the equivalent.
D4XUPCH2	Places four graphs on the LCD screen: one in the upper left (for channel 1), one in the upper right (for channel 2), one in the lower left (for channel 3), and one in the lower right (for channel 4).	
D4XUPCH3	Places four graphs on the LCD screen: one in the upper left (for channel 1), one in the upper right (for channel 3), one in the lower left (for channel 2), and one in the lower right (for channel 4).	Not available
DATI	Save the measurement data in memory.	**:CALC{1-16}:MATH:MEM**
DCONV	Select Down Convert in the mixer measurement.	Not available (Mixer measurement function not available.)
DEBU	Set the GPIB debug mode On/Off.	Not available
DECRLOOC	Subtract one from the loop counter value.	Not available (Test sequence function not available.)
DEFC	Return the color settings of all items to their initial states.	**:DISP:COL{1-2}:REF**
DEFLPRINT	Return the printer setup to its initial state.	Not available
DEFLTCPIO	Return the copy setup to its initial state.	Not available
DEFS	In defining calibration kits, start defining each standard.	Not available (You do not need to send the command for defining a standard.)
DELA	Set the display format to the group delay format.	**:CALC{1-16}:FORM GDEL**
DELO	Turn off the delta marker mode.	**:CALC{1-16}:MARK{1-10}:REF OFF**
DELR	Designate the delta marker as the designated marker.	Not available (Marker 10 is assigned as the delta marker.)
DELRFIXM	Designate the delta marker as a fixed delta marker.	Not available (No functions for fixed markers are available.)
DEMOAMPL	Display the AM modulated component only.	Not available (Demodulation function not available.)
DEMOOFF	Turn off the demodulation function.	
DEMOPHAS	Display the phase-modulated component only.	
DFLT	Return the plotter setup to its initial state.	Not available (Plotters are not supported.)
DIRS	Specify the size of the directory used in initializing a disk with LIF.	Not available (The LIF format is not supported.)
DISCUNIT	Specify the external disk to be used for Save/Recall.	Not available
DISCVOLU	Specify the partition on the external disk to be used for Save/Recall.	Not available
DISM	Set the LCD screen for all marker values to On/Off.	Not available (Always displays all marker values.)

8753ES vs. E5070B/E5071B Command Comparison (8753ES-only commands excluded)

8753ES	Function overview	E5070B/E5071B
DISPDATA	Display data traces.	**:DISP:WIND{1-16}:TRAC{1-16}:STAT ON** **:DISP:WIND{1-16}:TRAC{1-16}:MEM OFF** **:CALC{1-16}:MATH:FUNC NORM** (All three commands must be sent.)
DISPDATM	Display the data trace and memory trace at the same time.	**:DISP:WIND{1-16}:TRAC{1-16}:STAT ON** **:DISP:WIND{1-16}:TRAC{1-16}:MEM ON** **:CALC{1-16}:MATH:FUNC NORM** (All three commands must be sent.)
DISPDDM	Display the result of dividing the data trace by the memory trace.	**:DISP:WIND{1-16}:TRAC{1-16}:STAT ON** **:DISP:WIND{1-16}:TRAC{1-16}:MEM OFF** **:CALC{1-16}:MATH:FUNC DIV** (All three commands must be sent.)
DISPDMM	Display the result of subtracting the memory trace from the data trace.	**:DISP:WIND{1-16}:TRAC{1-16}:STAT ON** **:DISP:WIND{1-16}:TRAC{1-16}:MEM OFF** **:CALC{1-16}:MATH:FUNC SUBT** (All three commands must be sent.)
DISPMEMO	Display the memory trace.	**:DISP:WIND{1-16}:TRAC{1-16}:STAT OFF** **:DISP:WIND{1-16}:TRAC{1-16}:MEM ON** (Both commands must be sent.)
DIVI	Display the result of dividing the data trace by the memory trace.	**:DISP:WIND{1-16}:TRAC{1-16}:STAT ON** **:DISP:WIND{1-16}:TRAC{1-16}:MEM OFF** **:CALC{1-16}:MATH:FUNC DIV** (All three commands must be sent.)
DONE	When two or more standards exist in a calibration class, complete the measurement of the calibration data.	Not available (Only one type of standard is assigned to each calibration class.)
DONM	Complete the editing of the test sequence.	Not available (Test sequence function not available.)
DOSEQ	Start executing the selected test sequence.	Not available (Test sequence function not available.)
DOWN	Performs the same processing as pressing the [↓] key on the front panel.	Not available
DUAC	Set the simultaneous two-channel display On/Off.	**:DISP:SPL** (Sets up the channel window layout.) and **:DISP:WIND{1-16}:SPL** (Sets up the trace graph layout) are combined to enable you to perform the equivalent.
DUPLSEQ	Copy the test sequence.	Not available (Test sequence function not available.)
	[E]	
ECALAB?	Read the selected ECAL module.	Not available
ECALCONT	Resume the suspended ECAL operation.	Not available
ECALDONE	Read to see if the ECal operation has ended.	Not available
ECALERC	Perform ECal forward enhanced response calibration.	**:SENS{1-16}:CORR:COLL:ECAL:ERES**
ECALFREQS	Read the calibration frequency array store in the ECal module.	Not available
ECALFUL2	Perform ECal full 2-port calibration.	**:CALC{1-16}:CORR:COLL:ECAL:SOLT2**
ECALISOAVG	Specify the averaging factor during isolation measurement using the ECal module.	Not available
ECALMANTHRU	Set the manual THRU measurement for ECal On/Off	Not available (Always performs automatic measurement)
ECALMODID	Read the product number and serial number of the ECal module.	Not available
ECALMODINF	Read the information on the ECal module.	Not available
ECALMODSELA	Select module A as the active module.	Not available
ECALMODSELB	Select module B as the active module.	Not available

8753ES	Function overview	E5070B/E5071B
ECALNFREQS	Specify the size of the calibration frequency array to be read from the ECal module.	Not available
ECALOMII	Set the omission of isolation for ECal On/Off.	**:CALC{1-16}:CORR:COLL:ECAL:ISOL** (The On/Off relation on the 8753ES is opposite that on the E5070B/E5071B.)
ECALPAUSED	Read to see if the ECal operation is interrupted.	Not available
ECALRERC	Perform ECal reverse enhanced response calibration.	**:SENS{1-16}:CORR:COLL:ECAL:ERES**
ECALS11	Perform ECal S11 1-port calibration.	**:CALC{1-16}:CORR:COLL:ECAL:SOLT1 1**
ECALS22	Perform ECal S22 1-port calibration.	**:CALC{1-16}:CORR:COLL:ECAL:SOLT1 2**
EDITDONE	Complete editing the tables.	Not available (Each table is edited using one command; there is no corresponding command.)
EDITLIML	Start editing the limit test table.	Not available (**:CALC{1-16}:LIM:DATA** is used to edit the limit test table.)
EDITLIST	Start editing the list (segment) sweep table.	Not available (**:SENS{1-16}:SEGM:DATA** is used to edit the segment table.)
EDITRLIM	Start editing the ripple limit.	**:CALC{1-16}:RLIM:DATA**
ELED	Specify the electrical delay value.	**:CALC{1-16}:CORR:EDEL:TIME**
EMIB	Sounds beeps during the test sequence.	**:SYST:BEEP:COMP:IMM** (beep sound when an action completes) or **:SYST:BEEP:WARN:IMM** (beep sound when a warning occurs)
ENTO	Cause the entry area display to disappear from the LCD screen.	Not available (The entry area is not displayed in remote control.)
ERCDONE	Complete the measurement of forward enhanced response calibration and calculate the calibration coefficients on the basis of the data obtained.	**:SENS{1-16}:CORR:COLL:SAVE**
ESB?	Read the value of event status register B.	Not available (Register corresponding to event status register not available.)
ESE	Specify the value of the event status valid register.	***ESE**
ESNB	Specify the value of event status valid register B.	Not available (Register corresponding to event status valid register B not available.)
ESR?	Read the value of the event status register.	***ESR?**
EXTD	Designate the external disk drive as the storage to be manipulated.	Not available (Storing data to the external disk drive is not allowed.)
EXTMDATA	Determine whether or not to save corrected data along with the device status.	**:MMEM:STOR:STYP** (Selection of the contents to be saved (v) in the Instrument State file)
EXTMDATO	Save the data array selected only.	Not available (**:MMEM:STOR:FDAT** can be used to save the formatted memory array for the active trace on the active channel.)
EXTMFORM	Determine whether or not to save trace data along with the device status.	Not available
EXTMGRAP	Determine whether or not to save the LCD screen along with the device status.	Not available (Adding images on the LCD screen to the Instrument State file is not allowed.)
EXTMRAW	Determine whether or not to save raw data along with the device status.	Not available (Adding raw data is not allowed.)
EXTTOFF	Turn off the external trigger mode.	Not available (Automatically turns off if a setting other than external trigger is selected in **:TRIG:SOUR**.)
EXTTON	Set to the external trigger mode (per sweep).	**:TRIG:SOUR EXT** **:TRIG:POIN OFF**
EXTTHIGH	Set the external trigger line to High.	Not available (The external trigger line is set to Low.)
EXTTLOW	Set the external trigger line to Low.	

8753ES vs. E5070B/E5071B Command Comparison (8753ES-only commands excluded)

8753ES	Function overview	E5070B/E5071B
EXTTPOIN	Set to the external trigger mode (point by point).	**:TRIG:POIN ON**
	[F]	
FIXE	In defining the calibration kits, set the type of LOAD to fixed load.	Not available (The LOAD standard is treated as fixed LOAD)
FORM1	Select the intra-device binary format for data transfers.	Not available (Selecting the intra-device binary format is not allowed.)
FORM2	Select the IEEE 32-bit floating point format for data transfers.	**:FORM:DATA REAL32** **:FORM:BORD NORM**
FORM3	Select the IEEE 64-bit floating point format for data transfers.	**:FORM:DATA REAL** **:FORM:BORD NORM**
FORM4	Select the ASCII format for data transfers.	**:FORM:DATA ASC**
FORM5	Select the PC-DOS 32-bit floating point format for data transfers.	**:FORM:DATA REAL32** **:FORM:BORD SWAP**
FORMATDOS	Select DOS as the storage format.Çí	Not available (Not compatible with the LIF format)
FORMATLIF	Select LIF as the storage format.	
FREO	Cause the frequency display on the LCD screen to disappear.	**:DISP:ANN:FFREQ OFF** (Executing this command does not increase the coverage of the graph.)
FREQOFFS	Set the frequency offset mode in the mixer measurement On/Off.	Not available (Mixer measurement function not available.)
FRER	Set the trigger mode to continuous mode.	**:INIT{1-16}:CONT ON**
FULP	Set up the system for full page plotting.	Not available (Plotters are not supported.)
FWDI	Start measuring the data from the forward isolation in 2-port calibration.	**:SENS:CORR:COLL:ISOL** (Measures isolation bi-directionally.)
FWDM	Start measuring the data from the forward match in full 2-port calibration.	**:SENS:CORR:COLL:THRU** (Measures both transmission and match.)
FWDT	Start measuring the data from the forward transmission in full 2-port calibration.	
	[G]	
GATECENT	Specify the center value for the time-domain gate.	**:CALC{1-16}:FILT:TIME:CENT**
GATEO	Set the time-domain gate On/Off.	**:CALC{1-16}:FILT:TIME:STAT**
GATESPAN	Specify the span value of the time-domain gate.	**:CALC{1-16}:FILT:TIME:SPAN**
GATESTAR	Specify the start value of the time-domain gate.	**:CALC{1-16}:FILT:TIME:STAR**
GATESTOP	Specify the stop value of the time-domain gate.	**:CALC{1-16}:FILT:TIME:STOP**
GATSMAXI	Set the shape of the time-domain gate to maximum.	**:CALC{1-16}:FILT:TIME:SHAP MAX**
GATSMINI	Set the shape of the time-domain gate to minimum.	**:CALC{1-16}:FILT:TIME:SHAP MIN**
GATSNORM	Set the shape of the time-domain gate to normal.	**:CALC{1-16}:FILT:TIME:SHAP NORM**
GATSWIDE	Set the shape of the time-domain gate to wide.	**:CALC{1-16}:FILT:TIME:SHAP WIDE**
GOSUB	Perform another sequence from the test sequence.	Not available (Test sequence function not available.)
	[H]	
HARMOFF	Set the harmonics measurement mode to Off.	Not available (Harmonics measurement mode not available.)
HARMSEC	Select 2nd harmonics measurement.	
HARMTHIR	Select 3rd harmonics measurement.	
HOLD	Stop the sweep operation (Hold mode)	**:INIT{1-16}:CONT OFF**
	[I]	
IDN?	Read the product information.	***IDN?**
IFBIHIGH	Execute the test sequence when the designated GPIO bit is at High.	Not available (Test sequence function not available.)
IFBILOW	Execute the test sequence when the designated GPIO bit is at Low.	Not available (Test sequence function not available.)

8753ES	Function overview	E5070B/E5071B
IFBW	Specify the IF bandwidth.	**:SENS{1-16}:BAND**
IFLCEQZE	Execute the test sequence when the loop counter is at zero.	Not available (Test sequence function not available.)
IFLCNEZE	Execute the test sequence when the loop counter is at a value other than zero.	Not available (Test sequence function not available.)
IFLTFAIL	Execute the test sequence when the limit test fails.	Not available (Test sequence function not available.)
IFLTPASS	Execute the test sequence when the limit test passes.	Not available (Test sequence function not available.)
IMAG	Set the display format to Imaginary.	**:CALC{1-16}:FORM IMAG**
INCRLOOC	Add one to the loop counter reading.	Not available (Test sequence function not available.)
INID	Initialize the floppy disk.	Not available(Able to execute using a mouse)
INIE	Initialize the external disk.	Not available
INPUCALC	Enter data into the calibration coefficient array.	**:SENS{1-16}:CORR:COEF** You need to specify the calibration type with "**:SENS{1-16}:CORR:COEF:METH:xxxx**" in E5070B/E5071B before writing the calibration coefficient array.
INPUCALK	Enter data into the calibration kit array.	Not available (No access is allowed to the calibration kit array.)
INPUDATA	Enter data into the corrected data array.	**:CALC{1-16}:DATA:SDAT**
INPUFORM	Enter data into the formatted array.	**:CALC{1-16}:DATA:FDAT**
INPULEAS	Enter the learn string.	Not available (Reading/Writing the learn string is not allowed.)
INPUPMCAL1	Enter data into the power meter calibration array for channel 1.	Not available
INPUPMCAL2	Enter data into the power meter calibration array for channel 2.	
INPURAW1	Enter data into raw data array 1 (S11).	Not available (Reading/Writing the raw data array is not allowed.)
INPURAW2	Enter data into raw data array 2 (S21).	
INPURAW3	Enter data into raw data array 3 (S12).	
INPURAW4	Enter data into raw data array 4 (S22).	
INSMEXSA	Select the external source (auto) as the measuring instrument mode.	Not available (Always a standard network analyzer)
INSMEXSM	Select the external source (manual) as the measuring instrument mode.	
INSMNETA	Select the standard network analyzer as the measuring instrument mode.	
INSMTUNR	Select the tuned receiver as the measuring instrument mode.	
INTD	Designate the floppy disk drive as the storage to be manipulated.	Not available (When the file is saved in drive A using the file save command**:MMEM:SAVE**, it is saved to the floppy disk drive.)
INTE	Specify the brightness of the LCD screen.	Not available (Only On/Off setting for the backlight is allowed.)
INTM	Designate the internal memory as the storage to be manipulated.	Not available (Designated by the file Read/Write command.)
ISOD	Complete the measurement of data from the isolation of full 2-port calibration.	Not available (Data measurement completion command not available.)
ISOL	Start measuring the data from the isolation of full 2-port calibration.	Not available (Data measurement completion command not available.)

8753ES	Function overview	E5070B/E5071B
ISOOP	Start measuring the data from the isolation of one-bus 2-port calibration.	**:SENS{1-16}:CORR:COLL:ISOL**
	[K]	
KEY	Performs the same processing as pressing the designated key on the front panel.	Not available (No command available equivalent to the front panel key manipulation in terms of processing.)
KITD	Complete the operation for defining calibration kits.	Not available (No command available for ending defining operations.)
KOR?	Read the information for the previous front panel manipulation.	Not available
	[L]	
LABEFWDM	Give an arbitrary name to the Forward Match calibration class.	Not available (Editing of calibration class labels is not allowed.)
LABEFWDT	Give an arbitrary name to the Forward Transmission calibration class.	
LABERESI	Give an arbitrary name to the Response & Isolation calibration class.	
LABERESP	Give an arbitrary name to the Response calibration class.	
LABEREVM	Give an arbitrary name to the Reverse Match calibration class.	
LABEREVT	Give an arbitrary name to the Reverse Transmission calibration class.	
LABES11A	Give an arbitrary name to the S11A (OPEN) calibration class.	
LABES11B	Give an arbitrary name to the S11B (SHORT) calibration class.	
LABES11C	Give an arbitrary name to the S11C (LOAD) calibration class.	
LABES22A	Give an arbitrary name to the S22A (OPEN) calibration class.	
LABES22B	Give an arbitrary name to the S22B (SHORT) calibration class.	
LABES22C	Give an arbitrary name to the S22C (LOAD) calibration class.	
LABETRLL	Give an arbitrary name to the TRL Line/Match calibration class.	
LABETRLT	Give an arbitrary name to the TRL Thru calibration class.	
LABETRLR	Give an arbitrary name to the TRL Reflection calibration class.	
LABETLFM	Give an arbitrary name to the S11B (SHORT) calibration class.	
LABETLFT	Give an arbitrary name to the S11C (LOAD) calibration class.	
LABETLRM	Give an arbitrary name to the S22B (SHORT) calibration class.	
LABETLRT	Give an arbitrary name to the S22C (LOAD) calibration class.	
LABETRFM	Give an arbitrary name to the S11A (OPEN) calibration class.	
LABETRRM	Give an arbitrary name to the S22A (OPEN) calibration class.	
LABETTFM	Give an arbitrary name to the Forward match calibration class.	
LABETTFT	Give an arbitrary name to the Forward Transmission calibration class.	
LABETTRM	Give an arbitrary name to the Reverse Match calibration class.	
LABETTRT	Give an arbitrary name to the Reverse Transmission calibration class.	
LABK	Give an arbitrary name to the user-defined calibration kit label.	**:SENS{1-16}:CORR:COLL:CKIT:LAB**
LABS	Give an arbitrary name to the calibration standard.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:LAB**
LEFL	Set up the system so the object is output through the plotter onto the lower-left 1/4 of a sheet.	Not available (Plotters are not supported.)
LEFU	Set up the system so the object is output through the plotter onto the upper-left 1/4 of a sheet.	
LIMD	Specify the limit delta value for the limit test.	Not available (**:CALC{1-16}:LIM:DATA** is used to perform all the limit table setup work.)

8753ES	Function overview	E5070B/E5071B
LIMIAMPO	Specify the offset along the Y-axis in the limit range for the limit test.	**:CALC{1-16}:LIM:OFFS:AMPL**
LIMILINE	Set the limit line display On/Off.	**:CALC{1-16}:LIM:DISP**
LIMIMAOF	Set the marker value at the offset along the Y-axis in the limit range for the limit test.	**:CALC{1-16}:LIM:OFFS:MARK**
LIMISTIO	Specify the offset along the X-axis in the limit range for the limit test.	**:CALC{1-16}:LIM:OFFS:STIM**
LIMITEST	Set the limit test On/Off.	**:CALC{1-16}:LIM**
LIML	Specify the lowest value of the limit for the limit test.	Not available (**:CALC{1-16}:LIM:DATA** is used to perform all the limit table setup work.)
LIMM	Specify the center value of the limit for the limit test.	
LIMS	Specify the boundary value of the segment in the limit test.	
LIMTFL	Select a flat line as the limit type in the limit test.	
LIMTSL	Select a sloping line as the limit type in the limit test.	
LIMTSP	Select a single point as the limit type in the limit test.	
LIMU	Specify the highest value of the limit in the limit test.	
LINFREQ	Select linear sweep as the type of sweep.	**:SENS{1-16}:SWE:TYPE LIN**
LINM	Select the linear magnitude format as the display format.	**:CALC{1-16}:FORM MLIN**
LINTDATA	Specify the line type for data traces.	Not available (Always a solid line)
LINTMEMO	Specify the line type for memory traces.	
LISFREQ	Select the list frequency sweep as the type of sweep.	**:SENS{1-16}:SWE:TYPE SEGM**
LISIFBWM	Make the segment-by-segment IFBW setup for the list frequency sweep Valid/Invalid.	Not available (The **:SENS{1-16}:SEGM:DATA** command takes care of the entire segment setup.)
LISPWRM	Make the segment-by-segment power level setup for the list frequency sweep Valid/Invalid.	Not available (The **:SENS{1-16}:SEGM:DATA** command takes care of the entire segment setup.)
LISTTYPELSTP	Select the stepped list mode to perform the list frequency sweep.	**:SENS{1-16}:SWE:GEN STEP**(E5070B/E5071B change stepped/swept mode for the linear sweep.)
LISTTYPELSWP	Select the swept list mode to perform the list frequency sweep.	**:SENS{1-16}:SWE:GEN ANAL** (E5070B/E5071B change stepped/swept mode for the linear sweep. The swept mode also allows the IF bandwidth and power level to be specified segment by segment.)
LISV	Display the measurement results in a list.	Not available (List display function not available.)
LOAD	Call the Instrument State from a file on the disk.	**:MMEM:LOAD**
LOADSEQ	Call the test sequence from a file on the disk.	**:MMEM:LOAD:PROG** (Call a macro created with VBA.)
LOAN	If LOAD is defined as offset LOAD, measure LOAD without the offset.	Not available (LOAD is treated as fixed LOAD.)
LOAO	If LOAD is defined as offset LOAD, measure LOAD with the offset.	
LOCONT	Set the LO control On/Off.	Not available (LO control function not available.)
LOFREQ	Specify the LO frequency.	
LOFSTAR	Specify the starting frequency for LO.	
LOFSTOP	Specify the ending frequency for LO.	
LOFSWE	Select the sweep mode for the LO frequency.	
LOGFREQ	Select the log sweep as the type of sweep.	**:SENS{1-16}:SWE:TYPE LOG**
LOGM	Select the log magnitude format as the display format.	**:CALC{1-16}:FORM MLOG**
LOOC	Specify the loop counter reading.	Not available (Test sequence function not available.)

8753ES vs. E5070B/E5071B Command Comparison (8753ES-only commands excluded)

8753ES	Function overview	E5070B/E5071B
LOPOWER	Specify the power level for LO.	Not available (LO control function not available.)
LOPSTAR	Specify the starting power level for LO.	
LOPSTOP	Specify the ending power level for LO.	
LOPSWE	Select the power sweep mode for LO.	
LOWPIMPU	Select the LOWPASS IMPULSE mode for the time-domain transformation.	**:CALC{1-16}:TRAN:TIME LPAS** **:CALC{1-16}:TRAN:TIME:STIM IMP**
LOWPSTEP	Select the LOW PASS STEP mode for the time-domain transformation.	**:CALC{1-16}:TRAN:TIME LPAS** **:CALC{1-16}:TRAN:TIME:STIM STEP**
LRN	Perform Setup/Read of the learn string.	Not available (Setup/Read of the learn string is not allowed.)
[M]		
MANTRIG	Select the manual trigger mode (point by point).	Not available
MARK1	Activate marker 1 and move it to the designated position.	**:CALC{1-16}:MARK{1-10}** (Marker On/Off) and **:CALC{1-16}:MARK{1-10}:X** (Marker stimulus value) are combined for execution.
MARK2	Activate marker 2 and move it to the designated position.	
MARK3	Activate marker 3 and move it to the designated position.	
MARK4	Activate marker 4 and move it to the designated position.	**:CALC{1-16}:MARK{1-10}** (Marker ON/OFF) and **:CALC{1-16}:MARK{1-10}:X** (Marker stimulus value) are combined for execution.
MARK5	Activate marker 5 and move it to the designated position.	
MARKBUCK	Move the active marker to the designated point.	Not available (Specify the stimulus value when moving the marker.)
MARKCENT	Change the sweep center value to the stimulus value at the position of the active marker.	**:CALC{1-16}:MARK{1-10}:SET CENT**
MARKCONT	Select the mode in which the marker moves on the trace continuously.	**:CALC{1-16}:MARK{1-10}:DISC OFF**
MARKCOUP	Select the mode in which markers are coupled between channels.	**:CALC{1-16}:MARK:COUP ON** (Coupled between traces on the same channel)
MARKCW	Change the CW frequency value to the frequency value at the position of the active marker.	Not available (CW TIME sweep function and power sweep function not available.)
MARKDELA	Specify the electrical length so that the group delay is zero at the position of the active marker.	**:CALC{1-16}:MARK{1-10}:SET DEL**
MARKDISC	Select the mode in which the marker moves from one point to another on the trace.	**:CALC{1-16}:MARK{1-10}:DISC ON**
MARKFAUV	Move the fixed marker to the position of the designated auxiliary measured value.	Not available (Fixed marker function not available.)
MARKFSTI	Move the fixed marker to the position of the fixed stimulus value.	
MARKFVAL	Move the fixed marker to the position of the designated measured value.	
MARKMAXI	Move the active marker to the position of the maximum value.	**:CALC{1-16}:MARK{1-10}:FUNC:TYPE MAX** **:CALC{1-16}:MARK{1-10}:FUNC:EXEC** (Both commands must be sent.)
MARKMIDD	Set the center value of the limit in the delta limit test to the measured value at the position of the active marker.	Not available
MARKMINI	Move the active marker to the position of the minimum value.	**:CALC{1-16}:MARK{1-10}:FUNC:TYPE MIN** **:CALC{1-16}:MARK{1-10}:FUNC:EXEC** (Both commands must be sent.)
MARKOFF	Set all markers and the marker function to Off.	Not available
MARKREF	Change the reference value to the measured value at the position of the active marker.	**:CALC{1-16}:MARK{1-10}:SET RLEV**
MARKSPAN	Change the span value of the sweep range to the stimulus value at the position of the active marker.	Not available (The stimulus value is not allowed to be set to the span value of the sweep range.)
MARKSTAR	Change the starting value of the sweep range to the stimulus value at the position of the active marker.	**:CALC{1-16}:MARK{1-10}:SET STAR**

8753ES	Function overview	E5070B/E5071B
MARKSTIM	Set the boundary value of the segment in the limit test to the stimulus value at the position of the active marker.	Not available
MARKSTOP	Change the ending value of the sweep range to the stimulus value at the position of the active marker.	**:CALC{1-16}:MARK{1-10}:SET STOP**
MARKUNCO	Select the mode in which the markers are not coupled between channels.	**:CALC{1-16}:MARK{1-10}:COUP** OFF (Turn off the coupling between traces on the channel.)
MARKZERO	Move the fixed marker to the position of the active marker.	Not available (Fixed marker function not available.)
MAXF	In defining calibration kits, specify the maximum frequency value.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMAX**
MEASA	Select measurement A and display the traces.	Not available(The E5070B/E5071B does not have absolute value measuring function.)
MEASB	Select measurement B and display the traces.	
MEASR	Select measurement R and display the traces.	
MEASTAT	Set the statistics analysis function On/Off.	**:CALC{1-16}:MST**
MENUAVG	Display the softkey menu appearing when the [Avg] key is pressed.	Not available (No command is available that displays the softkey menu corresponding to each key.)
MENUCAL	Display the softkey menu appearing when the [Cal] key is pressed.	
MENUCOPY	Display the softkey menu appearing when the [Copy] key is pressed.	
MENUDISP	Display the softkey menu appearing when the [Display] key is pressed.	
MENUFORM	Display the softkey menu appearing when the [Format] key is pressed.	
MENUMARK	Display the softkey menu appearing when the [Marker] key is pressed.	
MENUMEAS	Display the softkey menu appearing when the [Meas] key is pressed.	
MENUMRKF	Display the softkey menu appearing when the [Marker Fctn] key is pressed.	
MENUOFF	Set the softkey menu display to Off.	**:DISP{1-16}:SKEY OFF**
MENUON	Set the softkey menu display to On.	**:DISP{1-16}:SKEY ON**
MENUPOWE	Display the softkey menu appearing when the [Power] key is pressed.	Not available (No command is available that displays the softkey menu corresponding to each key.)
MENURECA	Display the softkey menu appearing when the [Save/Recall] key is pressed.	
MENUSAVE	Display the softkey menu appearing when the [Save/Recall] key is pressed.	
MENUSCAL	Display the softkey menu appearing when the [Scale Ref] key is pressed.	
MENUSEQU	Display the softkey menu appearing when the [Seq] key is pressed.	
MENUSRCH	Display the softkey menu appearing when the [Marker Search] key is pressed.	
MENUSTIM	Display the softkey menu appearing when the [Sweep Setup] key is pressed.	
MENUSWEE	Display the softkey menu appearing when the [Sweep Setup] key is pressed.	
MENUSYST	Display the softkey menu appearing when the [System] key is pressed.	
MINF	In defining calibration kits, specify the minimum frequency value.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:FMIN**
MINMAX	Set the function for recording the maximum and minimum for each segment in the limit test to On/Off.	Not available

8753ES vs. E5070B/E5071B Command Comparison (8753ES-only commands excluded)

8753ES	Function overview	E5070B/E5071B
MINU	Display the result of subtracting the memory trace from the data trace.	**:DISP:WIND{1-16}:TRAC{1-16}:STAT ON** **:DISP:WIND{1-16}:TRAC{1-16}:MEM OFF** **:CALC{1-16}:MATH:FUNC SUBT** (All three commands must be sent.)
MODI1	Start defining the calibration kits.	Not available
MODS	Calculate the new calibration set using the adapter removal function.	Not available
[N]		
NEWSEQ	Create/Revise a test sequence.	Not available (Test sequence function not available.)
NEXP	Go to next page while the list is displayed on the LCD screen.	Not available (List display function not available.)
NOOP	Wait for a while without doing anything.	Not available
NUMG	Perform the sweep operation the specified number of times.	**:TRIG:AVER ON**
NUMR	Specify the number of power meter readings.	**:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:AVER**
[O]		
OFLD	Complete the offset LOAD measurement.	Not available (The LOAD standard is treated as fixed LOAD.)
OFLS	In defining calibration kits, select the offset LOAD as the type of LOAD.	
OFSD	Specify the offset value of the electrical delay.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:DEL**
OFSL	Specify the loss offset.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:LOSS**
OFSZ	Specify the offset value of the characteristic impedance.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:Z0**
OMII	Omit the isolation measurement when performing calibration.	Not available (Isolation measurement is treated as an option.)
OPC	When the next command have been completed , set bit 0 of the event status register standby.	***OPC**(When all operations on standby have been completed, set bit 0 of the event status register.)
OPEP	Display the list of Instrument State statuses on the LCD screen.	Not available
OUTPACTI	Read the entry area value.	Not available
OUTPAMAX	Read the maximum of the measured values in the segments in the limit test.	Not available
OUTPAMIN	Read the minimum of the measured values in the segments in the limit test.	Not available
OUTPAPER	Read the smoothing aperture value.	**:CALC{1-16}:SMO:APER?**
OUTPCALC{01-12}	Read the calibration coefficient array.	**:SENS{1-16}:CORR:COEF?**
OUTPCALK	Read the data about the calibration kit setup.	Not available (Reading/Writing the calibration kit array is not allowed.)
OUTPFARPLPT	Read the information about fails in the ripple test.	**:CALC{1-16}:RLIM:REP?**
OUTPCHAN	Read the active channel.	**:DISP:WIND{1-16}:ACT?** (Reading of the active channel) **:CALC{1-16}:PAR{1-16}:SEL?** (Reading of the active trace)
OUTPDATA	Read the corrected data array.	**:CALC{1-16}:DATA:SDAT?**
OUTPDATF	Read the corrected data array. (High-speed data transfer command)	**:CALC{1-16}:DATA:SDAT?** (High-speed data transfer command not available.)
OUTPDATP	Read the trace data at the designated point.	Not available
OUTPDATR	Read the trace data at points within the designated range.	Not available
OUTPERRO	Read error information from the error cue.	**:SYST:ERR?**

8753ES	Function overview	E5070B/E5071B
OUTPFAIP	Read the number of failed points and the stimulus value at points in the limit test.	Not available (The number of points can be read by **:CALC{1-16}:LIM:REP:POIN?**, and the stimulus value by **:CALC{1-16}:LIM:REP?**, but the measured values cannot be read.)
OUTPFORF	Read the formatted data array. (High-speed data transfer command)	**:CALC{1-16}:DATA:FDAT?** (High-speed data transfer command not available.)
OUTPFORM	Read the formatted data array.	**:CALC{1-16}:DATA:FDAT?**
OUTPICAL{01-12}	Read the interpolated calibration coefficient array.	**:SENS{1-16}:CORR:COEF?**
OUTPIDEN	Read the product information.	***IDN?**
OUTPIPMCL{1-2}	Read the interpolated power meter calibration array.	**:SOUR{1-16}:POW:PORT{1-2}:CORR:DATA?**
OUTPKEY	Read the code of the key you last pressed.	Not available
OUTPLEAS	Read the learn string.	Not available (Reading/Writing a learn string is not allowed.)
OUTPLIM{1-4}	Read the results of the limit test.	**:CALC{1-16}:LIM:FAIL?** (Read the result of the active trace on the specified channel. The value read from the results is different from that obtained by the 8753ES.)
OUTPLIMF	Read the information on the failed points and the number of failed points in the limit test.	Not available (You can read the number of failed points by using **:CALC{1-16}:LIM:REP:POIN?**.)
OUTPLIML	Read the results of the limit test for each point.	**:CALC{1-16}:LIM:REP:ALL?**
OUTPLIMM	Read the results of the limit test at the position of the active marker.	Not available
OUTPMARK	Read the value of the active marker.	**:CALC{1-16}:MARK{1-10}:X?** (Stimulus value) **:CALC{1-16}:MARK{1-10}:Y?** (Response value) can be used to read the marker value, but you must designate the channel and marker in the command.
OUTPMEMF	Read the data about the memory trace. (High-speed data transfer command)	**:CALC{1-16}:DATA:SMEM?** (High-speed data transfer command not available.)
OUTPMEMO	Read the data about the memory trace.	**:CALC{1-16}:DATA:SMEM?**
OUTPMSTA	Read the results of the statistics analysis.	**:CALC{1-16}:MST:DATA?**
OUTPMWID	Read the results of the bandwidth search (bandwidth, center value, and Q value).	**:CALC{1-16}:MARK{1-10}:BWID:DATA?** (The array read contains data on the loss value.)
OUTPMWIL	Read the results of the bandwidth search (bandwidth, center value, Q value, and loss value).	**:CALC{1-16}:MARK{1-10}:BWID:DATA?**
OUTPOPTS	Read the information about the installed options.	***OPT?**
OUTPPLOT	Outputs the LCD screen to the GPIB port in HP-GL format.	Not available (The LCD screen is not allowed as output from the GPIB.)
OUTPPMCAL{1-2}	Read the power meter calibration array.	Not available
OUTPPRE{1-4}	Read the pre-raw data (command for Take4 mode)	Not available (Reading/Writing pre-raw data is not allowed.)
OUTPPRIN	Outputs the LCD screen to the printer in PCL raster dump format.	**:HCOP**
OUTPPRINALL	Prints out all lists when lists are displayed.	Not available (List display function not available.)
OUTPRAF{1-4}	Read the raw data array (High-speed data transfer command).	Not available (Reading/Writing raw data array is not allowed.)
OUTPRAW{1-4}	Read the raw data array.	
OUTPRFFR	Read the frequency of the external RF signal source.	Not available (External RF signal source cannot be used.)

8753ES	Function overview	E5070B/E5071B
OUTPRPLBNDALL	Read the magnitudes of ripples in the ripple test in all valid bands.	**:CALC{1-16}:RLIM:REP?**
OUTPRPLBNDPF	Read the Pass/Fail of the ripple test in the designated band.	
OUTPRPLBNDVAL	Read the results of the ripple test and magnitudes of ripples in the designated band.	
OUTPSEGAF	Read the number of segments and segment-by-segment test results in the limit test.	Not available (Segment-by-segment test results are not allowed to be read.)
OUTPSEGAM	Read the maximum value/minimum value in all segments in the limit test.	
OUTPSEGF	Display the results in the designated segment in the limit test.	
OUTPSEGM	Display the maximum value/minimum value in the designated segment.	
OUTPSEQ{1-6}	Read the contents of the test sequence.	Not available (Test sequence function not available.)
OUTPSERN	Read the product serial number.	Included in the value read from ***IDN?**
OUTPSTAT	Read the value of the status byte register.	***STB?**
OUTPTITL	Read the title on the LCD screen.	**:DISP:WIND{1-16}:TITL:DATA?**
[P]		
PDATA	Determine whether or not to output the data trace when plotting.	Not available (Plotters are not supported.)
PGRAT	Determine whether or not to output graticule lines when plotting.	
PMEM	Determine whether or not to output the memory trace when plotting.	
PMKR	Determine whether or not to output markers when plotting.	
PSOFT	Determine whether or not to output softkeys when plotting.	
PTEXT	Determine whether or not to output the text when plotting.	
PARAIN{0-4}	Specify the bit number of the GPIO input port to be used for branching in the test sequence.	Not available (Test sequence function not available.)
PARAOUT{0-255}	Specify the output from the GPIO output port for all bits at the same time.	Not available (GPIO output is not supported.)
PARALGPIO	Set up the parallel port for GPIO use.	Not available (Parallel port is intended for the printer.)
PARALCPY	Set up the parallel port for printer use.	
PAUS	Insert a pause into the test sequence.	Not available (Test sequence function not available.)
PCB{0-30}	Specify the GPIB address where control is returned.	Not available (Pass control function not available)
PCOLDATA{1-4}	Specify the color for the data trace for printing.	Not available (Color setup is allowed only for turning highlighting of the entire screen On/Off.)
PCOLGRAT	Specify the color for graticule lines for printing.	
PCOLMEMO{1-4}	Specify the color for the memory trace for printing.	
PCOLREFL	Specify the color for the reference line for printing.	
PCOLTEXT	Specify the color for text for printing.	
PCOLWARN	Specify the color for warning messages for printing.	
PENNDATA{0-10}	Specify the pen number for the data trace for plotting.	Not available (Plotters are not supported.)
PENNGRAT{0-10}	Specify the pen number for the graticule lines for plotting.	
PENNMARK{0-10}	Specify the pen number for the marker for plotting.	
PENNMEMO{0-10}	Specify the pen number for the memory trace for plotting.	
PENNTEXT{0-10}	Specify the pen number for text for plotting.	
PHAO{0-360}	Specify the phase offset.	**:CALC{1-16}:CORR:OFFS:PHAS**

8753ES	Function overview	E5070B/E5071B
PHAS	Select the phase format as the display format.	**:CALC{1-16}:FORM PHAS**
PLOSSLOW	Set the pen speed for plotting to Slow.	Not available (Plotters are not supported.)
PLOSFAST	Set the pen speed for plotting to Fast.	
PLOT	Start plotting.	
PLTHNDSHK	Select the handshake mode for the plotter.	
PLTPRTDISK	Select the disk as the plotter port.	
PLTPRTHPIB	Select GPIO as the plotter port.	
PLTPRTPARA	Select the parallel port as the plotter port.	
PLTPRTSERI	Select the serial port as the plotter port.	
PLTTRAUTF	Set the plotter auto feed On/Off.	
PLTTRBAUD	Specify the baud rate for the serial port when using the plotter.	
PLTTRFORF	Send a form feed to the plotter.	
PLTTYPHPGL	Select a PCL5-compatible printer as the plotter type.	
PLTTYPPLTR	Set up the plotter type in the plotter.	
PMTRTTIT	Select the GPIB reading from the power meter as the title.	Not available
POIN	Specify the number of points.	**:SENS{1-16}:SWE:POIN** (Cannot be used for editing segments.)
POLA	Select the polar format as the display format.	**:CALC{1-16}:FORM PLIN** **:CALC{1-16}:FORM PLOG** **:CALC{1-16}:FORM POL** (you have to select the marker value reading format also.)
POLMLIN	Select LIN as the marker value reading format when using the polar format.	Not available (Selected at the same time the polar format is selected as the data format.)
POLMLOG	Select Log as the marker value reading format when using the polar format.	Not available (Selected at the same time the polar format is selected as the data format.)
POLMRI	Select Re/Im as the marker value reading format when using the polar format.	Not available (Selected at the same time the polar format is selected as the data format)
PORE	Set the port extension On/Off.	**:SENS{1-16}:CORR:EXT**
PORT1	Specify the port extension correction value for port 1.	**:SENS{1-16}:CORR:EXT:PORT**
PORT2	Specify the port extension correction value for port 2.	
PORTA	Specify the port extension correction value for input A.	Not available (Port extension correction for input is not allowed.)
PORTB	Specify the port extension correction value for input B.	
PORTP	Select Couple/Uncouple between ports for the power level.	**:SOUR{1-16}:POW:PORT:COUP**
POWE	Specify the power level.	**:SOUR{1-16}:POW**
POWLFREQ	Create the power loss list for power meter calibration.	Not available
POWLLIST		
POWLLOSS		
POWM	Specify the type of power meter.	
POWR{00-07}	Specify the power range of the signal source.	Specify the power range by using **:SOUR{1-16}:POW:ATT** to designate the attenuator.
POWS	Select the power level sweep as the type of sweep.	**:OUTP**
POWT	Set the signal source output On/Off.	Not available (Always On)
PRAN{0-7}	Specify the power range of the signal source.	Specify the power range by using **:SOUR{1-16}:POW:ATT** to designate the attenuator.
PREP	Go back to the previous page while the list is displayed on the LCD screen.	Not available (List display function not available.)

8753ES vs. E5070B/E5071B Command Comparison (8753ES-only commands excluded)

8753ES	Function overview	E5070B/E5071B
PRES	Reset	**:SYST:PRES**
		***RST**(Stop sweeping.)
PRIC	Select color printing.	Not available (Printer setup executed by using the front panel.)
PRIS	Select black-and-white printing.	
PRINALL	Start printing the LCD screen.	**:HCOP**
PRINSEQ	Start printing the test sequence.	Not available (Test sequence function not available.)
PRINTALL	Start printing the list.	Not available (List display function not available.)
PRNHNDSHK	Select the handshake mode for the printer.	Not available
PRNPRTHPIB	Select GPIB as the printer port.	Not available (GPIB printers are not supported.)
PRNPRTPARA	Select the parallel port as the printer port.	Not available
PRNPRTSERI	Select the serial port as the printer port.	Not available
PRNTRAUTF	Set the printer auto feed On/Off.	Not available
PRNTRBAUD	Specify the baud rate of the serial port when using the printer.	Not available
PRNTRFORF	Send a form feed to the printer.	Not available
PRNTYP540	Select the HP DeskJet 540/850C as the printer.	Not available (Printer setup executed by using the front panel.)
PRNTYPDJ	Select the HP DeskJet as the printer.	
PRNTYPEP	Select the Epson ESC/P2 as the printer.	
PRNTYPLJ	Select the HP LaserJet as the printer.	
PRNTYPPJ	Select the HP PaintJet as the printer.	
PRNTYPTJ	Select the HP ThinkJet as the printer.	
PTOS	Stop the designated sequence.	**:PROG:STA STOP**(Stop the VBA program.)
PURG	Delete the file.	**:MMEM:DEL**
PWMCEACS	Calibrate the power meter at every sweep.	Not availabl
PWMCOFF	Turn Off the power meter calibration.	**:SOUR{1-16}:POW:PORT{1-4}:CORR OFF**
PWMCONES	Calibrate the power meter in one sweep operation.	**:SOUR{1-16}:POW:PORT{1-4}:CORR ON**
PWRLOSS	Determine whether or not to use the power loss list for calibrating the power meter.	**:SOUR{1-16}:POW:PORT{1-4}:CORR:TABL:LOSS**
PWRMCAL	Cause the softkey for the power meter calibration menu to appear and specify the power level for calibration.	Not availabl
PWRR	Set the signal source power range changeover to Manual/Auto.	Not available (Always on Manual)
[Q]		
Q	Select the test sequence.	**:PROG:STA STOP**(Select the VBA program.)
[R]		
RAID	Calculate the calibration coefficients for the response & isolation calibration.	**:SENS{1-16}:CORR:COLL:SAVE**
RAIISOL	Execute the isolation measurement for the response & isolation calibration.	**:SENS{1-16}:CORR:COLL:ISOL**
RAIRESP	Start measuring the response for the response and isolation calibration.	**:SENS{1-16}:CORR:COLL:THRU**
RAWOFFS	Set the offset of the sampler and attenuator On/Off. (Take4 mode)	Not available
READDATE	Read the date from the internal clock.	**:SYST:DATE?**
READTIME	Read the time from the internal clock.	**:SYST:TIME?**
REAL	Select the real format as the display format.	**:CALC{1-16}:FORM REAL**
RECA	Recall the Instrument State status from the internal register.	**:MMEM:LOAD**
RECAREG		

8753ES	Function overview	E5070B/E5071B
RECO	Recall the color settings for the LCD screen.	Not available (Color setup is allowed only for turning highlighting of the entire screen On/Off.)
REFD	Complete the reflection data measurement for the 2-port calibration.	Not available (You do not need to send any completion command.)
REFL	Start measuring the reflection data for the 2-port calibration.	Not available (You do not need to send any start command.)
REFOP	Start measuring the data for reflection in the one-bus 2-port calibration (forward enhanced response calibration).	**:SENS{1-16}:CORR:COLL:OPEN** or **:SENS{1-16}:CORR:COLL:SHOR**
REFP	Specify the position of the reference line.	**:DISP:WIND{1-16}:TRAC{1-16}:Y:RLEV**
REFV	Specify the value for the reference line.	**:DISP:WIND{1-16}:TRAC{1-16}:Y:RPOS**
REFT	Read the title of the file from the disk.	Not available
REIC	Specify the power reference value for the receiver calibration.	Not available
RERCDONE	Complete the data measurement for the reverse enhanced response calibration and calculate the calibration coefficients on the basis of the data obtained.	**:SENS{1-16}:CORR:COLL:SAVE**
RESC	Resume the measurement of the calibration data interrupted immediately before.	Not available (Calibration resumption function not available.)
RESD	Return the list display screen for the measurement results to the normal graph screen.	Not available (List display function not available.)
RESPDONE	Calculate the calibration coefficients for the response calibration.	**:SENS{1-16}:CORR:COLL:SAVE**
REST	Interrupt the sweep and start sweeping over again.	Not available
REVI	Start measuring the data for reverse isolation of the full 2-port calibration.	**:SENS{1-16}:CORR:COLL:ISOL**
REVM	Start measuring the data for reverse match of the full 2-port calibration.	Not available (You do not need to send any start command.)
REVT	Start measuring the data for reverse transmission of the full 2-port calibration.	
RFGTLO	Set the signal source frequency to a value greater than LO.	Not available (Mixer measurement function not available.)
RFLTLO	Set the signal source frequency to a value smaller than LO.	
RFLP	Select the S11 measurement.	**:CALC{1-16}:PAR{1-16}:DEF S11**
RIGL	Set up the system so the object is output through the plotter onto the lower-right 1/4 of a sheet.	Not available (Entire screen is always output.)
RIGU	Set up the system so the object is output through the plotter onto the upper-right 1/4 of a sheet.	
RLIMLINE	Set the ripple limit line display On/Off.	**:CALC{1-16}:RLIM:DISP:LINE**
RLIMM	Specify the upper limit value for the ripple test.	**:CALC{1-16}:RLIM:DATA**
RLIMSTP	Specify the frequency band stop value for the ripple test.	
RLIMSTR	Specify the frequency band start value for the ripple test.	
RLIMTEST	Set the ripple test On/Off.	**:CALC{1-16}:RLIM**
RLIMVALABS	Set the ripple value display (absolute) On.	**:CALC{1-16}:RLIM:DISP:VAL**
RLIMVALMAR	Set the ripple value display (margin) On.	
RLIMVALOFF	Set the ripple value display Off.	
RSCO	Return the color setup to the initial state.	Not available (Color setup is allowed only for turning highlighting of the entire screen On/Off.)
RST	Reset	**:SYST:PRES**
		***RST**(Stop sweeping)
[S]		
S11	Select the S11 measurement.	**:CALC{1-16}:PAR{1-16}:DEF S11**

8753ES vs. E5070B/E5071B Command Comparison (8753ES-only commands excluded)

8753ES	Function overview	E5070B/E5071B
S12	Select the S12 measurement.	**:CALC{1-16}:PAR{1-16}:DEF S21**
S21	Select the S21 measurement	**:CALC{1-16}:PAR{1-16}:DEF S12**
S22	Select the S22 measurement	**:CALC{1-16}:PAR{1-16}:DEF S22**
SADD	Add segments while editing tables.	Not available (Each table is edited using one command; there is no corresponding command.)
SAMC	Set the sampler correction On/Off.	**:SYST:CORR**
SAV1	Complete the data measurement for 1-port calibration and calculate the calibration coefficients on the basis of the data obtained.	**:SENS{1-16}:CORR:COLL:SAVE**
SAV2	Complete the data measurement for 2-port calibration and calculate the calibration coefficients on the basis of the data obtained.	**:SENS{1-16}:CORR:COLL:SAVE**
SAVC	Finish writing from the external data to the calibration coefficient array.	**:SENS{1-16}:CORR:COEF:SAVE**
SAVE	Save the Instrument State status into the internal register.	**:MMEM:STOR**
SAVECSV	Save the measurement data in CSV format.	**:MMEM:STOR:FDAT**
SAVEJPG	Save the LCD screen image as a JPEG format file.	**:MMEM:STOR:IMAG** (Stored in Windows® Bitmap format/PNG format.)
SAVERC	Complete the data measurement of the forward enhanced response calibration and calculate the calibration coefficients on the basis of the data obtained.	**:SENS{1-16}:CORR:COLL:SAVE**
SAVEREG	Save the Instrument State status in the internal register.	**:MMEM:STOR**
SAVEUSEK	Save the selected calibration kit as a user calibration kit.	Not available
SAVRERC	Complete the data measurement for the reverse enhanced response calibration and calculate the calibration coefficients from the data saved.	**:SENS{1-16}:CORR:COLL:SAVE**
SAVT	Complete the data measurement for the TRL*/LRM* 2-port calibration and calculate the calibration coefficients on the basis of the data obtained.	**:SENS{1-16}:CORR:COLL:SAVE**
SAVUASCI	Select ASCII as the format for saving data.	Not available (Stored in binary format)
SAVUBINA	Select binary as the format for saving data.	
SCAL	Specify the Y-axis scale for displaying traces.	**:DISP:WIND{1-16}:TRAC{1-16}:Y:PDIV**
SCAPFULL	Select FULL as the plotting scale.	Not available (Plotters are not supported.)
SCAPGRAT	Select GRAT as the plotting scale.	
SDEL	Delete segments while editing tables.	Not available (Each table is edited using one command; there is no corresponding command.)
SDON	Complete the editing of segments while editing tables.	Not available (Each table is edited using one command; there is no corresponding command.)
SEAL	Search for the left target value.	**:CALC{1-16}:MARK{1-10}:FUNC:TYPE LTAR** **:CALC{1-16}:MARK{1-10}:FUNC:EXEC** (Both commands must be sent.)
SEAMAX	Search for the maximum value.	**:CALC{1-16}:MARK{1-10}:FUNC:TYPE MAX** **:CALC{1-16}:MARK{1-10}:FUNC:EXEC** (Both commands must be sent.)
SEAMIN	Search for the minimum value.	**:CALC{1-16}:MARK{1-10}:FUNC:TYPE MIN** **:CALC{1-16}:MARK{1-10}:FUNC:EXEC** (Both commands must be sent.)
SEAOFF	Set the marker search function Off.	Not available
SEAR	Search for the right target value.	**:CALC{1-16}:MARK{1-10}:FUNC:TYPE RTAR** **:CALC{1-16}:MARK{1-10}:FUNC:EXEC** (Both commands must be sent.)
SEATARG	Specify the target value.	**:CALC{1-16}:MARK{1-10}:FUNC:TARG**

8753ES	Function overview	E5070B/E5071B
SEDI	Select the number of the segment to be edited while editing tables.	Not available (Each table is edited using one command; there is no corresponding command.)
SEGIFBW	Specify the IFBW of segments while editing tables.	Not available (Each table is edited using one command; there is no corresponding command.)
SEGPOWER	Specify the POWER segment while editing tables.	Not available (Each table is edited using one command; there is no corresponding command.)
SELMAXPT	Specify the point at the upper limit of the range for reading.	Not available (Limiting the range for reading is not allowed.)
SELMINPT	Specify the point at the lower limit of the range for reading.	
SELPT	Specify the point for reading.	
SELSEG	Select the segment for reading.	
SELBND	Select the band for reading.	
SELL	Select REDIVISION of a learn string.	Reading/Writing a learn string is not allowed.
SEQ	Select the test sequence.	Not available (Test sequence function not available.)
SEQWAIT	Specify the waiting time in the test sequence.	
SETBIT	Set the designated bit in the GPIO port to 1.	Not available (GPIO is not supported.)
SETDATE	Set the date of the internal clock.	**:SYST:DATE**
SETF	Measure low pass frequencies.	Not available (Time-domain transformation function not available.)
SETRTHRU	Select THRU as the reference for the TRL*/LRM* 2-port calibration.	**:SENS{1-16}:CORR:COLL:CKIT:TRL:RPL THRU**
SETRREFL	Select REFLECT as the reference for the TRL*/LRM* 2-port calibration.	**:SENS{1-16}:CORR:COLL:CKIT:TRL:RPL REFL**
SETTIME	Set the time of the internal clock.	**:SYST:TIME**
SETZ	Specify the characteristic impedance of the measurement system.	**:CALC{1-16}:FSIM:SEND:ZCON:PORT{1-4}: Z0** (Allowed on the fixture simulator)
SHOM	Specify the softkey display in the test sequence.	Not available (Test sequence function not available.)
SING	Perform one sweep operation. (Single mode)	Not available
SLID	Finish measuring a sliding load.	Not available (The LOAD standard is treated as fixed LOAD.)
SLIL	In defining calibration kits, select sliding LOAD as the type of LOAD.	
SLIS	Make measurements after sliding the sliding LOAD.	
SLOPE	Specify the power slope value.	**:SOUR{1-16}:POW:SLOP**
SLOPO	Set the power slope On/Off.	**:SOUR{1-16}:POW:SLOP:STAT**
SM8	Set the spur avoidance function On/Off (Take4 mode).	Not available (not in Take4 mode)
SMIC	Select the Smith chart format as the display format.	**:CALC{1-16}:FORM SLIN** **:CALC{1-16}:FORM SLOG** **:CALC{1-16}:FORM SCOM** **:CALC{1-16}:FORM SMI** **:CALC{1-16}:FORM SADM** (Designate any one of the above commands, and select the marker value read format at the same time.Åj

8753ES vs. E5070B/E5071B Command Comparison (8753ES-only commands excluded)

8753ES	Function overview	E5070B/E5071B
SMIMGB	Select G+jB as the marker value read format when using the Smith chart format.	Not available (Selected at the same time the Smith chart format is selected as the data format)
SMIMLIN	Select LIN as the marker value read format when using the Smith chart format.	
SMIMLOG	Select LOG as the marker value read format when using the Smith chart format.	
SMIMRI	Select Re/Im as the marker value read format when using the Smith chart format.	
SMIMRX	Select R+jX as the marker value read format when using the Smith chart format.	
SMOOAPER	Specify the smoothing aperture.	**:CALC{1-16}:SMO:APER**
SMOOO	Set the smoothing On/Off.	**:CALC{1-16}:SMO**
SOFR	Display the firmware version on the screen.	Included in the value read from ***IDN?**
SOFT{1-8}	Perform the same processing as pressing the designated softkey.	Not available
SOUP	Set the signal source output On/Off.	Not available (Always On)
SPAN	Specify the span value of the sweep range.	**:SENS{1-16}:FREQ:SPAN** (Cannot be used for editing segments.) **:SOUR{1-16}:POW:SPAN**
SPECFWDM	In defining calibration kits, specify the standard for forward match.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU** (Definition of the Thru calibration class) Registering the Thru standard as the calibration class is equivalent to registering one standard in all calibration classes necessary for the thru measurement of full 2-port calibration on the 8753ES.
SPECFWDT	In defining calibration kits, specify the standard for forward transmission.	
SPECRESP	In defining calibration kits, specify the standard for response.	Not available (In the response measurement, the standards defined in the calibration classes of OPEN, SHORT, LOAD, and THRU are used. Therefore, a calibration class for response does not exist.)
SPECRESI	In defining calibration kits, specify the standard for response (response & isolation).	
SPECREVM	In defining calibration kits, designate a standard for reverse match.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU** (Definition of the Thru calibration class) Registering the Thru standard as the calibration class is equivalent to registering one standard in all calibration classes necessary for the thru measurement of full 2-port calibration on the 8753ES.
SPECREVT	In defining calibration kits, designate a standard for reverse transmission.	
SPECS11A	In defining calibration kits, designate a standard for S11A.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN** (Designate a port by using a parameter.)
SPECS11B	In defining calibration kits, designate a standard for S11B.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR** (Designate a port by using a parameter.)
SPECS11C	In defining calibration kits, designate a standard for S11C.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD** (Designate a port by using a parameter.)
SPECS22A	In defining calibration kits, designate a standard for S22A.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN** (Designate a port by using a parameter.)
SPECS22B	In defining calibration kits, designate a standard for S22B.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR** (Designate a port by using a parameter.)
SPECS22C	In defining calibration kits, designate a standard for S22C.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD** (Designate a port by using a parameter.)
SPECTRLL	In defining calibration kits, designate a standard for TRL Line/Match.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLL**
SPECTRLT	In defining calibration kits, designate a standard for TRL Thru.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLT**
SPECTRLR	In defining calibration kits, designate a standard for TRL Reflection.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:TRLR**

8753ES	Function overview	E5070B/E5071B
SPECTRFM	In defining calibration kits, designate a standard for S11A.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:OPEN** (Designate a port by using a parameter.)
SPECTRRM	In defining calibration kits, designate a standard for S22A.	
SPECTLFM	In defining calibration kits, designate a standard for S11B.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR** (Designate a port by using a parameter.)
SPECTLFT	In defining calibration kits, designate a standard for S11C.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD** (Designate a port by using a parameter.)
SPECTLRM	In defining calibration kits, designate a standard for S22B.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:SHOR** (Designate a port by using a parameter.)
SPECTLRT	In defining calibration kits, designate a standard for S22C.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:LOAD** (Designate a port by using a parameter.)
SPECTTFM	In defining calibration kits, designate a standard for forward match.	**:SENS{1-16}:CORR:COLL:CKIT:ORD:THRU** (Definition of the Thru calibration class) Registering the Thru standard as the calibration class is equivalent to registering one standard in all calibration classes necessary for the thru measurement of full 2-port calibration on the 8753ES.
SPECTTFT	In defining calibration kits, designate a standard for forward transmission.	
SPECTTRM	In defining calibration kits, designate a standard for reverse match.	
SPECTTRT	In defining calibration kits, designate a standard for reverse transmission.	
SPEG	Cause the softkey in the gate setup menu to appear.	Not available
SPLD	Set the split display On/Off.	**:DISP:SPL** (Setting up the window array for a channel) and **:DISP:WIND{1-16}:SPL** (Setting up the array of trace graphs) are combined to perform the equivalent.
SPLID1	Select one-screen display.	
SPLID2	Select two-screen display.	
SPLID4	Select four-screen display.	
SRE	Specify the value of the service request valid register.	***SRE**
SSEG	Use only the designated segment for the list frequency sweep.	Not available (All segments are always used.)
STANA	Execute measurement of the standard displayed in the first softkey from the top.	Not available (No command for this is available because only one standard can be registered in each calibration class.)
STANB	Execute measurement of the standard displayed in the second softkey from the top.	
STANC	Execute measurement of the standard displayed in the third softkey from the top.	
STAND	Execute measurement of the standard displayed in the fourth softkey from the top.	
STANE	Execute measurement of the standard displayed in the fifth softkey from the top.	
STANF	Execute measurement of the standard displayed in the sixth softkey from the top.	
STANG	Execute measurement of the standard displayed in the seventh softkey from the top.	
STAR	Specify the start value of the sweep range.	**:SENS{1-16}:FREQ:STAR** (Cannot be used for editing segments.) **:SOUR{1-16}:POW:STAR**
STB?	Read the value of the status byte register.	***STB?**
STDD	In defining calibration kits, complete the defining job for each standard.	Not available (Takes effect automatically upon sending the setup command.)
STDTARBI	Select Arbitrary Impedance as the type of standard being defined.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE ARBI**
STDTDELA	Select Delay/Thru as the type of standard being defined.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE THRU**
STDTLOAD	Select LOAD as the type of standard being defined.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE LOAD**
STDTOPEN	Select OPEN as the type of standard being defined.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE OPEN**

8753ES vs. E5070B/E5071B Command Comparison (8753ES-only commands excluded)

8753ES	Function overview	E5070B/E5071B
STDTSHOR	Select SHORT as the type of standard being defined.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:TYPE SHOR**
STOP	Specify the stop value of the sweep range.	**:SENS{1-16}:FREQ:STOP** (Cannot be used for editing segments.) **:SOUR{1-16}:POW:STOP**
STOR	Save the Instrument State status to the file.	**:MMEM:STOR**
STORSEQ	Save the test sequence to the file.	Not available (Test sequence function not available.)
STPSIZE	Specify the sweep step values between points in the segment.	Not available
SVCO	Save the color setup for the LCD screen.	Not available (No function available that saves the setup for colors only.)
SWEA	Automatically sets the sweep time to the shortest possible.	**:SENS{1-16}:SWE:TIME:AUTO ON**
SWET	Specify the sweep time.	**:SENS{1-16}:SWE:TIME**
SWPSTART	Initialize the sweep (in connection with Take4).	Not available (Take4 mode not available.)
SWR	Select the SWR format as the display format.	**:CALC{1-16}:FORM SWR**
[T]		
TAKCS	Start the sweep to acquire the data for the power meter calibration.	**:SOUR{1-16}:POW:PORT{1-4}:CORR:COLL**
TAKRS	Start the sweep to acquire the data for the receiver calibration.	**:SENS{1-16}:CORR:REC{1-4}:COLL:ACQ**
TAKE4	Set the system to the Take4 mode.	Not available (Take4 mode not available.)
TALKLIST	Select the talker/listener mode.	Not available (Can be set up from the front panel.)
TERI	Specify the terminal impedance when defining standards.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:ARB**
TESS?	Check to see if the test set is connected.	Not available (Test set cannot be used.)
TIMDTRAN	Set the time-domain transformation On/Off.	**:CALC{1-16}:TRAN:TIME:STAT**
TIMESTAM	Set the output time stamp from the printer/plotter On/Off.	Not available (Printed image include the timestamp because LCD always display it).
TINT	Specify the hue of the display color for the selected item.	Not available (Color setup is allowed only for turning highlighting of the entire screen On/Off.)
TITF	Assign a file name to the file for saving.	Not available (Assigned when saved)
TITL	Assign a title to the LCD screen.	**:DISP:WIND{1-16}:TITL:DATA**
TITP	Assign a file name to the file that receives plot output.	Not available (Plot output to a file is not allowed.)
TITR	Assign a name to the register for Save/Recall.	Not available (Register for Save/Recall not available.)
TITREG	Assign a name to the register for Save/Recall.	
TITSEQ	Name the test sequence.	Not available (Test sequence function not available.)
TITSQ	Display the softkey for naming the test sequence.	
TITTMEM	Send the title to the memory trace.	Not available
TITTPERI	Send the title to the GPIBaddresses of the peripherals.	Not available
TITTPMTR	Send the title to the GPIBaddress of the power meter.	Not available
TITTPRIN	Send the title to the GPIB address of the printer.	Not available
TRACK	Set the search tracking function On/Off.	**:CALC{1-16}:MARK{1-10}:FUNC:TRAC**
TRAD	Complete measuring the data to be transmitted on full 2-port calibration or enhanced response calibration.	Not available
TRAN	Start measuring the data to be transmitted on full 2-port calibration or enhanced response calibration.	Not available
TRAOP	Start measuring the data to be transmitted on the one-bus 2-port calibration.	**:SENS{1-16}:CORR:COLL:THRU**
TRAP	Select the S21 measurement.	**:CALC{1-16}:PAR{1-16}:DEF S21**
TRLL1	In measuring the data on TRL*/LRM* 2-port calibration, measure the data on Line/Match of port 1.	**:SENS{1-16}:CORR:COLL:TRLL**

8753ES	Function overview	E5070B/E5071B
TRLL2	In measuring the data on TRL*/LRM* 2-port calibration, measure the data on Line/Match of port 2.	**:SENS{1-16}:CORR:COLL:TRLL**
TRLR1	In measuring the data on TRL*/LRM* 2-port calibration, measure the data on S11 reflection.	**:SENS{1-16}:CORR:COLL:TRLR**
TRLR2	In measuring the data on TRL*/LRM* 2-port calibration, measure the data on S22 reflection.	**:SENS{1-16}:CORR:COLL:TRLR**
TRLT	In measuring the data on TRL*/LRM* 2-port calibration, measure the data on THRU.	**:SENS{1-16}:CORR:COLL:TRLT**
TSSWI	Specify the number of sweep operations in switch changeover in the test set.	Not available (Always continuous)
TST?	Perform the self-test and read the results of the test.	Not available
TSTIOFWD	Specify the bit in the test set in which the forward attenuator is set up.	Not available
TSTIOREV	Specify the bit in the test set in which the reverse attenuator is set up.	
TSTP	Select the port to be used when S-parameters are not measured.	Not available (Only S-parameters can be selected.)
TTLHPULS	Set up the system so that the pulse from Low to High can be output to TTL when sweep operations are finished.	Not available
TTLLPULS	Set up the system so that the pulse from High to Low can be output to TTL when sweep operations are finished.	
TTLOH	Always set TTL output to High.	
TTLOL	Always set TTL output to Low.	
[U]		
UCONV	Select the Up conversion in the mixer measurement.	Not available (Mixer measurement function not available.)
UP	Perform the same processing as pressing the [↑]key.	Not available
USEPASC	Select the pass control mode.	Not available (Cannot be set in pass control mode.)
USESENSA	Select A as the sensor for the power meter.	Not available
USESENSB	Select B as the sensor for the power meter.	
[V]		
VELOFACT	Specify the velocity factor of the transmission line.	**:SENS{1-16}:CORR:RVEL:COAX**
VIEMOFF	Display the mixer measurement setup on the LCD screen.	Not available (Mixer measurement function not available.)
VIEMON	Display the traces of the mixer measurement on the LCD screen.	
VOFF	Use the LO frequency for the offset mode.	
[W]		
WAIT	Wait for the sweep operation to end.	Not available
WAVD	Select waveguide as the type of electrical delay and specify the cutoff frequency.	Not available (Always treated as coaxial cables)
WAVE	Select waveguide as the offset setting in defining standards.	**:SENS{1-16}:CORR:COLL:CKIT:STAN{1-21}:CHAR WAV**
WIDT	Set the bandwidth search function On/Off.	**:CALC{1-16}:MARK:BWID**
WIDV	Specify the parameters for the bandwidth search.	**:CALC{1-16}:MARK{1-10}:BWID:THRU**
WINDMAXI	Set the maximum window size for the time-domain transformation.	**:CALC{1-16}:TRAN:TIME:KBES 13**
WINDMINI	Set the minimum window size for the time-domain transformation.	**:CALC{1-16}:TRAN:TIME:KBES 0**
WINDNORM	Set the normal window size for the time-domain transformation.	**:CALC{1-16}:TRAN:TIME:KBES 6**
WINDOW	Set the window size to an arbitrary value for the time-domain transformation.	**:CALC{1-16}:TRAN:TIME:KBES**
WINDUSEM	Set the use of memory traces for the time-domain transformation On/Off.	Not available
WRSK	Assign an arbitrary name to the softkey currently displayed.	Not available (Changing the softkeys is not allowed.)

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