

Agilent E5070A/E5071A ENA Series RF Network Analyzers

VBA Programmer's Guide

Second Edition

FIRMWARE REVISIONS

This manual applies directly to instruments that have the firmware revision 2.00.

For additional information on firmware revisions, see Appendix A.



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Manual Printing History

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Typeface Conventions

Sample (bold)	Boldface type is used when a term is defined or emphasized.
<i>Sample (Italic)</i>	Italic type is used for emphasis and for titles of manuals and other publications.
[Sample]	Indicates the hardkey whose key label is “Sample”.
[Sample] - Item	Indicates a series of key operations in which you press the [Sample] key, make the item called “Item” on the displayed menu blink by using the [↓] or in other ways, and then press the [Enter] key.

Sample Program Disk

A VBA sample program disk (Agilent part number: E5070-18011) is furnished with this manual. The disk contains the sample programs used in this manual.

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E5070A/E5071A Documentation Map

The following manuals are available for the E5070A/E5071A.

- ***User's Guide (Part Number: E5070-900x0, attached to optional ABA)***

This manual describes most of the basic information necessary to use the E5070A/E5071A. 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 E5070A/E5071A, 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 E5070A/E5071A 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 E5070A/E5071A. 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. Here, "0" indicates the initial edition, and each time a revision is made this number is incremented by 1. The latest edition allows the customer to specify Option ABJ (Japanese) or Option ABA (English) of the product.

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1 Making Effective Use of This Manual

This chapter provides an overview of this manual as well as useful information to help you navigate through the manual. It also briefly describes how to use this manual, focusing on how you can look up particular COM object.

Contents of This Manual

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

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

This chapter provides an overview of this manual as well as useful information to help you navigate through the manual. It also briefly describes how to use this manual, focusing on how you can look up particular COM object.

Chapter 2, “Introduction to VBA Programming.”

This chapter introduces you to the E5070A/E5071A's VBA macro function, describes how you can implement your system using the VBA macro function, and provides an overview of the COM objects that come with the E5070A/E5071A.

Chapter 3, “Operation Basics of the E5070A/E5071A's VBA.”

This chapter provides descriptive information on basic operations for creating VBA programs within the E5070A/E5071A's VBA environment; topics include launching Visual Basic Editor, creating, saving, and running VBA programs, and so on.

Chapter 4, “Controlling the E5070A/E5071A.”

This chapter describes how to use the E5070A/E5071A's VBA to control the E5070A/E5071A itself.

Chapter 5, “Controlling Peripherals.”

This chapter explains how to control peripherals connected to the E5070A/E5071A with GPIB by using the software (VISA library) installed in the E5070A/E5071A.

Chapter 6, “Application Programs.”

This chapter describes sample programs (VBA programs) based on actual measurement examples.

Chapter 7, “COM Object Reference.”

This chapter describes the COM object model of the Agilent E5070A/E5071A and the COM object reference in alphabetical order. If you want to look up COM objects by their function, see "COM object list by function."

Chapter 8, “Waveform Analysis Library.”

This chapter describes how to use the ripple analysis library and the procedures in the ripple analysis library.

Chapter 9, “Complex Operation Library.”

This chapter describes the complex operation library.

Appendix A, “Manual Changes.”

This appendix contains the information required to adapt this manual to versions or configurations of the E5070A/E5071A manufactured earlier than the current printing date of this manual.

How To Use This Manual

Chapter 3 provides the basic operation of VBA when coding VBA programs, and Chapter 4 provides the description of controlling the E5070A/E5071A and sample program examples that you can use to develop your custom programs. For more information on individual COM object, see Chapter 7, “COM Object Reference.”

Looking Up COM Objects

Chapter 7, “COM Object Reference.” contains a complete reference of COM objects. You can look up a particular COM object in any of the following ways:

Lookup by Abbreviated COM Object Name

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

Lookup by COM Object Function

Table 7-1 on page 120 provides a complete list of COM objects by function and indicates the page numbers where the COM objects appear in the COM object reference.

Lookup by Front panel key

Table 7-2 on page 131 provides a complete list of COM objects that correspond to the front panel key tree and indicates the page numbers where the COM objects appear in the COM object reference.

Using Sample Programs

The manual comes with a sample program disk, which contains the source files of the sample programs described in this manual. The disk is DOS-formatted.

Loading a Sample Program

For the method to load a sample program into the E5070A/E5071A VBA, see Section “Loading a VBA Program” on page 43 in the Chapter 3 “Operation Basics of the E5070A/E5071A's VBA”.

List of the Sample Programs

Table 1-1 shows the file list contained with the VBA sample program disk. To look up the description of a sample program, see the listings under “Sample program” in the index.

Table 1-1 List of the sample programs

Project	Object names of modules in the project	Module type	Content
apl_bsc.vba	mdlBscMeas	Standard module	Program for the basic measurement of the bandpass filter
apl_sys.vba	mdlDupMeas frmDupMeas	Standard module UserForm	Application program for the duplexer measurement
ctrl_ext.vba	mdlVisa Module1 Module2	Standard module Standard module Standard module	Program for reading out the product information of the peripheral.
meas_sing.vba	mdlSingMeas frmSingMeas	Standard module UserForm	Program for detecting the end of the measurement using SCPI.TRIGger.SEQuence.SINGle object and SCPI.IEEE4882.OPC object.
meas_srq.vba	mdlSrqMeas frmSrqMeas	Standard module UserForm	Program for detecting the end of the measurement through the status register
meas_user.vba	mdlUserMenu	Standard module	Program for utilizing the user menu function (interrupt processing by the assigned softkey)
read_write.vba	mdlReadWrite frmReadWrite	Standard module UserForm	Program for reading / displaying / writing a formatted data array

NOTE

The sample program disk also contains two definition file for controlling peripherals with VISA library, named “visa32.bas“ and “vpptype.bas“.

2

Introduction to VBA Programming

This chapter introduces you to the E5070A/E5071A's VBA macro function, describes how you can implement your system using the VBA macro function, and provides an overview of the COM objects that come with the E5070A/E5071A.

Introduction of the E5070A/E5071A Macro Function

The E5070A/E5071A has a built-in macro function that allows a single instruction to substitute for multiple instructions. You can have the E5070A/E5071A automatically execute your own macro program that contains a series of VBA (Visual Basic for Application) statements. The macro function allows you to run a variety of applications; you can control not only the E5070A/E5071A but also various peripherals from your own macro code.

The VBA is based on the VB (Visual Basic) programming language. Although the VBA is similar to the VB, they are not the same. The VBA is decreased some of the VB's features and added characteristic features for each application. The E5070A/E5071A VBA is added features for controlling the E5070A/E5071A. For details of difference between the VBA and the VB, refer to Microsoft official guides, and various books on VBA.

For information on the basic operating procedures for the E5070A/E5071A's VBA, see Chapter 3, "Operation Basics of the E5070A/E5071A's VBA," on page 27. This manual is not meant to be an in-depth guide to VBA programming basics and the syntax of VBA functions and commands. Such in-depth information is covered in VBA Help, Microsoft official guides, and various books on VBA.

The macro function allows you to control the E5070A/E5071A itself as well as various peripherals. You can do the following:

1. Automate repetitive tasks

You can use the E5070A/E5071A's macro function to combine several processes into one. Automating repetitive tasks provides higher efficiency and eliminates human error. Once you have contained repetitive tasks in Sub procedures, you can later call the procedures from other programs, thus allowing effective reuse of programming assets.

2. Implement a user interface

The E5070A/E5071A VBA supports user forms (see "User Form" on page 31) that simplify creating a visual user interface. User forms guide users through common tasks such as performing measurement and entering data, without requiring familiarity with the E5070A/E5071A, thus minimizing the possibility of human error.

An Overview of a Control System Based on the Macro Function

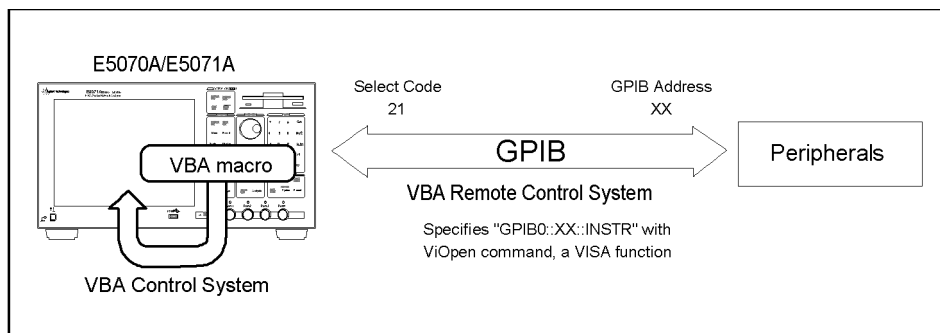
This section describes how you can use the E5070A/E5071A's built-in VBA macro function to implement a system that controls the E5070A/E5071A and peripherals, and what command sets are available for such purposes.

Implementing a Control System

Macro-based control systems are classified into two types: As shown in Figure 2-1, a VBA control system controls the E5070A/E5071A itself while a VBA remote control system controls peripherals. When you use the macro function to control peripherals, you must connect the E5070A/E5071A with the peripherals through GPIB cables, and configure them to communicate over VISA. For information on limitations that should be considered when implementing a GPIB, refer to the "Programmer's Guide."

Figure 2-1

Example of configuring a control system using the macro function



e5070ave013

Required Equipment

1. E5070A/E5071A
2. Peripherals and/or other instruments that serve your purpose
3. GPIB cables for connecting the E5070A/E5071A with the peripherals

Required Configuration Tasks

When you use the macro function to control the E5070A/E5071A itself, you do not need to be aware of the active control settings for the GPIB system. This means that you do not need to be aware of the settings of Talker/Listener mode (where the E5070A/E5071A is controlled from an external controller) and System Controller mode (where the E5070A/E5071A acts as a controller to peripherals).

However, when you use the macro function to control peripherals, they will be actually controlled through the E5070A/E5071A's built-in GPIB, and therefore you must configure the E5070A/E5071A to work in System Controller mode.

Step 1. Configure the E5070A/E5071A to work in System Controller mode.

- **[System] - GPIB Setup - GPIB Configuration (System Controller)**

Step 2. Configure the system controller's GPIB address. "XX" represents an address number.

- **[System] - GPIB Setup - System Controller Address (XX)**

Step 3. Turn off the E5070A/E5071A and turn it on.

Control Methods

The command set you can use differs depending on whether you use the macro function to control the E5070A/E5071A or a peripheral.

Controlling the E5070A/E5071A

When you want to control the E5070A/E5071A itself, you can create a program using COM objects within the E5070A/E5071A VBA environment. COM objects that come with the E5070A/E5071A include seven objects specific to the COM interface and COM objects that correspond to SCPI commands.

For information on using E5070A/E5071A's COM objects, see Chapter 7, "COM Object Reference," on page 117. For information on using SCPI commands, see the "SCPI Command Reference" in the *E5070A/E5071A Programmer's Guide*.

Controlling a Peripheral

When you want to control a peripheral, you can create a program using VISA library functions within the E5070A/E5071A VBA environment.

For information on using the VISA library, see Chapter 5, "Controlling Peripherals," on page 77. For a complete description of VISA functions, refer to the VISA library's online help. You can access this online help by double-clicking a file named visa.hlp contained in the CD-ROM (Agilent part No. E5070-905xx).

For information on the GPIB commands available with a particular peripheral, refer to the documentation that comes with the peripheral.

Overview of E5070A/E5071A COM Object

The E5070A/E5071A VBA environment provides COM objects that support controlling the E5070A/E5071A. This section provides an overview of COM objects as well as considerations for using the E5070A/E5071A's COM objects. For more information on the E5070A/E5071A's COM objects and the comparison with SCPI commands, refer to Chapter 7, “COM Object Reference,” on page 117.

The definitions and specifications of COM are beyond the scope of this guide. Such in-depth information is covered in a variety of books on COM.

About COM Object

When you control the E5070A/E5071A through the macro function, you can use COM objects as components of your application. The functionality of the E5070A/E5071A's COM objects is exposed through properties and methods.

Property

A property allows you to read or write a setting or attribute of an object. With the E5070A/E5071A, you can use properties to set or read the settings of the E5070A/E5071A.

You can find properties in the list of object types in Chapter 7, “COM Object Reference,” on page 117.

Method

A method allows you to manipulate an object in a particular way. With the E5070A/E5071A, you can use methods to perform specific tasks.

You can find methods in the list of object types in Chapter 7, “COM Object Reference,” on page 117.

Event

An event means an operation from outside that the program can recognize such as clicking a mouse. The E5070A/E5071A detects events that a specific softkey is pressed using the **UserMenu_OnPress(ByVal id As Long)** on page 158 procedure to execute the assigned procedure.

Using COM Object to Control the E5070A/E5071A

When you want to control the E5070A/E5071A, you can use COM objects alone or in conjunction with SCPI commands and the **Parse** on page 154 object. The latter method is a little slower than the former method because the **Parse** on page 154 object is used to parse the messages of SCPI commands. For instructions on using the E5070A/E5071A's VBA Editor to create a program that uses COM objects, refer to Chapter 3, “Operation Basics of the E5070A/E5071A's VBA,” on page 27.

Major Control Difference between COM Object and SCPI Command

While the control using SCPI commands allows SRQ (Service Request) interrupts through the status reporting mechanism, the control using COM objects does not support SRQ interrupts. Instead of SRQ interrupts, you can use the **WaitOnSRQ** object to suspend the program until the E5070A/E5071A is put into the desired state. For a detailed example of use, see “WaitOnSRQ” on page 161.

3 Operation Basics of the E5070A/E5071A's VBA

This chapter provides descriptive information on basic operations for creating VBA programs within the E5070A/E5071A's VBA environment; topics include launching Visual Basic Editor, creating, saving, and running VBA programs, and so on.

Displaying Visual Basic Editor

This section describes how to launch Visual Basic Editor.

Step 1. From the E5070A/E5071A measurement screen, launch Visual Basic Editor using one of the following methods:

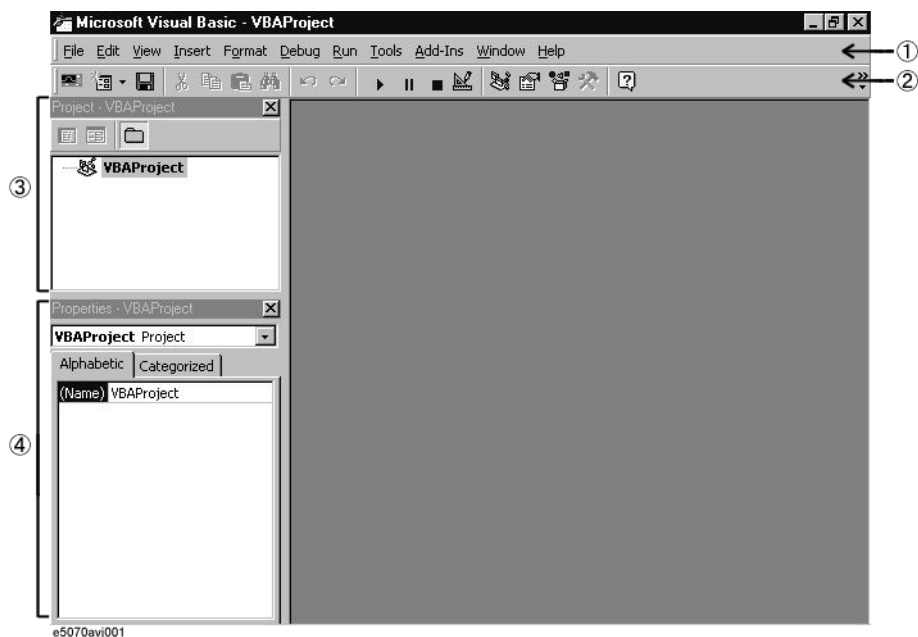
- **[Macro Setup] - VBA Editor**
- Press **[Alt] + [F11]** on the keyboard.

Initial Screen of Visual Basic Editor

When you launch Visual Basic Editor, it displays the initial screen, which contains a number of windows as shown in Figure 3-1. The initial screen provides the following GUI elements:

Figure 3-1

Example of Visual Basic Editor initial screen



1. Menu Bar

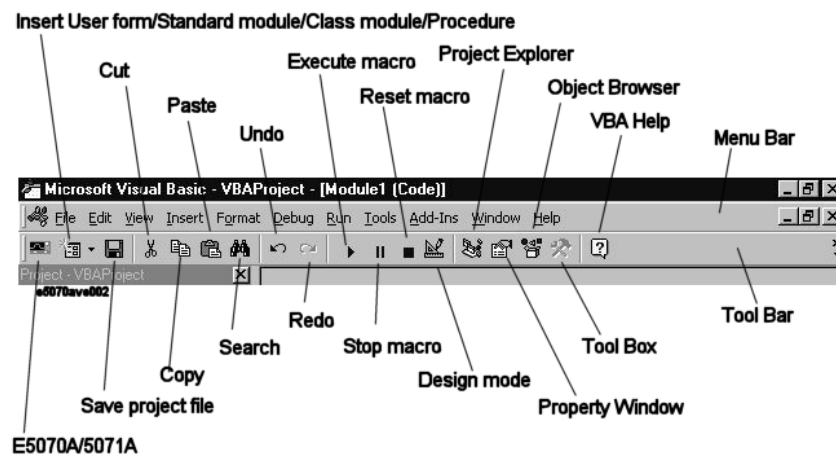
Clicking one of the menu labels brings up the corresponding menu. The menu bar can be used as the primary method to navigate through E5070A/E5071A's VBA environment.

2. Toolbar

The toolbar provides access to commonly used commands via icon buttons; these commands are a subset of the commands accessible from the menu bar. For the description of the buttons on the standard toolbar, see Figure 3-2.

Figure 3-2

Buttons on the standard toolbar



3. Project Explorer

Within the E5070A/E5071A's VBA environment, you can develop your application as a project that consists of a number of files (modules). Project Explorer shows a list of all files (modules) that make up a project. The list also includes files (modules) created or loaded in Visual Basic Editor. For information on modules, refer to “A Project and Three Types of Module” on page 31.

Step 1. To display the project explorer, do one of the following:

- On the **View** menu, click **Project Explorer**.
- Press **[Ctrl] + [R]** on the keyboard.
- On the toolbar, click "Project Explorer" icon (Figure 3-2).

4. Property Window

A property window shows the settings (label, font, color, size, etc.) of a control (such as a command button or text box) placed on the user form. For information on user forms, refer to “User Form” on page 31.

You can also set properties by programming in the code window.

Step 1. To display the project explorer, do one of the following:

- On the **View** menu, click **Properties Window**.
- Press **[F4]** on the keyboard.
- On the toolbar, click "Property Window" icon (Figure 3-2).

Closing Visual Basic Editor

This section describes how to quit Visual Basic Editor.

- Step 1.** Close the Visual Basic Editor using one of the following methods:
- On Visual Basic Editor's **File** menu, click **Close and Return to E5070**.
 - Within Visual Basic Editor, press **[Alt] + [Q]** on the keyboard.
 - **[Macro Setup] - Close Editor**(E5070A/E5071A measurement screen)

NOTE

Whenever you launch Visual Basic Editor, it automatically displays the project files you were working with in the previous session. However, once you turn off the power to the E5070A/E5071A, the project files kept in memory will be lost; therefore, it is strongly recommended to save your VBA programs before you turn off the power.

Switching to the E5070A/E5071A Measurement Screen

You can switch to the E5070A/E5071A measurement screen without closing Visual Basic Editor.

- Step 1.** To switch to the E5070A/E5071A measurement screen, do one of the following:
- On the **View** menu, click **E5070**.
 - Press **[Alt] + [F11]** on the keyboard.
 - On the toolbar, click "E5070A/E5071A" icon (Figure 3-2).
 - Press the **[Focus]** key on the E5070A/E5071A front panel.

Making a Preparation Before Coding

A Project and Three Types of Module

Project Explorer (Figure 3-1) displays a list of files (modules) that are used in the E5070A/E5071A VBA. This section describes a project composed of a number of files (modules) and three types of modules ("user form", "standard", and "class"). Each type of module serves its own purposes as described below.

Project

When you develop an application within the E5070A/E5071A's VBA environment, you use a number of VBA program files (modules), and manage them as one project. The project is saved with the file extension ".vba".

User Form

A user form contains controls such as buttons and text boxes. You can code event-driven procedures that are invoked when a particular event occurs on a particular control, thereby creating a user interface. The user form is saved with the file extension ".frm".

Standard module

A standard module contains a collection of one or more procedures (subprograms enclosed between Sub and End Sub). One typical use of a standard module is to contain shared subroutines and globally called functions. The standard module is saved with the file extension ".bas".

Class Module

A class module contains both data and procedures and acts as one object. Once you have created a class module that serves as an object, you can create any number of instances of that object by naming each instance as an object variable. While each procedure must be unique in a standard module, you can have multiple instances of an object created through a class module. The class module is saved with the file extension ".cls".

Displaying a Code Window

The code windows appear on the Visual Basic Editor by inserting the modules in a project. You can do coding (programming) on this code windows practically.

The E5070A/E5071A's VBA environment does not allow you to manage multiple projects. When the current project is existing in the Visual Basic Editor by loading the saved project file, you can replace the current project with a new project by the following method from the E5070A/E5071A measurement screen.

- **[Macro Setup] - New Project**

NOTE

When you replace the current project with a new project, the message whether or not the current project is saved may appear. If you want to save the project, click **Yes** button to display a dialog box for saving (Figure 3-6 on page 40). For saving the project, see "Saving a Project" on page 40.

Inserting the User Form

Within Visual Basic Editor, do one of the following to add a user form to your project (this brings up such a window as shown in Figure 3-3):

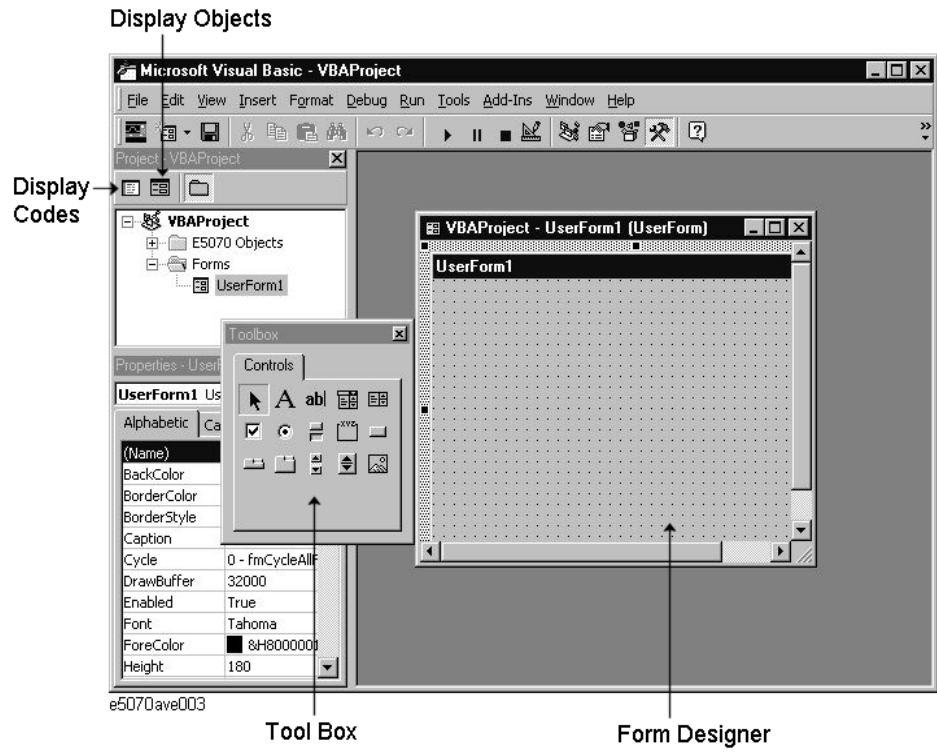
- On the **Insert** menu, click **UserForm**.
- On the toolbar, click "Insert User Form/Standard Module/Class Module/Procedure" icon (Figure 3-2), and click **UserForm**.
- In Project Explorer (Figure 3-1), right-click the "VBAProject" icon, and click **Insert - UserForm**.

NOTE

Adding a user form does not automatically open the code window for that user form. To open the code window, click the "Show Code" icon (Figure 3-3) in Project Explorer (Figure 3-1) or double-click a control placed on the user form.

Figure 3-3

Adding a user form



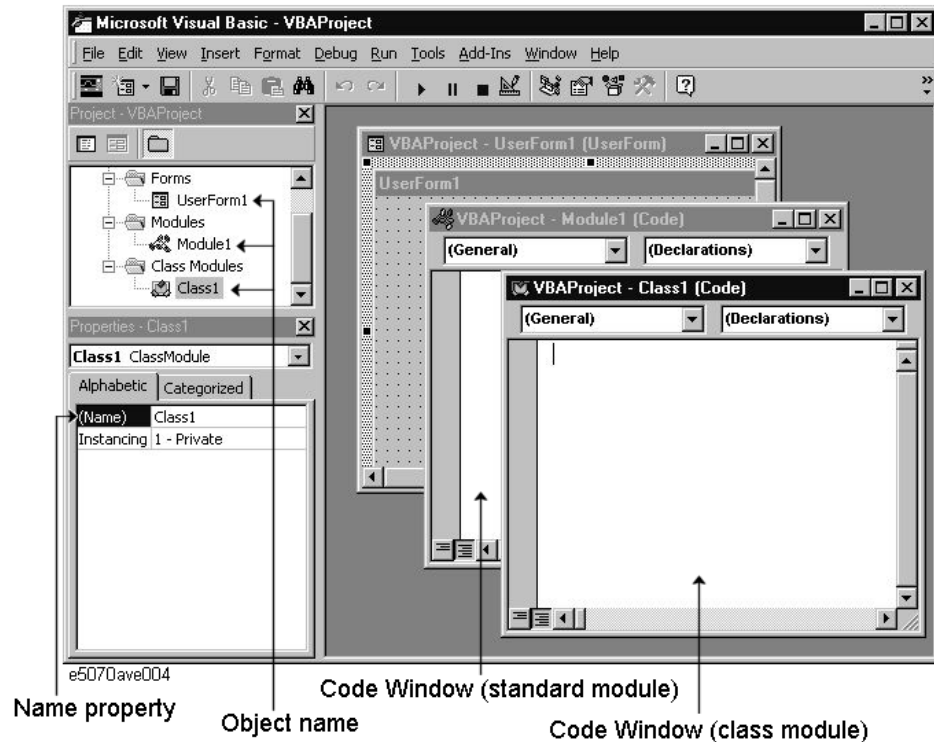
Operation Basics of the E5070A/E5071A's VBA Displaying a Code Window

Inserting the Standard Module

Within Visual Basic Editor, do one of the following to add a standard module to your project (this brings up such a window as shown in Figure 3-4):

- On the **Insert** menu, click **Module**.
- On the toolbar, click "Insert User Form/Standard Module/Class Module/Procedure" icon (Figure 3-2), and click **Module**.
- In Project Explorer (Figure 3-1), right-click the "VBAProject" icon, and click **Insert - Module**.

Figure 3-4 Adding a standard module/class module



Inserting the Class Module

Within Visual Basic Editor, do one of the following to add a class module to your project (this brings up such a window as shown in Figure 3-4):

- On the **Insert** menu, click **ClassModule**.
- On the toolbar, click "Insert User Form/Standard Module/Class Module/Procedure" icon (Figure 3-2), and click **ClassModule**.
- In Project Explorer (Figure 3-1), right-click the "VBAProject" icon, and click **Insert - ClassModule**.

Deleting Modules

You can delete any unnecessary module from the project within Visual Basic Editor. The following procedure assumes that you want to delete a class module named "Class1".

- Step 1.** In Project Explorer (Figure 3-1), click the "Class1" class module under the "Class Modules" icon to highlight it.
- Step 2.** Delete the "Class1" class module using one of the following methods:
 - On the **File** menu, click **Remove Class1...**
 - Click the right mouse button, and click **Remove Class1...**
- Step 3.** When you are prompted to confirm whether to export (save) "Class1", click **No**. Alternatively, you can click **Yes** if you want to save the module.

Coding a VBA Program

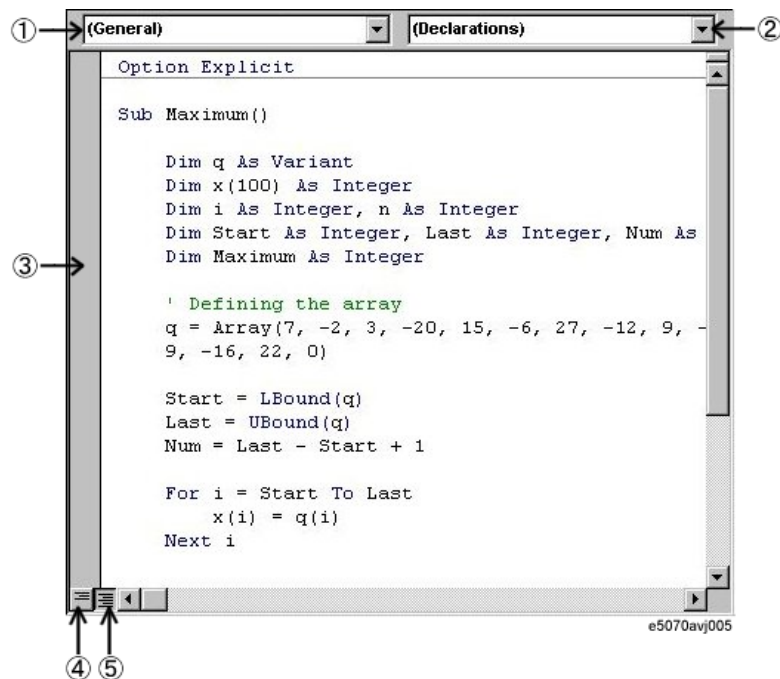
This section provides descriptive information on the user interface elements of a code window that lets you code a VBA program, and walks through a sample program (procedure) that finds the maximum value contained in an array so you can gain insight into how to create your own programs.

User Interface Elements of a Code Window

A code window is where you code a VBA program. When you are working with a user form, you can open the code window for that user form by double-clicking a control (such as a button or text box) placed on the form. Similarly, when you are working with a standard or class module, you can open the code window associated with that module by double-clicking the module's icon in Project Explorer (Figure 3-1).

Figure 3-5

Code window for a standard module



1. Object box

Provides a list of objects currently used within the code window.

2. Procedure box

Provides a list of procedures that reside within the code window. When you are working with a user form, this provides a list of events (actions such as click or double-click).

3. Margin indicator bar

Primarily intended for use when debugging a program.

4. Show Procedure button

Displays only the procedure at the cursor position.

5. Show Module button

Displays the entire program contained in the code window.

Creating a Simple VBA Program

This section walks through a sample program that finds the maximum value contained in an array while breaking down the code into a number of blocks and describing what they do. Line numbers are added for description purpose only, and do not appear in the actual program source code.

Example 3-1

Sample program that finds the maximum value contained in an array

```
10| Option Explicit
20|
30| Sub Maximum()
40|
50|     Dim q As Variant
60|     Dim x(100) As Integer
70|     Dim i As Integer, n As Integer
80|     Dim Start As Integer, Last As Integer, Num As Integer
90|     Dim Maximum As Integer
100|
110|     ' Defining the array
120|     q = Array(7, -2, 3, -20, 15, -6, 27, -12, 9, -5, 18, 23, _
130|     9, -16, 22, 0)
140|
150|     Start = LBound(q)
160|     Last = UBound(q)
170|     Num = Last - Start + 1
180|
190|     For i = Start To Last
200|         x(i) = q(i)
210|     Next i
220|
230|     Maximum = x(Start)
240|
250|     For n = Start + 1 To Last
260|         If x(n) > Maximum Then Maximum = x(n)
270|     Next n
280|
290|     MsgBox Maximum
300|
310| End Sub
```

Operation Basics of the E5070A/E5071A's VBA

Creating a Simple VBA Program

Let us break down the code into a number of blocks and see what they do.

Line 10	This instruction mandates explicit declaration of variables.
Lines 30 to 310	The code enclosed between Sub Maximum() and End Sub will be executed within the E5070A/E5071A's macro environment. Thus enclosed code is called a procedure. In this example, "Maximum" is the procedure name.
Lines 50 to 90	These lines declare data types of variables using Dim statements. A statement is the minimum instruction unit based on the syntax. The sample program declares the variable "q" as Variant, and the variables "x(100)", "i", "n", "Start", "Last", "Num", and "Maximum" as Integer. For a complete list of statements and data types supported by VBA, see VBA Online Help.
Line 110	Any text preceded by a comment indicator (') is treated as a comment.
Lines 120 to 130	These lines use VBA's Array function to initialize the array. The q() array contains elements delimited with commas in the ascending order of index numbers (zero-based). A combination of a space and underscore () is used to continue the statement across two or more lines.
Line 150	Stores the starting index number of the q array into the Start variable.
Line 160	Stores the last index number of the q array into the Last variable.
Line 170	Stores the number of elements in the q array into the Num variable.
Lines 190 to 210 and Lines 250 to 270	The code within each For ...Next statement is iterated until the counter reaches the specific number.
Line 200	Stores the contents of the q array (Variant) into the x variable (Integer).
Line 230	Uses the first element of the x array as the tentative maximum value.
Line 260	Compares the tentative maximum value with each of elements that follow; if an element is larger than the tentative maximum value, then that element is used as the tentative maximum value.
Line 290	Uses a message box function to display the maximum value. For a complete list of functions supported by VBA, see VBA Online Help.

NOTE

The sample program in Example 3-1 consists of a single procedure contained in a single module. However, when you deal with procedures and variables across multiple modules, you should be aware of the scope of variables and procedures.

Auto-complete Feature

When you use COM objects in Visual Basic Editor, the editor's auto-complete feature allows you to easily type in keywords without misspelling them.

The following procedure assumes that you are entering the **SCPI.INITiate(Ch).CONTInuous** on page 320 object.

- Step 1.** In a standard module, type **sub main** and press the **[Enter]** key. **End Sub** is automatically added.
- Step 2.** Typing **scpi** followed by a dot (.) brings up a list of classes under the SCPI class.
- Step 3.** Typing **in** automatically moves focus to **INITiate** in the list box.
- Step 4.** Typing **(** brings up a list of indexes.
- Step 5.** Typing **1).** brings up a list of classes under the INITiate class.
- Step 6.** Typing **c** automatically moves focus to **CONTInuous** in the list box.
- Step 7.** Typing **=** brings up a list box for setting a Boolean value (**True/False**).
- Step 8.** Typing **t** automatically moves focus to **True**.
- Step 9.** Pressing the **[Enter]** key completes the statement: **SCPI.INITiate(1).CONTInuous = True**.

Saving a VBA program

You can save VBA programs either as one complete project or on a module by module basis.

Saving a Project

When you opt to save your program as one complete project, you can have the files (modules) making up the project into a single package. A project is saved as a .vba file. You can save your program to a project file using one of the following two methods:

Saving a Project from Visual Basic Editor

Step 1. Open the Save As dialog box by doing one of the following:

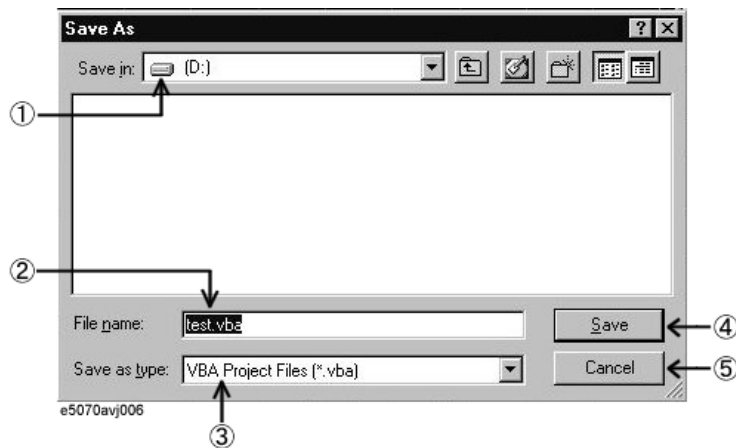
- On the **File** menu, click **Save xxx.VBA**. "xxx" represents the file name.
- On the toolbar, click "Save Project File" icon (Figure 3-2).
- Press **[Ctrl] + [S]** on the keyboard.

Step 2. The Save As dialog box (Figure 3-6) appears. Specify the file name and location (drive or folder) and click **Save**.

The Save As dialog box has the following user interface elements:

Figure 3-6

Save As dialog box



- 1. Save in:** Specify the location (drive or folder) where to save the file.
- 2. File name** Type in the file name.
- 3. Save as type:** Select the type of the file you are saving. Normally, you should select **VBA Project Files (*.vba)**.
- 4. Save:** Clicking this button saves the project.
- 5. Cancel:** Clicking this button closes the Save As dialog box and brings you back to the main screen.

E5070A/E5071A Saving a Project from the E5070A/E5071A Measurement Screen

- Step 1.** Display the E5070A/E5071A measurement screen following the instructions given in “Switching to the E5070A/E5071A Measurement Screen” on page 30.
- Step 2.** Open the Save As dialog box using the following key sequence:
 - **[Macro Setup] - Save Project**
- Step 3.** The Save As dialog box (Figure 3-6) appears. Specify the file name and location (drive or folder) and click **Save**.

Saving a Module (Exporting)

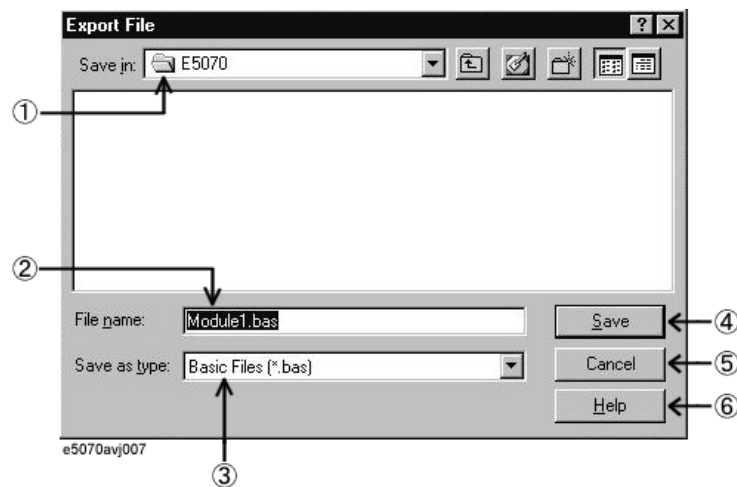
Alternatively, you can save each module (user form, standard, or class) of your VBA program individually. To save a module, you must use Visual Basic Editor. User forms are saved as .frm files, standard modules as .bas files, and class modules as .cls files.

- Step 1.** In Project Explorer (Figure 3-1), click the file name that appears under the desired module icon to highlight it.
- Step 2.** Open the Export File dialog box by doing one of the following:
 - On the **File** menu, click **Export File...**
 - Click the right mouse button, and click **Export File...**
 - Press **[Ctrl] + [E]** on the keyboard.
- Step 3.** The Export File dialog box (Figure 3-7) appears. Specify the file name and location (drive or folder) and click **Save**.

The Export File dialog box has the following user interface elements:

Figure 3-7

Export File dialog box



- 1. Save in:** Specify the location (drive or folder) where to save the file.
- 2. File name** Type in the file name.

Saving a Module (Exporting)

- 3. Save as type:** Select the type of the module you are saving. The type that corresponds to the module you are saving is selected by default. Normally, you should use the default.
- 4. Save:** Clicking this button saves the module.
- 5. Cancel:** Clicking this button closes the Export File dialog box and brings you back to the main screen.
- 6. Help:** Clicking this button brings up VBA Online Help.

Loading a VBA Program

Once you have saved a project or module file, you can load it later whenever necessary.

Loading a Project

You can load a saved project file either from the E5070A/E5071A measurement screen or by specifying that the project file be automatically loaded when the power is turned on.

Loading a Project from the E5070A/E5071A Measurement Screen

Step 1. Access the Open dialog box using the following key sequence:

- **[Macro Setup] - Load Project**

NOTE

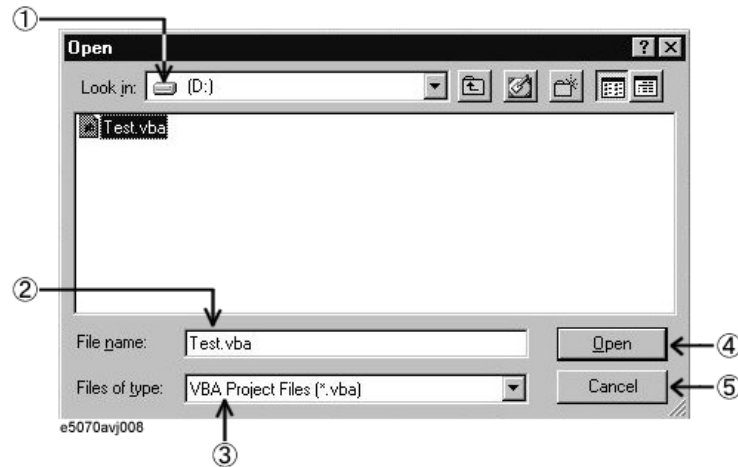
When the another project has already been loaded on the Visual Basic Editor, the message whether or not the current project is saved may appear. If you want to save the project, click **Yes** button to display a dialog box for saving (Figure 3-6 on page 40). For saving the project, see “Saving a Project” on page 40.

Step 2. The Open dialog box (Figure 3-8) appears. Specify the file name and location (drive or folder) of the file you want to load and click **Open**.

The Open dialog box has the following user interface elements:

Figure 3-8

Open dialog box



- 1. Look in:** Specify the location (drive or folder) where the project resides.
- 2. File name:** Specify the file name of the project you want to load.
- 3. Files of type:** Select the type of the file you want load. Normally, you should select **VBA Project Files (*.vba)**.
- 4. Open:** Clicking this button loads the project.
- 5. Cancel:** Clicking this button closes the Open dialog box and brings you back to the main screen.

Operation Basics of the E5070A/E5071A's VBA

Loading a Module (Importing)

Automatically Loading a Project at Power-On

Once you have saved a project file that satisfies the following conditions, the project will be automatically loaded whenever the power is turned ON.

Auto-loaded project	Conditions
Directory where the project resides.	A:\ (A:\) or D:\ (D:\)
Project file name	autoload.vba*1

*1. Upper/lower case insensitive.

NOTE

If there is the file named "autoload.vba" in both the A drive and the D drive, the file in the A drive is used.

Loading a Module (Importing)

To load a saved module into a project, you must use Visual Basic Editor.

Step 1. In Project Explorer (Figure 3-1), click the file name that appears under the desired module icon to highlight it.

Step 2. Open the Import File dialog box by doing one of the following:

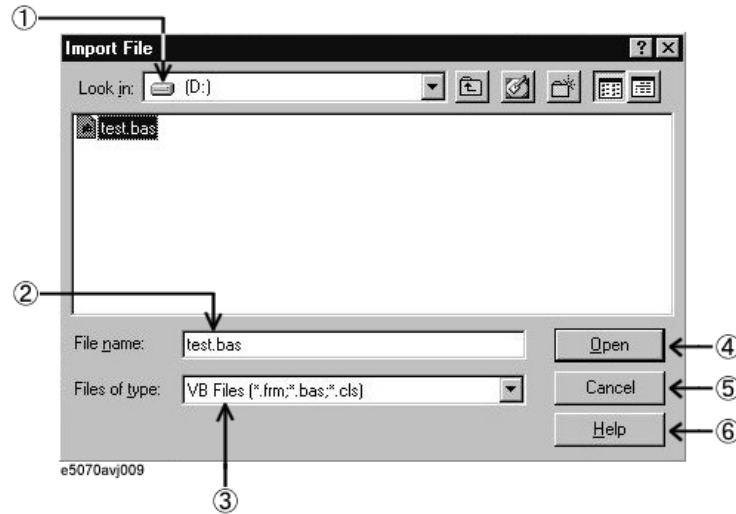
- On the **File** menu, click **Import File...**
- In Project Explorer (Figure 3-1), right-click the "VBAProject" icon, and click **Import File...**
- Press **[Ctrl] + [M]** on the keyboard.

Step 3. The Import File dialog box (Figure 3-9) appears. Specify the file name and location (drive or folder) of the file (module) you want to load and click **Open**.

The Import File dialog box has the following user interface elements:

Figure 3-9

Import File dialog box



1. **Look in:** Specify the location (drive or folder) where the module resides.
2. **File name:** Specify the file name of the module you want to load.
3. **Files of type:** Select the type of the file you want load. Normally, you should select **VB Files [*.frm;*.bas;*.cls]**.
4. **Open:** Clicking this button loads the module.
5. **Cancel:** Clicking this button closes the Import File dialog box and brings you back to the main screen.
6. **Help:** Clicking this button brings up VBA Online Help.

Running a VBA Program

The E5070A/E5071A allows you to run a VBA program using one of the four methods listed below. The execution status of the VBA program is indicated in the instrument status bar, as shown in Figure 3-10. "Run" indicates that the program is running while "Stop" indicates that the program is stopped.

Figure 3-10

Instrument status bar indicating the status of the VBA program



Running a Program from Visual Basic Editor

Step 1. Open the Macros dialog (Figure 3-11) box by doing one of the following:

- On the **Run** menu, click **Run Macro**.
- On the **Tools** menu, click **Macros...**
- On the toolbar, click "Run Macro" icon (Figure 3-2).
- Press **[F5]** on the keyboard.

NOTE

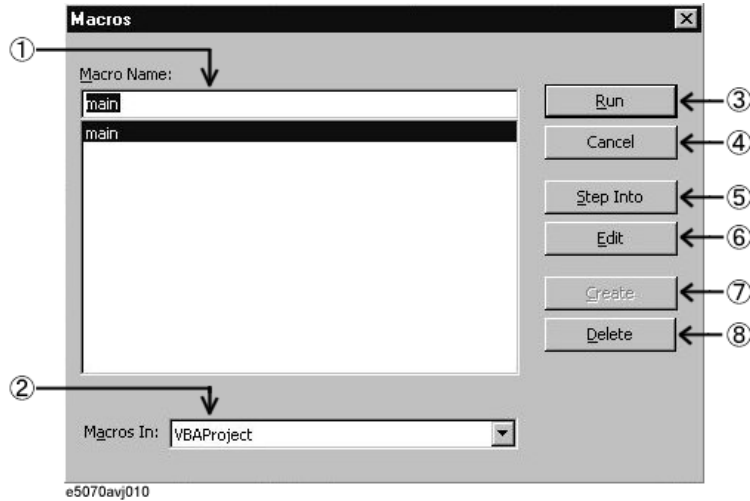
Doing the above steps with the cursor positioned within a procedure in the code window immediately runs the program without displaying the Macros dialog box.

Step 2. In the Macros dialog box, select the VBA program (procedure name) you want to run, and click the **Run** button.

The Macros dialog box has the following user interface elements:

Figure 3-11

Macros dialog box



- 1. Macro Name:** Select the VBA program (procedure name) you want to run from the list box so its name appears here.
- 2. Macro In:** Specify the project that contains the VBA program you want to run. Normally, use the default.
- 3. Run:** Clicking this button runs the selected VBA program (procedure).
- 4. Cancel:** Clicking this button closes the Macros dialog box and brings you back to the main screen.
- 5. Step Into:** Clicking this button brings up Visual Basic Editor and put it into step-in mode, where the selected VBA program is run step by step. This mode is primarily intended for use when debugging a VBA program. For more information on step-in mode, see “Debug Toolbar” on page 51.
- 6. Edit:** Displays the code of the selected VBA program. You can use this for re-editing your code.
- 7. Create:** This button is normally dimmed.
- 8. Delete:** Clicking this button deletes the selected VBA program. Take care not to inadvertently delete your VBA program before saving it.

NOTE

The Macros dialog provides access to subprograms (procedures enclosed between Sub and End Sub) created in a standard module.

Running a Program from the E5070A/E5071A Measurement Screen

- Step 1.** Display the E5070A/E5071A measurement screen following the instructions given in “Switching to the E5070A/E5071A Measurement Screen” on page 30.
- Step 2.** Run the VBA program (procedure) using the following key sequence:

- **[Macro Setup] - Select Macro - Module xxx**

where "**Module**" is the object name (Name property shown in the property window: see Figure 3-4 on page 34) and "**xxx**" is the procedure name.

- Press the **[Macro Run]** key on the E5070A/E5071A front panel. For a program to be run from the measurement screen, its procedure name must be "Main" (subprogram enclosed between Sub Main() and End Sub), and its object name (Name property as displayed in the property window) must be "Module1".

NOTE

When you are working with the E5070A/E5071A measurement screen, the E5070A/E5071A's macro environment only provides access to those VBA programs that are created as subprograms (enclosed between Sub and End Sub) in a standard module.

Stopping a VBA Program

Stopping with the Dialog Box Appeared

This section describes how to break a procedure during the execution of a VBA program (display a dialog box as shown in Figure 3-12 using forced interrupts).

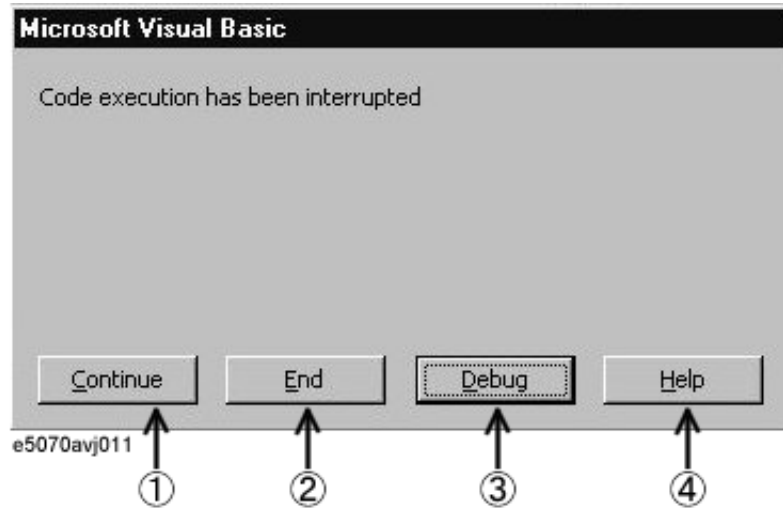
- Step 1.** To break the running VBA program, do one of the following:

- On the **Run** menu, click **Break**.
- On the toolbar, click "Break Macro" icon (Figure 3-2).
- Press **[Ctrl] + [Break]** on the keyboard.
- **[Macro Setup] - Stop**(E5070A/E5071A measurement screen)
- Press the **[Macro Break]** key on the E5070A/E5071A front panel.

- Step 2.** A dialog box as shown in Figure 3-12 is displayed through forced interrupts, and the program is suspended.

Figure 3-12

Dialog box that appears when a VBA program is suspended



1. **Continue:** Resumes the execution of the program.
2. **End:** Terminates the VBA program.
3. **Debug:** Displays a run-time error.
4. **Help:** Brings up VBA Online Help.

Abruptly Terminating the VBA Program

This section describes how to abruptly terminate a running procedure. When abruptly terminating the VBA program by the below methods, the "Program interrupted" message is shown in the instrument status bar on the bottom of the LCD display.

- Step 1.** To terminate the running VBA program, do one of the following:
- On the **Run** menu, click **Reset**.
 - On the toolbar, click "Reset Macro" icon (Figure 3-2).
 - Insert an *End* statement into your code.

Errors and Debugging

Types of Error

Errors in VBA programs are classified into the following two types:

Syntax errors

A syntax error is generated when Visual Basic Editor detects an invalid statement that violates the Visual Basic syntax rules. For example, misspelled keywords generate syntax errors. An error dialog box appears that indicates the error message, and highlight the invalid statement in red. To get detailed information on the error, click the **HELP** button in the error dialog box to display the help topic on the error. You cannot run the macro until you correct the syntax error.

The E5070A/E5071A VBA environment is by default configured to automatically check for syntax errors, but you can disable the auto syntax check feature using the following steps:

- Step 1.** On the **Tools** menu, click **Options...**
- Step 2.** On the **Editor** tab, clear the **Auto Syntax Check** check box.
- Step 3.** Click the **OK** button.

Run-time Errors

A run-time error is generated when a VBA program attempts to execute an invalid statement at run time. When a run-time error is generated, the program is stopped at the invalid statement, and an error dialog box as shown in Figure 3-12 appears. You can terminate the program by clicking the **END** button in the error dialog box. Also, you can click the **DEBUG** button in the error dialog box to identify the statement that caused the error. In this case, the statement in question is highlighted in yellow.

NOTE

Some run-time errors occur under particular conditions, even though a program run without occurring the errors under normal conditions. For example, the “Target value not found” error that occurs when a program that analyzes the results using the Marker Bandwidth Search feature fail to perform bandwidth search because the marker is not in the appropriate position, the “Ecal module not in RF path” error that occurs when a program that performs calibrations using a ECal module fail to measure the calibration data because the ECal module is not appropriately connected to test ports, and so on. To avoid interruption of the program by these errors, you can handle these errors like lines 730 to 960 in Example 6-1 on page 89.

Using a Debug Tool

The E5070A/E5071A's VBA environment provides a variety of debug tools that help you identify logical errors. Detailed information on using the debug tools is covered in VBA Online Help and books on VBA.

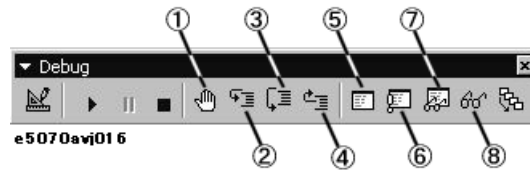
Debug Toolbar

The debug toolbar (Figure 3-13) provides tool buttons that allow you to easily access various debug tools. To display the debug toolbar, do the following:

- Step 1.** On the **View** menu, click **Toolbars - Debug**.

Figure 3-13

Debug toolbar



1. Set/clear break points (keyboard: **[F9]**)
Puts a break point at the cursor position or clears an existing break point.
2. Step-in (keyboard: **[F8]**)
Runs the VBA program step by step. If the current program contains a call to another procedure, that procedure is also run step by step.
3. Step-over (keyboard: **[Shift]+[F8]**)
Runs the VBA program step by step. If the current program contains a call to another procedure, that procedure is run as one line.
4. Step-out (keyboard: **[Ctrl]+[Shift]+[F8]**)
Executes the remaining lines of the function where the execution point is currently placed.
5. Local window
Opens the local window that shows the current values of local variables.
6. Immediate window (keyboard: **[Ctrl]+[G]**)
Opens the immediate window that evaluates entered values of variables or expressions.
7. Watch window
Opens the watch window that displays the current value of a specified expression.
8. (keyboard: **[Shift]+[F9]**)
Displays the current value of a specified expression in a dialog box.

Operation Basics of the E5070A/E5071A's VBA Using a Debug Tool

Setting a Break Point

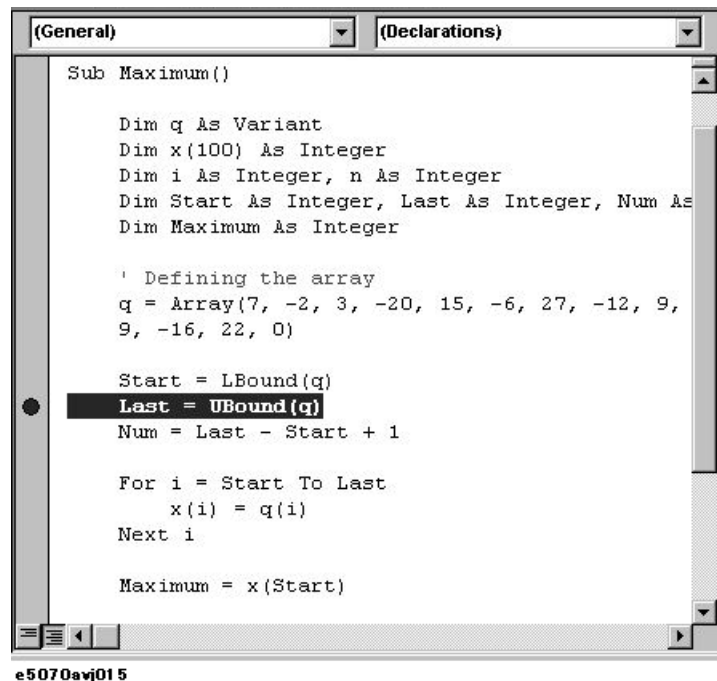
By placing a break point at a particular statement in a VBA program, you can automatically suspend the program when it is executed to that statement.

Step 1. When you put a break point at a line, the line is highlighted in amber as shown in Figure 3-14. To set a break point do one of the following:

- Place the cursor at the desired line of code, and click the "Set/clear break points" button (Figure 3-13: 1) on the debug toolbar.
- Click anywhere in the margin indicator bar of the code window.

Figure 3-14

Setting a break point



Monitoring Variable or Property Values

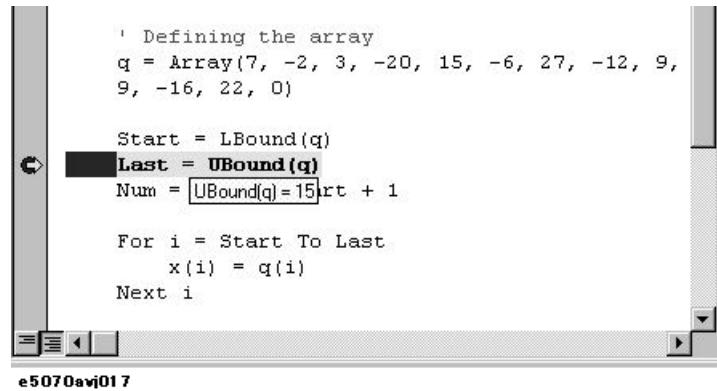
With your VBA program suspended, you can use the following debug tool to monitor variables or properties. To do this, you must set a break point, run the VBA program, and suspend it.

Data Hint

When you point to the variable or expression of interest, Data Hint shows the current value as shown in Figure 3-15.

Figure 3-15

Data Hint



Immediate Window

To display the immediate window, click the "Immediate Window" button (Figure 3-13:6) on the debug toolbar.

In the immediate window, enter a question mark (?) followed by the variable or expression whose value you want to check, and press the Enter key, as shown in Figure 3-16. The current value appears in the line that follows.

Figure 3-16

Immediate window

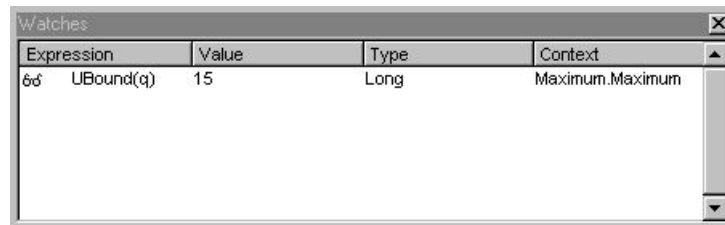


Watch Window

To display the watch window (Figure 3-17), click the "Watch Window" button (Figure 3-13: 7) on the debug toolbar.

Figure 3-17

Watch window



e5070avj019

Step 1. To open the Add Watch dialog box (Figure 3-18), do the following:

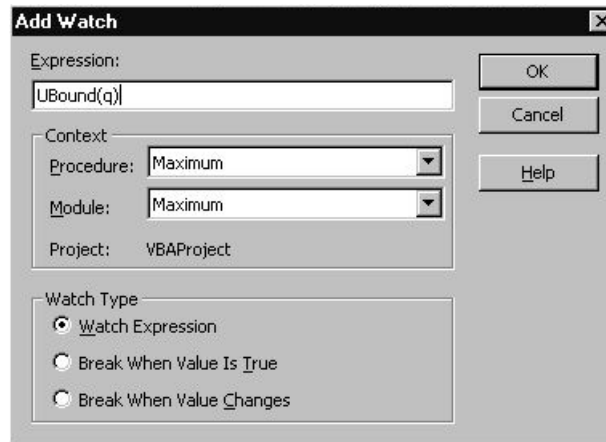
- On the **Debug** menu, click **Add Watch...**

Step 2. As shown in Figure 3-18, you can specify an expression of interest as a watch expression to always monitor its value.

Step 3. Click the **OK** button.

Figure 3-18

Add Watch dialog box



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Quick Watch

In the code window, select a variable or expression whose value you want to watch. On the debug toolbar, click the "Quick Watch" button (Figure 3-13:8) to open the Quick Watch dialog box (Figure 3-19). The dialog box displays the current value of your specified variable or expression.

Also, you can click the **Add** button in the Quick Watch dialog box to specify the current expression as a watch expression.

Figure 3-19

Quick watch



e5070avj021

Printing Output Values in the Echo Window

The echo window, which appears in the lower part of the E5070A/E5071A measurement screen, can be used to display a message or the return value (data) of an object.

Entering Values Output to the Echo Window

You can use the COM objects listed below to enter values output to the echo window. For more information on each object, see Chapter 7, "COM Object Reference."

- **ECHO** on page 152
- **SCPI.DISPlay.ECHO.DATA** on page 287

Opening the Echo Window

You can use the COM objects listed below to open the echo window. For more information on each object, see Chapter 7, "COM Object Reference."

- **SCPI.DISPlay.TABLE.TYPE** on page 296
- **SCPI.DISPlay.TABLE.STATe** on page 295

Alternatively, you can also open the echo window using the following key sequence:

- **[Macro Setup] - Echo Window (ON)**

Clearing Values Output in the Echo Window

You can use the COM object shown below to clear values output to the echo window. For more information on this object, see Chapter 7, "COM Object Reference."

- **SCPI.DISPlay.ECHO.CLEAr** on page 287

Alternatively, you can also clear values output to the echo window using the following key sequence:

- **[Macro Setup] - Clear Echo**

Using VBA Online Help

VBA Online Help provides useful topics, such as the VBA terminology or how to use a particular feature. In VBA Online Help, you can find a topic of interest through the Contents or by entering specific keywords.

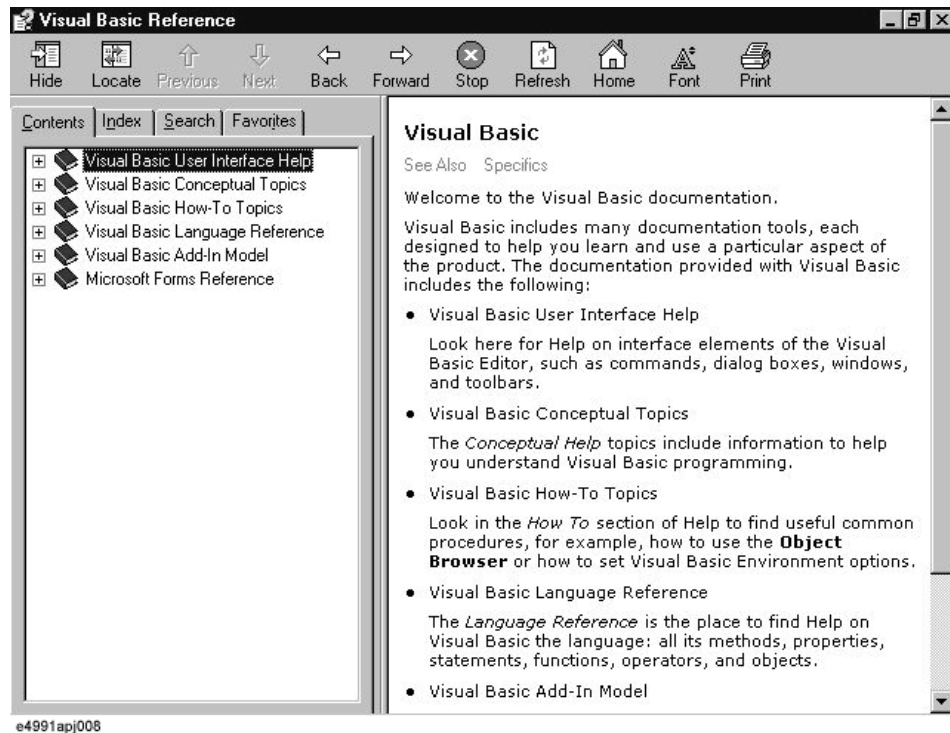
Accessing VBA Online Help

Step 1. From Visual Basic Editor, do one of the following to access the VBA Online Help screen (Figure 3-20):

- On the **Help** menu, click **Microsoft Visual Basic Help**.
- Press **[F1]** on the keyboard.
- On the toolbar, click "VBA Help" icon (Figure 3-2).

Figure 3-20

VBA Online Help screen



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Using the Contents Tab

Step 1. Clicking the **Contents** tab in the VBA Online Help screen brings up the items listed below. The E5070A/E5071A VBA Online Help has a hierarchical table of contents. Click an item to expand it, and then find a topic of interest.

- Visual Basic User Interface Help
- Visual Basic Conceptual Topics
- Visual Basic How-To Topics
- Visual Basic Language Reference
- Visual Basic Add-In Model
- Microsoft Forms Reference

When you need information on using Visual Basic Editor, use User Interface Help and How-To Topics as primary sources of information. Formats of VBA programs are covered in Visual Basic Conceptual Topics. Properties and methods supported by VBA are covered in Visual Basic Language Reference and Visual Basic Add-In Model. Information on using user forms is covered in Microsoft Forms Reference.

Using the Index Tab

Step 1. In the VBA Online Help screen, click the **Index** tab, and enter a keyword(s) into the text box. For example, you may wish to search for "Sub" or "With" when you are writing your own code.

Looking up a Keyword in the Code within Visual Basic Editor

When you want to know the usage or meaning of a keyword contained in a sample program or some other code, you can quickly access the help topic on that keyword by moving the cursor to the keyword and pressing **[F1]**.

Uses Advanced Techniques

Accessing a List of E5070A/E5071A COM Objects

The E5070A/E5071A VBA environment provides COM objects that support controlling the E5070A/E5071A. When you are developing a program using E5070A/E5071A COM objects, you can access a list of E5070A/E5071A COM objects by opening Object Browser within Visual Basic Editor.

Step 1. To open Object Browser, do one of the following:

- On the **View** menu, click **Object Browser**.
- On the toolbar, click "Object Browser" icon (Figure 3-2).

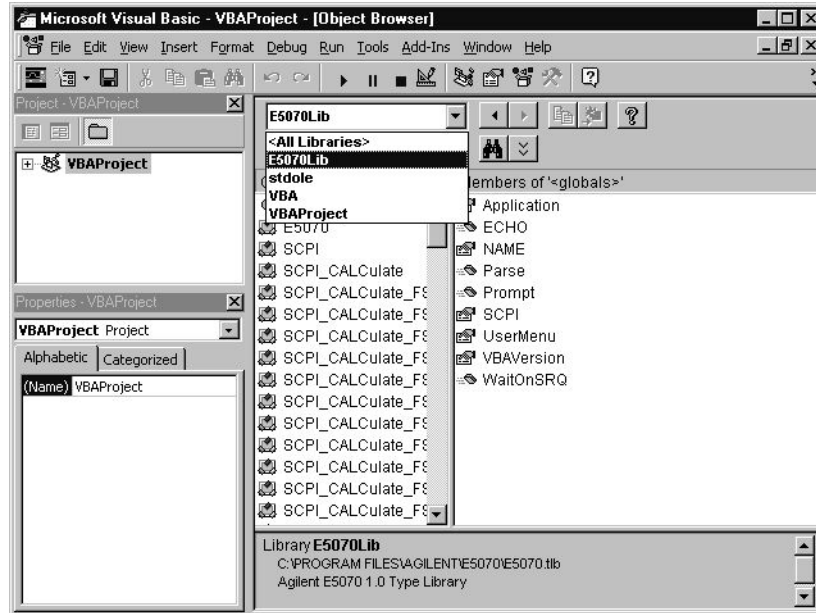
Step 2. Select **E5070Lib** from the Project/Library box to display the E5070A/E5071A library as shown in Figure 3-21.

NOTE

There are some COM objects NOT used in controlling with E5070A/E5071A VBA in the list of the E5070A/E5071A COM objects displayed on the Object Browser. The COM objects NOT used in controlling with E5070A/E5071A VBA are not described in the Chapter 7, "COM Object Reference," on page 117.

Figure 3-21

How to use Object Browser



e5070avj042

Using Automatic Library References

For libraries that satisfy the following conditions, the library reference will be automatically set whenever a new project is created and loaded (**[Macro Setup] - New Project**).

Automatically referenced libraries	Conditions
Directory where the library resides.	D:\Agilent (D:\Agilent)
Extensions of libraries	olb, tlb, dll, or ocx

To check the library reference setting, you must use Visual Basic Editor.

Step 1. Follow these steps to check the library reference setting.

- On the **Tools** menu, click **References...**

NOTE

A project sets the library reference when the project is created. Therefore, if the existing project is loaded, libraries added after the development of the project are not automatically set in the library reference.

4

Controlling the E5070A/E5071A

This chapter describes how to use the E5070A/E5071A's VBA to control the E5070A/E5071A itself.

Detecting the End of Measurement

This chapter uses sample programs to demonstrate how to trigger the instrument to start a new measurement cycle and how to detect the end of a measurement cycle. The trigger system is responsible for such tasks as detecting the start of a measurement cycle (triggering) and enabling/disabling measurement on each channel. For a detailed description of the trigger system and the concept of triggering, see Chapter "Making a Measurement" in *E5070A/E5071A Programmer's Guide* gives a detailed description.

You can detect the end of measurement by using either the status register or the **SCPI.TRIGger.SEquence.SINGLE** on page 444 object.

Using the Status Register

The status of the E5070A/E5071A can be detected through the status register. For a complete description of the status report mechanism, including the specifications of each bit of the status register, see Appendix "Status Reporting System" in *E5070A/E5071A Programmer's Guide*.

If your program is based on SPCI commands, you can use SRQ (Service Request) interrupts to detect the end of measurement. For more information, see Section "Waiting for the End of Measurement" in *E5070A/E5071A Programmer's Guide*.

On the other hand, if your program is based on COM objects, SRQ interrupts are not available; instead, you can use the following object to suspend the program until SRQs are generated upon completion of measurement.

- **WaitOnSRQ** on page 161

The sample program disk contains a sample program, named "meas_srq.vba", that demonstrates how to use the status register to suspend the program until the end of measurement. This VBA program consists of the following modules:

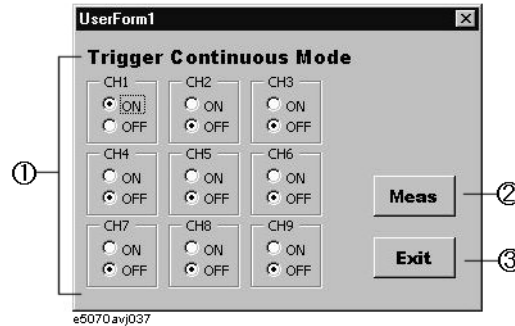
NOTE

For information on loading VBA programs, see "Loading a VBA Program" on page 43.

Object name	Module type	Content
frmSrqMeas	UserForm	Uses the status register to wait for the end of measurement.
mdlSrqMeas	Standard module	Invokes a UserForm.

When you run this VBA program, a UserForm as shown in Figure 4-1 appears. For how to use each element in Figure 4-1, see the following description.

Figure 4-1 The UserForm when running the Example 4-1 program



1. The program turns on Continuous Activation mode for each channel and determines whether to enable or disable each channel for measurement.
2. The program triggers the instrument to start a new measurement cycle, waits for the end of measurement, and then displays a message. For detail, see the description of the code window.
3. The program exits, and the UserForm disappears.

In Visual Basic Editor, open the UserForm (object name: frmSrqMeas), and double-click the **Meas** or **Exit** button to bring up the code window. The following is the description of the subprograms associated with the respective buttons.

Procedure called when the user clicks the **Exit** button on the UserForm (lines 10 to 50)

Line 30 Unloads the UserForm from the memory, and terminates the program.

Procedure called when the user clicks the **Meas** button on the UserForm (lines 70 to 390)

Line 110 Hides the UserForm (object name: frmSrqMeas) from the screen.

Line 130 Displays 9 channel windows.

Line 140 Sets the trigger source to "bus".

Lines 160 to 240 These lines turn on or off Continuous Activation mode for each channel depending on whether the corresponding option buttons are on or off. By default, the mode is turned on for channel 1 only.

Lines 260 to 270 These lines configure the instrument so that operation status event register's bit 4 is set to 1 only when operation status condition register's bit 4 is changed from 1 to 0 (negative transition).

Line 280 Enables the operation status event register's bit 4.

Line 290 Enables the status byte register's bit 7.

Line 300 Clears the status byte register and operation status event register.

Line 310 Triggers the instrument to start a measurement cycle.

Line 320 Verifies that the instrument is in a measurement cycle, and suspends the program until the end of measurement. The time-out is set to 100 seconds (maximum value).

Controlling the E5070A/E5071A Detecting the End of Measurement

Lines 330 to 350 These lines display a measurement completion message upon detecting the end of measurement.

Line 370 Displays the UserForm (object name :frmSrqMeas) on the screen.

Example 4-1

Using SRQs to detect the end of measurement (object name: frmSrqMeas)

```
10| Private Sub cmdExit_Click()
20|
30|     Unload Me
40|
50| End Sub
60|
70| Private Sub cmdMeas_Click()
80|
90|     Dim Cond As Boolean
100|
110|     frmSrqMeas.Hide
120|
130|     SCPI.DISPlay.Split = "d123_456_789"
140|     SCPI.TRIGger.SEQuence.Source = "bus"
150|
160|     SCPI.INITiate(1).CONTinuous = optOn1.Value
170|     SCPI.INITiate(2).CONTinuous = optOn2.Value
180|     SCPI.INITiate(3).CONTinuous = optOn3.Value
190|     SCPI.INITiate(4).CONTinuous = optOn4.Value
200|     SCPI.INITiate(5).CONTinuous = optOn5.Value
210|     SCPI.INITiate(6).CONTinuous = optOn6.Value
220|     SCPI.INITiate(7).CONTinuous = optOn7.Value
230|     SCPI.INITiate(8).CONTinuous = optOn8.Value
240|     SCPI.INITiate(9).CONTinuous = optOn9.Value
250|
260|     SCPI.STATus.OPERation.PTRansition = 0
270|     SCPI.STATus.OPERation.NTRansition = 16
280|     SCPI.STATus.OPERation.ENABLE = 16
290|     SCPI.IEEE4882.SRE = 128
300|     SCPI.IEEE4882.CLS
310|     SCPI.IEEE4882.TRG
320|     WaitOnSRQ Cond, 100000
330|     If Cond = True Then
340|         MsgBox "Measurement Completion"
350|     End If
360|
370|     frmSrqMeas.Show
380|
390| End Sub
```

Using the **SCPI.TRIGger.SEQUENCE.SINGLE** Object

When you trigger the instrument by issuing the **SCPI.TRIGger.SEQUENCE.SINGLE** on page 444 object, you can use the **SCPI.IEEE4882.OPC** on page 316 object to suspend the program until the end of measurement.

The sample program disk contains a sample program, named "meas_sing.vba", that demonstrates how to use the **SCPI.TRIGger.SEQUENCE.SINGLE** on page 444 object to suspend the program until the end of measurement. This VBA program consists of the following modules:

Object name	Module type	Content
frmSingMeas	UserForm	Uses the SCPI.TRIGger.SEQUENCE.SINGLE and SCPI.IEEE4882.OPC objects to suspend the program until the end of measurement.
mdlSingMeas	Standard module	Invokes a UserForm.

When you run this VBA program, a window as shown in Figure 4-1 appears. For how to use each element, see Figure 4-1 in the previous section.

In Visual Basic Editor, open the UserForm (object name: frmSingMeas), and double-click the **Meas** or **Exit** button to bring up the code window. The following is the description of the subprograms associated with the respective buttons.

Procedure called when the user clicks the **Exit** button on the UserForm (lines 10 to 50)

Line 30 Unloads the UserForm from the memory, and terminates the program.

Procedure called when the user clicks the **Meas** button on the UserForm (lines 70 to 330)

Line 110 Hides the UserForm (object name: frmSingMeas) from the screen.

Line 130 Displays 9 channel windows.

Line 140 Sets the trigger source to "bus".

Lines 160 to 240 These lines turn on or off Continuous Activation mode for each channel depending on whether the corresponding option buttons are on or off. By default, the mode is turned on for channel 1 only.

Line 260 Triggers the instrument to start a measurement cycle.

Line 270 Executes the **SCPI.IEEE4882.OPC** object to suspend the program until the value of 1 is returned indicating the end of measurement.

Line 290 Displays a measurement completion message.

Line 310 Displays the UserForm (object name: frmSingMeas) on the screen.

Controlling the E5070A/E5071A Detecting the End of Measurement

Example 4-2

Using the **SCPI.TRIGger.SEQuence.SINGle** object to suspend the program until the end of measurement (object name:frmSingMeas)

```
10| Private Sub cmdExit_Click()
20|
30|     Unload Me
40|
50| End Sub
60|
70| Private Sub cmdMeas_Click()
80|
90|     Dim Dmy As Long
100|
110|     frmSingMeas.Hide
120|
130|     SCPI.DISPlay.Split = "d123_456_789"
140|     SCPI.TRIGger.SEQuence.Source = "bus"
150|
160|     SCPI.INITiate(1).CONTinuous = optOn1.Value
170|     SCPI.INITiate(2).CONTinuous = optOn2.Value
180|     SCPI.INITiate(3).CONTinuous = optOn3.Value
190|     SCPI.INITiate(4).CONTinuous = optOn4.Value
200|     SCPI.INITiate(5).CONTinuous = optOn5.Value
210|     SCPI.INITiate(6).CONTinuous = optOn6.Value
220|     SCPI.INITiate(7).CONTinuous = optOn7.Value
230|     SCPI.INITiate(8).CONTinuous = optOn8.Value
240|     SCPI.INITiate(9).CONTinuous = optOn9.Value
250|
260|     SCPI.TRIGger.SEQuence.SINGle
270|     Dmy = SCPI.IEEE4882.OPC
280|
290|     MsgBox "Measurement Completion"
300|
310|     frmSingMeas.Show
320|
330| End Sub
```

Reading/Writing Measurement Data

This section describes how to process the E5070A/E5071A's internal data. You can use these internal data arrays: corrected data arrays, corrected memory arrays, formatted data arrays, formatted memory arrays, and stimulus data arrays. For more information on the internal data arrays, see Section "Internal Data Processing" in *E5070A/E5071A Programmer's Guide*.

To read/write a formatted data array or formatted memory array, use the following objects:

- **SCPI.CALCulate(Ch).SELEcted.DATA.FDATA** on page 203
- **SCPI.CALCulate(Ch).SELEcted.DATA.FMEMORY** on page 204

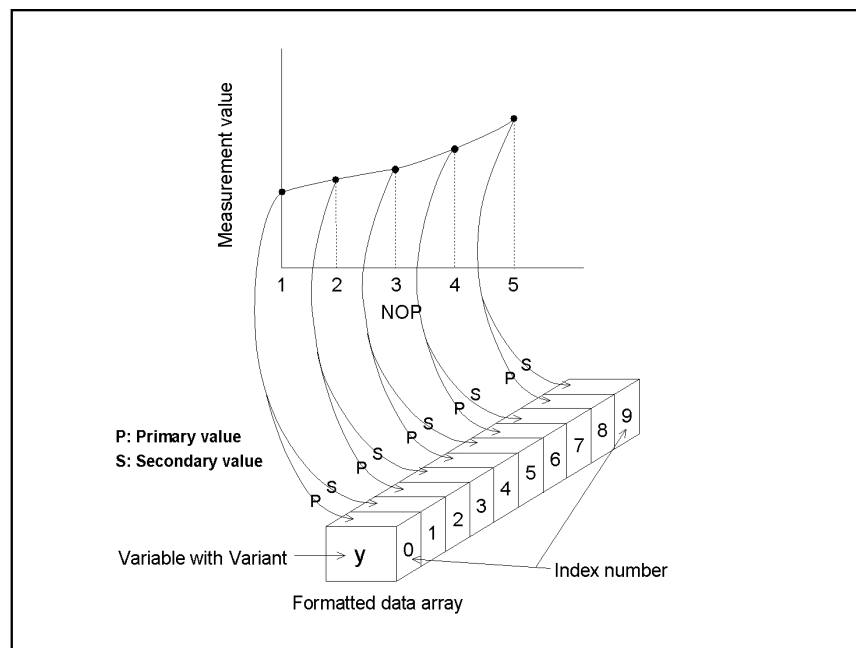
To read a corrected data array, corrected memory array, or stimulus data array, use the following objects:

- **SCPI.CALCulate(Ch).SELEcted.DATA.SDATA** on page 205
- **SCPI.CALCulate(Ch).SELEcted.DATA.SMEMORY** on page 206
- **SCPI.SENSE(Ch).FREQuency.DATA** on page 386

The E5070A/E5071A VBA allows you to deal with multiple pieces of data through variables of Variant type. Variant variables can contain any type of data, allowing you to deal with array data without being aware of the number of elements. For example, a formatted data array that includes 5 measurement points is stored as shown in Figure 4-2. Note that a formatted data array always contains 2 data items per measurement point, whichever data format is used. For more information on contained data, see Section "Internal Data Processing" in *E5070A/E5071A Programmer's Guide*; you can find a table that describes the relationship between contained data items and data formats.

Figure 4-2

Example storing data into a Variant variable



e5070ave038

Controlling the E5070A/E5071A Reading/Writing Measurement Data

NOTE

When you use one of the objects listed above, the base index number of the array is always 0 even if the declaration section contains the "Option Base 1" statement, which specifies the use of the base array index of 1.

For example, you may wish to read the formatted data array for a particular trace in its entirety (including all measurement points), display the data in the echo window, and then write the data into another trace. How to implement such a process can be better understood with the aid of a sample program.

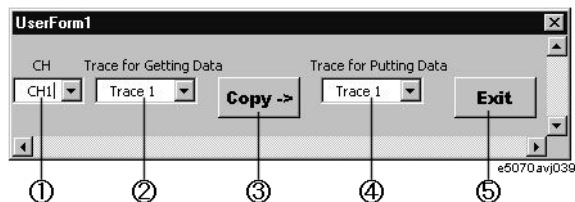
The sample program disk contains a sample program, named "read_write.vba", that demonstrates how to read and write measurement data. This VBA program consists of the following modules:

Object name	Module type	Content
frmReadWrite	UserForm	Reads, displays, and writes a formatted data array.
mdlReadWrite	Standard module	Invokes a UserForm.

When you run this VBA program, a window as shown in Figure 4-3 appears. For how to use each element in Figure 4-3, see the following description.

Figure 4-3

The UserForm when running the Example 4-3 program



1. The program lets the user specify the channel to be controlled.
2. The program lets the user specify which trace's formatted data array to read (source trace).
3. The program reads the formatted data array for the trace specified by the user, display the measurement results in the echo window, and write the data into the trace specified by the user. For detail, see the description of the code window.
4. The program lets the user specify which trace's formatted data array to overwrite (target trace).
5. The program exits, and the window disappears.

In Visual Basic Editor, open the UserForm (object name: frmReadWrite), and double-click the entire UserForm or the **Copy ->** or **Exit** button to bring up the code window. The following is the description of the subprograms associated with the respective buttons.

Procedure called when the user clicks the **Copy** button on the UserForm (lines 10 to 520)

- Lines 90 to 160 These lines identify the selected items in each list and store them into the variables TrGet, TrPut, and ActCh.
- Lines 180 to 210 If the specified target trace is not displayed, these lines display that trace.
- Lines 230 to 250 These lines make active the specified trace (TrGet: source trace) in the specified channel(ActCh) and hold the sweep.
- Line 260 Reads the number of measurement points for the specified channel (ActCh) and stores that number into the Nop variable.
- Line 280 Reads the formatted data array for the active trace (source trace) and store the data into the FmtData variable.
- Line 290 Reads the stimulus array for the specified channel (ActCh) and stores the data into the Freq variable.
- Line 330 Reads the data format for the active trace (source trace) and store it into the Fmt variable.
- Lines 340 to 350 These lines display the echo window in the lower part of the LCD screen.
- Lines 360 to 470 The lines display, in the echo window, each point along with one measured value (the odd part of the index is always 0) 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.
- Line 490 Makes active the specified trace (TrPut: target trace) in the specified channel(ActCh).
- Line 500 Writes the formatted data array (FmtData) into the active trace (target trace).

Procedure called when the user clicks the **Exit** button on the UserForm (lines 540 to 580)

- Line 560 Unloads the UserForm from the memory, and terminates the program.

Procedure that initializes the UserForm (lines 600 to 1020)

- Lines 620 to 1000 When the program is launched, these lines add each list item and set the default value for each list.

Example 4-3

Reading/displaying/writing a formatted data array (read_write.frm)

```

10| Private Sub cmdCopy_Click()
20|
30|   Dim X As Integer, Y As Integer, Z As Integer, I As Integer
40|   Dim ActCh As Long, TrGet As Long, TrPut As Long
50|   Dim TrCont As Long, Nop As Long
60|   Dim FmtData As Variant, Freq As Variant
70|   Dim Fmt As String
80|
90|   X = cboCh.ListIndex

```

Controlling the E5070A/E5071A Reading/Writing Measurement Data

```
100|   ActCh = X + 1
110|
120|   Y = cboGet.ListIndex
130|   TrGet = Y + 1
140|
150|   Z = cboPut.ListIndex
160|   TrPut = Z + 1
170|
180|   TrCont = SCPI.CALCulate(ActCh).PARAMeter.Count
190|   If TrCont < TrPut Then
200|       SCPI.CALCulate(ActCh).PARAMeter.Count = TrPut
210|   End If
220|
230|   SCPI.CALCulate(ActCh).PARAMeter(TrGet).SElect
240|   SCPI.INITiate(ActCh).CONTinuous = False
250|   SCPI.ABORT
260|   Nop = SCPI.SENSE(ActCh).SWEep.POINTs
270|
280|   FmtData = SCPI.CALCulate(ActCh).SElected.Data.FDATA
290|   Freq = SCPI.SENSE(ActCh).FREQuency.Data
300|
310|   ''Displays the formatted data
320|
330|   Fmt = SCPI.CALCulate(ActCh).SElected.Format
340|   SCPI.DISplay.TABLE.TYPE = "ECHO"
350|   SCPI.DISplay.TABLE.STATE = True
360|   Select Case Fmt
370|       Case "MLOG", "PHAS", "GDEL", "MLIN", "SWR", "REAL",
"IMAG", "UPH"
380|           ECHO "Nop", "Frequency(GHz)", "Data"
390|           For I = 0 To Nop - 1
400|               ECHO I + 1, Freq(I) / 1000000000#, FmtData(2 * I)
410|           Next I
420|       Case Else
430|           ECHO "Nop", "Frequency(GHz)", "Data1", "Data2"
440|           For I = 0 To Nop - 1
450|               ECHO I + 1, Freq(I) / 1000000000#, FmtData(2 * I),
FmtData(2 * I + 1)
460|           Next I
470|       End Select
480|
490|   SCPI.CALCulate(ActCh).PARAMeter(TrPut).SElect
500|   SCPI.CALCulate(ActCh).SElected.Data.FDATA = FmtData
510|
520| End Sub
530|
540| Private Sub cmdExit_Click()
550|
560|     Unload Me
570|
580| End Sub
590|
600| Private Sub UserForm_Initialize()
610|
620|     With cboCh
630|         .AddItem "CH1"
640|         .AddItem "CH2"
650|         .AddItem "CH3"
```

```
660|         .AddItem "CH4"  
670|         .AddItem "CH5"  
680|         .AddItem "CH6"  
690|         .AddItem "CH7"  
700|         .AddItem "CH8"  
710|         .AddItem "CH9"  
720|     End With  
730|  
740|     With cboGet  
750|         .AddItem "Trace 1"  
760|         .AddItem "Trace 2"  
770|         .AddItem "Trace 3"  
780|         .AddItem "Trace 4"  
790|         .AddItem "Trace 5"  
800|         .AddItem "Trace 6"  
810|         .AddItem "Trace 7"  
820|         .AddItem "Trace 8"  
830|         .AddItem "Trace 9"  
840|     End With  
850|  
860|     With cboPut  
870|         .AddItem "Trace 1"  
880|         .AddItem "Trace 2"  
890|         .AddItem "Trace 3"  
900|         .AddItem "Trace 4"  
910|         .AddItem "Trace 5"  
920|         .AddItem "Trace 6"  
930|         .AddItem "Trace 7"  
940|         .AddItem "Trace 8"  
950|         .AddItem "Trace 9"  
960|     End With  
970|  
980|     cboCh.ListIndex = 0  
990|     cboGet.ListIndex = 0  
1000|     cboPut.ListIndex = 0  
1010|  
1020| End Sub
```

Executing a Procedure with a Softkey (User Menu Function)

The E5070A/E5071A lets you perform procedures assigned to specific softkeys (**[Macro Setup] - User Menu - Button 1/2/3/4/5/6/7/8/9/10**) without using user forms by an event that the softkey is pressed. This function is called the user menu function.

NOTE

You do not have to execute any VBA program when using the user menu function.

Preparation for Using the User Menu Function

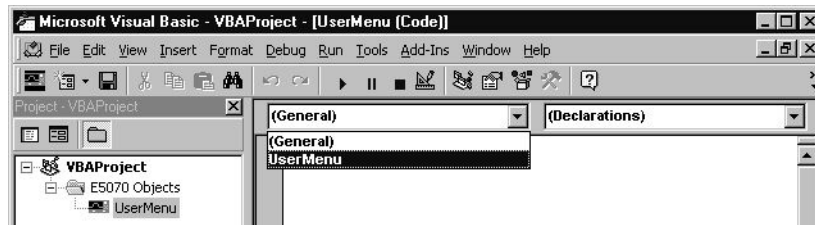
Before using the user menu function, perform the following preparation.

Coding of a Procedure Assigned to a Softkey

Follow these steps to create a procedure assigned to a specific softkey in the "UserMenu" object in the "E5070 Objects" folder.

Step 1. Double-click the "UserMenu" icon in the "E5070 Objects" folder to open the code window.

Step 2. In the object box in the code window, click **UserMenu** as shown below.



Step 3. In the **UserMenu_OnPress(ByVal id As Long)** on page 158 procedure, create a program you want to assign to a specific softkey (specify with the *id* variable). For actual use example, see Line 70 to 430 in the Example 4-5 on page 75.

NOTE

During processing an event (during execution of a procedure for a key pressed), another event (an interrupt by a procedure for another softkey pressed) cannot be accepted.

NOTE

You cannot save (export) the "UserMenu" object by module basis; save it by project basis.

Settings for Softkey Label and Softkey Enabled/Disabled

When you want to change the softkey labels for the user menu function, use the following COM object. For more information on this object, see Chapter 7, “COM Object Reference.”.

- **UserMenu.Item(id).Caption** on page 156

When you want to set the softkey enabled/disabled for the user menu function, use the following COM object. For more information on this object, see Chapter 7, “COM Object Reference.”.

- **UserMenu.Item(id).Enabled** on page 157

Moreover, when you want to preset the above settings for the user menu function, use the following COM object. For more information on this object, see Chapter 7, “COM Object Reference.”.

- **UserMenu.PRESet** on page 158

NOTE

The above user menu setting is also presetted by pressing **[Macro Setup] - Preset User Menu** on the E5070A/E5071A front panel.

How to Use the User Menu Function

To execute a procedure assigned to a softkey, you need to generate an event of pressing the softkey. To generate an event, the manual method and the COM object method are available.

Method by Manual Operation

Step 1. Click the specific softkey as follows:

- **[Macro Setup] - User Menu - Button No.**

"No." represents a button number. You can set the label for "Button No." as you like. For detail, refer to the “Settings for Softkey Label and Softkey Enabled/Disabled.” section.

Method by COM Object

You can use the following COM object to perform the same operation as pressing a specific softkey. For more information on this object, see Chapter 7, “COM Object Reference.”.

- **UserMenu.Press(id)** on page 159

Controlling the E5070A/E5071A Executing a Procedure with a Softkey (User Menu Function)

Simple Example

The sample program disk contains a sample program, named “meas_user.vba“, that demonstrates how to use the user menu function. This VBA program consists of the following standard module and the "UserMenu" object.

Object name	Module type	Content
mdlUserMenu	Standard module	Sets the softkey labels and enables interrupts from the softkeys.

The program (object name: mdlUserMenu) is described in detail below:

Line 70	Stores True into the State variable.
Lines 90 to 150	Sets the first to third softkey (<i>id</i> : 1 to 3) enabled, and sets the fourth to tenth softkey (<i>id</i> : 4 to 10) disabled.
Lines 170 to 190	Sets the first softkey label (<i>id</i> : 1) to “Setup” the second softkey label (<i>id</i> : 2) to “Meas” the third softkey label (<i>id</i> : 3) to “Exit”.
Line 210	Displays the buttons for the user menu function in the softkey area.
Lines 230 to 250	Processing repeated until the State variable is True (State = True). Line 240: Detects an event that a specific softkey is pressed and enables the interrupt from the event.

Example 4-4

Sample program using user menu (object name: mdlUserMenu)

```
10| Public State As Boolean
20|
30| Sub Main()
40|
50|     Dim I As Long, J As Long
60|
70|     State = True
80|
90|     For I = 1 To 3
100|         UserMenu.Item(I).Enabled = True
110|     Next I
120|
130|     For J = 4 To 10
140|         UserMenu.Item(J).Enabled = False
150|     Next J
160|
170|     UserMenu.Item(1).Caption = "Setup"
180|     UserMenu.Item(2).Caption = "Meas"
190|     UserMenu.Item(3).Caption = "Exit"
200|
210|     UserMenu.Show
220|
230|     Do While State
240|         DoEvents
250|     Loop
260|
270| End Sub
```

The procedures of the "UserMenu" object are described below.

Lines 70 to 190 The procedure when the first softkey (*id*: 1) is pressed.

Line 90: Returns the E5070A/E5071A to the preset state.

Lines 110 to 130 For channel 1, sets the sweep start value to 1.73 GHz, the sweep stop value to 1.83 GHz, and the number of measurement points to 51.

Lines 150 to 170 After aborting the measurement, sets the trigger source to the bus trigger and turns on the continuous trigger startup mode for channel 1.

Line 190: Displays the buttons for the user menu function in the softkey area.

Lines 210 to 320 The procedure when the second softkey (*id*: 2) is pressed.

Lines 230 to 240 Generates a trigger to start a single sweep and waits until the measurement finishes (1 is read out with the **SCPI.IEEE4882.OPC** object).

Line 260: Retrieves the number of points in channel 1 and stores that number into the Nop variable.

Lines 280 to 290 Specifies trace 1 of channel 1 to the active trace, retrieves the formatted data array, and stores the data into the FmtData variable.

Lines 310 to 320 Displays the echo window in the lower part of the LCD screen.

Lines 340 to 360: Displays 2 measurement data values (primary value and secondary value) for each measurement point in the echo window.

Lines 380 to 430 The procedure when the third softkey (*id*: 3) is pressed.

Line 400: Displays a program closing message.

Line 410: Stores False into the sta variable to terminate the main program.

Example 4-5

Sample program using user menu ("UserMenu" object)

```
10| Private Sub UserMenu_OnPress(ByVal id As Long)
20|
30| Dim I As Integer
40| Dim Nop As Long, Dmy As Long
50| Dim FmtData As Variant
60|
70| If id = 1 Then
80|
90|     SCPI.SYSem.PRESet
100|
110|     SCPI.SENSE(1).FREQuency.START = 1730000000#
120|     SCPI.SENSE(1).FREQuency.STOP = 1830000000#
130|     SCPI.SENSE(1).SWEep.POINts = 51
140|
150|     SCPI.ABORT
```

Controlling the E5070A/E5071A

Executing a Procedure with a Softkey (User Menu Function)

```
160|         SCPI.TRIGger.SEQuence.Source = "BUS"
170|         SCPI.INITiate(1).CONTinuous = True
180|
190|         UserMenu.Show
200|
210|     ElseIf id = 2 Then
220|
230|         SCPI.TRIGger.SEQuence.SINGle
240|         Dmy = SCPI.IEEE4882.OPC
250|
260|         Nop = SCPI.SENSE(1).SWEep.POINTs
270|
280|         SCPI.CALCulate(1).PARAMeter(1).SElect
290|         FmtData = SCPI.CALCulate(1).SElected.DATA.FDATA
300|
310|         SCPI.DISPlay.TABLE.TYPE = "ECHO"
320|         SCPI.DISPlay.TABLE.State = True
330|
340|         For I = 1 To Nop - 1
350|             ECHO FmtData(2 * I - 2), FmtData(2 * I - 1)
360|         Next I
370|
380|     ElseIf id = 3 Then
390|
400|         MsgBox "Program ended!"
410|         State = False
420|
430|     End If
440|
450| End Sub
```

5 **Controlling Peripherals**

This chapter explains how to control peripherals connected to the E5070A/E5071A with GPIB by using the software (VISA library) installed in the E5070A/E5071A.

Overview

The E5070A/E5071A macro function (E5070A/E5071A VBA) can be used not only to automate measurements but also to control external measurement instruments connected via GPIB cables by acting as a self-contained system controller (see “An Overview of a Control System Based on the Macro Function” on page 21).

The E5070A/E5071A macro function (E5070A/E5071A VBA) performs communications via the COM interface when controlling the E5070A/E5071A itself, but it communicates via VISA (Virtual Instrument Software Architecture) when controlling external measurement instruments.

To control peripherals connected to the E5070A/E5071A via GPIB, the following two preparations are required.

Preparations

1. Placing E5070A/E5071A in System Control Mode

When the E5070A/E5071A and its peripherals are controlled with the E5070A/E5071A macro function, this is done via the GPIB bus inside the E5070A/E5071A. Therefore, you need to set the GPIB system's control mode to the system controller mode. Then you need to set the GPIB address as the system controller. Follow these steps using the front panel to place the E5070A/E5071A in the system control mode.

Step 1. Place the E5070A/E5071A in the system controller mode.

- **[System] - GPIB Setup - GPIB Configuration (Sys Controller)**

Step 2. Set the GPIB address of the system controller. “**xx**” represents the address number.

- **[System] - GPIB Setup - System Controller Address (xx)**

Step 3. Reboot the E5070A/E5071A.

2. Importing Definition Files

To use the VISA library in the E5070A/E5071A macro (E5070A/E5071A VBA), you need to import two definition files into your project with the Visual Basic editor to define the VISA functions and perform other tasks. The definition files are stored on the sample programs disk under the following filenames (for information on importing modules, refer to “Saving a Module (Exporting)” on page 41).

- visa32.bas
- vpptype.bas

Programming with VISA

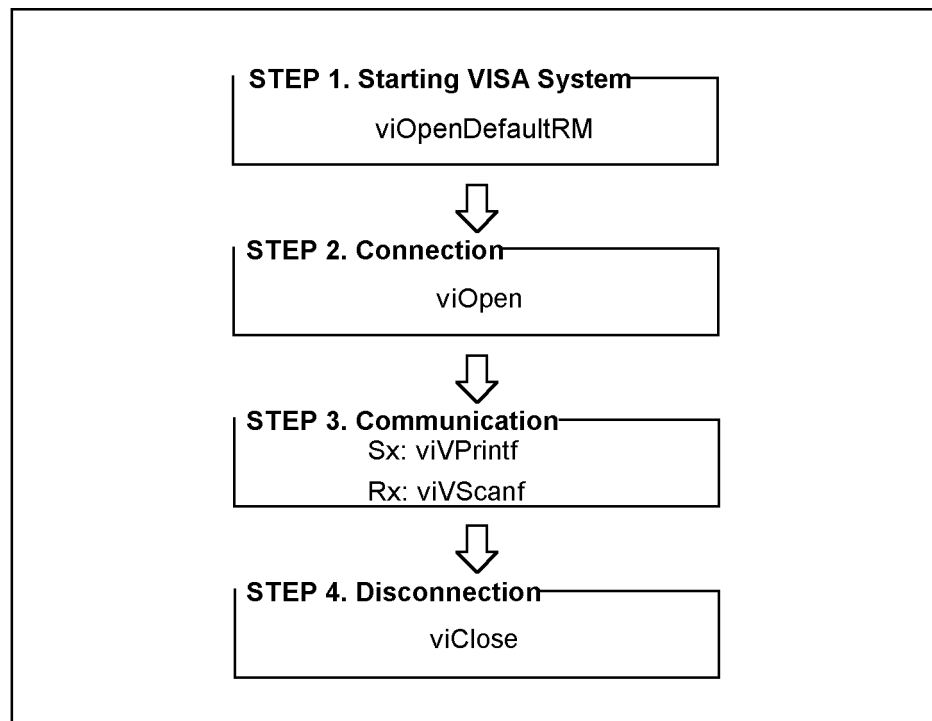
Figure 5-1 shows the flow of controlling the instrument with VISA. When developing a VISA program in the Visual Basic language, a special programming notice (in the readme text file listed below) must be reviewed.

For details on the use of the VISA library and the programming notice for using the VISA library with the E5070A/E5071A macro (E5070A/E5071A VBA), refer to the following files contained on the CD-ROM (Agilent part number: E5070-905xx).

- visa.hlp (on-line help for the VISA library)
- vbreadme.txt (notes on using the VISA library with VB)

Figure 5-1

Flow of instrument control with VISA



e4991ape033

STEP 1. Starting Up VISA System

The VISA system startup session is processed in Line 90 in Example 5-1. VISA's viOpenDefaultRM function initializes and starts up the VISA system. The viOpenDefaultRM function must be executed before other VISA functions are called, and the parameter of this function is startup information (Defrm in Example 5-1).

Syntax

viOpenDefaultRM(*param*)

Parameter

	<i>(param)</i>
Description	Startup information (output)
Data type	Long integer type

STEP 2. Connection

The connection session is handled in Line 130 in Example 5-1. VISA's viOpen function makes connection with the specified instrument. The viOpen function returns a value so that the VISA functions can apply it to the specified instrument. The parameters of this function are startup information (Defrm in Example 5-1), the address information of the specified instrument ("GPIB0::17::INSTR" in Example 5-1), access mode (0 in Example 5-1), timeout (0 in Example 5-1), and connection information (Equip in Example 5-1).

Syntax

viOpen(*param1,param2,param3,param4,param5*)

Parameters

	<i>(param1)</i>
Description	Startup information (input)
Data type	Long integer type

	<i>(param2)</i>
Description	Address information of the specified instrument (input)
Data type	Character string type
Syntax	GPIB[<i>board</i>] ^{*1} :: <i>primary address</i> ^{*2} ::INSTR

*1. GPIB0 for the E5070A/E5071A.

*2. The GPIB address of the instrument controlled by the E5070A/E5071A.

	<i>(param3)</i>
Description	Access mode (Enter 0)

	<i>(param4)</i>
Description	Timeout (Enter 0)

	<i>(param5)</i>
Description	Connection information (output)
Data type	Long integer type

STEP 3. Communication

The communication session is conducted in Line 170 in Example 5-1. VISA's viVPrintf function sends a program message (GPIB command) to the specified instrument. The parameters of this function are connection information (Equip in Example 5-1), the program message ("*IDN?" in Example 5-1), and the variable to be formatted (0 in Example 5-1).

NOTE

To input/output GPIB commands, the viVPrintf function and the viVScanf function are mainly used, but other VISA functions are also available. For more information, refer to visa.hlp (online help for the VISA library).

Syntax

viVPrintf(*param1,param2,param3*)

Parameters

	<i>(param1)</i>
Description	Connection information (input)
Data type	Long integer type

	<i>(param2)</i>
Description	Program message (input) ^{*1}
Data type	Character string type

*1. When sending a program message of the GPIB command, a message terminator is required at the end of the message (Chr\$(10) in Example 5-1).

	<i>(param3)</i>
Description	A variable to be formatted ^{*1}
Data type	Specified data type

*1. If not applicable, enter 0.

Controlling Peripherals Programming with VISA

The receiving session is controlled in Line 210 in Example 5-1. VISA's `viVScanf` function receives the result from the specified instrument and stores it in the output variable. The parameters of this function are connection information (Equip in Example 5-1), the format parameter for the output variable (%t in Example 5-1), and the output variable (Prod in Example 5-1).

Syntax

`viVScanf(param1,param2,param3)`

Parameters

	<i>(param1)</i>
Description	Connection information (input)
Data type	Long integer type

	<i>(param2)</i>
Description	Format parameter for the output variable
Data type	Character string type

	<i>(param3)</i>
Description	Output variable (output)
Data type	Character string type

STEP 4. Disconnection

The disconnection session is handled in Line 280 in Example 5-1. VISA's `viClose` function disconnects communication and terminates the VISA system. The parameter of this function is startup information (Defrm in Example 5-1).

Syntax

`viClose(param)`

Parameter

	<i>(param)</i>
Description	Startup information (input)
Data type	Long integer type

Example Program to Read Out the Product Information of Peripheral (Instrument)

Here is a sample program to control instruments connected through GPIB using the E5070A/E5071A as the system controller. The sample program disk contains a sample program, named “ctrl_ext.vba“, that reads out the product information of external instrument connected via GPIB. This VBA program consists of the following modules.

Object name	Module type	Content
mdlVisa	Standard module	Reads out the product information of external instrument.
Module1 Module2	Standard module	Two definition files to use VISA library

NOTE

When you control peripherals from E5070A/E5071A VBA, use the GPIB commands provided for the instrument to communicate over VISA. On the other hand, when you control the E5070A/E5071A itself from E5070A/E5071A VBA, use the COM objects provided for the E5070A/E5071A to communicate.

Lines 90 to 100	Initializes and starts up the VISA system and outputs the startup information to the Defrm variable. During this process, if an error occurs, the program goes to the error handling routine (Lines 320 to 360).
Lines 130 to 140	Establishes the connection to the external instrument (GPIB address: 17) connected via GPIB and outputs the connection information to the Equip variable. During this process, if an error occurs, the program goes to the error handling routine (Lines 320 to 360).
Lines 170 to 180	Queries the product information of the external instrument connected via GPIB through VISA. During this process, if an error occurs, the program goes to the error handling routine (Lines 320 to 360).
Lines 210 to 250	Retrieves the product information through VISA and outputs it into the Prod variable. Displays the read-out result in the message box. During this process, if an error occurs, the program goes to the error handling routine (Lines 320 to 360).
Line 280	Breaks the communication and terminates the VISA system.
Lines 320 to 360	If an error occurs in a VISA function, displays the detail of the error and terminates the program.

Example 5-1

Sample program to read out the product information

```
10| Sub Main()
20|
30|     Dim status As Long           'VISA function status return
code
40|     Dim Defrm As Long           'Session to Default Resource
Manager
50|     Dim Equip As Long           'Session to instrument
60|     Dim Prod As String * 100    'String to receive the result
70|
80|     ' Initializes the VISA system.
90|     status = viOpenDefaultRM(Defrm)
100|    If (status <> VI_SUCCESS) Then GoTo VisaErrorHandler
110|
120|    ' Opens the session to the specified instrument.
130|    status = viOpen(Defrm, "GPIB0::17::INSTR", 0, 0, Equip)
140|    If (status <> VI_SUCCESS) Then GoTo VisaErrorHandler
150|
160|    ' Asks for the instrument's product information.
170|    status = viVPrintf(Equip, "*IDN?" & Chr$(10), 0)
180|    If (status <> VI_SUCCESS) Then GoTo VisaErrorHandler
190|
200|    ' Reads the result.
210|    status = viVScanf(Equip, "%t", Prod)
220|    If (status <> VI_SUCCESS) Then GoTo VisaErrorHandler
230|
240|    ' Displays the result.
250|    MsgBox Prod
260|
270|    ' Closes the resource manager session (which closes
everything)
280|    Call viClose(Defrm)
290|
300|    GoTo Prog_end
310|
320| VisaErrorHandler:
330|     Dim VisaErr As String * 200
340|     Call viStatusDesc(Defrm, status, VisaErr)
350|     MsgBox "Error : " & VisaErr, vbExclamation
360|     Exit Sub
370|
380| Prog_end:
390|
400|     End Sub
```

6 Application Programs

This chapter describes sample programs (VBA programs) based on actual measurement examples.

Basic measurement (measuring a band-pass filter)

Example 6-1 shows a sample program (VBA program) that demonstrates how to perform the basic measurement of the bandpass filter. You can find the source file of this program, named “apl_bsc.vba“, on the sample program disk. This VBA program consists of the following standard module.

Object name	Module type	Content
mdlBscMeas	Standard module	Performs the basic measurement of the bandpass filter.

Overview of the program

The sample program performs full 2-port calibration using the 85032F calibration kit, measure 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 "Example of measuring a band-pass filter" in *Installation/Quick Start Guide* of the E5070A/E5071A. Therefore, for information on the flow of the measurement, the connection of the standard, and so on, refer to the description of *Installation/Quick Start Guide*.

Description of the program

When you run this VBA program, reset is performed, the measurement conditions are automatically set, and a message "Perform the full 2-port calibration." is displayed. To perform the full 2-port calibration, click the **Yes** button; to skip it, click the **No** button.

To perform the calibration, follow the onscreen messages to connect each standard of the Agilent 85032F calibration kit to the specified port, and click the **OK** button to measure the calibration data. Click the **Cancel** button to return to the beginning of the calibration. You cannot skip the isolation calibration. When the calibration data measurement for all standards is complete, a message "All calibration data completion." is displayed, and the calibration coefficient is calculated.

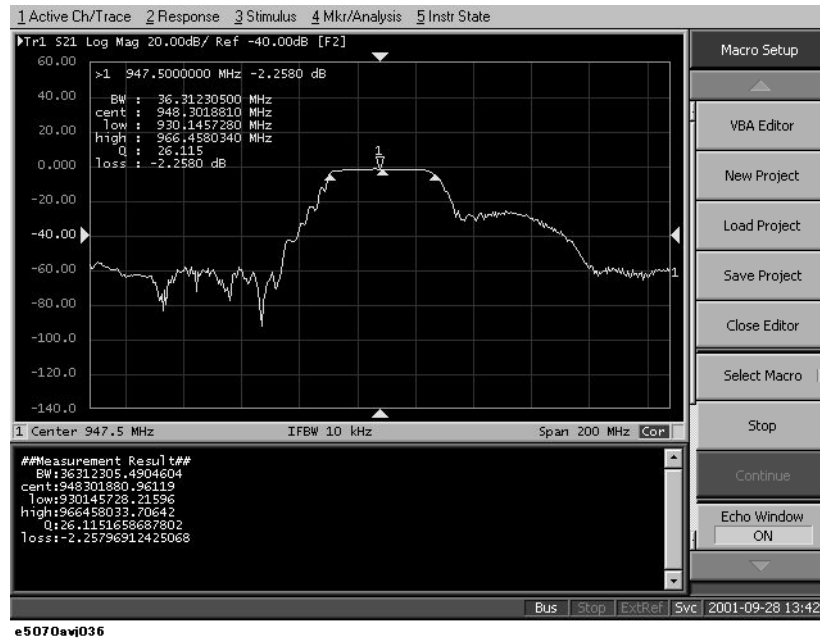
NOTE

When you cancel the calibration data measurement before completing the measurement of necessary calibration data, the settings condition may not be returned to its former state.

Then, a message "Connect DUT, and then press [Macro Setup]-Continue button." is displayed in the instrument status bar in the lower part of the LCD display. Connect a DUT, and perform **[Macro Setup] - Continue**. After the measurement, the search result is displayed in the echo window, as shown in Figure 6-1. If no bandwidth search target is found, only the result of the insertion loss obtained with the marker is displayed.

Figure 6-1

Example of the display after executing the program in Example 6-1



The basic measurement program (object name: mdlBscMeas) is described in detail below. Line numbers are added for description purpose only, and do not appear in the actual program source code.

- Lines 120 to 160 Store the sweep center value (947.5 MHz), the sweep span value (200 MHz), the number of measurement points (401), the IF bandwidth (10 kHz), the power level (-10 dBm) into the variables Center, Span, Nop, IFBw, and Pow, respectively.
- Lines 170 to 210 Stores the number of traces (1), the measurement parameter (S21), the data format (log amplitude), the calibration kit number (4: 85032F), and the save file name (State08.sta) into the variables, NumTrac, Par, Fmt, CalKit, and File, respectively.
- Line 250 Returns the E5070A/E5071A to the preset state.
- Lines 290 to 300 For channel 1, turns on the continuous trigger startup mode to on and sets the trigger source to the bus trigger.
- Lines 320 to 360 For channel 1, sets the sweep center value to the Center variable, the sweep span value to the Span variable, the number of measurement points to the Nop variable, the IF bandwidth to the IfBw variable, and the power level to the Pow variable.
- Lines 380 to 410 For channel 1, sets the number of traces to the NumTrac variable, the measurement parameter to the Par variable, and the data format to the Fmt variable, respectively.
- Line 450 Stores the calibration kit number for channel 1 to the CalKit variable.
- Line 460 Stores 1 and 2 to the Port variable that indicates ports used for the full 2-port calibration.
- Line 480 Calls the Calib_Solt procedure (lines 1200 to 2130). For information on the Calib_Solt procedure, see the description later.

Application Programs

Description of the program

- Lines 520 to 530 Saves the instrument setting and the calibration coefficient into a file whose name is specified with the File variable.
- Line 580 Displays a message that prompts you to connect a DUT (Device Under Test) in the instrument status bar in the lower part of the LCD display, and waits for the operation of **[Macro Setup] - Continue** after the connection.
- Lines 620 to 630 Generates a trigger to start a single sweep and waits until the measurement finishes (1 is read out with the **SCPI.IEEE4882.OPC** object).
- Line 650 For trace 1 of channel 1, executes the auto scale to set the optimum scale.
- Lines 690 to 710 Displays marker 1, and moves it so that the stimulus value becomes equal to the value of the Center variable. Then, reads out the response value of marker 1 and stores it into the MkrVal variable.
- Line 730 Enables the error handling routine starting from Bw_Err (lines 890 to 950). If a runtime error occurs, the program goes to the error handling routine.
- Lines 750 to 770 Sets the bandwidth definition value to -3 dB and the bandwidth search result display to on, reads out the bandwidth search result (bandwidth, center frequency, Q value, and insertion loss), and stores it into the BwData variable.
- Lines 790 to 840 Based on the bandwidth search result, stores the bandwidth to the Bw variable, the center frequency to the Cent variable, the Q value to the Qfac variable, and the insertion loss to the Loss variable, respectively. Then, goes to the processing starting from Skip_Bw_Err.
- Lines 880 to 960 Defines a runtime error handler. Reads out and displays the error number and error message of the error that occurred, and stores 0 to the Bw, Cent, and Qfac variables and the response value of marker 1 (the MkrVal(0) variable) to the Loss variable. Then, finishes the error handling and proceeds to the next processing.
- Lines 1000 to 1010 Calculates the 2 (higher and lower) cutoff frequencies from the values in the Bw and Cent variables and stores them into the CutLow and CutHigh variables.
- Lines 1030 to 1110 Displays the search result (the values of the Bw, Cent, CutLow, CutHigh, Qfac, and Loss variables) in the echo window.
- Lines 1130 to 1160 Displays the message asking you whether you want to perform measurement again. Click the **Yes** button to return to the DUT connection section. Click the **No** button to terminate the program.
- Procedure: Calib_Solt (lines 1200 to 2130).
- Lines 1260 to 1300 Displays the message that prompts for the execution of the full n-port calibration (specified with the SoltType variable). Click the **Cancel** button to cancel the calibration.
- Lines 1320 to 1410 Sets the calibration type to the full n-port calibration for the port specified with the Port variable.
- Lines 1450 to 1520 Displays the message that prompts for connecting the open standard to the specified port. Starts the measurement of the open calibration data

initiated by clicking the **OK** button after the connection and waits for the completion of the measurement. Click the **Cancel** button to return to the beginning of the calibration.

- Lines 1540 to 1610 Displays the message that prompts for connecting the short standard to the specified port. Starts the measurement of the short calibration data initiated by clicking the **OK** button after the connection and waits for the completion of the measurement. Click the **Cancel** button to return to the beginning of the calibration.
- Lines 1630 to 1700 Displays the message that prompts for connecting the load standard to the specified port. Starts the measurement of the load calibration data initiated by clicking the **OK** button after the connection and waits for the completion of the measurement. Click the **Cancel** button to return to the beginning of the calibration.
- Lines 1750 to 1840 Displays the message that prompts for connecting the thru standard between the specified ports. Starts the measurement of the thru calibration data initiated by clicking the **OK** button after the connection and waits for the completion of the measurement. Click the **Cancel** button to return to the beginning of the calibration.
- Lines 1880 to 2060 When the calibration type is not the full 1-port calibration (a value other than 1 is specified for the SoltType variable, displays the message asking you whether you want to measure the isolation calibration data. When the **Yes** button is clicked, displays the message that prompts for connecting the load standard to the specified 2 ports (specified with the Port(I-1) and Port(J-1) variables). Starts the measurement of the isolation calibration data initiated by clicking the **OK** button after the connection and waits for the completion of the measurement. Click the **Cancel** button to return to the beginning of the calibration.
- Lines 2080 to 2090 Calculates the calibration coefficients from the measured calibration data and turns on the error correction function. Then, displays a calibration completion message.

Example 6-1

Measuring a band-pass filter (object name: mdlBscMeas)

```

10| Sub Main()
20|
30|   Dim Par As String, Fmt As String, File As String
40|   Dim Center As Double, Span As Double, IfBw As Double, Pow
As Double
50|   Dim Bw As Double, Cent As Double
60|   Dim CutLow As Double, CutHigh As Double
70|   Dim Qfac As Double, Loss As Double
80|   Dim MkrVal As Variant, BwData As Variant
90|   Dim Nop As Long, NumTrac As Long, CalKit As Long, Buff As
Long
100|   Dim Port As Variant, Error As Variant
110|
120|   Center = 947500000#           'Center freq       : 947.5 MHz
130|   Span = 200000000#           'Span freq       : 200 MHz
140|   Nop = 401                   'Number of points : 401
150|   IfBw = 10000#              'IF bandwidth    : 10 kHz
160|   Pow = -10                   'Power level     : -10dBm
170|   NumTrac = 1                 'Number of traces : 1

```

Application Programs

Description of the program

```
180|   Par = "S21"                'Meas. parameter   : S21
190|   Fmt = "MLOG"              'Data format      : Log Mag
200|   CalKit = 4                'Calibration kit  : 85032F
210|   File = "State08.sta"      'Saved file name  : State08.sta
220|
230|   '''Presetting the E5070A/E5071A
240|
250|   SCPI.SYSTem.PRESet
260|
270|   '''Setting measurement conditions
280|
290|   SCPI.INITiate(1).CONTinuous = True
300|   SCPI.TRIGger.SEQuence.Source = "BUS"
310|
320|   SCPI.SENSE(1).FREQuency.Center = Center
330|   SCPI.SENSE(1).FREQuency.Span = Span
340|   SCPI.SENSE(1).SWEep.POINTs = Nop
350|   SCPI.SENSE(1).BANDwidth.RESolution = IfBw
360|   SCPI.Source(1).POWER.LEVel.IMMEDIATE.AMPLitude = Pow
370|
380|   SCPI.CALCulate(1).PARAmeter.Count = NumTrac
390|   SCPI.CALCulate(1).PARAmeter(1).DEFine = Par
400|   SCPI.CALCulate(1).PARAmeter(1).Select
410|   SCPI.CALCulate(1).SELected.Format = Fmt
420|
430|   '''Performing full 2-port calibration
440|
450|   SCPI.SENSE(1).CORRection.COLLect.CKIT.Select = CalKit
460|   Port = Array(1, 2)
470|
480|   Calib_Solt 1, 2, Port
490|
500|   '''Saving state & cal data
510|
520|   SCPI.MMEMory.STORe.STYPE = "CST"
530|   SCPI.MMEMory.STORe.STATE = File
540|
550|   '''Connecting DUT
560|
570|   Meas_Start:
580|   Prompt ("Connect DUT, and then press [Macro Setup]-Continue
button.")
590|
600|   '''Performing single sweep
610|
620|   SCPI.TRIGger.SEQuence.SINGle
630|   Dmy = SCPI.IEEE4882.OPC
640|
650|   SCPI.DISPlay.WINDow(1).TRACe(1).Y.SCALE.AUTO
660|
670|   '''Analyzing the results
680|
690|   SCPI.CALCulate(1).SELected.MARKer(1).STATE = True
700|   SCPI.CALCulate(1).SELected.MARKer(1).X = Center
710|   MkrVal = SCPI.CALCulate(1).SELected.MARKer(1).Y
720|
730|   On Error GoTo Bw_Err
740|
```

```

750| SCPI.CALCulate(1).SElected.MARKer(1).BWIDth.THReshold = -3
760| SCPI.CALCulate(1).SElected.MARKer(1).BWIDth.STATe = True
770| BwData = SCPI.CALCulate(1).SElected.MARKer(1).BWIDth.DATA
780|
790| Bw = BwData(0)
800| Cent = BwData(1)
810| Qfac = BwData(2)
820| Loss = BwData(3)
830|
840| GoTo Skip_Bw_Err
850|
860| Bw_Err:
870|
880| Error = SCPI.SYSTem.Error
890| MsgBox "Error No:" & Error(0) & " , Description:" &
Error(1)
900|
910| Bw = 0
920| Cent = 0
930| Qfac = 0
940| Loss = MkrVal(0)
950|
960| Resume Skip_Bw_Err
970|
980| Skip_Bw_Err:
990|
1000| CutLow = Cent - Bw / 2
1010| CutHigh = Cent + Bw / 2
1020|
1030| ECHO "##Measurement Result##"
1040| ECHO " BW:" & Bw
1050| ECHO "cent:" & Cent
1060| ECHO " low:" & CutLow
1070| ECHO "high:" & CutHigh
1080| ECHO " Q:" & Qfac
1090| ECHO "loss:" & Loss
1100| SCPI.DISPlay.TABLE.TYPE = "ECHO"
1110| SCPI.DISPlay.TABLE.STATE = True
1120|
1130| Buff = MsgBox("Do you make another measurement?", vbYesNo,
"Bandpass fileter measurement")
1140| If Buff = vbYes Then
1150|     GoTo Meas_Start
1160| End If
1170|
1180| End Sub
1190|
1200| Private Sub Calib_Solt(Chan As Long, SoltType As Long, Port
As Variant)
1210|
1220|     Dim Dmy As Long, I As Long, J As Long, Buff As Long
1230|
1240| Cal_Start:
1250|
1260| Buff = MsgBox("Perform the full " & SoltType & "-port
calibration.", vbOKCancel, "Full" & SoltType & "-port calibration")
1270|
1280| If Buff = vbCancel Then

```

Application Programs

Description of the program

```
1290|         GoTo Cal_Skip
1300|     End If
1310|
1320|     Select Case SoltType
1330|         Case 1
1340|             SCPI.SENSE(Chan).CORRection.COLLECT.METHOD.SOLT1 =
Port(0)
1350|         Case 2
1360|             SCPI.SENSE(Chan).CORRection.COLLECT.METHOD.SOLT2 =
Port
1370|         Case 3
1380|             SCPI.SENSE(Chan).CORRection.COLLECT.METHOD.SOLT3 =
Port
1390|         Case 4
1400|             SCPI.SENSE(Chan).CORRection.COLLECT.METHOD.SOLT4 =
Port
1410|     End Select
1420|
1430|     For I = 1 To SoltType
1440|
1450|         Buff = MsgBox("Connect the Open standard to Port " &
CStr(Port(I - 1)) & ".", _
1460|             vbOKCancel, "Full" & SoltType & "-port
calibration")
1470|         If Buff = vbOK Then
1480|             SCPI.SENSE(Chan).CORRection.COLLECT.ACQUIRE.OPEN =
Port(I - 1)
1490|             Dmy = SCPI.IEEE4882.OPC
1500|         Else
1510|             GoTo Cal_Start
1520|         End If
1530|
1540|         Buff = MsgBox("Connect the Short standard to Port " &
CStr(Port(I - 1)) & ".", _
1550|             vbOKCancel, "Full" & SoltType & "-port
calibration")
1560|         If Buff = vbOK Then
1570|             SCPI.SENSE(Chan).CORRection.COLLECT.ACQUIRE.Short =
Port(I - 1)
1580|             Dmy = SCPI.IEEE4882.OPC
1590|         Else
1600|             GoTo Cal_Start
1610|         End If
1620|
1630|         Buff = MsgBox("Connect the Load standard to Port " &
CStr(Port(I - 1)) & ".", _
1640|             vbOKCancel, "Full" & SoltType & "-port
calibration")
1650|         If Buff = vbOK Then
1660|             SCPI.SENSE(Chan).CORRection.COLLECT.ACQUIRE.Load =
Port(I - 1)
1670|             Dmy = SCPI.IEEE4882.OPC
1680|         Else
1690|             GoTo Cal_Start
1700|         End If
1710|     Next I
1720|
1730|     For I = 1 To SoltType - 1
```



```

1740|         For J = I + 1 To SoltType
1750|             Buff = MsgBox("Connect the Thru standard between
Port " & CStr(Port(I - 1)) & _
1760|                 " and Port " & CStr(Port(J - 1))
& ".", vbOKCancel, "Full" & SoltType & "-port calibration")
1770|             If Buff = vbOK Then
1780|
SCPI.SENSE(Chan).CORrection.COLlect.ACquire.THRU = Array(Port(I -
1), Port(J - 1))
1790|                 Dmy = SCPI.IEEE4882.OPC
1800|
SCPI.SENSE(Chan).CORrection.COLlect.ACquire.THRU = Array(Port(J -
1), Port(I - 1))
1810|                 Dmy = SCPI.IEEE4882.OPC
1820|             Else
1830|                 GoTo Cal_Start
1840|             End If
1850|         Next J
1860|     Next I
1870|
1880|     If SoltType <> 1 Then
1890|         Buff = MsgBox("Do you measure the Isolation
(Optional)?", vbYesNo, "Full" & SoltType & "-port calibration")
1900|         If Buff = vbYes Then
1910|             For I = 1 To SoltType - 1
1920|                 For J = I + 1 To SoltType
1930|                     Buff = MsgBox("Connect the Load standard to
Port " & Port(I - 1) & " and Port " & Port(J - 1) & ".", _
1940|                         vbOKCancel, "Full" &
SoltType & "-port calibration")
1950|                     If Buff = vbOK Then
1960|
SCPI.SENSE(Chan).CORrection.COLlect.ACquire.ISOLation =
Array(Port(I - 1), Port(J - 1))
1970|                         Dmy = SCPI.IEEE4882.OPC
1980|
SCPI.SENSE(Chan).CORrection.COLlect.ACquire.ISOLation =
Array(Port(J - 1), Port(I - 1))
1990|                         Dmy = SCPI.IEEE4882.OPC
2000|                     Else
2010|                         GoTo Cal_Start
2020|                     End If
2030|                 Next J
2040|             Next I
2050|         End If
2060|     End If
2070|
2080|     SCPI.SENSE(1).CORrection.COLlect.SAVE
2090|     MsgBox "All calibration data completion."
2100|
2110| Cal_Skip:
2120|
2130|     End Sub

```

Measuring a multi-port device

Example 6-2 shows a sample program (VBA program) that demonstrates how to measure a (3-terminal) duplexer. You can find the source file of this program, named “apl_sys.vba”, on the sample program disk. This VBA program consists of the following modules:

NOTE

For the E5070A/E5071A with Option 213 or 214 (2-port S-parameter test set), a runtime error occurs because there are parameters that it cannot measure.

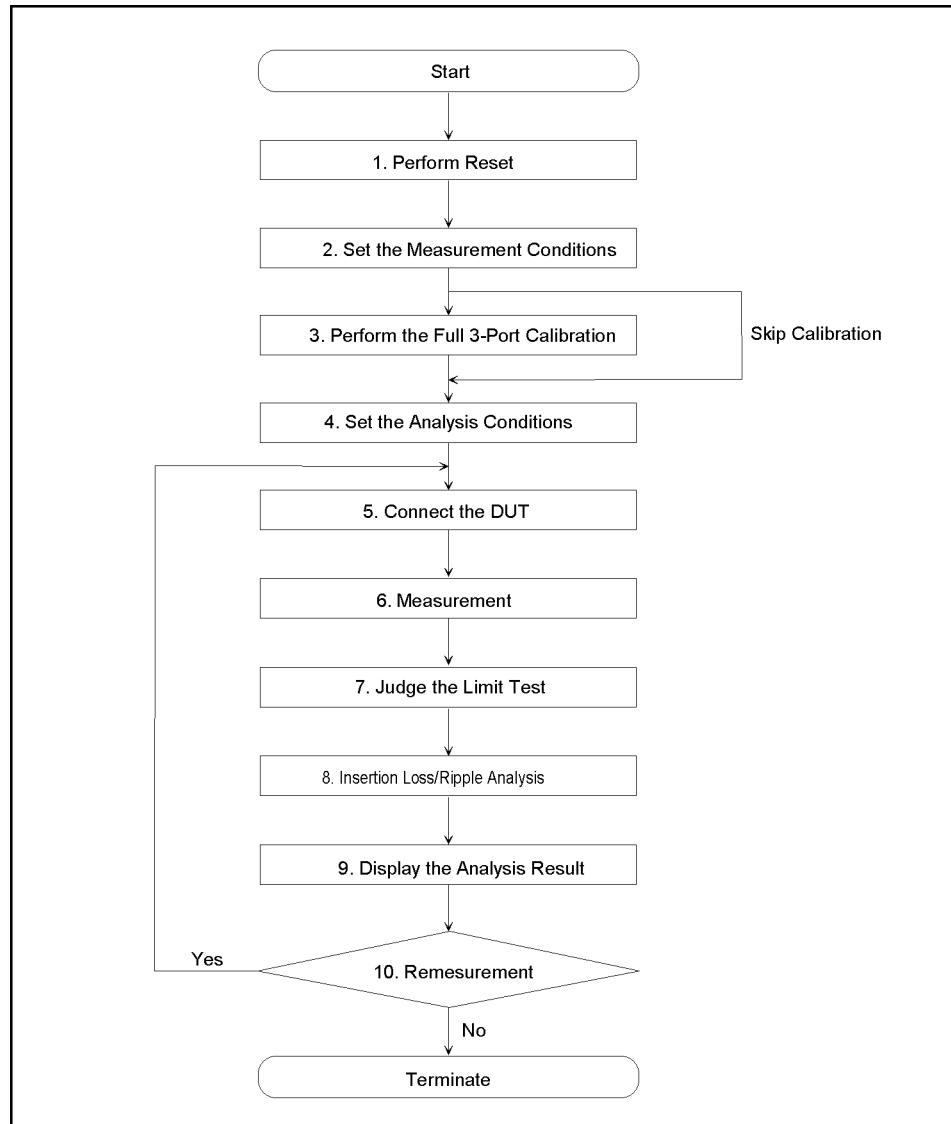
Object name	Module type	Description
frmDupRes	User form	Displays the analysis result.
mdlDupMeas	Standard module	Performs duplexer measurement.

Overview of the program

The program performs full 3-port calibration using the 85032F calibration kit, measure a (3-terminal) duplexer, and calculates and displays the limit test result, insertion loss, and band-pass ripple. Figure 6-2 shows the simple flow of the (3-terminal) duplexer measurement program.

Figure 6-2

Flow of duplexer measurement



e5070ave035

Description of the program

When you run this VBA program, reset is performed, the measurement conditions are set, and a message "Perform the full 3-port calibration." is displayed. To perform the full 3-port calibration, click the **Yes** button; to skip it, click the **No** button.

To perform the calibration, follow the onscreen messages to connect each standard of the Agilent 85032F calibration kit to the specified port, and click the **OK** button to measure the calibration data. Click the **Cancel** button to return to the beginning of the calibration. You cannot skip the isolation calibration. When the calibration data measurement for all standards is complete, a message "All calibration data completion." is displayed, and the calibration coefficient is calculated.

NOTE

When you cancel the calibration data measurement before completing the measurement of necessary calibration data, the settings condition may not be returned to its former state.

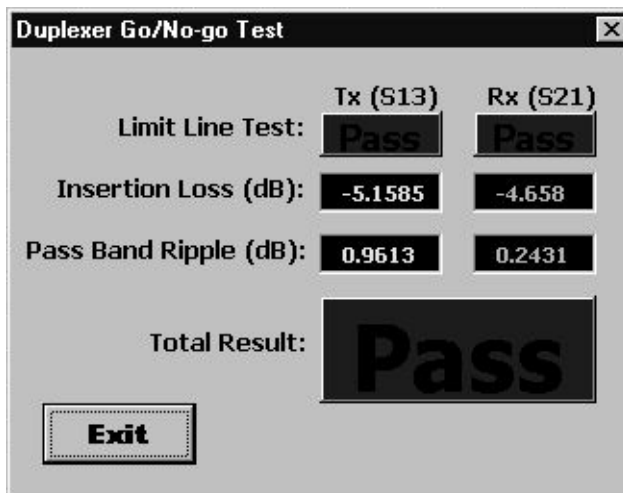
Then, the limit line is set and the setting required for the limit test judgment is performed.

The message "Set the DUT between test cables." is displayed. Connect the DUT (duplexer) between the test cables and click the **Yes** button. The limit line is set and a single sweep is executed. Then, for each of trace 1 (Tx: S13) and trace 2 (Rx: S21), the Pass/Fail judgment of the limit test and the insertion loss and ripple analysis result within the pass band (Figure 6-3) are displayed.

Click the **Exit** button on the user form to display the analysis result (Figure 6-3). The message prompting for remeasurement is displayed. To perform remeasurement, click the **Yes** button; to terminate the program, click the **No** button. Note that the detail of the program within the user form to display the analysis result (object name: frmDupRes) is not described here.

Figure 6-3

Display of the execution result of the program of Example 6-2



e5070avj041

The duplexer measurement program (object name: mdlDupMeas) is described in detail below. Line numbers are added for description purpose only, and do not appear in the actual program source code.

Line 90	Stores the calibration kit number (4: 85032F) to the CalKit variable.
Line 110	Turns off display update. Turning off display update shortens drawing time and object processing time.
Line 140	Returns the E5070A/E5071A to the preset state.
Lines 170 to 180	For channel 1, turns on the continuous trigger startup mode to on and sets the trigger source to the bus trigger.
Line 200	Calls the Setup_Parameter procedure (lines 910 to 1140). For information on the Setup_Parameter procedure, see the description later.
Line 220	Calls the Setup_Segment procedure (lines 1160 to 1530). For information on the Setup_Segment procedure, see the description later.
Line 250	Stores the calibration kit number for channel 1 to the CalKit variable.
Line 260	Stores 1, 2, and 3 to the Port variable that indicates ports used for the full 3-port calibration.
Line 280	Calls the Calib_Solt procedure (lines 1550 to 2420). For information on the Calib_Solt procedure, see the description in Example 6-1, “Measuring a band-pass filter (object name: mdlBscMeas),” on page 89 later.
Line 310	Calls the Setup_Limitline procedure (lines 2420 to 3180). For information on the Setup_Limitline procedure, see the description later.
Line 330	Calls the Setup_Register procedure (lines 3200 to 3260). For information on the Setup_Register procedure, see the description later.
Line 380	Displays the message that prompts for connecting a DUT (Device Under Test) and waits for clicking the OK button after the connection.
Line 410	Clears the questionable limit status event register and questionable limit channel 1 status event register.
Lines 420 to 430	Generates a trigger to start a single sweep and waits until the measurement finishes (1 is read out with the SCPI.IEEE4882.OPC object).
Lines 450 to 460	For traces 1 and 2, executes the auto scale to set the optimum scale.
Lines 490 to 500	Reads out the value of the questionable limit status event register, and stores the AND of the read-out value and 2 (the value in which only bit 1 is 1) into the Test_Ch1 variable.
Lines 510 to 530	Reads out the value of the questionable limit channel 1 status event register, and stores the AND of the read-out value and 2 (the value in which only bit 1 is 1) into the Test_Tr1 variable and the AND of the read-out value and 4 (the value in which only bit 2 is 1) into the Test_Tr2 variable.

Application Programs

Description of the program

- Lines 560 to 610 Specifies trace 1 as the active trace, and sets the analysis range (start point: 1.85 GHz and stop point: 1.91 GHz). Then sets the polarity of the peak search (both the positive peak and the negative peak) and the lower limit of the peak excursion value (0).
- Lines 620 to 640 Searches for the minimum value within the analysis range, and stores the analysis result into the IlossTx variables.
- Line 650 Uses the ripple analysis function to store the maximum value of the response differences between the positive peaks and the negative peaks within the analysis range into the RipTx variables.
- Lines 670 to 720 Specifies trace 2 as the active trace, and sets the analysis range (start point: 1.93 GHz and stop point: 1.99 GHz). Then sets the polarity of the peak search (both the positive peak and the negative peak) and the lower limit of the peak excursion value (0).
- Lines 730 to 750 Searches for the minimum value within the analysis range, and stores the analysis result into the IlossRx variables.
- Line 760 Uses the ripple analysis function to store the maximum value of the response differences between the positive peaks and the negative peaks within the analysis range into the RipRx variables.
- Line 790 Calls the Display_Update procedure (lines 3280 to 3620). For information on the Display_Update procedure, see the description later.
- Line 810 Displays the user form (object name: frmDupRes) on the screen to display the analysis result.
- Lines 830 to 870 Displays the message asking you whether you want to perform measurement again. Click the **Yes** button to return to the DUT connection section. Click the **No** button to terminate the program.
- Procedure: Setup_Parameter (lines 910 to 1140).
- Lines 970 to 1020 Stores the channel layout ("D1": 1-channel display), graph layout ("D1_2": upper/lower 2 part split display), measurement parameter of trace 1 (S13), measurement parameter of trace 2 (S21), data format of trace 1 (MLOG), and data format of trace 2 (MLOG) into the ChDisp, TracDisp, Par(0), Par(1), Fmt(0), and Fmt(1) variables, respectively.
- Lines 1040 to 1060 Sets the number of traces for channel 1 to 2, the channel layout to the ChDisp variable, and the graph layout for channel 1 to the TracDisp variable, respectively.
- Lines 1080 to 1120 Sets the measurement parameter for trace 1 to the Par(0) variable, the data format for trace 1 to the Fmt(0) variable, the measurement parameter for trace 2 to the Par(1) variable, and the data format for trace 2 to the Fmt(1) variable, respectively.
- Procedure: Setup_Segment (lines 1160 to 1530).
- Lines 1200 to 1260 Stores the conditions for the channel 1's segment table setting into the SegmData(0) to SegmData(6) variables. The settings are as follows. The stimulus setting mode: start/stop value. The IF bandwidth setting for each segment: off. The power setting for each segment: off. The sweep delay time setting for each segment: off. The sweep time setting for each segment: off. The number of segments: 5.

Lines 1280 to 1470 Stores the sweep start value, the sweep stop value, and the number of measurement points for channel 1's segments 1 through 5 into the SegmData(7) to SegmData(21) variables, respectively.

Line 1490 Sets the channel 1's segment table to the SegmData variable.

Line 1500 Sets channel 1's sweep type to "segment".

Line 1510 Sets the channel 1's graph horizontal axis display method to the order base (the axis on which the measurement point numbers are placed evenly in the order of measurement).

Procedure: Calib_Solt (lines 1550 to 2420).

See the Lines 1200 to 2130 of the Example 6-1 on page 89.

Procedure: Setup_Limitline (lines 2440 to 3180).

Line 2490 Stores the number of lines (5) in trace 1 limit table into the LimDataS13(0) variable.

Lines 2500 to 2790 Stores the settings in trace 1 limit table into the LimDataS13(1) to LimDataS13(25) variables.

Line 2820 Stores the number of lines (4) in trace 2 limit table into the LimDataS21(0) variable.

Lines 2830 to 3060 Stores the settings in trace 2 limit table into the LimDataS21(1) to LimDataS21(20) variables.

Lines 3080 to 3110 Specifies trace 1 as the active trace, stores the trace 1's limit line into the LimDataS13 variable, and displays it. Then, turns on the limit test function for trace 1.

Lines 3130 to 3160 Specifies trace 2 as the active trace, stores the trace 2's limit line into the LimDataS21 variable, and displays it. Then, turns on the limit test function for trace 2.

Procedure: Setup_Register (lines 3200 to 3260).

Lines 3220 to 3230 Sets the instrument so that the questionable limit channel status event register's bits 1 and 2 are set to 1 only when the questionable limit channel status register's bits 1 and 2 are changed from 0 to 1 (positive transition).

Line 3240 Enables the questionable limit channel status event register's bits 1 and 2.

Application Programs

Description of the program

Procedure: Display_Update (lines 3280 to 3620).

Line 3300 Updates the display on the LCD screen once.

Lines 3320 to 3380 When the trace 1's limit test result is Fail (Test_Tr1 = 2), displays Tx(S13) "Limit test result: Fail" on the user form (object name: frmDupRes) against a red background. On the other hand, when the trace 1's limit test result is Pass (Test_Tr1 ≠ 2), displays Tx(S13) "Limit test result: Pass" on the user form (object name: frmDupRes) against a blue background.

Lines 3400 to 3460 When the trace 2's limit test result is Fail (Test_Tr2 = 4), displays Rx(S21) "Limit test result: Fail" on the user form (object name: frmDupRes) against a red background. On the other hand, when the trace 1's limit test result is Pass (Test_Tr2 ≠ 4), displays Rx(S21) "Limit test result: Pass" on the user form (object name: frmDupRes) against a blue background.

Lines 3480 to 3540 When the channel 1's limit test result is Fail (Test_Ch1 = 2), displays "Overall limit test result: Fail" on the user form (object name: frmDupRes) against a red background. On the other hand, when the channel 1's limit test result is Pass (Test_Ch1 ≠ 2), displays "Overall limit test result: Pass" on the user form (object name: frmDupRes) against a blue background.

Lines 3560 to 3600 Displays the analysis results for traces 1 and 2 (insertion loss and band-pass ripple) as Tx(S13) and Rx(S21) on the user form (object name: frmDupRes).

Example 6-2

Duplexer measurement (object name: mdlDupMeas)

```
10| Sub Main()
20|
30| Dim CalKit As Long, Dmy As Long, Rgst As Long, I As Long,
Buff As Long
40| Dim Test_Ch1 As Integer, Test_Tr1 As Integer, Test_Tr2 As
Integer
50| Dim IlossTx As Variant, IlossRx As Variant
60| Dim RipTx As Double, RipRx As Double
70| Dim Port As Variant
80|
90| CalKit = 4           'Calibration kit       :85032F
100|
110| SCPI.DISPlay.ENABLE = False
120|
130| '''Presetting the E5070A/E5071A
140| SCPI.SYSTem.PRESet
150|
160| '''Setting measurement conditions
170| SCPI.INITiate(1).CONTinuous = True
180| SCPI.TRIGger.SEQuence.Source = "BUS"
190|
200| Setup_Parameter
210|
220| Setup_Segment
230|
240| '''Full 3-port calibration
250| SCPI.SENSE(1).CORRection.COLLect.CKIT.Select = CalKit
```



```

260|   Port = Array(1, 2, 3)
270|
280|   Calib_Solt 1, 3, Port
290|
300|   '''Setting analysis conditions
310|   Setup_Limitline
320|
330|   Setup_Register
340|
350|   Meas_Start:
360|
370|   '''Connecting DUT
380|   MsgBox "Connect DUT between test cables."
390|
400|   '''Performing single sweep
410|   SCPI.IEEE4882.CLS
420|   SCPI.TRIGger.SEQuence.SINGle
430|   Dmy = SCPI.IEEE4882.OPC
440|
450|   SCPI.DISPlay.WINDow(1).TRACe(1).Y.SCALE.AUTO
460|   SCPI.DISPlay.WINDow(1).TRACe(2).Y.SCALE.AUTO
470|
480|   '''Judging limit test
490|   Rgst = SCPI.STATus.QUEStionable.LIMit.EVENT
500|   Test_Ch1 = CInt(Rgst And 2)
510|   Rgst = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).EVENT
520|   Test_Tr1 = CInt(Rgst And 2)
530|   Test_Tr2 = CInt(Rgst And 4)
540|
550|   '''Analyzing insertion loss/bandpass ripple
560|   SCPI.CALCulate(1).PARAmeter(1).Select
570|   SCPI.CALCulate(1).SElected.FUNction.DOMain.START =
185000000#
580|   SCPI.CALCulate(1).SElected.FUNction.DOMain.STOP =
191000000#
590|   SCPI.CALCulate(1).SElected.FUNction.DOMain.STATe = True
600|   SCPI.CALCulate(1).SElected.FUNction.PPOLarity = "both"
610|   SCPI.CALCulate(1).SElected.FUNction.PEXCursion = 0
620|   SCPI.CALCulate(1).SElected.FUNction.TYPE = "MIN"
630|   SCPI.CALCulate(1).SElected.FUNction.EXECute
640|   IlossTx = SCPI.CALCulate(1).SElected.FUNction.DATA
650|   RipTx = MaxPeakToPeak(1)
660|
670|   SCPI.CALCulate(1).PARAmeter(2).Select
680|   SCPI.CALCulate(1).SElected.FUNction.DOMain.START =
193000000#
690|   SCPI.CALCulate(1).SElected.FUNction.DOMain.STOP =
199000000#
700|   SCPI.CALCulate(1).SElected.FUNction.DOMain.STATe = True
710|   SCPI.CALCulate(1).SElected.FUNction.PPOLarity = "both"
720|   SCPI.CALCulate(1).SElected.FUNction.PEXCursion = 0
730|   SCPI.CALCulate(1).SElected.FUNction.TYPE = "MIN"
740|   SCPI.CALCulate(1).SElected.FUNction.EXECute
750|   IlossRx = SCPI.CALCulate(1).SElected.FUNction.DATA
760|   RipRx = MaxPeakToPeak(1)
770|
780|   '''Displaying the results
790|   Display_Update Test_Tr1, Test_Tr2, Test_Ch1, IlossTx,

```

Application Programs

Description of the program

```
IlossRx, RipTx, RipRx
800|
810|   frmDupRes.Show
820|
830|   Buff = MsgBox("Do you make another measurement?", vbYesNo,
"Duplexer Measurement")
840|
850|   If Buff = vbYes Then
860|       GoTo Meas_Start
870|   End If
880|
890| End Sub
900|
910| Private Sub Setup_Parameter()
920|
930|   Dim I As Long
940|   Dim ChDisp As String, TracDisp As String
950|   Dim Par(1) As String, Fmt(1) As String
960|
970|   ChDisp = "D1"
980|   TracDisp = "D1_2"
990|   Par(0) = "S13"
1000|   Par(1) = "S21"
1010|   Fmt(0) = "MLOG"
1020|   Fmt(1) = "MLOG"
1030|
1040|   SCPI.CALCulate(1).PARAMeter.Count = 2
1050|   SCPI.DISPlay.Split = ChDisp
1060|   SCPI.DISPlay.WINDow(1).Split = TracDisp
1070|
1080|   For I = 1 To 2
1090|       SCPI.CALCulate(1).PARAMeter(I).DEFine = Par(I - 1)
1100|       SCPI.CALCulate(1).PARAMeter(I).Select
1110|       SCPI.CALCulate(1).SElected.Format = Fmt(I - 1)
1120|   Next I
1130|
1140| End Sub
1150|
1160| Private Sub Setup_Segment()
1170|
1180|   Dim SegmData(21) As Variant
1190|
1200|   SegmData(0) = 5           'Anytime 5 is set at
segment settings
1210|   SegmData(1) = 0           'Allows stimulus range
to be set using Start/Stop frequency
1220|   SegmData(2) = 0           'Not allows IF bandwidth
to be set
1230|   SegmData(3) = 0           'Not allows power to be
set
1240|   SegmData(4) = 0           'Not allows delay time
to be set
1250|   SegmData(5) = 0           'Not allows sweep time
to be set
1260|   SegmData(6) = 5           'Number of segments
1270|
1280|   '''Segment 1
1290|   SegmData(7) = 1730000000# 'Start frequency
```

```

1300| SegmData(8) = 1830000000#           'Stop frequency
1310| SegmData(9) = 50                   'Number of points
1320| '''Segment 2
1330| SegmData(10) = 1830000000#        'Start frequency
1340| SegmData(11) = 2030000000#       'Stop frequency
1350| SegmData(12) = 400                'Number of points
1360| '''Segment 3
1370| SegmData(13) = 2030000000#       'Start frequency
1380| SegmData(14) = 2130000000#       'Stop frequency
1390| SegmData(15) = 50                'Number of points
1400| '''Segment 4
1410| SegmData(16) = 3650000000#       'Start frequency
1420| SegmData(17) = 4030000000#       'Stop frequency
1430| SegmData(18) = 38                'Number of points
1440| '''Segment 5
1450| SegmData(19) = 5500000000#       'Start frequency
1460| SegmData(20) = 6020000000#       'Stop frequency
1470| SegmData(21) = 52                'Number of points
1480|
1490| SCPI.SENSE(1).SEGMENT.DATA = SegmData
1500| SCPI.SENSE(1).SWEep.TYPE = "SEGM"
1510| SCPI.DISPlay.WINDow(1).X.SPACing = "OBAS"
1520|
1530| End Sub
1540|
1550| Private Sub Calib_Solt(Chan As Long, SoltType As Long, Port
As Variant)
1560|
1570|     Dim Dmy As Long, I As Long, J As Long, Buff As Long
1580|
1590| Cal_Start:
1600|
1610|     Buff = MsgBox("Perform the full " & SoltType & "-port
calibration.", vbOKCancel, "Full" & SoltType & "-port calibration")
1620|     If Buff = vbCancel Then
1630|         GoTo Cal_Skip
1640|     End If
1650|
1660|     Select Case SoltType
1670|         Case 1
1680|             SCPI.SENSE(Chan).CORRection.COLLect.METHod.SOLT1 =
Port(0)
1690|         Case 2
1700|             SCPI.SENSE(Chan).CORRection.COLLect.METHod.SOLT2 =
Port
1710|         Case 3
1720|             SCPI.SENSE(Chan).CORRection.COLLect.METHod.SOLT3 =
Port
1730|         Case 4
1740|             SCPI.SENSE(Chan).CORRection.COLLect.METHod.SOLT4 =
Port
1750|     End Select
1760|
1770|     For I = 1 To SoltType
1780|
1790|         Buff = MsgBox("Connect the Open standard to Port " &
CStr(Port(I - 1)) & ".", vbOKCancel, "Full" & SoltType & "-port
calibration")

```

Application Programs

Description of the program

```
1800|         If Buff = vbOK Then
1810|             SCPI.SENSE(Chan).CORRection.COLLECT.ACQUIRE.OPEN =
Port(I - 1)
1820|             Dmy = SCPI.IEEE4882.OPC
1830|         Else
1840|             GoTo Cal_Start
1850|         End If
1860|
1870|         Buff = MsgBox("Connect the Short standard to Port " &
CStr(Port(I - 1)) & ".", vbOKCancel, "Full" & SoltType & "-port
calibration")
1880|         If Buff = vbOK Then
1890|             SCPI.SENSE(Chan).CORRection.COLLECT.ACQUIRE.Short =
Port(I - 1)
1900|             Dmy = SCPI.IEEE4882.OPC
1910|         Else
1920|             GoTo Cal_Start
1930|         End If
1940|
1950|         Buff = MsgBox("Connect the Load standard to Port " &
CStr(Port(I - 1)) & ".", vbOKCancel, "Full" & SoltType & "-port
calibration")
1960|         If Buff = vbOK Then
1970|             SCPI.SENSE(Chan).CORRection.COLLECT.ACQUIRE.Load =
Port(I - 1)
1980|             Dmy = SCPI.IEEE4882.OPC
1990|         Else
2000|             GoTo Cal_Start
2010|         End If
2020|     Next I
2030|
2040|     For I = 1 To SoltType - 1
2050|         For J = I + 1 To SoltType
2060|             Buff = MsgBox("Connect the Thru standard between
Port " & CStr(Port(I - 1)) & " and Port " & CStr(Port(J - 1)) & ".",
vbOKCancel, "Full" & SoltType & "-port calibration")
2070|             If Buff = vbOK Then
2080|
SCPI.SENSE(Chan).CORRection.COLLECT.ACQUIRE.THURU = Array(Port(I -
1), Port(J - 1))
2090|                 Dmy = SCPI.IEEE4882.OPC
2100|
SCPI.SENSE(Chan).CORRection.COLLECT.ACQUIRE.THURU = Array(Port(J -
1), Port(I - 1))
2110|                 Dmy = SCPI.IEEE4882.OPC
2120|             Else
2130|                 GoTo Cal_Start
2140|             End If
2150|         Next J
2160|     Next I
2170|
2180|     If SoltType <> 1 Then
2190|         Buff = MsgBox("Do you measure the Isolation
(Optional)?", vbYesNo, "Full" & SoltType & "-port calibration")
2200|         If Buff = vbYes Then
2210|             For I = 1 To SoltType - 1
2220|                 For J = I + 1 To SoltType
2230|                     Buff = MsgBox("Connect the Load standard to
```

```

Port " & Port(I - 1) & " and Port " & Port(J - 1) & ".", vbOKCancel,
"Full" & SoltType & "-port calibration")
2240|         If Buff = vbOK Then
2250|
SCPI.SENSE(Chan).CORRection.COLLECT.ACQUIRE.ISOLation =
Array(Port(I - 1), Port(J - 1))
2260|         Dmy = SCPI.IEEE4882.OPC
2270|
SCPI.SENSE(Chan).CORRection.COLLECT.ACQUIRE.ISOLation =
Array(Port(J - 1), Port(I - 1))
2280|         Dmy = SCPI.IEEE4882.OPC
2290|         Else
2300|             GoTo Cal_Start
2310|         End If
2320|     Next J
2330| Next I
2340| End If
2350| End If
2360|
2370| SCPI.SENSE(1).CORRection.COLLECT.SAVE
2380| MsgBox "All calibration data completion."
2390|
2400| Cal_Skip:
2410|
2420| End Sub
2430|
2440| Private Sub Setup_Limitline()
2450|
2460|     Dim LimDataS13(25) As Variant, LimDataS21(20) As Variant
2470|
2480|     '''Limit line for S13
2490|     LimDataS13(0) = 5           'Number of segment
2500|     '''Limit_line 1
2510|     LimDataS13(1) = 1         'Maximum
2520|     LimDataS13(2) = 1730000000# 'Beginning of stimulus
2530|     LimDataS13(3) = 1930000000# 'End of stimulus
2540|     LimDataS13(4) = 0         'Beginning of response
2550|     LimDataS13(5) = 0         'End of response
2560|     '''Limit_line 2
2570|     LimDataS13(6) = 2         'Minimum
2580|     LimDataS13(7) = 1850000000# 'Beginning of stimulus
2590|     LimDataS13(8) = 1910000000# 'End of stimulus
2600|     LimDataS13(9) = -8       'Beginning of response
2610|     LimDataS13(10) = -8     'End of response
2620|     '''Limit_line 3
2630|     LimDataS13(11) = 1        'Maximum
2640|     LimDataS13(12) = 1930000000# 'Beginning of stimulus
2650|     LimDataS13(13) = 1990000000# 'End of stimulus
2660|     LimDataS13(14) = -35     'Beginning of response
2670|     LimDataS13(15) = -35     'End of response
2680|     '''Limit_line 4
2690|     LimDataS13(16) = 1        'Maximum
2700|     LimDataS13(17) = 1990000000# 'Beginning of stimulus
2710|     LimDataS13(18) = 2130000000# 'End of stimulus
2720|     LimDataS13(19) = -40     'Beginning of response
2730|     LimDataS13(20) = -40     'End of response
2740|     '''Limit_line 5
2750|     LimDataS13(21) = 1        'Maximum

```

Application Programs

Description of the program

```
2760|     LimDataS13(22) = 2130000000#     'Beginning of stimulus
2770|     LimDataS13(23) = 6020000000#     'End of stimulus
2780|     LimDataS13(24) = -20             'Beginning of response
2790|     LimDataS13(25) = -20             'End of response
2800|
2810|     '''Limit line for S21
2820|     LimDataS21(0) = 4                 'Number of segment
2830|     '''Limit_line 1
2840|     LimDataS21(1) = 1                 'Maximum
2850|     LimDataS21(2) = 1730000000#     'Beginning of stimulus
2860|     LimDataS21(3) = 1850000000#     'End of stimulus
2870|     LimDataS21(4) = -40              'Beginning of response
2880|     LimDataS21(5) = -40              'End of response
2890|     '''Limit_line 2
2900|     LimDataS21(6) = 1                 'Maximum
2910|     LimDataS21(7) = 1850000000#     'Beginning of stimulus
2920|     LimDataS21(8) = 1910000000#     'End of stimulus
2930|     LimDataS21(9) = -40              'Beginning of response
2940|     LimDataS21(10) = -40             'End of response
2950|     '''Limit_line 3
2960|     LimDataS21(11) = 1                'Maximum
2970|     LimDataS21(12) = 1910000000#     'Beginning of stimulus
2980|     LimDataS21(13) = 6020000000#     'End of stimulus
2990|     LimDataS21(14) = 0                'Beginning of response
3000|     LimDataS21(15) = 0                'End of response
3010|     '''Limit_line 4
3020|     LimDataS21(16) = 2                'Minimum
3030|     LimDataS21(17) = 1930000000#     'Beginning of stimulus
3040|     LimDataS21(18) = 1990000000#     'End of stimulus
3050|     LimDataS21(19) = -10             'Beginning of response
3060|     LimDataS21(20) = -10             'End of response
3070|
3080|     SCPI.CALCulate(1).PARAmeter(1).Select
3090|     SCPI.CALCulate(1).SElected.LIMit.DATA = LimDataS13
3100|     SCPI.CALCulate(1).SElected.LIMit.DISPlay.STATE = True
3110|     SCPI.CALCulate(1).SElected.LIMit.STATE = True
3120|
3130|     SCPI.CALCulate(1).PARAmeter(2).Select
3140|     SCPI.CALCulate(1).SElected.LIMit.DATA = LimDataS21
3150|     SCPI.CALCulate(1).SElected.LIMit.DISPlay.STATE = True
3160|     SCPI.CALCulate(1).SElected.LIMit.STATE = True
3170|
3180| End Sub
3190|
3200| Private Sub Setup_Register()
3210|
3220|     SCPI.STATus.QUEStionable.LIMit.CHANnel(1).PTRansition = 6
3230|     SCPI.STATus.QUEStionable.LIMit.CHANnel(1).NTRansition = 0
3240|     SCPI.STATus.QUEStionable.LIMit.CHANnel(1).ENable = 6
3250|
3260| End Sub
3270|
3280| Sub Display_Update(Test_Tr1 As Integer, Test_Tr2 As Integer,
Test_Ch1 As Integer, IlossTx As Variant, IlossRx As Variant, RipTx
As Variant, RipRx As Variant)
3290|
3300|     SCPI.DISPlay.UPDate.IMMediate
3310|
```

```
3320|   If Test_Tr1 = 2 Then
3330|       frmDupRes.lblJudgeS13.BackColor = RGB(255, 0, 0)
3340|       frmDupRes.lblJudgeS13.Caption = "Fail"
3350|   Else
3360|       frmDupRes.lblJudgeS13.BackColor = RGB(0, 0, 255)
3370|       frmDupRes.lblJudgeS13.Caption = "Pass"
3380|   End If
3390|
3400|   If Test_Tr2 = 4 Then
3410|       frmDupRes.lblJudgeS21.BackColor = RGB(255, 0, 0)
3420|       frmDupRes.lblJudgeS21.Caption = "Fail"
3430|   Else
3440|       frmDupRes.lblJudgeS21.BackColor = RGB(0, 0, 255)
3450|       frmDupRes.lblJudgeS21.Caption = "Pass"
3460|   End If
3470|
3480|   If Test_Ch1 = 2 Then
3490|       frmDupRes.lblResult.BackColor = RGB(255, 0, 0)
3500|       frmDupRes.lblResult.Caption = "Fail"
3510|   Else
3520|       frmDupRes.lblResult.BackColor = RGB(0, 0, 255)
3530|       frmDupRes.lblResult.Caption = "Pass"
3540|   End If
3550|
3560|       frmDupRes.txtIlossS13.Text = Format(IlossTx(0),
"0.####")
3570|       frmDupRes.txtIlossS21.Text = Format(IlossRx(0),
"0.####")
3580|
3590|       frmDupRes.txtRipS13.Text = Format(RipTx, "0.####")
3600|       frmDupRes.txtRipS21.Text = Format(RipRx, "0.####")
3610|
3620| End Sub
```

Measurement using E5091A (measuring FEM)

Example 6-3 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 apl_fem.vba, on the sample program disk.

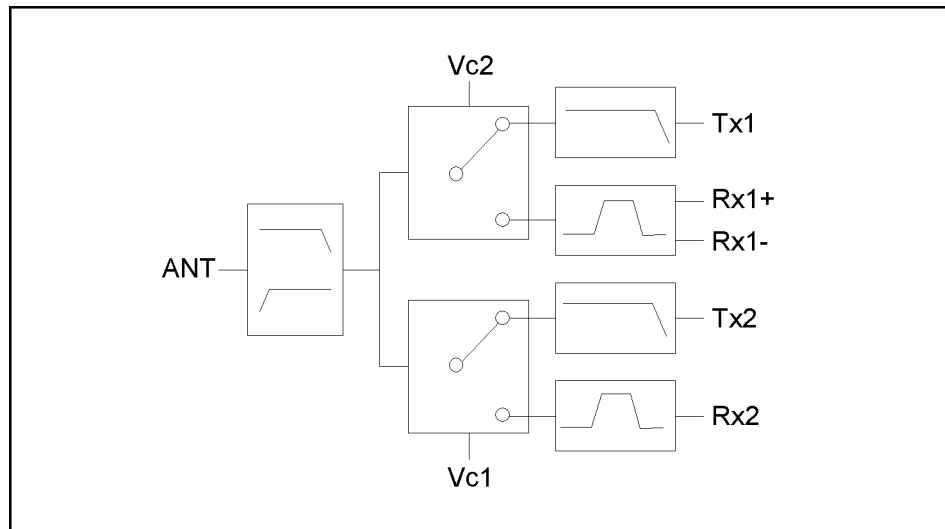
NOTE

For the E5070A/E5071A other than that with Option 413 or 414 (4-port S parameter test set), a runtime error occurs because there are parameters that it cannot measure.

Table 6-1

Object name	Module type	Description
mdlFemMeas	Standard module	Performs the measurement of FEM.

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.



e5070auj199

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 then press the **OK** key to calibrate channel 1. If an error occurs due to a problem in the connection to the ECal module, an error message is displayed. You can execute calibration again by clicking the **Retry** button. If you want to abort the program, click the **Cancel** button. For channels 2 to 4, execute the calibration in the same way.

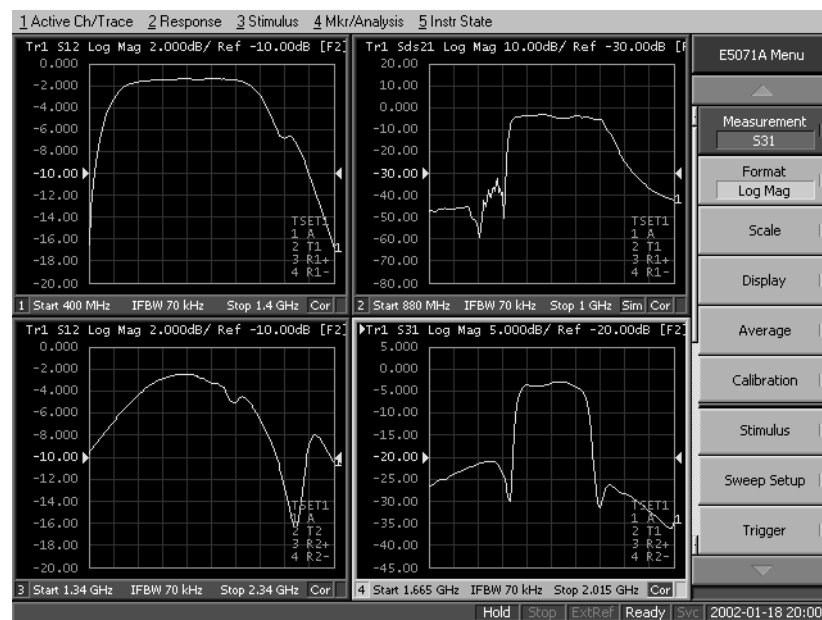
When the calibration is complete, "Set DUT." is displayed. Connect the DUT (FEM) and the E5091A as shown below and click the **OK** button to start the measurement.

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 6-4 shows a sample display of the LCD screen after the program exits execution.

Figure 6-4

Example of display after execution of program in Example 6-3



Application Programs

Description of the program

The FEM measurement program (object name: mdlFemMeas) is described in detail below. Line numbers are added for description purpose only, and do not appear in the actual program source code.

Lines 140 to 330 Sets the ports assigned to Port 1 to Port 4 of the E5091A and the control line setting (the below table) into the 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 340 to 660 Sets the settings required for the measurement conditions in the below table to the variables.

Channel number	Sweep range		Number of points	Number of traces	Measurement 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 710 Puts the instrument into preset state.

Line 720 Allocate the windows to the upper left, upper right, lower left, and lower right.

Lines 740 to 1020 Repeat the following for channels 1 to 4. Where, Ch is the channel number.

Lines 780 to 810: For the E5091A whose ID is 1, sets the port assigned to port 1 to Port1(Ch-1), the port assigned to port 2 to Port2(Ch-1), the Port assigned to port 3 to Port3(Ch-1), and the port assigned to port 4 to Port4(Ch-1), respectively.

Line 820: Sets the control line of the E5091A whose ID is 1 to Clines(Ch-1).

Lines 860 to 890: Sets the sweep start value to Freq_star(Ch-1), the sweep stop value to Freq_stop(Ch-1), the number of points to Nop(Ch-1), and the number of traces to N_tr(Ch-1), respectively.

Lines 910 to 950: If the fixture simulator function is ON (Fsim(Ch-1) is True), sets the fixture simulator function to ON, the device type to Dev(Ch-1), the port assignment to Tpl(Ch-1), the balance-unbalance conversion to ON, and the measurement

parameter (mix mode S-parameter) to Trc(Ch-1), respectively.

Line 970: If the fixture simulator function is OFF (Fsim(i) is False), sets the measurement parameter (S-parameter) to Trc(Ch-1).

Lines 990 to 1010: Sets the title label to Ttl(Ch-1), the title display to ON, and the continuous startup mode to ON, respectively.

- Line 1040 Sets the trigger source to "Bus."
- Lines 1050 to 1060 For the E5091A whose ID is 1, sets the property display to ON and the control to ON, respectively.
- Lines 1100 to 1120 Recalls the Function procedure: ECal_solt (Lines 1410 to 1770) 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. For information on the Function procedure: ECal_solt, see the description later.
- Lines 1130 to 1210 Executes the calibration of channels 2 to 4 in the same way.
- Line 1260 Displays the message that prompts for connecting a DUT (Device Under Test) and waits for clicking the **OK** button after the connection.
- Lines 1280 to 1290 Generates a trigger to start a single sweep and waits until the measurement finishes (1 is read out with the **SCPI.IEEE4882.OPC** object).
- Lines 1310 to 1330 Executes auto scale for the trace 1 of channels 1 to 4.
- Line 1350 Displays the message asking you whether you want to perform measurement again.
- Line 1360 If the **Yes** button is clicked, returns to the DUT connection section.
- Function procedure: ECal_solt (lines 1410 to 1770).
- Line 1460 Clears the error queue.
- Lines 1460 to 1480 Displays the message that prompts for connecting the Tset_Port of the E5091A to the ECal module and waits for clicking the **OK** button after the connection.
- Line 1500 Enables the error handling routine starting from Ecal_Err (lines 1670 to 1740). If a runtime error occurs, the program goes to the error handling routine.
- Line 1540 If solt is 1, executes the ECal command that performs full 1-port calibration on port Ana_port(0) of channel Ch.
- Line 1560 If solt is 2, executes the ECal command that performs full 2-port calibration on port Ana_port of channel Ch.
- Line 1580 If solt is 3, executes the ECal command that performs full 3-port calibration on port Ana_port of channel Ch.
- Line 1600 If solt is 4, executes the ECal command that performs full 4-port calibration on port Ana_port of channel Ch.
- Line 1630 Sets the return value of ECal_solt to 0.
- Lines 1670 to 1740 Defines a runtime error handler.

Application Programs

Description of the program

Lines 780 to 810: For the E5091A whose ID is 1, sets the port assigned to port 1 to Port1(Ch-1), the port assigned to port 2 to Port2(Ch-1), the Port assigned to port 3 to Port3(Ch-1), and the port assigned to port 4 to Port4(Ch-1), respectively.

Line 1670: Retrieves the error number and error message from the error queue.

Line 1680: Displays the error message.

Line 1700: When the **Retry** button is clicked, the program will disable the error handler routine and then return to the connection part and repeat ECal.

Lines 1720 to 1730: When the **Cancel** button is clicked, the program will set the return value of ECal_solt to the error number and disable the error handler routine.

Example 6-3

Measurement of FEM (object name: mdlFemMeas)

```
10| Sub Main()
20|
30|   Dim Port1(3) As String, Port2(3) As String
40|   Dim Port3(3) As String, Port4(3) As String
50|   Dim Trc(3) As String, Fsim(3) As Boolean, Dev(3) As String
60|   Dim Tpl(3) As Variant, Ttl(3) As String, Inp_char As String
70|   Dim Freq_star(3) As Double, Freq_stop(3) As Double
80|   Dim CLines(3) As Long, Nop(3) As Long, N_tr(3) As Long
90|   Dim Ch As Long, Res As Long, Buff As Long, Dmy As Long
100|  Dim AnaPort As Variant
110|  '
120|  ' E5091A Setup
130|  '
140|  Port1(0) = "A"           '[Ch1]   Port1: A
150|  Port2(0) = "T1"        '         Port2: T1
160|  Port3(0) = "R1"        '         Port3: R1+
170|  Port4(0) = "R1"        '         Port4: R1-
180|  CLines(0) = 0          ' Control Lines: 0
190|  Port1(1) = "A"           '[Ch2]   Port1: A
200|  Port2(1) = "T1"        '         Port2: T1
210|  Port3(1) = "R1"        '         Port3: R1+
220|  Port4(1) = "R1"        '         Port3: R1-
230|  CLines(1) = 2          ' Control Lines: 2 (Line1:HIGH)
240|  Port1(2) = "A"           '[Ch3]   Port1: A
250|  Port2(2) = "T2"        '         Port2: T2
260|  Port3(2) = "R2"        '         Port3: R2+
270|  Port4(2) = "R2"        '         Port4: R2- (Dummy)
280|  CLines(2) = 0          ' Control Lines: 2 (Line1:HIGH)
290|  Port1(3) = "A"           '[Ch4]   Port1: A
300|  Port2(3) = "T2"        '         Port2: T2
310|  Port3(3) = "R2"        '         Port3: R2+
320|  Port4(3) = "R2"        '         Port4: R2- (Dummy)
330|  CLines(3) = 1          ' Control Lines: 1 (Line0:HIGH)
340|  '
350|  ' Measurement Condition
360|  '                               [Ch1]
370|  Freq_star(0) = 400000000# ' Start frequency   : 400 MHz
380|  Freq_stop(0) = 1400000000# ' Stop frequency    : 1.4 GHz
390|  Nop(0) = 51              ' Number of points  : 51
400|  N_tr(0) = 1              ' Number of traces   : 1
410|  Fsim(0) = False          ' Fixture Simulator  : OFF
420|  Trc(0) = "S12"          ' Meas. parameter   : S12
430|  Ttl(0) = "[EGSM] Tx-Antenna" ' Title
```

```

440| ' [Ch2]
450| Freq_star(1) = 880000000# ' Start frequency : 880 MHz
460| Freq_stop(1) = 1000000000# ' Stop frequency : 1 GHz
470| Nop(1) = 101 ' Number of points : 101
480| N_tr(1) = 1 ' Number of traces : 1
490| Fsim(1) = True ' Fixture Simulator : ON
500| Dev(1) = "SBAL" ' Bal. Device Type : SE-Bal
510| Tpl(1) = Array(1, 3, 4) ' Topology : SE:1, Bal:3-4
520| Trc(1) = "SDS21" ' Meas. parameter : Sds21
530| Ttl(1) = "[EGSM] Antenna-Rx" ' Title
540| ' [Ch3]
550| Freq_star(2) = 1340000000# ' Start frequency : 1.34 GHz
560| Freq_stop(2) = 2340000000# ' Stop frequency : 2.34 GHz
570| Nop(2) = 201 ' Number of points : 201
580| N_tr(2) = 1 ' Number of traces : 1
590| Fsim(2) = False ' Fixture Simulator : OFF
600| Trc(2) = "S12" ' Meas. parameter : S12
610| Ttl(2) = "[GSM1800] Tx-Antenna" ' Title
620| ' [Ch4]
630| Freq_star(3) = 1665000000# ' Start frequency : 1.665 GHz
640| Freq_stop(3) = 2015000000# ' Stop frequency : 2.015 GHz
650| Nop(3) = 101 ' Number of points : 101
660| N_tr(3) = 1 ' Number of traces : 1
670| Fsim(3) = False ' Fixture Simulator : OFF
680| Trc(3) = "S31" ' Meas. parameter : S31
690| Ttl(3) = "[GSM1800] Antenna-Rx" ' Title
700|
710| SCPI.SYSTem.PRESet
720| SCPI.DISPlay.Split = "D12_34"
730|
740| For Ch = 1 To 4
750| '
760| ' E5091A Setup
770| '
780| SCPI.SENSE(CH).MULTIplexer(1).TSET9.Port1 = Port1(Ch - 1)
790| SCPI.SENSE(CH).MULTIplexer(1).TSET9.Port2 = Port2(Ch - 1)
800| SCPI.SENSE(CH).MULTIplexer(1).TSET9.Port3 = Port3(Ch - 1)
810| SCPI.SENSE(CH).MULTIplexer(1).TSET9.Port4 = Port4(Ch - 1)
820| SCPI.SENSE(CH).MULTIplexer(1).TSET9.OUTPUT.DATA = CLines(Ch -
1)
830| '
840| ' Measurement Condition
850| '
860| SCPI.SENSE(CH).FREQuency.START = Freq_star(Ch - 1)
870| SCPI.SENSE(CH).FREQuency.STOP = Freq_stop(Ch - 1)
880| SCPI.SENSE(CH).SWEep.POINTs = Nop(Ch - 1)
890| SCPI.CALCulate(CH).PARAMeter.Count = N_tr(Ch - 1)
900| If Fsim(Ch - 1) = True Then
910| SCPI.CALCulate(CH).FSIMulator.STATE = True
920| SCPI.CALCulate(CH).FSIMulator.BALun.DEVICE = Dev(Ch - 1)
930| SCPI.CALCulate(CH).FSIMulator.BALun.TOPology.SBALanced.
PPORTs = Tpl(Ch - 1)
940| SCPI.CALCulate(CH).FSIMulator.BALun.PARAMeter(1).STATE =
True
950| SCPI.CALCulate(CH).FSIMulator.BALun.PARAMeter(1).SBALanced.
DEFINE = Trc(Ch - 1)
960| Else
970| SCPI.CALCulate(CH).PARAMeter(1).DEFINE = Trc(Ch - 1)
980| End If
990| SCPI.DISPlay.WINDow(CH).TITLE.DATA = Ttl(Ch - 1)
1000| SCPI.DISPlay.WINDow(CH).TITLE.STATE = True
1010| SCPI.INITiate(CH).CONTinuous = True
1020| Next Ch
1030|

```

Application Programs

Description of the program

```
1040| SCPI.TRIGger.SEQuence.Source = "BUS"
1050| SCPI.SENSE.MULTIplexer(1).DISPlay.STATE = True
1060| SCPI.SENSE.MULTIplexer(1).STATE = True
1070| '
1080| ' Calibration
1090| '
1100| AnaPort = Array(1, 2)
1110| Res = ECal_Solt(1, 2, AnaPort, "A and T1")
1120| If Res <> 0 Then GoTo Prg_end
1130| AnaPort = Array(1, 3, 4)
1140| Res = ECal_Solt(2, 3, AnaPort, "A, R1+ and R1-")
1150| If Res <> 0 Then GoTo Prg_end
1160| AnaPort = Array(1, 2)
1170| Res = ECal_Solt(3, 2, AnaPort, "A and T2")
1180| If Res <> 0 Then GoTo Prg_end
1190| AnaPort = Array(1, 3)
1200| Res = ECal_Solt(4, 2, AnaPort, "A and R2+")
1210| If Res <> 0 Then GoTo Prg_end
1220| '
1230| ' Measurement
1240| '
1250| Meas_Start:
1260|   MsgBox "Connect DUT.", vbOKOnly, "Measurement"
1270|
1280|   SCPI.TRIGger.SEQuence.SINGle
1290|   Dmy = SCPI.IEEE4882.OPC
1300|
1310|   For Ch = 1 To 4
1320|     SCPI.DISPlay.WINDow(Ch).TRACe(1).Y.SCALe.AUTO
1330|   Next Ch
1340|
1350|   Buff = MsgBox("Do you make another measurement?", vbYesNo)
1360|   If Buff = vbYes Then GoTo Meas_Start
1370|
1380| Prg_end:
1390| End Sub
1400|
1410| Function ECal_Solt(Ch As Long, Solt As Long, AnaPort As Variant,
TsetPort As String) As Long
1420|   Dim Err_info As Variant
1430|   Dim Buff As Long
1440|
1450|   Ecal_start:
1460|     SCPI.IEEE4882.CLS
1470|
1480|     MsgBox "Connect " + TsetPort + " to ECal Module."
1490|
1500|     On Error GoTo Ecal_err
1510|
1520|     Select Case Solt
1530|       Case 1
1540|         SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT1 = AnaPort(0)
1550|       Case 2
1560|         SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT2 = AnaPort
1570|       Case 3
1580|         SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT3 = AnaPort
1590|       Case 4
1600|         SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT4 = AnaPort
1610|     End Select
1620|
1630|     ECal_Solt = 0
1640|     GoTo Ecal_end
1650|
1660| Ecal_err:
```

```
1670| Err_info = SCPI.SYSem.Error
1680| Buff = MsgBox("Error: " + Err_info(1), vbRetryCancel)
1690| If Buff = vbRetry Then
1700|     Resume Ecal_start
1710| Else
1720|     ECal_Solt = Err_info(0)
1730|     Resume Ecal_end
1740| End If
1750|
1760| Ecal_end:
1770| End Function
```

Application Programs
Description of the program

7**COM Object Reference**

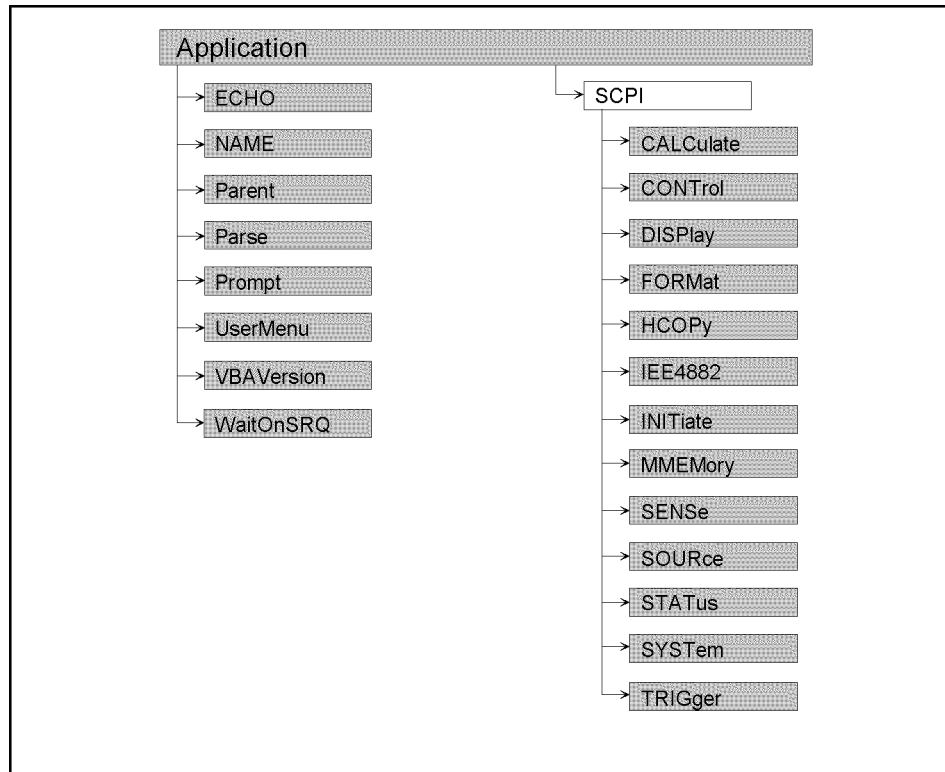
This chapter describes the COM object model of the Agilent E5070A/E5071A and the COM object reference in alphabetical order. If you want to look up COM objects by their function, see "COM object list by function."

COM Object Model

The COM objects provided for the E5070A/E5071A are structured hierarchically as shown in Figure 7-1.

Figure 7-1

E5070A/E5071A COM object model



e5070avj012

Application Objects

The Application objects are at the top of the hierarchy of the E5070A/E5071A COM object model. They consist of 7 objects dedicated to the COM interface and SCPI objects corresponding to SCPI commands. For information on the basic use of the 7 objects dedicated to the COM interface, see “Application Objects” on page 118.

SCPI Objects

The SCPI objects are created to realize the SCPI commands of the E5070A/E5071A with the COM interface. For information on the basic use of the SCPI objects, see “SCPI Objects” on page 119.

The conversion rules from the SCPI commands when writing SCPI object messages are as follows:

- SCPI. must be at the beginning. Notice that the IEEE common commands start with SCPI.IEEE4882. and "*" is omitted.
- Replace colons (:) used as the hierarchical separator symbol with dots (.).
- The number written in the object message is specified with ().
- You cannot omit the command message in the syntax.

SCPI command	COM object
OUTPUT 717;":SOUR1:POW -10"	→ SCPI.SOURce(1).POWer.LEVel.IMMEDIATE.AMPLitude = -10
OUTPUT 717;":SENS1:CORR:COLL:METH:TYPE?" ENTER 717;AS	→ A = SCPI.SENSE(1).CORRection.COLLect.METHod:TYPE
OUTPUT 717;":*CLS"	→ SCPI.IEEE4882.CLS

COM Object List

List by Function

Table 7-1 shows the COM object list by function.

Table 7-1 E5070A/E5071A COM objects by function

Function	Item to be set/executed		COM Object
Measurement Conditions	Preset		SCPI.IEEE4882.RST on page 317 SCPI.SYSTem.PRESet on page 439
	Selects active channel.		SCPI.DISPlay.WINDow(Ch).ACTivate on page 297
	Selects active trace.		SCPI.CALCulate(Ch).PARAmeter(Tr).SELEct on page 198
	Number of traces		SCPI.CALCulate(Ch).PARAmeter.COUNT on page 196
	Measurement parameter		SCPI.CALCulate(Ch).PARAmeter(Tr).DEFine on page 197
	Data format		SCPI.CALCulate(Ch).SELEcted.FORMat on page 214
	Power level		SCPI.SOURce(Ch).POWEr.LEVEl.IMMEdiate. AMPLitude on page 410
Sweep	Range	Start value	SCPI.SENSE(Ch).FREQuency.STARt on page 388
		Stop value	SCPI.SENSE(Ch).FREQuency.STOP on page 389
		Center value	SCPI.SENSE(Ch).FREQuency.CENter on page 385
		Span value	SCPI.SENSE(Ch).FREQuency.SPAN on page 387
	Number of measurement points		SCPI.SENSE(Ch).SWEep.POINts on page 405
	Time	Turns on/off the automatic setting.	SCPI.SENSE(Ch).SWEep.TIME.AUTO on page 406
		Sets sweep time.	SCPI.SENSE(Ch).SWEep.TIME.DATA on page 407
	Delay time		SCPI.SENSE(Ch).SWEep.DELay on page 403
	Type		SCPI.SENSE(Ch).SWEep.TYPE on page 408
	sweep mode		SCPI.SENSE(Ch).SWEep.GENERation on page 404
Segment sweep	Edits the table.		SCPI.SENSE(Ch).SEGMENT.DATA on page 399
	Reads total number of measurement points.		SCPI.SENSE(Ch).SEGMENT.SWEep.POINts on page 401
	Reads total sweep time.		SCPI.SENSE(Ch).SEGMENT.SWEep.TIME.DATA on page 401
IF bandwidth			SCPI.SENSE(Ch).BANDwidth.RESolution on page 339 SCPI.SENSE(Ch).BWIDth.RESolution on page 340
Averaging	On/Off		SCPI.SENSE(Ch).AVERAge.STATE on page 338
	Averaging counts		SCPI.SENSE(Ch).AVERAge.COUNT on page 337
	Clears the counts.		SCPI.SENSE(Ch).AVERAge.CLEAR on page 337
Smoothing	On/Off		SCPI.CALCulate(Ch).SELEcted.SMOOthing.STATE on page 256
	Smoothing aperture		SCPI.CALCulate(Ch).SELEcted.SMOOthing.APERTure on page 255

Table 7-1 E5070A/E5071A COM objects by function

Function	Item to be set/executed	COM Object	
Display	Window(Channel) allocation	SCPI.DISPLAY.SPLIT on page 293	
	Selects active channel.	SCPI.DISPLAY.WINDOW(Ch).ACTivate on page 297	
	Maximizes active channel's window.	SCPI.DISPLAY.MAXimize on page 291	
	Number of traces to be displayed	SCPI.CALCulate(Ch).PARAmeter.COUNT on page 196	
	Measurement parameter	SCPI.CALCulate(Ch).PARAmeter(Tr).DEFine on page 197	
	Data format	SCPI.CALCulate(Ch).SELected.FORMAT on page 214	
	Graph(Trace) allocation	SCPI.DISPLAY.WINDOW(Ch).SPLIT on page 300	
	Selects active trace.	SCPI.CALCulate(Ch).PARAmeter(Tr).SELect on page 198	
	Maximizes active trace's graph.	SCPI.DISPLAY.WINDOW(Ch).MAXimize on page 299	
	Turns on/off the backlight.	SCPI.SYStem.BACKlight on page 431	
	Turns on/off the display update.	SCPI.DISPLAY.ENABLE on page 288	
	Executes the display update once when the display update is OFF.	SCPI.DISPLAY.UPDate.IMMEDIATE on page 297	
	Clears the display of error message.	SCPI.DISPLAY.CCLEar on page 279	
	Data trace	Turn on/off the display.	SCPI.DISPLAY.WINDOW(Ch).TRACe(Tr).STATe on page 304
		Calculated data	SCPI.CALCulate(Ch).SELected.MATH.FUNCTION on page 252
	Memory trace	Turns on/off the display.	SCPI.DISPLAY.WINDOW(Ch).TRACe(Tr).MEMory. STATe on page 303
		Copy the measurement data	SCPI.CALCulate(Ch).SELected.MATH.MEMorize on page 253
	Turns on/off the display of division label.	SCPI.DISPLAY.WINDOW(Ch).LABEl on page 298	
	Turns on/off the clock display.	SCPI.DISPLAY.CLOCK on page 280	
	Turns on/off the frequency display.	SCPI.DISPLAY.ANNotation.FREQuency.STATe on page 279	
	Turns on/off the display in softkey area.	SCPI.DISPLAY.SKEY.STATe on page 292	
	Title display	On/Off	SCPI.DISPLAY.WINDOW(Ch).TITLe. STATe on page 302
		Enters title label.	SCPI.DISPLAY.WINDOW(Ch).TITLe.DATA on page 301
	Table display	On/Off	SCPI.DISPLAY.TABLe. STATe on page 295
		Selects table type.	SCPI.DISPLAY.TABLe.TYPE on page 296
	ECHO Window	Outputs data.	ECHO on page 152 SCPI.DISPLAY.ECHO.DATA on page 287
		Clears data.	SCPI.DISPLAY.ECHO.CLEar on page 287
	Display type (Normal/Inverted)		SCPI.DISPLAY.IMAGe on page 290
	Display color	Data trace	SCPI.DISPLAY.COLor(Dnum).TRACe(Tr).DATA on page 285
		Memory trace	SCPI.DISPLAY.COLor(Dnum).TRACe(Tr).MEMory on page 286
		Graph	SCPI.DISPLAY.COLor(Dnum).GRATICule(Gnum) on page 282
		Limit test	SCPI.DISPLAY.COLor(Dnum).LIMit(Lnum) on page 283
		Background	SCPI.DISPLAY.COLor(Dnum).BACK on page 281
		Reset	SCPI.DISPLAY.COLor(Dnum).RESet on page 284
	Horizontal axis display type at segment sweep (Frequency base/Order base)		SCPI.DISPLAY.WINDOW(Ch).X.SPACing on page 308
	Electrical delay time		SCPI.CALCulate(Ch).SELected.CORREction.EDELay. TIME on page 201
	Velocity factor		SCPI.SENSE(Ch).CORREction.RVELocity.COAX on page 382
	Phase offset		SCPI.CALCulate(Ch).SELected.CORREction.OFFSet. PHASe on page 202

COM Object Reference
List by Function

Table 7-1 E5070A/E5071A COM objects by function

Function	Item to be set/executed		COM Object
Display (Continued)	Scale	Executes auto scale.	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.AUTO on page 304
		Number of division	SCPI.DISPlay.WINDow(Ch).Y.SCALe.DIVisions on page 309
		Scale value per division	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. PDIVision on page 305
		Reference scale line's position	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. RPOStion on page 307
		Reference scale line's value	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVel on page 306
		Full scale value (data format: smith chart/polar chart)	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. PDIVision on page 305
Calibration	On/Off		SCPI.SENSE(Ch).CORRection.STATe on page 383
	Selects calibration kit.		SCPI.SENSE(Ch).CORRection.COLLECT.CKIT.SELect on page 350
	Selects calibration type.	Response calibration (Open)	SCPI.SENSE(Ch).CORRection.COLLECT.METHod. RESPonSe.OPEN on page 372
		Response calibration (Short)	SCPI.SENSE(Ch).CORRection.COLLECT.METHod. RESPonSe.SHORT on page 372
		Response calibration (Thru)	SCPI.SENSE(Ch).CORRection.COLLECT.METHod. RESPonSe.THRU on page 373
		Full 1-port calibration	SCPI.SENSE(Ch).CORRection.COLLECT.METHod. SOLT1 on page 373
		Full 2-port calibration	SCPI.SENSE(Ch).CORRection.COLLECT.METHod. SOLT2 on page 374
		Full 3-port calibration	SCPI.SENSE(Ch).CORRection.COLLECT.METHod. SOLT3 on page 375
		Full 4-port calibration	SCPI.SENSE(Ch).CORRection.COLLECT.METHod. SOLT4 on page 376
	Reads the calibration type.		SCPI.SENSE(Ch).CORRection.COLLECT.METHod.TYPE on page 377
	Reads calibration type applied for specified trace.		SCPI.SENSE(Ch).CORRection.TYPE(Tr) on page 384
	Turns on/off the display of calibration property.		SCPI.SENSE(Ch).CORRection.PROPERty on page 381
	Measures calibration data.	Open standard	SCPI.SENSE(Ch).CORRection.COLLECT.ACQuire.OPEN on page 343
		Short standard	SCPI.SENSE(Ch).CORRection.COLLECT.ACQuire. SHORt on page 343
		Load standard	SCPI.SENSE(Ch).CORRection.COLLECT.ACQuire.LOAD on page 342
		Thru standard	SCPI.SENSE(Ch).CORRection.COLLECT.ACQuire.THRU on page 344
		Isolation	SCPI.SENSE(Ch).CORRection.COLLECT.ACQuire. ISOLation on page 341
	Calculates calibration coefficient		SCPI.SENSE(Ch).CORRection.COLLECT.SAVE on page 378
	Port extension	On/Off	SCPI.SENSE(Ch).CORRection.EXTension.STATe on page 380
		Value	SCPI.SENSE(Ch).CORRection.EXTension.PORT(Pt).TIME on page 379
Velocity factor		SCPI.SENSE(Ch).CORRection.RVELocity.COAX on page 382	

Table 7-1 E5070A/E5071A COM objects by function

Function	Item to be set/executed		COM Object	
Calibration (Continued)	Defines calibration kit.	Reset	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.RESet on page 350	
		Calibration kit label	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.LABel on page 345	
	Defines standards.	Standard type	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).TYPE on page 363	
		C0	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).C0 on page 352	
		C1	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).C1 on page 353	
		C2	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).C2 on page 354	
		C3	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).C3 on page 355	
		L0	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).L0 on page 357	
		L1	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).L1 on page 358	
		L2	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).L2 on page 359	
		L3	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).L3 on page 360	
		Offset delay	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).DE Lay on page 356	
		Offset loss	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).LOSS on page 362	
		Offset Z0	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).Z0 on page 364	
		Arbitrary impedance	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).AR Bitrary on page 351	
	Specifies calibration class.	Open	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.ORDER.OPEN(Cpt) on page 347	
		Short	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.ORDER.SHORT(Cpt) on page 348	
		Load	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.ORDER.LOAD(Cpt) on page 346	
		Thru	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.ORDER.THRU(Cpt_m,Cpt_n) on page 349	
	ECAL	Executes 1-port calibration.		SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT1 on page 367
		Executes 2-port calibration.		SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT2 on page 368
		Executes 3-port calibration.		SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT3 on page 369
		Executes 4-port calibration.		SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT4 on page 370
Executes response calibration (Thru).		SCPI.SENSE(Ch).CORRection.COLLect.ECAL.THRU on page 371		
Turns On/Off the Isolation measurement.		SCPI.SENSE(Ch).CORRection.COLLect.ECAL.ISOLation.ST ATe on page 365		
Reads the connected port.		SCPI.SENSE.CORRection.COLLect.ECAL.PATH(Cpt) on page 366		

COM Object Reference
List by Function

Table 7-1 E5070A/E5071A COM objects by function

Function	Item to be set/executed		COM Object	
Measurement	Aborts the sweep.		SCPI.ABORt on page 162	
	Trigger system (Trigger mode)	Single trigger (Single)	SCPI.INITiate(Ch).IMMediate on page 321	
		Turns on/off continuous mode. (Continuous/Hold)	SCPI.INITiate(Ch).CONTInuous on page 320	
	Triggers when trigger source is BUS.		SCPI.IEEE4882.TRG on page 319	
	Triggers at any settings for trigger source.		SCPI.TRIGger.SEQuence.IMMediate on page 443	
	Triggers at any settings for trigger source.		SCPI.TRIGger.SEQuence.SINGle on page 444	
	Selects trigger source.		SCPI.TRIGger.SEQuence.SOURce on page 445	
Reads/Writes the data	Data transfer format	Format	SCPI.FORMat.DATA on page 311	
		Byte order	SCPI.FORMat.BORDer on page 310	
	Reads/Writes the formatted trace data.		SCPI.CALCulate(Ch).SElected.DATA.FDATA on page 203	
	Reads/Writes the formatted memory data.		SCPI.CALCulate(Ch).SElected.DATA.FMEMory on page 204	
	Reads the corrected trace data.		SCPI.CALCulate(Ch).SElected.DATA.SDATA on page 205	
	Reads the corrected memory data.		SCPI.CALCulate(Ch).SElected.DATA.SMEMory on page 206	
	Reads the stimulus (frequency) data.		SCPI.SENSE(Ch).FREQuency.DATA on page 386	
Limit test	On/Off		SCPI.CALCulate(Ch).SElected.LIMit.STATe on page 232	
	Turns on/off the display of limit line.		SCPI.CALCulate(Ch).SElected.LIMit.DISPlay.STATe on page 228	
	Turns on/off the "Fail" display on the LCD screen.		SCPI.DISPlay.FSIGN on page 289	
	Edits limit line table.		SCPI.CALCulate(Ch).SElected.LIMit.DATA on page 226	
	Reads test result.	Test results for each trace		SCPI.CALCulate(Ch).SElected.LIMit.FAIL on page 229
		Frequency value at measurement points failed		SCPI.CALCulate(Ch).SElected.LIMit.REPort.DATA on page 230
		Number of measurement points failed		SCPI.CALCulate(Ch).SElected.LIMit.REPort.POINTs on page 231
Marker	Selects active marker.		SCPI.CALCulate(Ch).SElected.MARKer(Mk).ACTivate on page 233	
	Turns on/off the marker.		SCPI.CALCulate(Ch).SElected.MARKer(Mk).STATe on page 249	
	Turns on/off marker coupling function.		SCPI.CALCulate(Ch).SElected.MARKer.COUPLE on page 237	
	Movement mode (Continuous/Discrete)		SCPI.CALCulate(Ch).SElected.MARKer.DISCrete on page 238	
	Turns on/off reference marker mode.		SCPI.CALCulate(Ch).SElected.MARKer.REFerence. STATe on page 247	
	Reads marker value.	Response value		SCPI.CALCulate(Ch).SElected.MARKer(Mk).Y on page 251
		Stimulus value		SCPI.CALCulate(Ch).SElected.MARKer(Mk).X on page 250
	Sets marker stimulus value.			
	Marker search	Executes search		SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon.EXECute on page 239
		Search type		SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon.TYPE on page 245
		Peak definition	Lower limit of peak excursion value	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon.PEXCursion on page 240
Polarity			SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon.PPOLarity on page 241	

Table 7-1 E5070A/E5071A COM objects by function

Function	Item to be set/executed			COM Object	
Marker (Continued)	Marker search (Continued)	Target definition	Target value	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNCTION.TARGET on page 242	
			Polarity	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNCTION.TTRansition on page 244	
		Turns on/off tracking function.		SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNCTION.TRACKing on page 243	
	Bandwidth search	Turns on/off the results display.		SCPI.CALCulate(Ch).SElected.MARKer.BWIDth.STATE on page 235	
		Bandwidth definition value		SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth.THREshold on page 236	
		Reads the result.		SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth. DATA on page 234	
	Sets the marker value to start/stop/center/scale reference value			SCPI.CALCulate(Ch).SElected.MARKer(Mk).SET on page 248	
	Statistical analysis for the trace	Turns on/off the result display.		SCPI.CALCulate(Ch).SElected.MSTatistics.STATE on page 254	
		Reads the result.		SCPI.CALCulate(Ch).SElected.MSTatistics.DATA on page 253	
	Analysis	Executes analysis			SCPI.CALCulate(Ch).SElected.FUNCTION.EXECute on page 219
Analysis type			SCPI.CALCulate(Ch).SElected.FUNCTION.TYPE on page 225		
Peak definition		Lower limit of peak excursion value	Polarity	SCPI.CALCulate(Ch).SElected.FUNCTION.PPOLarity on page 222	
			Target definition	Target value	SCPI.CALCulate(Ch).SElected.FUNCTION.TARGET on page 223
Target definition		Polarity	Polarity	SCPI.CALCulate(Ch).SElected.FUNCTION.TTRansition on page 224	
			Reads analysis result	Data for analysis	SCPI.CALCulate(Ch).SElected.FUNCTION.DATA on page 215
Number of data for analysis		SCPI.CALCulate(Ch).SElected.FUNCTION.POINts on page 221			
Fixture simulator		Turns on/off fixture simulator function.			SCPI.CALCulate(Ch).FSIMulator.STATE on page 195
	Topology	Balanced device type		SCPI.CALCulate(Ch).FSIMulator.BALun.DEVice on page 166	
		Port assignment	Unbalance-Balance		SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology.SBALanced.PPORTs on page 181
			Balance-Balance		SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology.BBALanced.PPORTs on page 180
			Unbalance-Unbalance-Balance		SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology.SSBALanced.PPORTs on page 182
	Balance/Unbalance conversion function	On/Off		SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).STATE on page 179	
		Measurement parameter	Unbalance-Balance		SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).SBALanced.DEFIne on page 177
			Balance-Balance		SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).BBALanced.DEFIne on page 176
			Unbalance-Unbalance-Balance		SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).SSBALanced.DEFIne on page 178

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List by Function

Table 7-1 E5070A/E5071A COM objects by function

Function	Item to be set/executed		COM Object	
Fixture simulator (Continued)	Matching circuit embedding function	On/Off	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 192	
		Circuit type		SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).TYPE on page 190
		Circuit constant	C	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.C on page 186
			G	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.G on page 187
			L	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.L on page 188
			R	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.R on page 189
	User file		SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).USER.FILEname on page 191	
	Port impedance conversion function	On/Off	SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONversion. STATE on page 194	
		Z0	SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONversion. PORT(Pt).Z0.R on page 193	
	Network de-embedding function	On/Off	SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. STATE on page 185	
		Type	SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).TYPE on page 183	
		User file		SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).USER.FILEname on page 184
	Differential matching circuit embedding function	On/Off	SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. STATE on page 173	
		Circuit type		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE on page 171
		Circuit constant	C	SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.C on page 167
G			SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.G on page 168	
L			SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.L on page 169	
R			SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.R on page 170	
User file		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).USER.FILEname on page 172		
Differential port impedance conversion function	On/Off	SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion. STATE on page 175		
	Z0	SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion. BPORT(Bpt).Z0.R on page 174		
Common port impedance conversion function	On/Off	SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion. STATE on page 165		
	Z0	SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion. BPORT(Bpt).Z0.R on page 163		

Table 7-1 E5070A/E5071A COM objects by function

Function	Item to be set/executed		COM Object	
Time domain	Transform	On/Off	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.STATE on page 263	
		Transform type	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.TYPE on page 267	
		Stimulus type	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.STIMulus on page 265	
		Changes the frequency range to match with the low-pass type	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.LPFRequency on page 260	
		Window setup	β	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.KBESsel on page 259
			Impulse width	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.IMPulse.WIDTH on page 258
			Rise time of step signal	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.STEP.RTIME on page 264
		Display range after time domain transformation	Start	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.START on page 262
			Stop	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.STOP on page 266
			Center	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.CENTer on page 257
	Span		SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.SPAN on page 261	
	Gating	On/Off	SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.STATE on page 211	
		Gate type	SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.TYPE on page 213	
		Gate shape	SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.SHAPe on page 208	
		Display range after time domain transformation	Start	SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.START on page 210
			Stop	SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.STOP on page 212
			Center	SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.CENTer on page 207
Span			SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.SPAN on page 209	
Parameter conversion	On/Off	SCPI.CALCulate(Ch).SElected.CONVersion.STATE on page 200		
	Selects the conversion parameter.	SCPI.CALCulate(Ch).SElected.CONVersion.FUNction on page 199		

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Table 7-1 E5070A/E5071A COM objects by function

Function	Item to be set/executed	COM Object	
Status report system	Clears register.	SCPI.IEEE4882.CLS on page 314	
	Reads status byte register.	SCPI.IEEE4882.STB on page 319	
	Sets service request enable register.	SCPI.IEEE4882.SRE on page 318	
	Standard event status register	Reads register value.	SCPI.IEEE4882.ESR on page 315
		Sets enable register value.	SCPI.IEEE4882.ESE on page 314
		Sets OPC bit on operation termination.	SCPI.IEEE4882.OPC on page 316
	Operation status register	Reset	SCPI.STATus.PRESet on page 415
		Reads conditional register value.	SCPI.STATus.OPERation.CONDition on page 411
		Sets enable register value.	SCPI.STATus.OPERation.ENABLE on page 412
		Reads event register value.	SCPI.STATus.OPERation.EVENT on page 413
		Sets positive transition filter value.	SCPI.STATus.OPERation.PTRansition on page 415
	Questionable status register	Reset	SCPI.STATus.PRESet on page 415
		Reads conditional register value.	SCPI.STATus.QUEStionable.CONDition on page 416
		Sets enable register value.	SCPI.STATus.QUEStionable.ENABLE on page 417
		Reads event register value.	SCPI.STATus.QUEStionable.EVENT on page 418
		Sets positive transition filter value.	SCPI.STATus.QUEStionable.PTRansition on page 430
	Questionable limit status register	Reset	SCPI.STATus.PRESet on page 415
		Reads conditional register value.	SCPI.STATus.QUEStionable.LIMit.CONDition on page 424
		Sets enable register value.	SCPI.STATus.QUEStionable.LIMit.ENABLE on page 425
		Reads event register value.	SCPI.STATus.QUEStionable.LIMit.EVENT on page 426
		Sets positive transition filter value.	SCPI.STATus.QUEStionable.LIMit.PTRansition on page 428
	Questionable limit channel status register	Reset	SCPI.STATus.PRESet on page 415
		Reads conditional register value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). CONDition on page 419
		Sets enable register value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).ENABLE on page 420
		Reads event register value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).EVENT on page 421
		Sets positive transition filter value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).PTRansition on page 423
	Handler I/O control	Outputs data using port A.	SCPI.CONTRol.HANDler.A.DATA on page 268
Outputs data using port B.		SCPI.CONTRol.HANDler.B.DATA on page 269	
Port C		Inputs/Outputs data.	SCPI.CONTRol.HANDler.C.DATA on page 270
		Selects input/output mode.	SCPI.CONTRol.HANDler.C.MODE on page 271
Port D		Inputs/Outputs data.	SCPI.CONTRol.HANDler.D.DATA on page 272
		Selects input/output mode.	SCPI.CONTRol.HANDler.D.MODE on page 273
Inputs/outputs data using port E (port C + port D)		SCPI.CONTRol.HANDler.E.DATA on page 274	
Outputs data using port F (port A + port B)		SCPI.CONTRol.HANDler.F.DATA on page 277	
Sets/Reads OUTPUT1 and OUTPUT2		SCPI.CONTRol.HANDler.OUTPUT(Num).DATA on page 278	
Turns on/off INDEX signal.		SCPI.CONTRol.HANDler.EXTension.INDEx.STATE on page 275	
Turns on/off READY FOR TRIGGER signal.	SCPI.CONTRol.HANDler.EXTension.RTRigger.STATE on page 276		

Table 7-1 E5070A/E5071A COM objects by function

Function	Item to be set/executed		COM Object	
E5091A control	On/Off of control		SCPI.SENSE.MULTIplexer(Id).STATE on page 392	
	On/Off of the E5091A property display		SCPI.SENSE.MULTIplexer(Id).DISPlay.STATE on page 391	
	Reads number of port.		SCPI.SENSE.MULTIplexer(Id).COUNT on page 390	
	Assigns the port.	Port 1	SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT1 on page 394	
		Port 2	SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT2 on page 395	
		Port 3	SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT3 on page 396	
Port 4		SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT4 on page 397		
Sets control lines.		SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.OUTPUT.DATA on page 393		
File operation	Save	Instrument setting	Entire instrument state (file)	SCPI.MMEMORY.STORE.STATE on page 335
			State for each channel (register)	SCPI.MMEMORY.STORE.CHANNEL.STATE on page 330
			Selects contents.	SCPI.MMEMORY.STORE.STYPE on page 336
		Formatted trace data		SCPI.MMEMORY.STORE.FDATA on page 331
		Display image on the LCD screen		SCPI.MMEMORY.STORE.IMAGE on page 332
		Segment sweep table		SCPI.MMEMORY.STORE.SEGMENT on page 334
		Limit line table		SCPI.MMEMORY.STORE.LIMIT on page 333
	Recall	Instrument setting	Entire instrument state (file)	SCPI.MMEMORY.LOAD.STATE on page 328
			State for each channel (register)	SCPI.MMEMORY.LOAD.CHANNEL.STATE on page 325
		Segment sweep table		SCPI.MMEMORY.LOAD.SEGMENT on page 327
		Limit line table		SCPI.MMEMORY.LOAD.LIMIT on page 326
		Clears registers.		SCPI.MMEMORY.STORE.CHANNEL.CLEAR on page 330
	Creates directory (folder).		SCPI.MMEMORY.MDIRectory on page 329	
	Copys file.		SCPI.MMEMORY.COPY on page 323	
	Deletes file or directory.		SCPI.MMEMORY.DELETE on page 324	
	Reads list of files in the directory.		SCPI.MMEMORY.CATALOG(Dir) on page 322	
	VBA Macro	User menu function	Preset	UserMenu.PRESet on page 158
Label name			UserMenu.Item(id).Caption on page 156	
Softkey enabled/disabled			UserMenu.Item(id).Enabled on page 157	
Event processing			UserMenu_OnPress(ByVal id As Long) on page 158	
Show the softkey			UserMenu.Show on page 159	
Reads VBA application name.		NAME on page 153		
Reads VBA version.		VBAVersion on page 160		
Control through SCPI commands		Parse on page 154		
Waits for clicking [Macro Setup] - Continue button.		Prompt on page 155		
Waits for returning 1 at RQS/MSS bit (status register).		WaitOnSRQ on page 161		
Print	Outputs print.		SCPI.HCOPY.IMMEDIATE on page 313	
	Aborts printing.		SCPI.HCOPY.ABORT on page 312	
	Selects print mode.		SCPI.HCOPY.IMAGE on page 312	
Operations	Disables front panel/keyboard operations.		SCPI.SYSTEM.KLOCK.KBD on page 437	
	Disables mouse/touch screen operations.		SCPI.SYSTEM.KLOCK.MOUSE on page 438	

COM Object Reference
List by Function

Table 7-1 E5070A/E5071A COM objects by function

Function	Item to be set/executed		COM Object
Beeper	For operation completion	On/Off	SCPI.SYSTem.BEEPer.COMPLete.STATe on page 432
		Makes beep sound.	SCPI.SYSTem.BEEPer.COMPLete.IMMEdiate on page 431
	For warning/limit test result	On/Off	SCPI.SYSTem.BEEPer.WARNing.STATe on page 433
		Makes beep sound.	SCPI.SYSTem.BEEPer.WARNing.IMMEdiate on page 432
Internal clock	Date		SCPI.SYSTem.DATE on page 435
	Time		SCPI.SYSTem.TIME on page 442
Others	Shutdown		SCPI.SYSTem.POFF on page 438
	Reads product information.		SCPI.IEEE4882.IDN on page 315
	Reads options installed.		SCPI.IEEE4882.OPT on page 317
	Waits for command execution.		SCPI.IEEE4882.WAI on page 319
	Returns 1 when completing command execution.		SCPI.IEEE4882.OPC on page 316
	Reads error message occurred.		SCPI.SYSTem.ERRor on page 436
	Confirms whether external reference signal is inputted or not.		SCPI.SENSE(Ch).ROSCillator.SOURce on page 398
	Turns on/off the spurious avoid mode.		SCPI.SENSE(Ch).SWEep.ASPurious on page 402
	Turns on/off the system correction.		SCPI.SYSTem.CORRection.STATe on page 434
	Confirms whether warm-up is enough or not.		SCPI.SYSTem.TEMPerature.STATe on page 441
	Turns on/off the high temperature mode.		SCPI.SYSTem.TEMPerature.HIGH on page 440
Confirms whether service mode or not.		SCPI.SYSTem.SERVice on page 439	

List by Front Panel Key

Table 7-2 shows the COM objects that correspond to the front panel keys (in alphabetical order).

Table 7-2 Front panel key tree vs. COM objects correspondence table

Front panel key (Operation)		Corresponding COM object		
[Analysis]	Conversion	Conversion	SCPI.CALCulate(Ch).SELEcted.CONVERsion.STATe on page 200	
		Function	SCPI.CALCulate(Ch).SELEcted.CONVERsion.FUNCTion on page 199	
	Fixture Simulator	BalUn	SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr). STATe on page 179	
		Balun OFF All Traces	N/A	
		Balun ON All Traces	N/A	
		Cmn ZConv- ersion	Cmn ZConversion	SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion. STATe on page 165
			Port n (bal)	SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion. BPORT(Bpt).Z0.R on page 163
		De-Embedding	De- Embedding	SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. STATe on page 185
			Select Port	SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).TYPE on page 183
			Select Type	
			User File	SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).USER.FILename on page 184
		Diff Matching	C	SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.C on page 167
	Diff Matching		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. STATe on page 173	
	G		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.G on page 168	
	L		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.L on page 169	
	R		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.R on page 170	
	Select Bal Port		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE on page 171	
	Select Circuit			
	User File		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).USER.FILename on page 172	
	Diff ZConv- ersion	Diff ZConversion	SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion. STATe on page 175	
		Port n (bal)	SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion. BPORT(Bpt).Z0.R on page 174	
	Measurement		SCPI.CALCulate(Ch).PARAmeter(Tr).DEFine on page 197 SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr). SBALanced.DEFine on page 177 SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).BBALanced.DEFine on page 176 SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr). SSBALanced.DEFine on page 178	
	Fixture Simulator		SCPI.CALCulate(Ch).FSIMulator.STATe on page 195	

Table 7-2 Front panel key tree vs. COM objects correspondence table

Front panel key (Operation)			Corresponding COM object	
[Analysis] (Continued)	Fixture Simulator (Continued)	Port Matching	C	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.C on page 186
			G	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.G on page 187
			L	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.L on page 188
			Port Matching	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 192
			R	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.R on page 189
			Select Port	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.
			Select Circuit	PORT(Pt).TYPE on page 190
			User File	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).USER.FILename on page 191
		Port ZConv- ersion	Port ZConversion	SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONversion. STATE on page 194
			Port n Z0	SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONversion. PORT(Pt).Z0.R on page 193
		Topology	Device	SCPI.CALCulate(Ch).FSIMulator.BALun.DEVice on page 166
			Port n (se) Port n (bal)	SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology. SSBALanced.PPORts on page 182 SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology. SBALanced.PPORts on page 181 SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology. BBALanced.PPORts on page 180
		Gating	Center	
	Gating		SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME. STATE on page 211	
	Shape		SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME. SHAPe on page 208	
	Span		SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME. SPAN on page 209	
	Start		SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME. START on page 210	
	Stop		SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME. STOP on page 212	
	Type		SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME. TYPE on page 213	
	Limit Test	Edit Limit Line	Add / Delete / Clear Limit Table	SCPI.CALCulate(Ch).SELEcted.LIMit.DATA on page 226
			Export to CSV File	SCPI.MMEMory.STORE.LIMit on page 333
			Import from CSV File	SCPI.MMEMory.LOAD.LIMit on page 326
		Fail Sign		SCPI.DISPlay.FSIGN on page 289
Limit Line		SCPI.CALCulate(Ch).SELEcted.LIMit.DISPlay.STATE on page 228		
Limit Test		SCPI.CALCulate(Ch).SELEcted.LIMit.STATE on page 232		

Table 7-2 Front panel key tree vs. COM objects correspondence table

Front panel key (Operation)			Corresponding COM object	
[Analysis] (Continued)	Transform	Center	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. CENTER on page 257	
		Set Freq Low Pass	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. LPFRequency on page 260	
		Span	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. SPAN on page 261	
		Start	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. START on page 262	
		Stop	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. STOP on page 266	
		Transform	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. TYPE on page 267 SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. STATE on page 263	
		Type	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. STIMulus on page 265	
		Window	Impulse Width	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. IMPulse.WIDTH on page 258
			Kaiser Beta	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. KBESsel on page 259
			Maximum	
Minimum				
Normal				
Step Rise	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. STEP.RTIme on page 264			
[Avg]	Averaging		SCPI.SENSE(Ch).AVERAge.STATe on page 338	
	Averaging Restart		SCPI.SENSE(Ch).AVERAge.CLEAr on page 337	
	Avg Factor		SCPI.SENSE(Ch).AVERAge.COUNT on page 337	
	Smo Aperture		SCPI.CALCulate(Ch).SElected.SMOothing.APERture on page 255	
	Smoothing		SCPI.CALCulate(Ch).SElected.SMOothing.STATE on page 256	
	IF Bandwidth		SCPI.SENSE(Ch).BANDwidth.RESolution on page 339 SCPI.SENSE(Ch).BWIDTH.RESolution on page 340	
[Cal]	Cal Kit			SCPI.SENSE(Ch).CORRection.COLLEct.CKIT.SElect on page 350
	Calibrate	1-Port Cal	Done	SCPI.SENSE(Ch).CORRection.COLLEct.SAVE on page 378
			Load	SCPI.SENSE(Ch).CORRection.COLLEct.ACQUIRE.LOAD on page 342
			Open	SCPI.SENSE(Ch).CORRection.COLLEct.ACQUIRE.OPEN on page 343
			Select Port	SCPI.SENSE(Ch).CORRection.COLLEct.METHod. SOLT1 on page 373
			Short	SCPI.SENSE(Ch).CORRection.COLLEct.ACQUIRE. SHORT on page 343

7. COM Object Reference

Table 7-2 Front panel key tree vs. COM objects correspondence table

Front panel key (Operation)			Corresponding COM object		
[Cal]	Calibrate	2-Port Cal	Done	SCPI.SENSE(Ch).CORRection.COLLect.SAVE on page 378	
		3-Port Cal	Isolation (Optional)	SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE. ISOLation on page 341	
		4-Port Cal	Reflection	Port n Load	SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE.LOAD on page 342
				Port n Open	SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE.OPEN on page 343
				Port n Short	SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE. SHORT on page 343
		Select Ports	(2-Port Cal)	SCPI.SENSE(Ch).CORRection.COLLect.METHod. SOLT2 on page 374	
			(3-Port Cal)	SCPI.SENSE(Ch).CORRection.COLLect.METHod. SOLT3 on page 375	
			(4-Port Cal)	SCPI.SENSE(Ch).CORRection.COLLect.METHod. SOLT4 on page 376	
		Transmission	SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE.THURU on page 344		
		Response (Open)	Done	SCPI.SENSE(Ch).CORRection.COLLect.SAVE on page 378	
			Load (Optional)	SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE.LOAD on page 342	
			Open	SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE.OPEN on page 343	
			Select Port	SCPI.SENSE(Ch).CORRection.COLLect.METHod. RESPonse.OPEN on page 372	
		Response (Short)	Done	SCPI.SENSE(Ch).CORRection.COLLect.SAVE on page 378	
			Load (Optional)	SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE.LOAD on page 342	
			Select Port	SCPI.SENSE(Ch).CORRection.COLLect.METHod. RESPonse.SHORT on page 372	
			Short	SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE. SHORT on page 343	
		Response (Thru)	Done	SCPI.SENSE(Ch).CORRection.COLLect.SAVE on page 378	
			Isolation (Optional)	SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE. ISOLation on page 341	
	Select Ports		SCPI.SENSE(Ch).CORRection.COLLect.METHod. RESPonse.THURU on page 373		
	Thru		SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE.THURU on page 344		
	Correction		SCPI.SENSE(Ch).CORRection.STATe on page 383		
	ECal	1Port ECal	SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT1 on page 367		
		2Port ECal	SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT2 on page 368		
		3Port ECal	SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT3 on page 369		
		4Port ECal	SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT4 on page 370		
		Thru ECal	SCPI.SENSE(Ch).CORRection.COLLect.ECAL.THURU on page 371		
Isolation		SCPI.SENSE(Ch).CORRection.COLLect.ECAL.ISOLation.STATe on page 365			

Table 7-2 Front panel key tree vs. COM objects correspondence table

Front panel key (Operation)					Corresponding COM object
[Cal] (Continued)	Modify Cal Kit	Define STDs	1. XXXX to 21. XXXX	Arb. Impedance	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).ARbitrary on page 351
				C0	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).C0 on page 352
				C1	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).C1 on page 353
				C2	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).C2 on page 354
				C3	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).C3 on page 355
				L0	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).L0 on page 357
				L1	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).L1 on page 358
				L2	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).L2 on page 359
				L3	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).L3 on page 360
				Label	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).LABel on page 361
				Offset Delay	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).DELay on page 356
				Offset Loss	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).LOSS on page 362
				Offset Z0	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).Z0 on page 364
				STD Type	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).TYPE on page 363
	Label Kit		SCPI.SENSE(Ch).CORRection.COLlect.CKIT.LABel on page 345		
	Specify CLSs	Load	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.ORDER. LOAD(Cpt) on page 346		
			SCPI.SENSE(Ch).CORRection.COLlect.CKIT.ORDER. OPEN(Cpt) on page 347		
			SCPI.SENSE(Ch).CORRection.COLlect.CKIT.ORDER. SHORt(Cpt) on page 348		
			SCPI.SENSE(Ch).CORRection.COLlect.CKIT.ORDER. THRU(Cpt_m,Cpt_n) on page 349		
	Port Extensions	Extension Port 1	SCPI.SENSE(Ch).CORRection.EXTension.PORT(Pt).TIME on page 379		
		Extension Port 2			
Extension Port 3					
Extension Port 4					
Extensions		SCPI.SENSE(Ch).CORRection.EXTension.STATe on page 380			
Property		SCPI.SENSE(Ch).CORRection.PROPRerty on page 381			
Velocity Factor		SCPI.SENSE(Ch).CORRection.RVELocity.COAX on page 382			
[Center]					SCPI.SENSE(Ch).FREQuency.CENTer on page 385
[Channel Prev]					SCPI.DISPlay.WINDow(Ch).ACTivate on page 297
[Channel Max]					SCPI.DISPlay.MAXimize on page 291
[Channel Next]					SCPI.DISPlay.WINDow(Ch).ACTivate on page 297

7. COM Object Reference

COM Object Reference
List by Front Panel Key

Table 7-2 Front panel key tree vs. COM objects correspondence table

Front panel key (Operation)		Corresponding COM object
[Display]	Allocate Channels	SCPI.DISPlay.SPLit on page 293
	Allocate Traces	SCPI.DISPlay.WINDow(Ch).SPLit on page 300
	Data - > Mem	SCPI.CALCulate(Ch).SELected.MATH.MEMorize on page 253
	Data Math	SCPI.CALCulate(Ch).SELected.MATH.FUNcTION on page 252
	Display	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).STATe on page 304 SCPI.DISPlay.WINDow(Ch).TRACe(Tr).MEMory. STATe on page 303
	Edit Title Label	SCPI.DISPlay.WINDow(Ch).TITLe.DATA on page 301
	Frequency	SCPI.DISPlay.ANNotation.FREQuency.STATe on page 279
	Graticule Label	SCPI.DISPlay.WINDow(Ch).LABel on page 298
	Invert Color	SCPI.DISPlay.IMAGe on page 290
	Num of Traces	SCPI.CALCulate(Ch).PARAmeter.COUNT on page 196
	Title Label	SCPI.DISPlay.WINDow(Ch).TITLe.STATe on page 302
	Update	SCPI.DISPlay.ENABLE on page 288
[Format]		SCPI.CALCulate(Ch).SELected.FORMat on page 214
[Macro Break]		N/A
[Macro Run]		N/A
[Macro Setup]	Clear Echo	SCPI.DISPlay.ECHO.CLEar on page 287
	Close Editor	N/A
	Continue	N/A
	Echo Window	SCPI.DISPlay.TABLE.STATe on page 295 SCPI.DISPlay.TABLE.TYPE on page 296
	Load Project	N/A
	New Project	N/A
	Preset User Menu	UserMenu.PRESet on page 158
	Save Project	N/A
	Select Macro	N/A
	Stop	N/A
	User Menu	UserMenu.Press(id) on page 159
VBA Editor	N/A	
[Marker]	Clear Marker Menu	SCPI.CALCulate(Ch).SELected.MARKer(Mk).STATe on page 249
	Marker 1 to Marker 4	SCPI.CALCulate(Ch).SELected.MARKer(Mk).STATe on page 249 SCPI.CALCulate(Ch).SELected.MARKer(Mk).ACTivate on page 233 SCPI.CALCulate(Ch).SELected.MARKer(Mk).X on page 250
	Marker - > Ref Marker	N/A
	More Markers	Marker 5 to Marker 9 SCPI.CALCulate(Ch).SELected.MARKer(Mk).STATe on page 249 SCPI.CALCulate(Ch).SELected.MARKer(Mk).ACTivate on page 233 SCPI.CALCulate(Ch).SELected.MARKer(Mk).X on page 250
	Ref Marker	SCPI.CALCulate(Ch).SELected.MARKer(Mk).STATe on page 249 SCPI.CALCulate(Ch).SELected.MARKer(Mk).ACTivate on page 233 SCPI.CALCulate(Ch).SELected.MARKer(Mk).X on page 250 SCPI.CALCulate(Ch).SELected.MARKer.REFerence. STATe on page 247
	Ref Marker Mode	SCPI.CALCulate(Ch).SELected.MARKer.REFerence. STATe on page 247

Table 7-2 Front panel key tree vs. COM objects correspondence table

Front panel key (Operation)		Corresponding COM object	
[Marker Func]	Couple	SCPI.CALCulate(Ch).SElected.MARKer.COUPle on page 237	
	Discrete	SCPI.CALCulate(Ch).SElected.MARKer.DISCrete on page 238	
	Marker Table	SCPI.DISPlay.TABLe.STATe on page 295 SCPI.DISPlay.TABLe.TYPE on page 296	
	Marker - > Center	SCPI.CALCulate(Ch).SElected.MARKer(Mk).SET on page 248	
	Marker - > Reference		
	Marker - > Start		
	Marker - > Stop		
	Statistics	SCPI.CALCulate(Ch).SElected.MSTATistics.STATe on page 254 SCPI.CALCulate(Ch).SElected.MSTATistics.DATA on page 253	
[Marker Search]	Bandwidth	SCPI.CALCulate(Ch).SElected.MARKer.BWIDth.STATe on page 235 SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth. DATA on page 234	
	Bandwidth Value	SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth. THREshold on page 236	
	Max	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. TYPE on page 245	
	Min	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. EXECute on page 239	
	Peak	Peak Excursion	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. PEXCursion on page 240
		Peak Polarity	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. PPOLarity on page 241
		Search Left	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. TYPE on page 245 SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. EXECute on page 239
		Search Peak	
		Search Right	
	Target	Search Left	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. TYPE on page 245 SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. EXECute on page 239
		Search Right	
		Search Target	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. EXECute on page 242
		Target Transition	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. TTRansition on page 244
		Target Value	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. TARGet on page 242
	Tracking	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. TRACKing on page 243	
	[Meas]	SCPI.CALCulate(Ch).PARAmeter(Tr).DEFine on page 197 SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).SBALanced.DEFine on page 177 SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).BBALanced.DEFine on page 176 SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).SSBALanced.DEFine on page 178	
	[Preset]	OK	SCPI.SYSTem.PRESet on page 439

COM Object Reference
List by Front Panel Key

Table 7-2 Front panel key tree vs. COM objects correspondence table

Front panel key (Operation)		Corresponding COM object	
[Save/ Recall]	Explorer	N/A	
	Recall Channel	SCPI.MMEMory.LOAD.CHANnel.STATE on page 325	
	Recall State	SCPI.MMEMory.LOAD.STATE on page 328	
	Save Channel	Clear States	SCPI.MMEMory.STORE.CHANnel.CLEAr on page 330
		Clear States	SCPI.MMEMory.STORE.CHANnel.STATE on page 330
	Save State	SCPI.MMEMory.STORE.STATE on page 335	
	Save Trace Data	SCPI.MMEMory.STORE.FDATA on page 331	
Save Type	SCPI.MMEMory.STORE.STYPE on page 336		
[Scale]	Auto Scale	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.AUTO on page 304	
	Auto Scale All	N/A	
	Divisions	SCPI.DISPlay.WINDow(Ch).Y.SCALe.DIVisions on page 309	
	Electrical Delay	SCPI.CALCulate(Ch).SELEcted.CORREction.EDELay. TIME on page 201	
	Marker -> Reference	SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).SET on page 248	
	Phase Offset	SCPI.CALCulate(Ch).SELEcted.CORREction.OFFSet. PHASe on page 202	
	Reference Position	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. RPOSition on page 307	
	Reference Value	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVel on page 306	
	Scale/Div	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. PDIVision on page 305	
[Softkey On/Off]		SCPI.DISPlay.SKEY.STATE on page 292	
[Span]		SCPI.SENSE(Ch).FREQuency.SPAN on page 387	
[Start]		SCPI.SENSE(Ch).FREQuency.START on page 388	
[Stop]		SCPI.SENSE(Ch).FREQuency.STOP on page 389	
[Sweep Setup]	Edit Segment Table		SCPI.SENSE(Ch).SEGMENT.DATA on page 399
	Edit Segment Table	Export to CSV File	SCPI.MMEMory.STORE.SEGMENT on page 334
		Import from CSV File	SCPI.MMEMory.LOAD.SEGMENT on page 327
	Points		SCPI.SENSE(Ch).SWEep.POINts on page 405
	Power		SCPI.SOURce(Ch).POWER.LEVel.IMMEDIATE. AMPLitude on page 410
	Power Ranges		SCPI.SOURce(Ch).POWER.ATTenuation.DATA on page 409
	Segment Display		SCPI.DISPlay.WINDow(Ch).X.SPACing on page 308
	Sweep Delay		SCPI.SENSE(Ch).SWEep.DELay on page 403
	Sweep Time		SCPI.SENSE(Ch).SWEep.TIME.DATA on page 407 SCPI.SENSE(Ch).SWEep.TIME.AUTO on page 406
	Sweep Type		SCPI.SENSE(Ch).SWEep.TYPE on page 408
	Swept Mode		SCPI.SENSE(Ch).SWEep.GENERation on page 404

Table 7-2 Front panel key tree vs. COM objects correspondence table

Front panel key (Operation)			Corresponding COM object	
[System]	Abort Printing		SCPI.HCOpy.ABORT on page 312	
	Backlight		SCPI.SYStem.BACKlight on page 431	
	Dump Screen Image		SCPI.MMEMory.STORe.IMAGe on page 332	
	E5091A Setup	Control Lines	SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.OUTPUT.DATA on page 393	
		E5091A Control	SCPI.SENSE.MULTiplexer(Id).STATE on page 392	
		E5091A Property	SCPI.SENSE.MULTiplexer(Id).DISPlay.STATE on page 391	
		Port 1	SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT1 on page 394	
		Port 2	SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT2 on page 395	
		Port 3	SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT3 on page 396	
		Port 4	SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT4 on page 397	
		Select ID	N/A	
	Firmware Revision		SCPI.IEEE4882.IDN on page 315	
	Invert Image		SCPI.HCOpy.IMAGe on page 312	
	Misc Setup	Beeper	Beep Complete	SCPI.SYStem.BEEPer.COMPLete.STATE on page 432
			Beep Warning	SCPI.SYStem.BEEPer.WARNing.STATE on page 433
			Test Beep Complete	SCPI.SYStem.BEEPer.COMPLete.IMMEdiate on page 431
			Test Beep Warning	SCPI.SYStem.BEEPer.WARNing.IMMEdiate on page 432
		Clock Setup	Set Date and Time	SCPI.SYStem.DATE on page 435 SCPI.SYStem.TIME on page 442
			Show Clock	SCPI.DISPlay.CLOCK on page 280
		Color Setup		SCPI.DISPlay.COLor(Dnum).TRACe(Tr).DATA on page 285 SCPI.DISPlay.COLor(Dnum).TRACe(Tr).MEMory on page 286 SCPI.DISPlay.COLor(Dnum).GRATICule(Gnum) on page 282 SCPI.DISPlay.COLor(Dnum).LIMit(Lnum) on page 283 SCPI.DISPlay.COLor(Dnum).BACK on page 281 SCPI.DISPlay.COLor(Dnum).RESet on page 284
		GPIB Setup		N/A
		Key Lock	Front Panel & Keyboard Lock	SCPI.SYStem.KLOCK.KBD on page 437
			Touch Screen & Mouse Lock	SCPI.SYStem.KLOCK.MOUSe on page 438
	Network Setup		N/A	
	Print		SCPI.HCOpy.IMMEdiate on page 313	
	Printer Setup		N/A	
	Service Menu	Avoid Spurious	SCPI.SENSE(Ch).SWEep.ASPurious on page 402	
		System Correction	SCPI.SYStem.CORRection.STATE on page 434	
		High Temperature	SCPI.SYStem.TEMPerature.HIGH on page 440	
[Trace Prev]			SCPI.CALCulate(Ch).PARAmeter(Tr).SELEct on page 198	
[Trace Max]			SCPI.DISPlay.WINDow(Ch).MAXimize on page 299	
[Trace Next]			SCPI.CALCulate(Ch).PARAmeter(Tr).SELEct on page 198	

COM Object Reference
List by Front Panel Key

Table 7-2 Front panel key tree vs. COM objects correspondence table

Front panel key (Operation)		Corresponding COM object
[Trigger]	Continuous	SCPI.INITiate(Ch).CONTinuous on page 320
	Continuous Disp Channels	N/A
	Hold	SCPI.ABORT on page 162 SCPI.INITiate(Ch).CONTinuous on page 320
	Hold All Channels	N/A
	Restart	SCPI.ABORT on page 162
	Single	SCPI.ABORT on page 162 SCPI.INITiate(Ch).CONTinuous on page 320 SCPI.INITiate(Ch).IMMediate on page 321
	Trigger Source	SCPI.TRIGger.SEQuence.SOURce on page 445
	Trigger	SCPI.TRIGger.SEQuence.IMMediate on page 443

COM Object Tree

Table 7-3 shows the COM object tree of the E5070A/E5071A.

Table 7-3 E5070A/E5071A COM object tree

Object	Object type	Note
ECHO	Method	[No read]
NAME	Property(Data Type:String)	[Read only]
Parse	Method	
Prompt	Method	[No read]
UserMenu		
.Item(<i>id</i>)		
.Caption	Property(Data Type:String)	
.Enabled	Property(Data Type:Boolean)	
_OnPress(ByVal <i>id</i> As Long)	Event	
.PRESet	Method	[No read]
.Press(<i>id</i>)	Method	[No read]
.Show	Method	[No read]
VBAVersion	Property(Data Type:String)	[Read only]
WaitOnSRQ	Method	[No read]
SCPI		
.ABORT	Method	[No read]
.CALCulate(<i>Ch</i>)		
.FSIMulator		
.BALun		
.CZConversion		
.BPORT(<i>Bpt</i>)		
.Z0	R	Property(Data Type:Double)
.STATE		Property(Data Type:Boolean)
.DEVice		Property(Data Type:String)
.DMCircuit		
.BPORT(<i>Bpt</i>)		
.PARAMeters		
.C		Property(Data Type:Double)
.G		Property(Data Type:Double)
.L		Property(Data Type:Double)
.R		Property(Data Type:Double)
.TYPE		Property(Data Type:String)
.USER		
.FILEname		Property(Data Type:String)
.STATE		Property(Data Type:Boolean)
.DZConversion		
.BPORT(<i>Bpt</i>)		
.Z0	R	Property(Data Type:Double)
.STATE		Property(Data Type:Boolean)
.PARAMeter(<i>Tr</i>)		
.BBALanced		
.DEFINE		Property(Data Type:String)
.SBALanced		
.DEFINE		Property(Data Type:String)
.SSBalanced		
.DEFINE		Property(Data Type:String)
.STATE		Property(Data Type:Boolean)

Table 7-3 E5070A/E5071A COM object tree

Object	Object type	Note
SCPI		
.CALCulate(<i>Ch</i>)		
.FSIMulator		
.BALun		
.TOPology		
.BBALanced		
.PPORts	Property(Data Type:Variant)	
.SBALanced		
.PPORts	Property(Data Type:Variant)	
.SSBalanced		
.PPORts	Property(Data Type:Variant)	
.SENDED		
.DEEMbed		
.PORT(<i>Pt</i>)		
.TYPE	Property(Data Type:String)	
.USER		
.FILename	Property(Data Type:String)	
.STATe	Property(Data Type:Boolean)	
.PMCircuit		
.PORT(<i>Pt</i>)		
.PARameters		
.C	Property(Data Type:Double)	
.G	Property(Data Type:Double)	
.L	Property(Data Type:Double)	
.R	Property(Data Type:Double)	
.TYPE	Property(Data Type:String)	
.USER		
.FILename	Property(Data Type:String)	
.STATe	Property(Data Type:Boolean)	
.ZCONversion		
.PORT(<i>Pt</i>)		
.Z0		
.R	Property(Data Type:Double)	
.STATe	Property(Data Type:Boolean)	
.STATe	Property(Data Type:Boolean)	
.PARameter(<i>Tr</i>)		
.COUNt	Property(Data Type:Long)	
.DEFine	Property(Data Type:String)	
.SELect	Method	[No read]
.SELected		
.CONVersion		
.FUNCTion	Property(Data Type:String)	
.STATe	Property(Data Type:Boolean)	
.CORRection		
.EDELay		
.TIME	Property(Data Type:Double)	
.OFFSet		
.PHASe	Property(Data Type:Double)	
.DATA		
.FDATa	Property(Data Type:Variant)	
.FMEMory	Property(Data Type:Variant)	
.SDATa	Property(Data Type:Variant)	[Read only]
.SMEMory	Property(Data Type:Variant)	[Read only]

Table 7-3 E5070A/E5071A COM object tree

Object	Object type	Note
SCPI		
.CALCulate(<i>Ch</i>)		
.SELEcted		
.FILTer		
.GATE		
.TIME		
.CENTer	Property(Data Type:Double)	
.SHAPe	Property(Data Type:String)	
.SPAN	Property(Data Type:Double)	
.START	Property(Data Type:Double)	
.STATe	Property(Data Type:Boolean)	
.STOP	Property(Data Type:Double)	
.TYPE	Property(Data Type:String)	
.FORMat	Property(Data Type:String)	
.FUNcTion		
.DATA	Property(Data Type:Variant)	[Read only]
.DOMain		
.START	Property(Data Type:Double)	
.STATe	Property(Data Type:Boolean)	
.STOP	Property(Data Type:Double)	
.EXECute	Method	[No read]
.PEXCursion	Property(Data Type:Double)	
.POINts	Property(Data Type:Long)	[Read only]
.PPOLarity	Property(Data Type:String)	
.TARGet	Property(Data Type:Double)	
.TTRansition	Property(Data Type:String)	
.TYPE	Property(Data Type:String)	
.LIMit		
.DATA	Property(Data Type:Variant)	
.DISPlay		
.STATe	Property(Data Type:Boolean)	
.FAIL	Property(Data Type:Boolean)	[Read only]
.REPort		
.DATA	Property(Data Type:Variant)	[Read only]
.POINts	Property(Data Type:Long)	[Read only]
.STATe	Property(Data Type:Boolean)	
.MARKer(<i>Mk</i>)		
.ACTivate	Method	[No read]
.BWIDth		
.DATA	Property(Data Type:Variant)	[Read only]
.STATe	Property(Data Type:Boolean)	
.THReshold	Property(Data Type:Double)	
.COUPle	Property(Data Type:Boolean)	
.DISCrete	Property(Data Type:Boolean)	
.FUNcTion		
.EXECute	Method	[No read]
.PEXCursion	Property(Data Type:Double)	
.PPOLarity	Property(Data Type:String)	
.TARGet	Property(Data Type:Double)	
.TRACKing	Property(Data Type:Boolean)	
.TTRansition	Property(Data Type:String)	
.TYPE	Property(Data Type:String)	
.REFerence		
.STATe	Property(Data Type:Boolean)	

7. COM Object Reference

Table 7-3 E5070A/E5071A COM object tree

Object	Object type	Note
SCPI		
.CALCulate(<i>Ch</i>)		
.SELected		
.MARKer(<i>Mk</i>)		
.SET	Property(Data Type:String)	
.STATe	Property(Data Type:Boolean)	
.X	Property(Data Type:Double)	
.Y	Property(Data Type:Variant)	[Read only]
.MATH		
.FUNCTion	Property(Data Type:String)	
.MEMorize	Method	[No read]
.MSTATistics		
.DATA	Property(Data Type:Variant)	[Read only]
.STATe	Property(Data Type:Boolean)	
.SMOothing		
.APERTure	Property(Data Type:Double)	
.STATe	Property(Data Type:Boolean)	
.TRANSform		
.TIME		
.CENTer	Property(Data Type:Double)	
.IMPulse		
.WIDTH	Property(Data Type:Double)	
.KBESsel	Property(Data Type:Double)	
.LPFRequency	Method	[No read]
.SPAN	Property(Data Type:Double)	
.STARt	Property(Data Type:Double)	
.STATe	Property(Data Type:Boolean)	
.STEP		
.RTIME	Property(Data Type:Double)	
.STIMulus	Property(Data Type:String)	
.STOP	Property(Data Type:Double)	
.TYPE	Property(Data Type:String)	
.CONTRol		
.HANDler		
.A		
.DATA	Property(Data Type:Long)	[No read]
.B		
.DATA	Property(Data Type:Long)	[No read]
.C		
.DATA	Property(Data Type:Long)	
.MODE	Property(Data Type:String)	
.D		
.DATA	Property(Data Type:Long)	
.MODE	Property(Data Type:String)	
.E		
.DATA	Property(Data Type:Long)	
.EXTension		
.INDEX		
.STATe	Property(Data Type:Boolean)	
.RTRigger		
.STATe	Property(Data Type:Boolean)	
.F		
.DATA	Property(Data Type:Long)	[No read]
.OUTPut(<i>Num</i>)		
.DATA	Property(Data Type:Long)	

Table 7-3 E5070A/E5071A COM object tree

Object	Object type	Note
SCPI		
.DISPlay		
.ANNotation		
.FREQuency		
.STATe	Property(Data Type:Boolean)	
.CCLear	Method	[No read]
.CLOCK	Property(Data Type:Boolean)	
.COLor(<i>Dnum</i>)		
.BACK	Property(Data Type:Variant)	
.GRATicule(<i>Gnum</i>)	Property(Data Type:Variant)	
.LIMit(<i>Lnum</i>)	Property(Data Type:Variant)	
.RESet	Method	[No read]
.TRACe(<i>Tr</i>)		
.DATA	Property(Data Type:Variant)	
.MEMory	Property(Data Type:Variant)	
.ECHO		
.CLEar	Method	[No read]
.DATA	Property(Data Type:String)	[No read]
.ENABLE	Property(Data Type:Boolean)	
.FSIGn	Property(Data Type:Boolean)	
.IMAGe	Property(Data Type:String)	
.MAXimize	Property(Data Type:Boolean)	
.SKEY		
.STATe	Property(Data Type:Boolean)	
.SPLit	Property(Data Type:String)	
.TABLe		
.STATe	Property(Data Type:Boolean)	
.TYPE	Property(Data Type:String)	
.UPDate		
.IMMediate	Method	[No read]
.WINDow(<i>Ch</i>)		
.ACTivate	Method	[No read]
.LABel	Property(Data Type:Boolean)	
.MAXimize	Property(Data Type:Boolean)	
.SPLit	Property(Data Type:String)	
.TITLe		
.DATA	Property(Data Type:String)	
.STATe	Property(Data Type:Boolean)	
.TRACe(<i>Tr</i>)		
.MEMory		
.STATe	Property(Data Type:Boolean)	
.STATe	Property(Data Type:Boolean)	
.Y		
.SCALe		
.AUTO	Method	[No read]
.PDIVision	Property(Data Type:Double)	
.RLEVel	Property(Data Type:Double)	
.RPOSition	Property(Data Type:Long)	
.X		
.SPACing	Property(Data Type:String)	
.Y		
.SCALe		
.DIVisions	Property(Data Type:Long)	

Table 7-3 E5070A/E5071A COM object tree

Object	Object type	Note
SCPI		
.FORMat		
.BORDer	Property(Data Type:String)	
.DATA	Property(Data Type:String)	
.HCOPy		
.ABORt	Method	[No read]
.IMAGe	Property(Data Type:String)	
.IMMediate	Method	[No read]
.IEEE4882		
.CLS	Method	[No read]
.ESE	Property(Data Type:Long)	
.ESR	Property(Data Type:Long)	[Read only]
.IDN	Property(Data Type:String)	[Read only]
.OPC	Property(Data Type:Long)	
.OPT	Property(Data Type:String)	[Read only]
.RST	Method	[No read]
.SRE	Property(Data Type:Long)	
.STB	Property(Data Type:Long)	[Read only]
.TRG	Method	[No read]
.WAI	Method	[No read]
.INITiate(<i>Ch</i>)		
.CONTInuous	Property(Data Type:Boolean)	
.IMMediate	Method	[No read]
.MMEMory		
.CATalog(<i>Dir</i>)	Property(Data Type:String)	[Read only]
.COPY	Property(Data Type:Variant)	[No read]
.DELeTe	Property(Data Type:String)	[No read]
.LOAD		
.CAHNnel		
.STATe	Property(Data Type:String)	[No read]
.LIMit	Property(Data Type:String)	[No read]
.SEGMent	Property(Data Type:String)	[No read]
.STATe	Property(Data Type:String)	[No read]
.MDIRectory	Property(Data Type:String)	[No read]
.STORe		
.CAHNnel		
.CLEAr	Method	[No read]
.STATe	Property(Data Type:String)	[No read]
.FDATa	Property(Data Type:String)	[No read]
.IMAGe	Property(Data Type:String)	[No read]
.LIMit	Property(Data Type:String)	[No read]
.SEGMent	Property(Data Type:String)	[No read]
.STATe	Property(Data Type:String)	[No read]
.STYPe	Property(Data Type:String)	
.SENSe(<i>Ch</i>)		
.AVERAge		
.CLEAr	Method	[No read]
.COUNt	Property(Data Type:Long)	
.STATe	Property(Data Type:Boolean)	
.BANDwidth		
.RESolution	Property(Data Type:Double)	
.BWIDth		
.RESolution	Property(Data Type:Double)	

Table 7-3 E5070A/E5071A COM object tree

Object	Object type	Note
SCPI		
.SENSE(<i>Ch</i>)		
.CORRection		
.COLLect		
.ACQuire		
.ISOLation	Property(Data Type:Variant)	[No read]
.LOAD	Property(Data Type:Long)	[No read]
.OPEN	Property(Data Type:Long)	[No read]
.SHORt	Property(Data Type:Long)	[No read]
.THRU	Property(Data Type:Variant)	[No read]
.CKIT		
.LABel	Property(Data Type:String)	
.ORDER		
.LOAD(<i>Cpt</i>)	Property(Data Type:Long)	
.OPEN(<i>Cpt</i>)	Property(Data Type:Long)	
.SHORt(<i>Cpt</i>)	Property(Data Type:Long)	
.THRU(<i>Cpt_m,Cpt_n</i>)	Property(Data Type:Long)	
.RESet	Method	[No read]
.SELect	Property(Data Type:Long)	
.STAN(<i>Std</i>)		
.ARBitary	Property(Data Type:Double)	
.C0	Property(Data Type:Double)	
.C1	Property(Data Type:Double)	
.C2	Property(Data Type:Double)	
.C3	Property(Data Type:Double)	
.DELay	Property(Data Type:Double)	
.L0	Property(Data Type:Double)	
.L1	Property(Data Type:Double)	
.L2	Property(Data Type:Double)	
.L3	Property(Data Type:Double)	
.LABel	Property(Data Type:String)	
.LOSS	Property(Data Type:Double)	
.TYPE	Property(Data Type:String)	
.Z0	Property(Data Type:Double)	
.ECAL		
.ISOLation		
.STATe	Property(Data Type:Boolean)	
.PATH(<i>Cpt</i>)	Property(Data Type:Long)	[Read only]
.SOLT1	Property(Data Type:Long)	[No read]
.SOLT2	Property(Data Type:Variant)	[No read]
.SOLT3	Property(Data Type:Variant)	[No read]
.SOLT4	Property(Data Type:Variant)	[No read]
.THRU	Property(Data Type:Variant)	[No read]
.METHod		
.RESPOnse		
.OPEN	Property(Data Type:Long)	[No read]
.SHORt	Property(Data Type:Long)	[No read]
.THRU	Property(Data Type:Variant)	[No read]
.SOLT1	Property(Data Type:Long)	[No read]
.SOLT2	Property(Data Type:Variant)	[No read]
.SOLT3	Property(Data Type:Variant)	[No read]
.SOLT4	Property(Data Type:Variant)	[No read]
.TYPE	Property(Data Type:String)	[Read only]
.SAVE	Method	[No read]

7. COM Object Reference

COM Object Reference
COM Object Tree

Table 7-3 E5070A/E5071A COM object tree

Object	Object type	Note
SCPI		
.SENSE(<i>Ch</i>)		
.CORRection		
.EXTension		
.PORT(<i>Pt</i>)		
.TIME	Property(Data Type:Double)	
.STATE	Property(Data Type:Boolean)	
.PROPerTy	Property(Data Type:Boolean)	
.RVELocity		
.COAX	Property(Data Type:Double)	
.STATE	Property(Data Type:Boolean)	
.TYPE(<i>Tr</i>)	Property(Data Type:Variant)	[Read only]
.FREQuency		
.CENTer	Property(Data Type:Double)	
.DATA	Property(Data Type:Variant)	[Read only]
.SPAN	Property(Data Type:Double)	
.STARt	Property(Data Type:Double)	
.STOP	Property(Data Type:Double)	
.MULTiPlexer(<i>Id</i>)		
.COUNt	Property(Data Type:Long)	[Read only]
.DISPlay		
.STATE	Property(Data Type:Boolean)	
.STATE	Property(Data Type:Boolean)	
.TSET9		
.OUTPut		
.DATA	Property(Data Type:Long)	
.PORT1	Property(Data Type:String)	
.PORT2	Property(Data Type:String)	
.PORT3	Property(Data Type:String)	
.PORT4	Property(Data Type:String)	
.ROSCillator		
.SOURce	Property(Data Type:String)	[Read only]
.SEGMent		
.DATA	Property(Data Type:Variant)	
.SWEep		
.POINts	Property(Data Type:Long)	[Read only]
.TIME		
.DATA	Property(Data Type:Double)	[Read only]
.SWEep		
.ASPurious	Property(Data Type:Boolean)	
.DELay	Property(Data Type:Double)	
.GENeration	Property(Data Type:String)	
.POINts	Property(Data Type:Long)	
.TIME		
.AUTO	Property(Data Type:Boolean)	
.DATA	Property(Data Type:Double)	
.TYPE	Property(Data Type:String)	
.SOURce(<i>Ch</i>)		
.POWER		
.ATTenuation		
.DATA	Property(Data Type:Long)	
.LEVel		
.IMMEDIATE		
.AMPLitude	Property(Data Type:Double)	

Table 7-3 E5070A/E5071A COM object tree

Object	Object type	Note
SCPI		
.STATus		
.OPERation		
.CONDITION	Property(Data Type:Long)	[Read only]
.ENABLE	Property(Data Type:Long)	
.EVENT	Property(Data Type:Long)	[Read only]
.NTRansition	Property(Data Type:Long)	
.PTRansition	Property(Data Type:Long)	
.PRESet	Method	[No read]
.QUEStionable		
.CONDITION	Property(Data Type:Long)	[Read only]
.ENABLE	Property(Data Type:Long)	
.EVENT	Property(Data Type:Long)	[Read only]
.LIMit		
.CHANnel(<i>Ch</i>)		
.CONDITION	Property(Data Type:Long)	[Read only]
.ENABLE	Property(Data Type:Long)	
.EVENT	Property(Data Type:Long)	[Read only]
.NTRansition	Property(Data Type:Long)	
.PTRansition	Property(Data Type:Long)	
.CONDITION	Property(Data Type:Long)	[Read only]
.ENABLE	Property(Data Type:Long)	
.EVENT	Property(Data Type:Long)	[Read only]
.NTRansition	Property(Data Type:Long)	
.PTRansition	Property(Data Type:Long)	
.NTRansition	Property(Data Type:Long)	
.PTRansition	Property(Data Type:Long)	
.SYSTem		
.BACKlight	Property(Data Type:Boolean)	
.BEEPer		
.COMPLete		
.IMMediate	Method	[No read]
.STATe	Property(Data Type:Boolean)	
.WARNing		
.IMMediate	Method	[No read]
.STATe	Property(Data Type:Boolean)	
.CORRection		
.STATe	Property(Data Type:Boolean)	
.DATE	Property(Data Type:Variant)	
.ERRor	Property(Data Type:Variant)	[Read only]
.KLOCK		
.KBD	Property(Data Type:Boolean)	
.MOUSe	Property(Data Type:Boolean)	
.POFF	Method	[No read]
.PRESet	Method	[No read]
.SERVice	Property(Data Type:Boolean)	[Read only]
.TEMPerature		
.HIGH	Property(Data Type:Boolean)	
.STATe	Property(Data Type:Boolean)	[Read only]
.TIME	Property(Data Type:Variant)	
.TRIGger		
.SEQuence		
.IMMediate	Method	[No read]
.SINGle	Method	[No read]
.SOURce	Property(Data Type:String)	

Notational Rules of COM Objects

This section describes the rules for the description of the COM objects in this chapter.

Object Type

Part with heading "Object type" describes the type of the E5070A/E5071A COM object. The E5070A/E5071A provides properties and methods as the types of COM objects. In the E5070A/E5071A COM objects, COM objects to set (send)/read (return) the state of the E5070A/E5071A using variables are defined as property and ones to prompt some kind of processing as method.

Syntax

Part with heading "Syntax" describes the syntax to send a COM object from the E5070A/E5071A VBA to the E5070A/E5071A. The syntax consists of the object part and the set/read part, with an equal "=" inserted between them. Variables are indicated by italicized letters. Variables with () are indices. For indices with () having their preset values, you can omit "(*variable*)," and, if omitted, the preset values are automatically set.

There are the following 3 types of syntax for coding using objects.

"Object (property) = *variable*": to set the stat of the E5070A/E5071A.

variable=object (property): to read the stat of the E5070A/E5071A.

"Object (method)": to make the E5070A/E5071A perform some processing.

Description

Part with heading "Description" describes how to use the COM object or the operation when executed. COM objects used only to read the state of the E5070A/E5071A are indicated with "Read only" and ones used only to set the state of the E5070A/E5071A "No read."

Variable

Part with heading "Variable" describes necessary variables when using the object. It gives the description, data type, allowable range, preset value, unit, resolution, and notes for *variable* (*italic*) shown in the syntax.

Variables declared as the string data type (String) are case insensitive. For variables of the string type that indicate arguments (written as *Param* in the syntax), you can omit lower-case letters.

The data types of the E5070A/E5071A COM objects include 5 types as shown in Table 7-4. Before using variables, declare the data type of each variable. If you do not declare the data type of a variable, it is automatically dealt as the variant type.

Table 7-4 Data type

Data type	Name	Consumed memory	Range
Long	Long integer type	4 bytes	-2,147,483,648 to 2,147,483,647
Double	Double precision floating point type	8 bytes	For a negative value: -1.79769313486232E+308 to -4.94065645841247E-324 For a positive value: -1.79769313486232E+308 to -4.94065645841247E-324
Boolean	Boolean type	2 bytes	-1 (True) or 0 (False)
String	Character string type *1	1 byte/alphan umeric character	Up to approximately 2 billion characters
Variant	Variant type	16 bytes	No limitation

*1. For a fixed length string, declare the number of characters.

Examples

Part with heading "Examples" describes a simple example of how to use the object for coding with E5070A/E5071A VBA.

Related Objects

Part with heading "Related objects" describes related objects when using the object.

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, move the focus to the button called Item on the displayed menu using the **[←↓]** key and so on, and then press the **[Enter]** key.

Application Objects

The Application objects are at the top of the hierarchy of the E5070A/E5071A COM object model. They consist of 7 objects dedicated to the E5070A/E5071A COM interface and SCPI objects corresponding to SCPI commands. This section describes the objects dedicated to the E5070A/E5071A COM interface.

ECHO

Object type	Method						
Syntax	ECHO <i>V1,V2,...,V10</i> ECHO <i>SCPI object</i>						
Description	<p>Provides display in the echo window. (No read)</p> <p>There is the following difference from the display with the SCPI.DISPLAY.ECHO.DATA object.</p> <ul style="list-style-type: none"> • Up to 10 data items can be displayed. • Data is displayed as the declared data type without a cast. <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"></td> <td><i>V1,V2,...,V10</i></td> </tr> <tr> <td>Description</td> <td>Data you want to display in the echo window.</td> </tr> <tr> <td>Data type</td> <td>Variant type (Variant)</td> </tr> </table>		<i>V1,V2,...,V10</i>	Description	Data you want to display in the echo window.	Data type	Variant type (Variant)
	<i>V1,V2,...,V10</i>						
Description	Data you want to display in the echo window.						
Data type	Variant type (Variant)						
Examples (1)	<pre>Dim Nop As Long Dim i As Integer Dim Fdata As Variant Nop = SCPI.SENSE(1).SWEep.POINTs Fdata = SCPI.CALCulate(1).SElected.DATA.FDATA ECHO "Test Results" For i=1 to Nop ECHO i, Fdata(2*i-2), Fdata(2*i-1) Next i</pre>						
Examples (2)	ECHO SCPI.SYSTEM.ERROR						
Related objects	SCPI.DISPLAY.ECHO.DATA on page 287						
Equivalent key	No equivalent key is available on the front panel.						

NAME

Object type Property

Syntax *App* = NAME

Description Reads out the application name of VBA. "E5070A" or "E5071A" is always read out. (Read only)

Variable

	<i>App</i>
Description	Application name
Data type	Character string type (String)

Examples

```
Dim Inst As String
Inst = NAME
ECHO Inst
```

Equivalent key No equivalent key is available on the front panel.

Parse

Object type Method

Syntax `Parse(Scpi)`

Return = `Parse(Scpi?)`

Description Executes an SCPI command of the E5070A/E5071A. For information on the SCPI commands, see Chapter “SCPI Command Reference“ in the *E5070A/E5071A Programmer’s Guide*.

The **Parse** object is a little slower in the execution speed because it must parse the message string of the SCPI command.

Variable

	<i>Scpi</i>
Description	SCPI command
Data type	Character string type (String)

	<i>Return</i>
Description	Response (query) of the SCPI command
Data type	Character string type (String)

Examples (1) `Dim Start As String`
`Parse(":SENS1:FREQ:STAR 100E6")`
`Start = Parse(":SENS1:FREQ:STAR?")`

Examples (2) `Dim TtlLbl As String`
`Parse(":DISP:WIND1:TITL:DATA ""filter"")`
`TtlLbl = Parse(":DISP:WIND1:TITL:DATA?")`

Examples (3) `Dim Fmt As String`
`Parse(":CALC1:PAR2:SEL")`
`Parse(":CALC1:FORM SMIT")`
`Fmt = Parse(":CALC1:FORM?")`

Examples (4) `Dim BckLght As String`
`Parse(":SYST:BACK OFF")`
`BckLght = Parse(":SYST:BACK?")`

Equivalent key No equivalent key is available on the front panel.

Prompt

Object type	Method
Syntax	Prompt(<i>Mes</i>)
Description	Displays the message you specify on the instrument status bar (at the bottom of the LCD display) and suspends the program until the [Macro Setup] - Continue button is pressed. (No read)

NOTE When using this object, execute the program with the Visual Basic closed since you need to press the **[Macro Setup] - Continue**. For more information, see “Running a Program from the E5070A/E5071A Measurement Screen” on page 48. If you need to abort the program, see “Stopping with the Dialog Box Appeared” on page 48 .

Variable

	<i>Mes</i>
Description	Message
Data type	Character string type (String)

Examples Prompt("Connect DUT, and then press [Continue]")

Equivalent key No equivalent key is available on the front panel.

UserMenu.Item(*id*).Caption

Object type	Property
Syntax	UserMenu.Item(<i>id</i>).Caption = <i>Lbl</i> <i>Lbl</i> = UserMenu.Item(<i>id</i>).Caption
Description	Sets the label name of the user menu function softkeys 1 to 10 (<i>id</i>).
Variable	

Table 7-5

Variable (*id*)

	<i>id</i>
Description	Softkey number for the user menu function
Data type	Long integer type (Long)
Range	1 to 10
Note	You cannot omit this because it does not have a preset value. If the specified variable is out of the valid setting range, an error occurs when executed.

	<i>Lbl</i>
Description	Softkey label name for the user menu function
Data type	Character string type (String)
Preset value	Varies depending on the specified softkey number.

Example of use

```
Dim KeyLbl As String
UserMenu.Item(1).Caption = "Meas"
KeyLbl = UserMenu.Item(1).Caption
```

Equivalent key No equivalent key is available on the front panel.

UserMenu.Item(*id*).Enabled

Object type	Property
Syntax	UserMenu.Item(<i>id</i>).Enabled = <i>Status</i> <i>Status</i> = UserMenu.Item(<i>id</i>).Enabled
Description	Makes the user menu function softkeys 1 to 10 (<i>id</i>) enabled/disabled. The softkey label enabled is displayed with the grey color and its softkey cannot be pressed.
Variable	

	<i>Status</i>
Description	Enabled/disabled for the user menu function softkey
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> • True or -1 Makes the softkey enabled. • False or 0 Makes the softkey enabled.
Preset value	True or -1

For information on the variable (*id*), see Table 7-5, “Variable (*id*),” on page 156.

Example of use	<pre>Dim KeyEna As Boolean UserMenu.Item(10).Enabled = False KeyEna = UserMenu.Item(10).Enabled</pre>
Related objects	UserMenu.Press(<i>id</i>) on page 159
Equivalent key	No equivalent key is available on the front panel.

UserMenu_OnPress(ByVal *id* As Long)

Object type	Event
Description	Executes the processing when one of the user menu function softkeys 1 to 10 (<i>id</i>) is pressed. Write the processing in the "UserMenu" object. For more information on its use, see "Executing a Procedure with a Softkey (User Menu Function)" on page 72.
Variable	For information on the variable (<i>id</i>), see Table 7-5, "Variable (id)," on page 156.
Example of use	<pre>Private Sub UserMenu_OnPress (ByVal id As Long) If id = 1 Then MsgBox "Button 1 was pressed." ElseIf id = 10 Then MsgBox "Button 10 was pressed." End If End Sub</pre>
Equivalent key	No equivalent key is available on the front panel.

UserMenu.PRESet

Object type	Method
Syntax	UserMenu.PRESet
Description	Presets the label name and enabled/disabled settings for the user menu softkeys. (No read)
Example of use	<code>UserMenu.PRESet</code>
Related objects	UserMenu.Item(id).Caption on page 156 UserMenu.Item(id).Enabled on page 157
Equivalent key	[Macro Setup] - Preset User Menu

UserMenu.Press(*id*)

Object type	Method
Syntax	UserMenu.Press(<i>id</i>)
Description	Presses one of the user menu function softkeys 1 to 10 (<i>id</i>). (No read)
Variable	For information on the variable (<i>id</i>), see Table 7-5, “Variable (id),” on page 156.
Example of use	UserMenu.Press(1)
Related objects	UserMenu.Item(id).Enabled on page 157
Equivalent key	[Macro Setup] - User Menu - Button 1 Button 2 Button 3 Button 4 Button 5 Button 6 Button 7 Button 8 Button 9 Button 10

UserMenu.Show

Object type	Method
Syntax	UserMenu.Show
Description	Displays the user menu function softkeys in the softkey area. (No read)
Example of use	UserMenu.Show
Equivalent key	[Macro Setup] - User Menu

VBAVersion

Object type	Property
Syntax	<i>Vers</i> = VBAVersion
Description	Reads out the version information of VBA installed in the E5070A/E5071A. (Read only)
Variable	

	<i>Vers</i>
Description	VBA version information
Data type	Character string type (String)

Examples

```
Dim Version As String
Version = VBAVersion
ECHO Version
```

Equivalent key From the **Help** menu of the Visual Basic editor, click **About Microsoft Visual Basic...**

WaitOnSRQ

Object type	Method
Syntax	WaitOnSRQ <i>Status, Timeout</i>
Description	Suspends the program for specified time until the RQS/MSS bit (bit 6) of the status byte register changes to 1. For information on the structure of the status register, see Appendix “Status Reporting System“ in the <i>E5070A/E5071A Programmer’s Guide</i> . (No read)
Variable	

	<i>Status</i>
Description	State of the RQS/MSS bit (read only)
Data type	Boolean type (Boolean)
Range	One of the following is returned. <ul style="list-style-type: none"> • True or -1 1 has been received within the specified time. • False or 0 1 has not been received within the specified time due to timeout or abort.

	<i>Timeout</i>
Description	Timeout time
Data type	Long integer type (Long)
Range	0 to 2,147,483,647
Preset value	-1 (infinity)
Unit	ms (millisecond)
Note	If the specified variable 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.

Examples

```
Dim Stat As Boolean
SCPI.IEEE4882.CLS
SCPI.STATUS.OPERation.PTRansition = 0
SCPI.STATUS.OPERation.NTRansition = 16
SCPI.STATUS.OPERation.ENABLE = 16
SCPI.IEEE4882.SRE = 128
SCPI.TRIGger.SEQuence.SOURce = "bus"
SCPI.INITiate(1).CONTinuous = True
SCPI.TRIGger.SEQuence.IMMediate
WaitOnSRQ Stat, 10000
If Stat = True Then
    MsgBox "Done"
End If
```

Equivalent key No equivalent key is available on the front panel.

SCPI Objects

SCPI objects are a collection of the COM interface having one-on-one correspondence with the SCPI commands. This section describes the SCPI objects provided for the E5070A/E5071A.

SCPI.ABORT

Object type	Method
Syntax	SCPI.ABORT
Description	<p>Aborts the measurement and changes the trigger sequence for all channels to idle state.</p> <p>The channels for which the continuous startup mode is set to ON (setting to start up the trigger system continuously) change into the startup state immediately after the change to the idle state.</p> <p>For details about the trigger system, see Section “Trigger System“ in the <i>E5070A/E5071A Programmer’s Guide</i>. (No read)</p>
Examples	SCPI.ABORT
Related objects	SCPI.INITiate(Ch).IMMEDIATE on page 321 SCPI.INITiate(Ch).CONTinuous on page 320
Equivalent key	[Trigger] - Restart

SCPI.CALCulate(*Ch*).FSIMulator.BALun.CZConversion.BPORT(*Bpt*).Z0.R

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).FSIMulator.BALun.CZConversion.BPORT(<i>Bpt</i>).Z0.R = <i>Value</i> <i>Value</i> = SCPI.CALCulate(<i>Ch</i>).FSIMulator.BALun.CZConversion.BPORT(<i>Bpt</i>).Z0.R
Description	For balance ports 1 and 2 (<i>Bpt</i>) of channels 1 to 9 (<i>Ch</i>), sets the impedance value for the common port impedance conversion function.
Variable	

Table 7-6

Variable (*Ch*)

	<i>Ch</i>
Description	Channel number
Data type	Long integer type (Long)
Range	1 to 9
Preset value	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

Table 7-7

Variable (*Bpt*)

	<i>Bpt</i>
Description	Balance port number*1
Data type	Long integer type (Long)
Range	1 to 2
Preset value	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

*1. Specify the balance ports assigned with the SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology.BBALanced.PPORTs object, the SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology.SBALanced.PPORTs object, and the SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology.SSBALanced.PPORTs object on the order base. For more information on assigning the balance ports, see Figure 7-2 on page 166.

	<i>Value</i>
Description	Impedance value for the common port impedance conversion function
Data type	Double precision floating point type (Double)
Range	1E-3 to 1E7
Preset value	25
Unit	Ω (ohm)
Resolution	0.001
Note	If the specified variable 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.

Examples

```
Dim CZ0 As Double
SCPI.CALCulate(1).FSIMulator.BALun.CZConversion.BPORT(1).Z0.R = 30
CZ0 = SCPI.CALCulate(1).FSIMulator.BALun.CZConversion.BPORT(1).Z0.R
```

Related objects

SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion.STATE on page 165

Equivalent key**[Analysis] - Fixture Simulator - Cmn ZConversion - Port1(bal)|Port2(bal)|Port3(bal)**

SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion. STATE

Object type	Property
Syntax	SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion.STATE = <i>Status</i> <i>Status</i> = SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion.STATE
Description	For all the balance ports of channels 1 to 9 (<i>Ch</i>), turns ON/OFF the common port impedance conversion function when the fixture simulator function is ON.
Variable	

	<i>Status</i>
Description	ON/OFF of the common port impedance conversion function
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> • True or -1 Turns ON the common port impedance conversion function. • False or 0 Turns OFF the common port impedance conversion function.
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

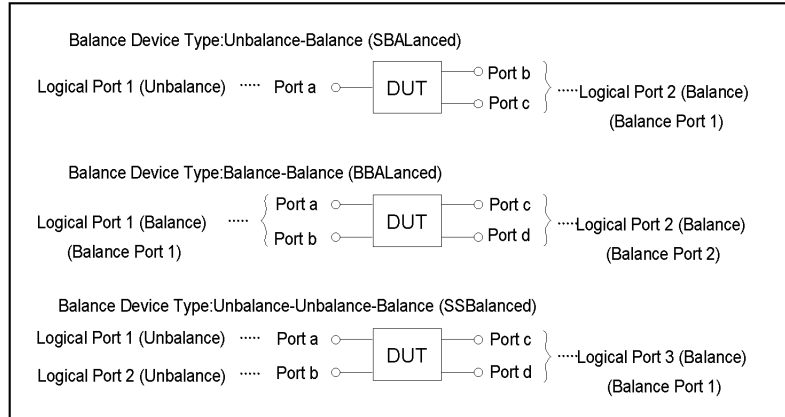
Examples	Dim ComZcon As Boolean SCPI.CALCulate(1).FSIMulator.BALun.CZConversion.STATE = True ComZcon = SCPI.CALCulate(1).FSIMulator.BALun.CZConversion.STATE
Related objects	SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion. BPORT(Bpt).Z0.R on page 163
Equivalent key	[Analysis] - Fixture Simulator - Cmn ZConversion - Cmn ZConversion

SCPI.CALCulate(Ch).FSIMulator.BALun.DEVICE

Object type	Property
Syntax	SCPI.CALCulate(Ch).FSIMulator.BALun.DEVICE = <i>Param</i> <i>Param</i> = SCPI.CALCulate(Ch).FSIMulator.BALun.DEVICE
Description	For channels 1 to 9 (<i>Ch</i>), selects the balance device type of the fixture simulator function.

Figure 7-2

Balance device type



e5070ape019

Variable

	<i>Param</i>
Description	Balance device type (See Figure 7-2)
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"SBALanced" Specifies the unbalance-balance (3 ports). •"BBALanced" Specifies the balance-balance (4 ports). •"SSBALanced" Specifies the unbalance-unbalance-balance (4 ports).
Preset value	"SBALanced"

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim BalDev As String
SCPI.CALCulate(1).FSIMulator.BALun.DEVICE = "bbal"
BalDev = SCPI.CALCulate(1).FSIMulator.BALun.DEVICE
```

Related objects

- SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology. BBALanced.PPORTs on page 180
- SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology. SBALanced.PPORTs on page 181
- SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology. SSBALanced.PPORTs on page 182

Equivalent key

[Analysis] - Fixture Simulator - Topology - Device

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.C

Object type Property

Syntax SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit.BPORT(*Bpt*).PARAMeters.C = *Value*
Value = SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit.BPORT(*Bpt*).PARAMeters.C

Description For balance port 1 and balance port 2 (*Bpt*) of channel 1 to 9 (*Ch*), sets the C value of the differential matching circuit consisting of shunt L and shunt C (PLPC is specified with the SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE object).

Variable

	<i>Value</i>
Description	C value of the differential matching circuit
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	0
Unit	F (farad)
Resolution	1E-18
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Bpt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-7, “Variable (Bpt),” on page 163, respectively.

Examples

```
Dim DmC As Double
SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.BPORT(1).PARAMeters.C = 12E-12
DmC = SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.BPORT(1).PARAMeters.C
```

Related objects

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.G on page 168

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.L on page 169

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.R on page 170

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE on page 171

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. STAtE on page 173

Equivalent key **[Analysis] - Fixture Simulator - Diff Matching - C**

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.G

Object type Property

Syntax SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit.BPORT(*Bpt*).PARAMeters.G = *Value*
Value = SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit.BPORT(*Bpt*).PARAMeters.G

Description For balance port 1 and balance port 2 (*Bpt*) of channel 1 to 9 (*Ch*), sets the G value of the differential matching circuit consisting of shunt L and shunt C (PLPC is specified with the SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).TYPE object).

Variable

	<i>Value</i>
Description	G value of the differential matching circuit
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	0
Unit	S (siemens)
Resolution	1E-18
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Bpt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-7, “Variable (Bpt),” on page 163, respectively.

Examples

```
Dim DmcG As Double
SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.BPORT(1).PARAMeters.G = 12E-12
DmcG = SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.BPORT(1).PARAMeters.G
```

Related objects

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.C on page 167

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.L on page 169

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.R on page 170

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).TYPE on page 171

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. STATE on page 173

Equivalent key

[Analysis] - Fixture Simulator - Diff Matching - G

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.L

- Object type** Property
- Syntax** SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit.BPORT(*Bpt*).PARAMeters.L = *Value*
Value = SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit.BPORT(*Bpt*).PARAMeters.L
- Description** For balance port 1 and balance port 2 (*Bpt*) of channel 1 to 9 (*Ch*), sets the L value of the differential matching circuit consisting of shunt L and shunt C (PLPC is specified with the SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE object).

Variable

	<i>Value</i>
Description	L value of the differential matching circuit
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	0
Unit	H (henry)
Resolution	1E-18
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Bpt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-7, “Variable (Bpt),” on page 163, respectively.

- Examples**
- ```
Dim DmcL As Double
SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.BPORT(1).PARAMeters.L
= 12E-12
DmcL =
SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.BPORT(1).PARAMeters.L
```

- Related objects**
- SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.C on page 167
  - SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.G on page 168
  - SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.R on page 170
  - SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE on page 171
  - SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. STATE on page 173

- Equivalent key** **[Analysis] - Fixture Simulator - Diff Matching - L**

## SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.R

Object type Property

Syntax SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit.BPORT(*Bpt*).PARAMeters.R = *Value*  
*Value* = SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit.BPORT(*Bpt*).PARAMeters.R

Description For balance port 1 and balance port 2 (*Bpt*) of channel 1 to 9 (*Ch*), sets the R value of the differential matching circuit consisting of shunt L and shunt C (PLPC is specified with the SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).TYPE object).

Variable

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | R value of the differential matching circuit                                                                                                                                                                 |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | -1E18 to 1E18                                                                                                                                                                                                |
| Preset value | 0                                                                                                                                                                                                            |
| Unit         | $\Omega$ (ohm)                                                                                                                                                                                               |
| Resolution   | 1E-18                                                                                                                                                                                                        |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*) and the variable (*Bpt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-7, “Variable (Bpt),” on page 163, respectively.

Examples

```
Dim DmcR As Double
SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.BPORT(1).PARAMeters.R = 12E-12
DmcR = SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.BPORT(1).PARAMeters.R
```

Related objects

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.C on page 167

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.G on page 168

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.L on page 169

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).TYPE on page 171

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. STATE on page 173

Equivalent key

[Analysis] - Fixture Simulator - Diff Matching - R

## SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).TYPE

|             |                                                                                                                                                                                                                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                                                                                                  |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.DMCircuit.BPORT( <i>Bpt</i> ).TYPE = <i>Param</i><br><i>Param</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.DMCircuit.BPORT( <i>Bpt</i> ).TYPE                                                                                          |
| Description | For balance ports 1 and 2 ( <i>Bpt</i> ) of channels 1 to 9 ( <i>Ch</i> ), selects the type of the differential matching circuit. For information on the model of the differential matching circuit, see Section “Evaluating Balanced Devices“ in the <i>E5070A/E5071A User’s Guide</i> . |

### Variable

|              | <i>Param</i>                                                                                                                                                                                                                                                                                                                       |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Type of the differential matching circuit                                                                                                                                                                                                                                                                                          |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                     |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"NONE"                      Specifies no-circuit.</li> <li>•"PLPC"                      Specifies the circuit that consists of shunt L and shunt C.</li> <li>•"USER"                      Specifies the user-defined circuit<sup>*1</sup>.</li> </ul>        |
| Preset value | "NONE"                                                                                                                                                                                                                                                                                                                             |
| Note         | 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 when executed and NONE is automatically selected. |

\*1. The information on the circuit is read out from the 2-port touchstone file specified with the SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).USER.FILEname object.

For information on the variable (*Ch*) and the variable (*Bpt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-7, “Variable (Bpt),” on page 163, respectively.

### Examples

```
Dim CirType As String
SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.BPORT(1).TYPE = "plpc"
CirType = SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.BPORT(1).TYPE
```

### Related objects

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.C on page 167

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.G on page 168

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.L on page 169

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.R on page 170

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).USER.FILEname on page 172

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. STATE on page 173

### Equivalent key

**[Analysis] - Fixture Simulator - Diff Matching - Select Circuit**

**SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit.  
BPORT(Bpt).USER.FILename**

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Syntax      | SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit.BPORT(Bpt).USER.FILename = <i>File</i><br><i>File</i> = SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit.BPORT(Bpt).USER.FILename                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Description | <p>For balance ports 1 and 2 (<i>Bpt</i>) of channels 1 to 9 (<i>Ch</i>), specifies the file in which the information on the user-defined differential matching circuit is saved (2-port touchstone file with the .s2p extension).</p> <p>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 (folder names) and file name, separate them with "\" (back slash), or "/" (slash).</p> <p>Even if the specified file does not exist, no error occurs when you execute this object. However, when you set the type of the differential matching circuit to the user-defined circuit with the SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit.BPORT(Bpt).TYPE object, an error occurs when executed.</p> |

## Variable

|              | <i>File</i>                                                                         |
|--------------|-------------------------------------------------------------------------------------|
| Description  | 2-port touchstone file name (extension: .s2p) for the differential matching circuit |
| Data type    | Character string type (String)                                                      |
| Range        | 254 characters or less                                                              |
| Preset value | ""                                                                                  |

For information on the variable (*Ch*) and the variable (*Bpt*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-7, "Variable (Bpt)," on page 163, respectively.

|          |                                                                                                                                                                                                                                                                    |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples | <pre>Dim DmcUser As String SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.BPORT(1).USER.FILename = "dmc.s2p" DmcUser = SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.BPORT(1).USER.FILename SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.BPORT(1).TYPE = "user"</pre> |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                                                                                                |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Related objects | SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE on page 171<br>SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. STATE on page 173 |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------|

|                |                                                                   |
|----------------|-------------------------------------------------------------------|
| Equivalent key | <b>[Analysis] - Fixture Simulator - Diff Matching - User File</b> |
|----------------|-------------------------------------------------------------------|



## SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. **STATE**

**Object type** Property

**Syntax** SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit.STATE = *Status*  
*Status* = SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit.STATE

**Description** For all the balance ports of channels 1 to 9 (*Ch*), turns ON/OFF the differential matching circuit embedding function when the fixture simulator function is ON.

**Variable**

|              | <i>Status</i>                                                                                                                                                                                                                                                                             |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | ON/OFF of the differential matching circuit embedding function                                                                                                                                                                                                                            |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                                                                    |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns ON the differential matching circuit embedding function.</li> <li>•False or 0                      Turns OFF the differential matching circuit embedding function.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                                                                                |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

**Examples**

```
Dim DifMch As Boolean
SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.STATE = True
DifMch = SCPI.CALCulate(1).FSIMulator.BALun.DMCircuit.STATE
```

**Related objects**

- SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.C on page 167
- SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.G on page 168
- SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.L on page 169
- SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.R on page 170
- SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).USER.FILename on page 172
- SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE on page 171
- SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr). STATE on page 179
- SCPI.CALCulate(Ch).FSIMulator.STATE on page 195

**Equivalent key**

**[Analysis] - Fixture Simulator - Diff Matching - Diff Matching**

**SCPI.CALCulate(*Ch*).FSIMulator.BALun.DZConversion.BPORT(*Bpt*).Z0.R**

|             |                                                                                                                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                               |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.DZConversion.BPORT( <i>Bpt</i> ).Z0.R = <i>Value</i><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.DZConversion.BPORT( <i>Bpt</i> ).Z0.R |
| Description | For balance ports 1 and 2 ( <i>Bpt</i> ) of channels 1 to 9 ( <i>Ch</i> ), sets the impedance value for the differential port impedance conversion function.                                           |

## Variable

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Impedance value for the differential port impedance conversion function                                                                                                                                      |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | 1E-3 to 1E7                                                                                                                                                                                                  |
| Preset value | 100                                                                                                                                                                                                          |
| Unit         | $\Omega$ (ohm)                                                                                                                                                                                               |
| Resolution   | 0.001                                                                                                                                                                                                        |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*) and the variable (*Bpt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-7, “Variable (Bpt),” on page 163, respectively.

|                 |                                                                                                                                                                 |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | Dim DZ0 As Double<br>SCPI.CALCulate(1).FSIMulator.BALun.DZConversion.BPORT(1).Z0.R = 200<br>DZ0 = SCPI.CALCulate(1).FSIMulator.BALun.DZConversion.BPORT(1).Z0.R |
| Related objects | SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion.STATE on page 175                                                                                              |
| Equivalent key  | <b>[Analysis] - Fixture Simulator - DiffZConversion - Port1(bal) Port2(bal) Port3(bal)</b>                                                                      |

**SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion. STATE**

|             |                                                                                                                                                                         |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                |
| Syntax      | SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion.STATE = <i>Status</i><br><i>Status</i> = SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion.STATE                        |
| Description | For all the balance ports of channels 1 to 9 ( <i>Ch</i> ), turns ON/OFF the differential port impedance conversion function when the fixture simulator function is ON. |
| Variable    |                                                                                                                                                                         |

|              | <i>Status</i>                                                                                                                                                                                                                                                                             |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | ON/OFF of the differential port impedance conversion function                                                                                                                                                                                                                             |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                                                                    |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>• True or -1                      Turns ON the differential port impedance conversion function.</li> <li>• False or 0                      Turns OFF the differential port impedance conversion function.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                                                                                |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

|                 |                                                                                                                                                                |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim DifZcon As Boolean SCPI.CALCulate(1).FSIMulator.BALun.DZConversion.STATE = True DifZcon = SCPI.CALCulate(1).FSIMulator.BALun.DZConversion.STATE</pre> |
| Related objects | SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion. BPORT(Bpt).Z0.R on page 174                                                                                  |
| Equivalent key  | <b>[Analysis] - Fixture Simulator - Diff ZConversion - Diff ZConversion</b>                                                                                    |

## SCPI.CALCulate(*Ch*).FSIMulator.BALun.PARAmeter(*Tr*).BBALanced.DEFINE

|             |                                                                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                   |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.PARAmeter( <i>Tr</i> ).BBALanced.DEFINE = <i>Param</i><br><i>Param</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.PARAmeter( <i>Tr</i> ).BBALanced.DEFINE |
| Description | For traces 1 to 9 ( <i>Tr</i> ) of channels 1 to 9 ( <i>Ch</i> ), sets the measurement parameter when the balance device type is "balance-balance."                                                        |

### Variable

|              | <i>Param</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Measurement parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"SDD11"                Specifies Sdd11.</li> <li>•"SDD21"                Specifies Sdd21.</li> <li>•"SDD12"                Specifies Sdd12.</li> <li>•"SDD22"                Specifies Sdd22.</li> <li>•"SCD11"                Specifies Scd11.</li> <li>•"SCD21"                Specifies Scd21.</li> <li>•"SCD12"                Specifies Scd12.</li> <li>•"SCD22"                Specifies Scd22.</li> <li>•"SDC11"                Specifies Sdc11.</li> <li>•"SDC21"                Specifies Sdc21.</li> <li>•"SDC12"                Specifies Sdc12.</li> <li>•"SDC22"                Specifies Sdc22.</li> <li>•"SCC11"                Specifies Scc11.</li> <li>•"SCC21"                Specifies Scc21.</li> <li>•"SCC12"                Specifies Scc12.</li> <li>•"SCC22"                Specifies Scc22.</li> <li>•"IMB1"                 Specifies Imbalance1.</li> <li>•"IMB2"                 Specifies Imbalance2.</li> <li>•"CMRR"                 Specifies CMRR (Sdd21/Sc21).</li> </ul> |
| Preset value | "SDD11"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-9, "Variable (Tr)," on page 198, respectively.

### Examples

```
Dim BbalPara As String
SCPI.CALCulate(1).FSIMulator.BALun.DEVICE = "bbal"
SCPI.CALCulate(1).FSIMulator.BALun.PARAmeter(1).BBALanced.DEFINE = "sdd21"
BbalPara = SCPI.CALCulate(1).FSIMulator.BALun.PARAmeter(1).BBALanced.DEFINE
```

### Related objects

SCPI.CALCulate(Ch).FSIMulator.BALun.DEVICE on page 166

### Equivalent key

**[Analysis] - Fixture Simulator|[Meas] - Sdd11|Sdd21|Sdd12|Sdd22|Scd11|Scd21|Scd12|Scd22|Sdc11|Sdc21|Sdc12|Sdc22|Sc21|Sc22|Sc11|Sc12|Sc21|Sc22|Imbalance1|Imbalance2|Sdd21/Sc21**

**SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr). SBALanced.DEFine**

|             |                                                                                                                                                                        |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                               |
| Syntax      | SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).SBALanced.DEFine = <i>Param</i><br><i>Param</i> = SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).SBALanced.DEFine |
| Description | For traces 1 to 9 ( <i>Tr</i> ) of channels 1 to 9 ( <i>Ch</i> ), sets the measurement parameter when the balance device type is "balance-balance."                    |

## Variable

|              | <i>Param</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Measurement parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"SSS11"                Specifies Sss11.</li> <li>•"SDS21"                Specifies Sds21.</li> <li>•"SSD12"                Specifies Ssd12.</li> <li>•"SCS21"                Specifies Scs21.</li> <li>•"SSC12"                Specifies Ssc12.</li> <li>•"SDD22"                Specifies Sdd22.</li> <li>•"SCD22"                Specifies Scd22.</li> <li>•"SDC22"                Specifies Sdc22.</li> <li>•"SCC22"                Specifies Scc22.</li> <li>•"IMB"                    Specifies Imbalance.</li> <li>•"CMRR"                 Specifies CMRR (Sds21/Scs21).</li> </ul> |
| Preset value | "SSS11"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-9, "Variable (Tr)," on page 198, respectively.

## Examples

```
Dim SbalPara As String
SCPI.CALCulate(1).FSIMulator.BALun.DEVICE = "sbal"
SCPI.CALCulate(1).FSIMulator.BALun.PARAmeter(1).SBALanced.DEFine = "scs21"
SbalPara = SCPI.CALCulate(1).FSIMulator.BALun.PARAmeter(1).SBALanced.DEFine
```

## Related objects

SCPI.CALCulate(Ch).FSIMulator.BALun.DEVICE on page 166

## Equivalent key

**[Analysis] - Fixture Simulator[Meas] - Sss11|Sds21|Ssd12|Scs21|Ssc12|Sdd22|Scd22|Sdc22|Scc22|Imbalance|Sds21/Scs21**

## SCPI.CALCulate(*Ch*).FSIMulator.BALun.PARAmeter(*Tr*).SSBalanced.DEFine

|             |                                                                                                                                                                                                              |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                     |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.PARAmeter( <i>Tr</i> ).SSBalanced.DEFine = <i>Param</i><br><i>Param</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.PARAmeter( <i>Tr</i> ).SSBalanced.DEFine |
| Description | For traces 1 to 9 ( <i>Tr</i> ) of channels 1 to 9 ( <i>Ch</i> ), sets the measurement parameter when the balance device type is "unbalance-unbalance-balance."                                              |

### Variable

|              | <i>Param</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Measurement parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"SSS11"                    Specifies Sss11.</li> <li>•"SSS21"                    Specifies Sss21.</li> <li>•"SSS12"                    Specifies Sss12.</li> <li>•"SSS22"                    Specifies Sss22.</li> <li>•"SDS31"                    Specifies Sds31.</li> <li>•"SDS32"                    Specifies Sds32.</li> <li>•"SSD13"                    Specifies Ssd13.</li> <li>•"SSD23"                    Specifies Ssd23.</li> <li>•"SCS31"                    Specifies Scs31.</li> <li>•"SCS32"                    Specifies Scs32.</li> <li>•"SSC13"                    Specifies Ssc13.</li> <li>•"SSC23"                    Specifies Ssc23.</li> <li>•"SDD33"                    Specifies Sdd33.</li> <li>•"SCD33"                    Specifies Scd33.</li> <li>•"SDC33"                    Specifies Sdc33.</li> <li>•"SCC33"                    Specifies Scc33.</li> <li>•"IMB1"                    Specifies Imbalance1.</li> <li>•"IMB2"                    Specifies Imbalance2.</li> <li>•"CMRR1"                    Specifies CMRR ( Sds31/Scs31).</li> <li>•"CMRR2"                    Specifies CMRR ( Sds32/Scs32).</li> </ul> |
| Preset value | "SSS11"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-9, "Variable (Tr)," on page 198, respectively.

### Examples

```
Dim SsbPara As String
SCPI.CALCulate(1).FSIMulator.BALun.DEVice = "ssb"
SCPI.CALCulate(1).FSIMulator.BALun.PARAmeter(1).SSBalanced.DEFine = "sds31"
SsbPara = SCPI.CALCulate(1).FSIMulator.BALun.PARAmeter(1).SSBalanced.DEFine
```

Related objects SCPI.CALCulate(Ch).FSIMulator.BALun.DEVice on page 166

Equivalent key **[Analysis] - Fixture Simulator|[Meas] - Sss11|Sss21|Sss12|Sss22|Sds31|Sds32|Ssd13|Ssd23|Scs31|Scs32|Ssc13|Ssc23|Sdd33|Scd33|Sdc33|Scc33|Imbalance1|Imbalance2|Sds31/Scs31|Sds32/Scs32**

## SCPI.CALCulate(*Ch*).FSIMulator.BALun.PARAmeter(*Tr*). STATE

- Object type** Property
- Syntax** SCPI.CALCulate(*Ch*).FSIMulator.BALun.PARAmeter(*Tr*).STATE = *Status*  
*Status* = SCPI.CALCulate(*Ch*).FSIMulator.BALun.PARAmeter(*Tr*).STATE
- Description** For traces 1 and 9 (*Tr*) of channels 1 to 9 (*Ch*), turns ON/OFF the balance-unbalance conversion function when the fixture simulator function is ON.
- Variable**

|              |                                                                                                                                                                                                                                                                       |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <i>Status</i>                                                                                                                                                                                                                                                         |
| Description  | ON/OFF of the balance-unbalance conversion function                                                                                                                                                                                                                   |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                                                |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>• True or -1                      Turns ON the balance-unbalance conversion function.</li> <li>• False or 0                      Turns OFF the balance-unbalance conversion function.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                                                            |

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-9, “Variable (Tr),” on page 198, respectively.

- Examples**
- ```
Dim BalMode As Boolean
SCPI.CALCulate(1).FSIMulator.BALun.PARAmeter(1).STATE = True
BalMode = SCPI.CALCulate(1).FSIMulator.BALun.PARAmeter(1).STATE
```
- Related objects** SCPI.CALCulate(Ch).FSIMulator.STATE on page 195
- Equivalent key** **[Analysis] - Fixture Simulator - BalUn**

SCPI.CALCulate(*Ch*).FSIMulator.BALun.TOPology.BBALanced.PPORts

Object type Property
 Syntax SCPI.CALCulate(*Ch*).FSIMulator.BALun.TOPology.BBALanced.PPORts = *Ports*
Ports = SCPI.CALCulate(*Ch*).FSIMulator.BALun.TOPology.BBALanced.PPORts

Description For channels 1 to 9 (*Ch*), assigns each port when the balance device type is "balance-balance."
 To set the balance device type to "balance-balance," specify BBAL with the SCPI.CALCulate(*Ch*).FSIMulator.BALun.DEVICE object.

Variable

	<i>Ports</i>
Description	Indicates 4-element array data (port number). <ul style="list-style-type: none"> • <i>Ports(0)</i> <i>Ports(1)</i> Port numbers assigned to logical port 1 (balance). (Port a and b in Figure 7-2 on page 166) • <i>Ports(2)</i> <i>Ports(3)</i> Port numbers assigned to logical port 2 (balance). (Port c and d in Figure 7-2 on page 166) The index of the array starts from 0.
Data type	Variant type (Variant)
Range	1 to 4
Preset value	Ports(0):1 / Ports(1):2 / Ports(2):3 / Ports(3):4
Resolution	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed. If you specify the same port number to 2 or more port numbers, an error occurs when executed.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples (1)

```
Dim BbalPort As Variant
SCPI.CALCulate(1).FSIMulator.BALun.DEVICE = "bbal"
SCPI.CALCulate(1).FSIMulator.BALun.TOPology.BBALanced.PPORts = Array(3,4,1,2)
BbalPort = SCPI.CALCulate(1).FSIMulator.BALun.TOPology.BBALanced.PPORts
```

Examples (2)

```
Dim BbalPort(3) As Variant
Dim Ref As Variant
BbalPort(0) = 3
BbalPort(1) = 4
BbalPort(2) = 1
BbalPort(3) = 2
SCPI.CALCulate(1).FSIMulator.BALun.DEVICE = "bbal"
SCPI.CALCulate(1).FSIMulator.BALun.TOPology.BBALanced.PPORts = BbalPort
Ref = SCPI.CALCulate(1).FSIMulator.BALun.TOPology.BBALanced.PPORts
```

Related objects SCPI.CALCulate(*Ch*).FSIMulator.BALun.DEVICE on page 166

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 port separately.

SCPI.CALCulate(*Ch*).FSIMulator.BALun.TOPology.SBALanced.PPORTs

Object type Property

Syntax SCPI.CALCulate(*Ch*).FSIMulator.BALun.TOPology.SBALanced.PPORTs = *Ports*
Ports = SCPI.CALCulate(*Ch*).FSIMulator.BALun.TOPology.SBALanced.PPORTs

Description For channels 1 to 9 (*Ch*), assigns each port when the balance device type is "unbalance-balance."
 To set the balance device type to "unbalance-balance," specify SBAL with the SCPI.CALCulate(Ch).FSIMulator.BALun.DEVICE object.

Variable

	<i>Ports</i>
Description	Indicates 3-element array data (port number). <ul style="list-style-type: none"> • <i>Ports(0)</i> Port number assigned to logical port 1 (unbalance). (Port a in Figure 7-2 on page 166) • <i>Ports(1)</i> <i>Ports(2)</i> Port numbers assigned to logical port 2 (balance). (Port b and c in Figure 7-2 on page 166) The index of the array starts from 0.
Data type	Variant type (Variant)
Range	1 to 4
Preset value	Ports(0):1 / Ports(1):2 / Ports(2):3
Resolution	1
Note	If the specified variable 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. If you specify the same port number to 2 or more port numbers, an error occurs when executed.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim SbalPort As Variant
SCPI.CALCulate(1).FSIMulator.BALun.DEVICE = "sbal"
SCPI.CALCulate(1).FSIMulator.BALun.TOPology.SBALanced.PPORTs = Array(1,3,4)
SbalPort = SCPI.CALCulate(1).FSIMulator.BALun.TOPology.SBALanced.PPORTs
```

Related objects SCPI.CALCulate(Ch).FSIMulator.BALun.DEVICE on page 166

Equivalent key **[Analysis] - Fixture Simulator - Topology - Port1(se)**
[Analysis] - Fixter Simulator - Topology - Port2(bal)

NOTE When performing the operation from the front panel, set each port separately.

SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.DEEMbed. PORT(*Pt*).TYPE

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).FSIMulator.SENDEd.DEEMbed.PORT(<i>Pt</i>).TYPE = <i>Param</i> <i>Param</i> = SCPI.CALCulate(<i>Ch</i>).FSIMulator.SENDEd.DEEMbed.PORT(<i>Pt</i>).TYPE
Description	For ports 1 and 4 (<i>Pt</i>) of channels 1 to 9 (<i>Ch</i>), selects the type of the network de-embedding.

Variable

Table 7-8

Variable (*Pt*)

	<i>Pt</i>
Description	Port number
Data type	Long integer type (Long)
Range	1 to 4
Preset value	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

	<i>Param</i>
Description	Type of the network de-embedding
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"NONE" Specifies no network de-embedding. •"USER" Specifies the user-defined network de-embedding*1.
Preset value	"NONE"
Note	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 when executed and NONE is automatically selected.

*1. The information on the network is read out from the 2-port touchstone file specified with the SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).USER.FILEname object.

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 163.

Examples

```
Dim DeemType As String
SCPI.CALCulate(1).FSIMulator.SENDEd.DEEMbed.PORT(1).USER.FILEname = "network.s2p"
SCPI.CALCulate(1).FSIMulator.SENDEd.DEEMbed.PORT(1).TYPE = "user"
DeemType = SCPI.CALCulate(1).FSIMulator.SENDEd.DEEMbed.PORT(1).TYPE
```

Related objects SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).USER.FILEname on page 184

SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. STATE on page 185

Equivalent key **[Analysis] - Fixture Simulator - De-Embedding - Select Type**

**SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed.
PORT(Pt).USER.FILename**

Object type Property

Syntax SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed.PORT(Pt).USER.FILename = *File*
File = SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed.PORT(Pt).USER.FILename

Description For ports 1 and 4 (*Pt*) of channels 1 to 9 (*Ch*), specifies the file in which the information on the user-defined network for the network de-embedding function is saved (2-port touchstone file with the .s2p 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 (folder names) and file name, separate them with "\" (back slash), or "/" (slash).

Even if the specified file does not exist, no error occurs when you execute this object. However, when you set the type of the network de-embedding to the user-defined network with the SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).TYPE object, an error occurs.

Variable

	<i>File</i>
Description	2-port touchstone file name (extension: .s2p) for the network de-embedding function
Data type	Character string type (String)
Range	254 characters or less
Preset value	""

For information on the variable (*Ch*) and the variable (*Pt*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-8, "Variable (Pt)," on page 183, respectively.

Examples

```
Dim DeemUser As String
SCPI.CALCulate(1).FSIMulator.SENDEd.DEEMbed.PORT(1).USER.FILename = "network.s2p"
DeemUser = SCPI.CALCulate(1).FSIMulator.SENDEd.DEEMbed.PORT(1).USER.FILename
SCPI.CALCulate(1).FSIMulator.SENDEd.DEEMbed.PORT(1).TYPE = "user"
```

Related objects SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).TYPE on page 183

SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. STATE on page 185

Equivalent key **[Analysis] - Fixture Simulator - De-Embedding - User File**

SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.DEEMbed. STATE

- Object type** Property
- Syntax** SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.DEEMbed.STATE = *Status*
Status = SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.DEEMbed.STATE
- Description** For all the ports of channel 1 to 9 (*Ch*), turns ON/OFF the network de-embedding function when the fixture simulator function is ON.
- Variable**

	<i>Status</i>
Description	ON/OFF of the network de-embedding function
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the network de-embedding function. •False or 0 Turns OFF the network de-embedding function.
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples**
- ```
Dim Deemb As Boolean
SCPI.CALCulate(1).FSIMulator.SENDEd.DEEMbed.STATE = True
Deemb = SCPI.CALCulate(1).FSIMulator.SENDEd.DEEMbed.STATE
```
- Related objects**
- SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).USER.FILEname on page 184
- SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).TYPE on page 183
- SCPI.CALCulate(Ch).FSIMulator.STATE on page 195
- Equivalent key** **[Analysis] - Fixture Simulator - De-Embedding - De-Embedding**

**SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.  
PORT(Pt).PARAmeters.C**

|                    |                                                                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Object type</b> | Property                                                                                                                                                                                           |
| <b>Syntax</b>      | SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).PARAmeters.C = <i>Value</i><br><i>Value</i> = SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).PARAmeters.C                         |
| <b>Description</b> | For ports 1 and 4 ( <i>Pt</i> ) of channels 1 to 9 ( <i>Ch</i> ), sets the C value of the matching circuit specified with the SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).TYPE object. |

**Variable**

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | C value of the matching circuit                                                                                                                                                                              |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | -1E18 to 1E18                                                                                                                                                                                                |
| Preset value | 0                                                                                                                                                                                                            |
| Unit         | F (farad)                                                                                                                                                                                                    |
| Resolution   | 1E-18                                                                                                                                                                                                        |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*) and the variable (*Pt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-8, “Variable (Pt),” on page 183, respectively.

**Examples**

```
Dim PmcC As Double
SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).PARAmeters.C = 12E-12
PmcC = SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).PARAmeters.C
```

**Related objects**

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).TYPE on page 190  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.G on page 187  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.L on page 188  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.R on page 189  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 192

**Equivalent key**

**[Analysis] - Fixture Simulator - Port Matching - C**

## **SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.PMCircuit. PORT(*Pt*).PARAmeters.G**

**Object type** Property

**Syntax** SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.PMCircuit.PORT(*Pt*).PARAmeters.G = *Value*  
*Value* = SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.PMCircuit.PORT(*Pt*).PARAmeters.G

**Description** For ports 1 and 4 (*Pt*) of channels 1 to 9 (*Ch*), sets the G value of the matching circuit specified with the SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).TYPE object.

**Variable**

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | G value of the matching circuit                                                                                                                                                                              |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | -1E18 to 1E18                                                                                                                                                                                                |
| Preset value | 0                                                                                                                                                                                                            |
| Unit         | S (siemens)                                                                                                                                                                                                  |
| Resolution   | 1E-18                                                                                                                                                                                                        |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*) and the variable (*Pt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-8, “Variable (Pt),” on page 183, respectively.

**Examples**

```
Dim PmcG As Double
SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).PARAmeters.G = 12E-12
PmcG = SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).PARAmeters.G
```

**Related objects**

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).TYPE on page 190

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.C on page 186

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.L on page 188

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.R on page 189

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 192

**Equivalent key** **[Analysis] - Fixture Simulator - Port Matching - G**

## SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.PMCircuit. PORT(*Pt*).PARAmeters.L

|             |                                                                                                                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                       |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).FSIMulator.SENDEd.PMCircuit.PORT( <i>Pt</i> ).PARAmeters.L = <i>Value</i><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.SENDEd.PMCircuit.PORT( <i>Pt</i> ).PARAmeters.L |
| Description | For ports 1 and 4 ( <i>Pt</i> ) of channels 1 to 9 ( <i>Ch</i> ), sets the L value of the matching circuit specified with the SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT( <i>Pt</i> ).TYPE object.    |

### Variable

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | L value of the matching circuit                                                                                                                                                                              |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | -1E18 to 1E18                                                                                                                                                                                                |
| Preset value | 0                                                                                                                                                                                                            |
| Unit         | H (henry)                                                                                                                                                                                                    |
| Resolution   | 1E-18                                                                                                                                                                                                        |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*) and the variable (*Pt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-8, “Variable (Pt),” on page 183, respectively.

### Examples

```
Dim PmcL As Double
SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).PARAmeters.L = 12E-12
PmcL = SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).PARAmeters.L
```

### Related objects

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).TYPE on page 190  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.C on page 186  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.G on page 187  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.R on page 189  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 192

### Equivalent key

**[Analysis] - Fixture Simulator - Port Matching - L**



## SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.PMCircuit. PORT(*Pt*).PARAmeters.R

**Object type** Property

**Syntax** SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.PMCircuit.PORT(*Pt*).PARAmeters.R = *Value*  
*Value* = SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.PMCircuit.PORT(*Pt*).  
 PARAmeters.R

**Description** For ports 1 and 4 (*Pt*) of channels 1 to 9 (*Ch*), sets the R value of the matching circuit specified with the SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).TYPE object.

**Variable**

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | R value of the matching circuit                                                                                                                                                                              |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | -1E18 to 1E18                                                                                                                                                                                                |
| Preset value | 0                                                                                                                                                                                                            |
| Unit         | $\Omega$ (ohm)                                                                                                                                                                                               |
| Resolution   | 1E-18                                                                                                                                                                                                        |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*) and the variable (*Pt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-8, “Variable (Pt),” on page 183, respectively.

**Examples**

```
Dim PmcR As Double
SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).PARAmeters.R = 12E-12
PmcR = SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).PARAmeters.R
```

**Related objects**

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).TYPE on page 190

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.C on page 186

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.G on page 187

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.L on page 188

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 192

**Equivalent key**

**[Analysis] - Fixture Simulator - Port Matching - R**

**SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.  
PORT(Pt).TYPE**

|             |                                                                                                                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                                                                                               |
| Syntax      | SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).TYPE = <i>Param</i><br><i>Param</i> = SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).TYPE                                                                                                                             |
| Description | For ports 1 and 4 ( <i>Pt</i> ) of channels 1 to 9 ( <i>Ch</i> ), selects the type of the matching circuit. For information on the model of the matching circuit, see Section “Determining Characteristics After Adding a Matching Circuit“ in the <i>E5070A/E5071A User’s Guide</i> . |

## Variable

|              | <i>Param</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Type of the matching circuit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"NONE"                      Specifies no-circuit.</li> <li>•"SLPC"                      Specifies the circuit that consists of series L and shunt C.</li> <li>•"PCSL"                      Specifies the circuit that consists of shunt C and series L.</li> <li>•"PLSC"                      Specifies the circuit that consists of shunt L and series C.</li> <li>•"SCPL"                      Specifies the circuit that consists of series C and shunt L.</li> <li>•"PLPC"                      Specifies the circuit that consists of shunt L and shunt C.</li> <li>•"USER"                      Specifies the user-defined circuit<sup>*1</sup>.</li> </ul> |
| Preset value | "NONE"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Note         | 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 when executed and NONE is automatically selected.                                                                                                                                                                                                                                                                                                                                                                                                      |

\*1. The information on the circuit is read out from the 2-port touchstone file specified with the SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).USER.FILEname object.

For information on the variable (*Ch*) and the variable (*Pt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-8, “Variable (Pt),” on page 183, respectively.

## Examples

```
Dim CirType As String
SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).TYPE = "slpc"
CirType = SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).TYPE
```

## Related objects

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.C on page 186

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.G on page 187

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.L on page 188

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.R on page 189

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).USER.FILEname on page 191

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 192

## Equivalent key

**[Analysis] - Fixture Simulator - Port Matching - Select Circuit**

## **SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).USER.FILename**

**Object type** Property

**Syntax** SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).USER.FILename = *File*  
*File* = SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).USER.FILename

**Description** For ports 1 and 4 (*Pt*) of channels 1 to 9 (*Ch*), 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 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 (folder names) and file name, separate them with "\" (back slash), or "/" (slash).

Even if the specified file does not exist, no error occurs when you execute this object. However, when you set the type of the matching circuit to the user-defined circuit with the SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).TYPE object, an error occurs.

**Variable**

|              |                                                                        |
|--------------|------------------------------------------------------------------------|
|              | <i>File</i>                                                            |
| Description  | 2-port touchstone file name (extension: .s2p) for the matching circuit |
| Data type    | Character string type (String)                                         |
| Range        | 254 characters or less                                                 |
| Preset value | ""                                                                     |

For information on the variable (*Ch*) and the variable (*Pt*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-8, "Variable (Pt)," on page 183, respectively.

**Examples**

```
Dim PmcUser As String
SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).USER.FILename = "match.s2p"
PmcUser = SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).USER.FILename
SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).TYPE = "user"
```

**Related objects** SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).TYPE on page 190  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 192

**Equivalent key** **[Analysis] - Fixture Simulator - Port Matching - User File**

**SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE**

|             |                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                           |
| Syntax      | SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.STATE = <i>Status</i><br><i>Status</i> = SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.STATE       |
| Description | For all the ports of channel 1 to 9 ( <i>Ch</i> ), turns ON/OFF the matching circuit embedding function when the fixture simulator function is ON. |

## Variable

|              | <i>Status</i>                                                                                                                                                                                                                                                     |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | ON/OFF of the matching circuit embedding function                                                                                                                                                                                                                 |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                                            |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>• True or -1                      Turns ON the matching circuit embedding function.</li> <li>• False or 0                      Turns OFF the matching circuit embedding function.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                                                        |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

## Examples

```
Dim Pmcir As Boolean
SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.STATE = True
Pmcir = SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.STATE
```

## Related objects

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).TYPE on page 190  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.C on page 186  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.G on page 187  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.L on page 188  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.R on page 189  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).USER.FILEname on page 191  
 SCPI.CALCulate(Ch).FSIMulator.STATE on page 195

## Equivalent key

**[Analysis] - Fixture Simulator - Port Matching - Port Matching**

**SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.ZCONversion. PORT(*Pt*).Z0.R**

|             |                                                                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                           |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).FSIMulator.SENDEd.ZCONversion.PORT( <i>Pt</i> ).Z0.R = <i>Value</i><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.SENDEd.ZCONversion.PORT( <i>Pt</i> ).Z0.R |
| Description | For ports 1 and 4 ( <i>Pt</i> ) of channels 1 to 9 ( <i>Ch</i> ), sets the impedance value for the port impedance conversion function.                                                             |
| Variable    |                                                                                                                                                                                                    |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Impedance value for the port impedance conversion function                                                                                                                                                   |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | 0.001 to 1E7                                                                                                                                                                                                 |
| Preset value | 50                                                                                                                                                                                                           |
| Unit         | $\Omega$ (ohm)                                                                                                                                                                                               |
| Resolution   | 0.001                                                                                                                                                                                                        |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*) and the variable (*Pt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-8, “Variable (Pt),” on page 183, respectively.

|                 |                                                                                                                                                                  |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | Dim ZconR As Double<br>SCPI.CALCulate(1).FSIMulator.SENDEd.ZCONversion.PORT(1).Z0.R = 75<br>ZconR = SCPI.CALCulate(1).FSIMulator.SENDEd.ZCONversion.PORT(1).Z0.R |
| Related objects | SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONversion. STATE on page 194                                                                                              |
| Equivalent key  | <b>[Analysis] - Fixture Simulator - Port ZConversion - Port1 Z0 Port2 Z0 Port3 Z0 Port4 Z0</b>                                                                   |

**SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONversion. STATE**

|             |                                                                                                                                                   |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                          |
| Syntax      | SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONversion.STATE = <i>Status</i><br><i>Status</i> = SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONversion.STATE  |
| Description | For all the ports of channel 1 to 9 ( <i>Ch</i> ), turns ON/OFF the port impedance conversion function when the fixture simulator function is ON. |
| Variable    |                                                                                                                                                   |

|              |                                                                                                                                                                                                                                                                 |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <i>Status</i>                                                                                                                                                                                                                                                   |
| Description  | ON/OFF of the port impedance conversion function                                                                                                                                                                                                                |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                                          |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>• True or -1                      Turns ON the port impedance conversion function.</li> <li>• False or 0                      Turns OFF the port impedance conversion function.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                                                      |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

|                 |                                                                                                                                                     |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | Dim Zcon As Boolean<br>SCPI.CALCulate(1).FSIMulator.SENDEd.ZCONversion.STATE = True<br>Zcon = SCPI.CALCulate(1).FSIMulator.SENDEd.ZCONversion.STATE |
| Related objects | SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONversion. PORT(Pt).Z0.R on page 193<br>SCPI.CALCulate(Ch).FSIMulator.STATE on page 195                      |
| Equivalent key  | <b>[Analysis] - Fixture Simulator - Port ZConversion - Port ZConversion</b>                                                                         |

## SCPI.CALCulate(*Ch*).FSIMulator.STATe

**Object type** Property

**Syntax** SCPI.CALCulate(*Ch*).FSIMulator.STATe = *Status*  
*Status* = SCPI.CALCulate(*Ch*).FSIMulator.STATe

**Description** Turns ON/OFF the fixture simulator function of channels 1 to 9 (*Ch*).

**Variable**

|              |                                                                                                                                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <b><i>Status</i></b>                                                                                                                                                                                |
| Description  | ON/OFF of the fixture simulator function                                                                                                                                                            |
| Data type    | Boolean type (Boolean)                                                                                                                                                                              |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•True or -1 Turns ON the fixture simulator function.</li> <li>•False or 0 Turns OFF the fixture simulator function.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                          |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

**Examples**

```
Dim FxtSim As Boolean
SCPI.CALCulate(1).FSIMulator.STATe = True
FxtSim = SCPI.CALCulate(1).FSIMulator.STATe
```

**Equivalent key** **[Analysis] - Fixture Simulator - Fixture Simulator**

## SCPI.CALCulate(*Ch*).PARAmeter.COUNT

|             |                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                 |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).PARAmeter.COUNT = <i>Value</i><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).PARAmeter.COUNT |
| Description | Sets the number of traces of channels 1 to 9 ( <i>Ch</i> ).                                                              |
| Variable    |                                                                                                                          |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Number of traces                                                                                                                                                                                             |
| Data type    | Long integer type (Long)                                                                                                                                                                                     |
| Range        | 1 to 9                                                                                                                                                                                                       |
| Preset value | 1                                                                                                                                                                                                            |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

**Examples**

```
Dim TraceNum As Long
SCPI.CALCulate(1).PARAmeter.COUNT = 4
TraceNum = SCPI.CALCulate(1).PARAmeter.COUNT
```

**Equivalent key**     **[Display] - Num of Traces**



## SCPI.CALCulate(*Ch*).PARAmeter(*Tr*).DEFine

|             |                                                                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                             |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).PARAmeter( <i>Tr</i> ).DEFine = <i>Param</i><br><i>Param</i> = SCPI.CALCulate( <i>Ch</i> ).PARAmeter( <i>Tr</i> ).DEFine |
| Description | For channels 1 to 9 ( <i>Ch</i> ), sets the measurement parameter of traces 1 to 9 ( <i>Tr</i> ).                                                    |
| Variable    |                                                                                                                                                      |

|              | <i>Param</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Measurement parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"S11"                 Specifies S11.</li> <li>•"S21"                 Specifies S21.</li> <li>•"S31"                 Specifies S31.</li> <li>•"S41"                 Specifies S41.</li> <li>•"S12"                 Specifies S12.</li> <li>•"S22"                 Specifies S22.</li> <li>•"S32"                 Specifies S32.</li> <li>•"S42"                 Specifies S42.</li> <li>•"S13"                 Specifies S13.</li> <li>•"S23"                 Specifies S23.</li> <li>•"S33"                 Specifies S33.</li> <li>•"S43"                 Specifies S43.</li> <li>•"S14"                 Specifies S14.</li> <li>•"S24"                 Specifies S24.</li> <li>•"S34"                 Specifies S34.</li> <li>•"S44"                 Specifies S44.</li> </ul> |
| Preset value | "S11"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-9, “Variable (Tr),” on page 198, respectively.

**Examples**

```
Dim MeasPara As String
SCPI.CALCulate(1).PARAmeter(1).DEFine = "s21"
MeasPara = SCPI.CALCulate(1).PARAmeter(1).DEFine
```

**Equivalent key**     **[Meas] - S11|S21|S31|S41|S12|S22|S32|S42|S13|S23|S33|S43|S14|S24|S34|S44**

## SCPI.CALCulate(*Ch*).PARAmeter(*Tr*).SElect

Object type Method

Syntax SCPI.CALCulate(*Ch*).PARAmeter(*Tr*).SElect

Description Sets traces 1 to 9 (*Tr*) of channels 1 to 9 (*Ch*) to the active trace.  
You can set only a trace displayed to the active trace. If this object is used to set a trace not displayed to the active trace, an error occurs when executed and the object is ignored. (No read)

Variable

Table 7-9

### Variable (*Tr*)

|              | <i>Tr</i>                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------|
| Description  | Trace number                                                                                  |
| Data type    | Long integer type (Long)                                                                      |
| Range        | 1 to 9                                                                                        |
| Preset value | 1                                                                                             |
| Note         | If the specified variable is out of the allowable setup range, an error occurs when executed. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples SCPI.CALCulate(2).PARAmeter(2).SElect

Related objects SCPI.DISPlay.WINDow(Ch).ACTivate on page 297

Equivalent key **[Trace Prev]** / **[Trace Next]**

## SCPI.CALCulate(*Ch*).SElected.CONVersion.FUNCTION

**Object type** Property

**Syntax** SCPI.CALCulate(*Ch*).SElected.CONVersion.FUNCTION = *Param*  
*Param* = SCPI.CALCulate(*Ch*).SElected.CONVersion.FUNCTION

**Description** For the active trace of channels 1 to 9 (*Ch*), select the parameter after conversion using the parameter conversion function.

**Variable**

|              | <i>Param</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | The parameter after conversion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"ZREflection"      Specifies the equivalent impedance in reflection measurement.</li> <li>•"ZTRansmit"      Specifies the equivalent impedance in transmission measurement.</li> <li>•"YREflection"      Specifies the equivalent admittance in reflection measurement.</li> <li>•"YTRansmit"      Specifies the equivalent admittance in transmission measurement.</li> <li>•"INVersion"      Specifies the inverse S-parameter.</li> </ul> |
| Preset value | "ZREflection"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 163.

**Examples**

```
Dim Func As String
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.CONVersion.FUNCTION = "ztr"
Func = SCPI.CALCulate(1).SElected.CONVersion.FUNCTION
```

**Related objects** SCPI.CALCulate(Ch).SElected.CONVersion.STATE on page 200  
SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198

**Equivalent key** **[Analysis] - Conversion - Z:Reflection|Z:Transmission|Y:Reflection|Y:Transmission|1/S**

## SCPI.CALCulate(*Ch*).SElected.CONVersion.STATe

|             |                                                                                                                                                |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                       |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.CONVersion.STATe = <i>Status</i><br><i>Status</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.CONVersion.STATe |
| Description | For the active trace of channels 1 to 9 ( <i>Ch</i> ), turns ON/OFF the parameter conversion function.                                         |
| Variable    |                                                                                                                                                |

|              |                                                                                                                                                                                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <i>Status</i>                                                                                                                                                                                                                                       |
| Description  | ON/OFF of the parameter conversion function                                                                                                                                                                                                         |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                              |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns ON the parameter conversion function.</li> <li>•False or 0                      Turns OFF the parameter conversion function.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                                          |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

|                 |                                                                                                                                                                            |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Conv As Boolean SCPI.CALCulate(1).PARAMeter(1).SElect SCPI.CALCulate(1).SElected.CONVersion.STATe = True Conv = SCPI.CALCulate(1).SElected.CONVersion.STATe</pre> |
| Related objects | <p>SCPI.CALCulate(<i>Ch</i>).SElected.CONVersion.FUNcTION on page 199</p> <p>SCPI.CALCulate(<i>Ch</i>).PARAMeter(<i>Tr</i>).SElect on page 198</p>                         |
| Equivalent key  | <b>[Analysis] - Conversion - Conversion</b>                                                                                                                                |

## SCPI.CALCulate(*Ch*).SElected.CORRection.EDElay. TIME

|             |                                                                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                 |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.CORRection.EDElay.TIME = <i>Value</i><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.CORRection.EDElay.TIME |
| Description | Sets the electrical delay time of the active trace of channels 1 to 9 ( <i>Ch</i> ).                                                                     |
| Variable    |                                                                                                                                                          |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Electrical delay time                                                                                                                                                                                        |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | -10 to 10                                                                                                                                                                                                    |
| Preset value | 0                                                                                                                                                                                                            |
| Unit         | s (second)                                                                                                                                                                                                   |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

**Examples**

```
Dim Edel As Double
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.CORRection.EDElay.TIME = 0.2
Edel = SCPI.CALCulate(1).SElected.CORRection.EDElay.TIME
```

**Related objects** SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198

**Equivalent key** **[Scale] - Electrical Delay**

**SCPI.CALCulate(*Ch*).SElected.CORRection.OFFSet.PHASE**

|             |                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                   |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.CORRection.OFFSet.PHASE = <i>Value</i><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.CORRection.OFFSet.PHASE |
| Description | Sets the phase offset of the active trace of channels 1 to 9 ( <i>Ch</i> ).                                                                                |
| Variable    |                                                                                                                                                            |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Phase offset                                                                                                                                                                                                 |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | -360 to 360                                                                                                                                                                                                  |
| Preset value | 0                                                                                                                                                                                                            |
| Unit         | ° (degree)                                                                                                                                                                                                   |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

|                 |                                                                                                                                                                                            |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Offset As Double SCPI.CALCulate(2).PARAMeter(1).SElect SCPI.CALCulate(2).SElected.CORRection.OFFSet.PHASE = 2.5 Offset = SCPI.CALCulate(2).SElected.CORRection.OFFSet.PHASE</pre> |
| Related objects | SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198                                                                                                                                        |
| Equivalent key  | <b>[Scale] - Phase Offset</b>                                                                                                                                                              |

## SCPI.CALCulate(Ch).SElected.DATA.FDATA

**Object type** Property

**Syntax** SCPI.CALCulate(Ch).SElected.DATA.FDATA = *Data*  
*Data* = SCPI.CALCulate(Ch).SElected.DATA.FDATA

**Description** For the active trace of channels 1 to 9 (*Ch*), sets/reads out the formatted data array. The array data element varies in the data format (specified with the SCPI.CALCulate(Ch).SElected.FORMAT object). For more information on the formatted data array, see Section “Internal Data Processing“ in the *E5070A/E5071A Programmer’s Guide*.

**Variable**

|             | <i>Data</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | Indicates the array data (formatted data array) of NOP (number of measurement points)×2. Where n is an integer between 1 and NOP.<br><ul style="list-style-type: none"> <li>• <i>Data(n×2-2)</i> Data (primary value) at the n-th measurement point.</li> <li>• <i>Data(n×2-1)</i> 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.</li> </ul> The index of the array starts from 0. |
| Data type   | Variant type (Variant)                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Note        | If there is no array data of NOP (number of measurement point)×2 when setting a formatted data array, an error occurs when executed and the object is ignored.                                                                                                                                                                                                                                                                                                             |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

**Examples**

```
Dim FmtData As Variant
SCPI.SENSE(1).SWEep.POINTs = 201
SCPI.CALCulate(1).PARAmeter(1).SElect
FmtData = SCPI.CALCulate(1).SElected.DATA.FDATA
SCPI.CALCulate(1).PARAmeter(2).SElect
SCPI.CALCulate(1).SElected.DATA.FDATA = FmtData
```

**Related objects**

- SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198
- SCPI.SENSE(Ch).SWEep.POINTs on page 405
- SCPI.CALCulate(Ch).SElected.FORMAT on page 214
- SCPI.CALCulate(Ch).SElected.DATA.FMEMORY on page 204
- SCPI.CALCulate(Ch).SElected.DATA.SDATA on page 205

**Equivalent key** No equivalent key is available on the front panel.

## SCPI.CALCulate(Ch).SElected.DATA.FMEMory

|             |                                                                                                                                                                                                                                                                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                                                                                                                                                                       |
| Syntax      | SCPI.CALCulate(Ch).SElected.DATA.FMEMory = <i>Data</i><br><i>Data</i> = SCPI.CALCulate(Ch).SElected.DATA.FMEMory                                                                                                                                                                                                                                               |
| Description | For the active trace of channels 1 to 9 ( <i>Ch</i> ), sets/reads out the formatted memory array. The array data element varies in the data format (specified with the SCPI.CALCulate(Ch).SElected.FORMAT object). For more information on the formatted memory array, see Section “Internal Data Processing“ in the <i>E5070A/E5071A Programmer’s Guide</i> . |

Variable

|             | <b><i>Data</i></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | Indicates the array data (formatted memory array) of NOP (number of measurement points)×2. Where n is an integer between 1 and NOP.<br><br><ul style="list-style-type: none"> <li>• <i>Data(n×2-2)</i>                      Data (primary value) at the n-th measurement point.</li> <li>• <i>Data(n×2-1)</i>                      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.</li> </ul> <p>The index of the array starts from 0.</p> |
| Data type   | Variant type (Variant)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Note        | If there is no array data of NOP (number of measurement point)×2 when setting a formatted memory array, an error occurs when executed and the object is ignored.                                                                                                                                                                                                                                                                                                                                                                  |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim FmtMem As Variant
SCPI.SENSE(1).SWEp.POINTs = 201
SCPI.CALCulate(1).PARAMeter(1).SElect
FmtMem = SCPI.CALCulate(1).SElected.DATA.FMEMory
SCPI.CALCulate(1).PARAMeter(2).SElect
SCPI.CALCulate(1).SElected.DATA.FMEMory = FmtMem
```

Related objects

- SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198
- SCPI.SENSE(Ch).SWEp.POINTs on page 405
- SCPI.CALCulate(Ch).SElected.FORMAT on page 214
- SCPI.CALCulate(Ch).SElected.DATA.FDATA on page 203
- SCPI.CALCulate(Ch).SElected.DATA.SMEMory on page 206

Equivalent key

No equivalent key is available on the front panel.



## SCPI.CALCulate(*Ch*).SElected.DATA.SDATA

|             |                                                                                                                                                                                                                            |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                                   |
| Syntax      | <i>Data</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.DATA.SDATA                                                                                                                                                              |
| Description | Reads out the corrected data array of channels 1 to 9 ( <i>Ch</i> ). For more information on the corrected data array, see Section “Internal Data Processing“ in the <i>E5070A/E5071A Programmer’s Guide</i> . (Read only) |
| Variable    |                                                                                                                                                                                                                            |

|             | <i>Data</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | <p>Indicates the array data (corrected data array) of NOP (number of measurement points)×2. Where n is an integer between 1 and NOP.</p> <ul style="list-style-type: none"> <li>• <i>Data</i>(<i>n</i>×2-2)            Real part of the data (complex number) at the n-th measurement point.</li> <li>• <i>Data</i>(<i>n</i>×2-1)            Imaginary part of the data (complex number) at the n-th measurement point.</li> </ul> <p>The index of the array starts from 0.</p> |
| Data type   | Variant type (Variant)                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

|                 |                                                                                                                                                                                                                                 |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim CorData As Variant SCPI.CALCulate(1).PARAMeter(1).SElect SCPI.SENSE(1).SWEep.POINts = 201 CorData = SCPI.CALCulate(1).SElected.DATA.SDATA</pre>                                                                        |
| Related objects | <p>SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198</p> <p>SCPI.SENSE(Ch).SWEep.POINts on page 405</p> <p>SCPI.CALCulate(Ch).SElected.DATA.SMEMory on page 206</p> <p>SCPI.CALCulate(Ch).SElected.DATA.FDATA on page 203</p> |
| Equivalent key  | No equivalent key is available on the front panel.                                                                                                                                                                              |

## SCPI.CALCulate(*Ch*).SElected.DATA.SMEMory

|             |                                                                                                                                                                                                                                |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                                       |
| Syntax      | <i>Data</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.DATA.SMEMory                                                                                                                                                                |
| Description | Reads out the corrected memory array of channels 1 to 9 ( <i>Ch</i> ). For more information on the corrected memory array, see Section “Internal Data Processing“ in the <i>E5070A/E5071A Programmer’s Guide</i> . (Read only) |

### Variable

|             | <i>Data</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | <p>Indicates the array data (corrected memory array) of NOP (number of measurement points)×2. Where n is an integer between 1 and NOP.</p> <ul style="list-style-type: none"> <li>• <i>Data</i>(<i>n</i>×2-2)      Real part of the data (complex number) at the n-th measurement point.</li> <li>• <i>Data</i>(<i>n</i>×2-1)      Imaginary part of the data (complex number) at the n-th measurement point.</li> </ul> <p>The index of the array starts from 0.</p> |
| Data type   | Variant type (Variant)                                                                                                                                                                                                                                                                                                                                                                                                                                                |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

**Examples**

```
Dim CorMem As Variant
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.SENSE(1).SWEep.POINTs = 201
CorMem = SCPI.CALCulate(1).SElected.DATA.SMEMory
```

**Related objects**

- SCPI.CALCulate(*Ch*).PARAMeter(*Tr*).SElect on page 198
- SCPI.SENSE(*Ch*).SWEep.POINTs on page 405
- SCPI.CALCulate(*Ch*).SElected.DATA.SDATA on page 205
- SCPI.CALCulate(*Ch*).SElected.DATA.FMEMory on page 204

**Equivalent key**      No equivalent key is available on the front panel.

## SCPI.CALCulate(*Ch*).SElected.FILTer.GATE.TIME. CENTER

- Object type** Property
- Syntax** SCPI.CALCulate(*Ch*).SElected.FILTer.GATE.TIME.CENTer = *Value*  
*Value* = SCPI.CALCulate(*Ch*).SElected.FILTer.GATE.TIME.CENTer
- Description** For the active trace of channels 1 to 9 (*Ch*), sets the center value of the gate used for the gating function of the time domain function.
- Variable**

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | The center value of the gate                                                                                                                                                                                 |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | Varies depending on the frequency span and the number of points.                                                                                                                                             |
| Preset value | 0                                                                                                                                                                                                            |
| Unit         | s (second)                                                                                                                                                                                                   |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples**
- ```
Dim FilCent As Double
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.CENTer = 1E-8
FilCent = SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.CENTer
```
- Related objects**
- SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. SPAN on page 209
 - SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STATE on page 211
 - SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198
- Equivalent key** **[Analysis] - Gating - Center**

SCPI.CALCulate(*Ch*).SElected.FILTer.GATE.TIME. SHAPe

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.FILTer.GATE.TIME.SHAPe = <i>Param</i> <i>Param</i> = SCPI.CALCulate(<i>Ch</i>).SElected.FILTer.GATE.TIME.SHAPe
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), selects the shape of the gate used for the gating function of the time domain function.

Variable

	<i>Param</i>
Description	The shape of the gate
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"MAXimum" Specifies the maximum shape. •"WIDE" Specifies the wide shape. •"NORMal" Specifies the normal shape. •"MINimum" Specifies the minimum shape.
Preset value	"NORMal"

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 163.

Examples	<pre>Dim FilShape As String SCPI.CALCulate(1).PARAMeter(1).SElect SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.SHAPe = "wide" FilShape = SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.SHAPe</pre>
Related objects	<p>SCPI.CALCulate(<i>Ch</i>).SElected.FILTer.GATE.TIME. TYPE on page 213</p> <p>SCPI.CALCulate(<i>Ch</i>).SElected.FILTer.GATE.TIME. STATE on page 211</p> <p>SCPI.CALCulate(<i>Ch</i>).PARAMeter(<i>Tr</i>).SElect on page 198</p>
Equivalent key	[Analysis] - Gating - Shape - Maximum Wide Normal Minimum

SCPI.CALCulate(*Ch*).SElected.FILTer.GATE.TIME.SPAN

- Object type** Property
- Syntax** SCPI.CALCulate(*Ch*).SElected.FILTer.GATE.TIME.SPAN = *Value*
Value = SCPI.CALCulate(*Ch*).SElected.FILTer.GATE.TIME.SPAN
- Description** For the active trace of channels 1 to 9 (*Ch*), sets the span value of the gate used for the gating function of the time domain function.
- Variable**

	<i>Value</i>
Description	The span value of the gate
Data type	Double precision floating point type (Double)
Range	Varies depending on the frequency span and the number of points.
Preset value	2E-8
Unit	s (second)
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples**
- ```
Dim FilStar As Double
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.SPAN = 1E-8
FilStar = SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.SPAN
```
- Related objects**
- SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.CENTer on page 207
  - SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.STATe on page 211
  - SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198
- Equivalent key** **[Analysis] - Gating - Span**

**SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. START**

Object type      Property

Syntax            SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.START = *Value*  
*Value* = SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.START

Description      For the active trace of channels 1 to 9 (*Ch*), sets the start value of the gate used for the gating function of the time domain function.

Variable

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | The start value of the gate                                                                                                                                                                                  |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | Varies depending on the frequency span and the number of points.                                                                                                                                             |
| Preset value | -1E-8                                                                                                                                                                                                        |
| Unit         | s (second)                                                                                                                                                                                                   |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim FilCent As Double
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.START = 0
FilCent = SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.START
```

Related objects

SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STOP on page 212  
 SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STATE on page 211  
 SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198

Equivalent key

**[Analysis] - Gating - Start**

## SCPI.CALCulate(*Ch*).SElected.FILTer.GATE.TIME. STATE

- Object type** Property
- Syntax** SCPI.CALCulate(*Ch*).SElected.FILTer.GATE.TIME.STATE = *Status*  
*Status* = SCPI.CALCulate(*Ch*).SElected.FILTer.GATE.TIME.STATE
- Description** For the active trace of channels 1 to 9 (*Ch*), 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.

**Variable**

|              | <i>Status</i>                                                                                                                                                                                                           |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | ON/OFF of the gating function                                                                                                                                                                                           |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                  |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns ON the gating function.</li> <li>•False or 0                      Turns OFF the gating function.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                              |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples**
- ```
Dim Gating As Boolean
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.STATE = True
Gating = SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.STATE
```
- Related objects** SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198
 SCPI.SENSE(Ch).SWEep.TYPE on page 408
 SCPI.SENSE(Ch).SWEep.POINts on page 405
- Equivalent key** **[Analysis] - Gating - Gating**

SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STOP

Object type

Property

Syntax

SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.STOP = *Value**Value* = SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.STOP

Description

For the active trace of channels 1 to 9 (*Ch*), sets the stop value of the gate used for the gating function of the time domain function.

Variable

	<i>Value</i>
Description	The stop value of the gate
Data type	Double precision floating point type (Double)
Range	Varies depending on the frequency span and the number of points.
Preset value	1E-8
Unit	s (second)
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim FilStop As Double
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.STOP = 2E-8
FilStop = SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.STOP
```

Related objects

SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. START on page 210

SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STATE on page 211

SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198

Equivalent key

[Analysis] - Gating - Stop

SCPI.CALCulate(*Ch*).SElected.FILTer.GATE.TIME. TYPE

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.FILTer.GATE.TIME. TYPE = <i>Param</i> <i>Param</i> = SCPI.CALCulate(<i>Ch</i>).SElected.FILTer.GATE.TIME. TYPE
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), selects the gate type used for the gating function of the time domain function.
Variable	

	<i>Param</i>
Description	The gate type
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"BPASs" Specifies the band-pass type. •"NOTCh" Specifies the notch type.
Preset value	"BPASs"

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples	<pre>Dim FilType As String SCPI.CALCulate(1).PARAMeter(1).SElect SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.SHApe = "notc" FilType = SCPI.CALCulate(1).SElected.FILTer.GATE.TIME.SHApe</pre>
Related objects	<p>SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. SHApe on page 208</p> <p>SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STATE on page 211</p> <p>SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198</p>
Equivalent key	[Analysis] - Gating - Type

SCPI.CALCulate(*Ch*).SElected.FORMAT

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.FORMAT = <i>Param</i> <i>Param</i> = SCPI.CALCulate(<i>Ch</i>).SElected.FORMAT
Description	Selects the data format of the active trace of channels 1 to 9 (<i>Ch</i>).
Variable	

	<i>Param</i>
Description	Data format
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"MLOGarithmic" Specifies the log 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 (Re/Im). •"SMITH" Specifies the Smith chart format (R+jX). •"SADMittance" Specifies the Smith chart format (G+jB). •"PLINear" Specifies the polar format (Lin/Phase). •"PLOGarithmic" Specifies the polar format (Log/Phase). •"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.
Preset value	"MLOGarithmic"

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 163.

Examples

```
Dim Fmt As String
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.FORMAT = "smit"
Fmt = SCPI.CALCulate(1).SElected.FORMAT
```

Related objects SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198

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] - Polar - Lin/Phase|Log/Phase|Real/Imag

SCPI.CALCulate(*Ch*).SElected.FUNction.DATA

Object type	Property
Syntax	<i>Data</i> = SCPI.CALCulate(<i>Ch</i>).SElected.FUNction.DATA
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), reads out the analysis result of the SCPI.CALCulate(Ch).SElected.FUNction.EXECute object. (Read only)
Variable	

	<i>Data</i>
Description	<p>Indicates the array data (analysis result) of N (number of data pairs)×2. N (number of data pairs) can be read out with the SCPI.CALCulate(Ch).SElected.FUNction.POINts object. Where n is an integer between 1 and N.</p> <ul style="list-style-type: none"> • <i>Data</i>(<i>n</i>×2-2) Response value or analysis result of the searched n-th measurement point. • <i>Data</i>(<i>n</i>×2-1) Stimulus value of the searched n-th measurement point. Always 0 for the analysis of the mean value^{*1}, the standard deviation^{*1}, and the difference between the maximum value and the minimum value^{*1}. <p>The index of the array starts from 0.</p>
Data type	Variant type (Variant)

*1. To specify the type of the analysis, use the SCPI.CALCulate(Ch).SElected.FUNction.TYPE object.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim AnaData As Variant
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.FUNction.TYPE = "mean"
SCPI.CALCulate(1).SElected.FUNction.EXECute
AnaData = SCPI.CALCulate(1).SElected.FUNction.DATA
```

Related objects

- SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198
- SCPI.CALCulate(Ch).SElected.FUNction.TYPE on page 225
- SCPI.CALCulate(Ch).SElected.FUNction.EXECute on page 219
- SCPI.CALCulate(Ch).SElected.FUNction.POINts on page 221

Equivalent key No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.FUNction.DOMain.START

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.FUNction.DOMain.START = <i>Value</i> <i>Value</i> = SCPI.CALCulate(<i>Ch</i>).SElected.FUNction.DOMain.START
Description	For channels 1 to 9 (<i>Ch</i>), sets the start value of the analysis range of the SCPI.CALCulate(<i>Ch</i>).SElected.FUNction.EXECute object.
Variable	

	<i>Value</i>
Description	Start value of the analysis range
Data type	Double precision floating point type (Double)
Preset value	0
Unit	Hz (hertz) ^{*1}

*1. When the span value of the sweep range is 0, the unit is s (second).

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples	<pre>Dim AnaStar As Double SCPI.CALCulate(1).SElected.FUNction.DOMain.START = 1.5E9 AnaStar = SCPI.CALCulate(1).SElected.FUNction.DOMain.START</pre>
Related objects	<p>SCPI.CALCulate(Ch).SElected.FUNction.DOMain.STOP on page 218</p> <p>SCPI.CALCulate(Ch).SElected.FUNction.DOMain.STATe on page 217</p> <p>SCPI.CALCulate(Ch).SElected.FUNction.EXECute on page 219</p>
Equivalent key	No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.FUNction.DOMain.STATe

Object type Property

Syntax SCPI.CALCulate(*Ch*).SElected.FUNction.DOMain.STATe = *Status*
Status = SCPI.CALCulate(*Ch*).SElected.FUNction.DOMain.STATe

Description For channels 1 to 9 (*Ch*), sets whether to use an arbitrary range when executing the analysis with the SCPI.CALCulate(*Ch*).SElected.FUNction.EXECute object.

Variable

	<i>Status</i>
Description	Selection of the analysis range
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> • True or -1 Specifies an arbitrary range ^{*1}. • False or 0 Specifies the entire sweep range.
Preset value	False or 0

*1. Specify with the SCPI.CALCulate(*Ch*).SElected.FUNction.DOMain.START object and the SCPI.CALCulate(*Ch*).SElected.FUNction.DOMain.STOP object.

For information on the variable (*Ch*), see Table 7-6, “Variable (*Ch*),” on page 163.

Examples

```
Dim AnaRnge As Boolean
SCPI.CALCulate(1).SElected.FUNction.DOMain.START = 1.5E9
SCPI.CALCulate(1).SElected.FUNction.DOMain.STOP = 1.8E9
SCPI.CALCulate(1).SElected.FUNction.DOMain.STATe = True
AnaRnge = SCPI.CALCulate(1).SElected.FUNction.DOMain.STATe
```

Related objects SCPI.CALCulate(*Ch*).SElected.FUNction.DOMain.START on page 216
SCPI.CALCulate(*Ch*).SElected.FUNction.DOMain.STOP on page 218
SCPI.CALCulate(*Ch*).SElected.FUNction.EXECute on page 219

Equivalent key No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.FUNcTion.DOMain.STOP

Object type

Property

Syntax

SCPI.CALCulate(*Ch*).SElected.FUNcTion.DOMain.STOP = *Value**Value* = SCPI.CALCulate(*Ch*).SElected.FUNcTion.DOMain.STOP

Description

For channels 1 to 9 (*Ch*), sets the stop value of the analysis range of the SCPI.CALCulate(*Ch*).SElected.FUNcTion.EXECute object.

Variable

	<i>Value</i>
Description	Stop value of the analysis range
Data type	Double precision floating point type (Double)
Preset value	0
Unit	Hz (hertz) ^{*1}

*1. When the span value of the sweep range is 0, the unit is s (second).

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim AnaStop As Double
SCPI.CALCulate(1).SElected.FUNcTion.DOMain.STOP = 1.8E9
AnaStop = SCPI.CALCulate(1).SElected.FUNcTion.DOMain.STOP
```

Related objects

SCPI.CALCulate(*Ch*).SElected.FUNcTion.DOMain.STARt on page 216SCPI.CALCulate(*Ch*).SElected.FUNcTion.DOMain.STATe on page 217SCPI.CALCulate(*Ch*).SElected.FUNcTion.EXECute on page 219

Equivalent key

No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.FUNcTion.EXECute

Object type	Method
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.FUNcTion.EXECute
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), executes the analysis specified with the SCPI.CALCulate(Ch).SElected.FUNcTion.TYPE object. (No read)
Variable	For information on the variable (<i>Ch</i>), see Table 7-6, “Variable (Ch),” on page 163.
Examples	<pre>SCPI.CALCulate(1).PARAmeter(1).SElect SCPI.CALCulate(1).SElected.FUNcTion.EXECute</pre>
Related objects	SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198 SCPI.CALCulate(Ch).SElected.FUNcTion.TYPE on page 225 SCPI.CALCulate(Ch).SElected.FUNcTion.DOMain.STATE on page 217
Equivalent key	No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.FUNction.PEXCursion

Object type Property

Syntax SCPI.CALCulate(*Ch*).SElected.FUNction.PEXCursion = *Value*
Value = SCPI.CALCulate(*Ch*).SElected.FUNction.PEXCursion

Description For the active trace of channels 1 to 9 (*Ch*), sets the lower limit of peak excursion value (the minimum value of the difference relative to the right and left adjacent measurement points) when executing the peak search with the SCPI.CALCulate(*Ch*).SElected.FUNction.EXECute object. For information on the peak excursion value, see Section “Searching for the Peak“ in the *E5070A/E5071A User’s Guide*.

Variable

	<i>Value</i>
Description	Lower limit of peak excursion value
Data type	Double precision floating point type (Double)
Range	0 to 5E8
Preset value	3
Unit	Varies depending on the data format. <ul style="list-style-type: none"> • Log magnitude (MLOG) : dB (decibel) • Phase (PHAS) or Expanded phase (UPH) : ° (degree) • Group delay (GDEL) : s (second) • Others : No unit
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim PeakExc As Double
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.FUNction.TYPE = "peak"
SCPI.CALCulate(1).SElected.FUNction.PEXCursion = 1.5
PeakExc = SCPI.CALCulate(1).SElected.FUNction.PEXCursion
```

Related objects SCPI.CALCulate(*Ch*).PARAMeter(*Tr*).SElect on page 198
SCPI.CALCulate(*Ch*).SElected.FUNction.TYPE on page 225
SCPI.CALCulate(*Ch*).SElected.FUNction.PPOLarity on page 222
SCPI.CALCulate(*Ch*).SElected.FUNction.EXECute on page 219

Equivalent key No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.FUNcTion.POINts

Object type Property

Syntax *Value* = SCPI.CALCulate(*Ch*).SElected.FUNcTion.POINts

Description For the active trace of channels 1 to 9 (*Ch*), reads out the number of data pairs of the analysis result of the SCPI.CALCulate(Ch).SElected.FUNcTion.EXECute object.

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. (Read only)

Variable

	<i>Value</i>
Description	Number of analyzed data pairs
Data type	Long integer type (Long)

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim AnaPoin As Long
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.FUNcTion.TYPE = "ape"
SCPI.CALCulate(1).SElected.FUNcTion.EXECute
AnaPoin = SCPI.CALCulate(1).SElected.FUNcTion.POINts
```

Related objects

SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198
 SCPI.CALCulate(Ch).SElected.FUNcTion.EXECute on page 219
 SCPI.CALCulate(Ch).SElected.FUNcTion.DATA on page 215

Equivalent key

No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.FUNcTion.PPOLarity

Object type Property

Syntax SCPI.CALCulate(*Ch*).SElected.FUNcTion.PPOLarity = *Param*
Param = SCPI.CALCulate(*Ch*).SElected.FUNcTion.PPOLarity

Description For the active trace of channels 1 to 9 (*Ch*), selects the polarity when performing the peak search with the SCPI.CALCulate(*Ch*).SElected.FUNcTion.EXECute object.

Variable

	<i>Param</i>
Description	Polarity for peak search
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"POSitive" Specifies the positive peak. •"NEGative" Specifies the negative peak. •"BOTH" Specifies both the positive peak and the negative peak.
Preset value	"POSitive"

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim PeakPol As String
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.FUNcTion.TYPE = "peak"
SCPI.CALCulate(1).SElected.FUNcTion.PPOLarity = "both"
PeakPol = SCPI.CALCulate(1).SElected.FUNcTion.PPOLarity
```

Related objects

- SCPI.CALCulate(*Ch*).PARAMeter(*Tr*).SElect on page 198
- SCPI.CALCulate(*Ch*).SElected.FUNcTion.TYPE on page 225
- SCPI.CALCulate(*Ch*).SElected.FUNcTion.PEXcursion on page 220
- SCPI.CALCulate(*Ch*).SElected.FUNcTion.EXECute on page 219

Equivalent key No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.FUNcTion.TARGet

Object type Property

Syntax SCPI.CALCulate(*Ch*).SElected.FUNcTion.TARGet = *Value*
Value = SCPI.CALCulate(*Ch*).SElected.FUNcTion.TARGet

Description For the active trace of channels 1 to 9 (*Ch*), selects the target value when performing the target search with the SCPI.CALCulate(*Ch*).SElected.FUNcTion.EXECute object.

Variable

	<i>Value</i>
Description	Target value
Data type	Double precision floating point type (Double)
Range	-5E8 to 5E8
Preset value	0
Unit	Varies depending on the data format. <ul style="list-style-type: none"> • Log magnitude (MLOG) : dB (decibel) • Phase (PHAS) or Expanded phase (UPH) : ° (degree) • Group delay (GDEL) : s (second) • Others : No unit
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim TargVal As Double
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.FUNcTion.TYPE = "atar"
SCPI.CALCulate(1).SElected.FUNcTion.TARGet = -12.5
TargVal = SCPI.CALCulate(1).SElected.FUNcTion.TARGet
```

Related objects

- SCPI.CALCulate(*Ch*).PARAmeter(*Tr*).SElect on page 198
- SCPI.CALCulate(*Ch*).SElected.FUNcTion.TYPE on page 225
- SCPI.CALCulate(*Ch*).SElected.FUNcTion.TTRansition on page 224
- SCPI.CALCulate(*Ch*).SElected.FUNcTion.EXECute on page 219

Equivalent key No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.FUNction.TTRansition

Object type Property

Syntax SCPI.CALCulate(*Ch*).SElected.FUNction.TTRansition = *Param*
Param = SCPI.CALCulate(*Ch*).SElected.FUNction.TTRansition

Description For the active trace of channels 1 to 9 (*Ch*), selects the transition type when performing the target search with the SCPI.CALCulate(*Ch*).SElected.FUNction.EXECute object. For more information on the transition type, see Section “Searching for the Target Value“ in the *E5070A/E5071A User’s Guide*.

Variable

	<i>Param</i>
Description	Transition type for search
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"POSitive" Specifies the positive transition. •"NEGative" Specifies the negative transition. •"BOTH" Specifies both the positive transition and the negative transition.
Preset value	"BOTH"

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim TargTran As String
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.FUNction.TYPE = "atar"
SCPI.CALCulate(1).SElected.FUNction.TTRansition = "pos"
TargTran = SCPI.CALCulate(1).SElected.FUNction.TTRansition
```

Related objects SCPI.CALCulate(*Ch*).PARAMeter(*Tr*).SElect on page 198
SCPI.CALCulate(*Ch*).SElected.FUNction.TYPE on page 225
SCPI.CALCulate(*Ch*).SElected.FUNction.TARGET on page 223
SCPI.CALCulate(*Ch*).SElected.FUNction.EXECute on page 219

Equivalent key No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.FUNCTION.TYPE

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.FUNCTION.TYPE = <i>Param</i> <i>Param</i> = SCPI.CALCulate(<i>Ch</i>).SElected.FUNCTION.TYPE
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), selects the type of analysis.
Variable	

	<i>Param</i>
Description	Analysis type
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"PTPeak" 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 peak *1. •"APEak" Specifies the search for all peaks *1. •"ATARget" Specifies the search for all targets *2.
Preset value	"PTPeak"

*1. To specify the conditions of the peak, use the SCPI.CALCu-
late(Ch).SElected.FUNCTION.PEXCursion object and the SCPI.CALCu-
late(Ch).SElected.FUNCTION.PPOLarity object.

*2. To specify the conditions of the target, use the SCPI.CALCu-
late(Ch).SElected.FUNCTION.TARGET object and the SCPI.CALCu-
late(Ch).SElected.FUNCTION.TTRansition object.

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 163.

Examples

```
Dim AnaType As String
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.FUNCTION.TYPE = "atar"
AnaType = SCPI.CALCulate(1).SElected.FUNCTION.TYPE
```

Related objects

- SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198
- SCPI.CALCulate(Ch).SElected.FUNCTION.PEXCursion on page 220
- SCPI.CALCulate(Ch).SElected.FUNCTION.PPOLarity on page 222
- SCPI.CALCulate(Ch).SElected.FUNCTION.TARGET on page 223
- SCPI.CALCulate(Ch).SElected.FUNCTION.TTRansition on page 224
- SCPI.CALCulate(Ch).SElected.FUNCTION.EXECute on page 219

Equivalent key No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.LIMit.DATA

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.LIMit.DATA = <i>Data</i> <i>Data</i> = SCPI.CALCulate(<i>Ch</i>).SElected.LIMit.DATA
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), sets the limit table for the limit test.
Variable	

	<i>Data</i>
Description	<p>Indicates the array data (for limit line) of 1 + Num (number of limit lines)×5. Where n is an integer between 1 and Num.</p> <ul style="list-style-type: none"> • <i>Data</i>(0) The number of limit lines you want to set. Specify an integer ranging 0 to 100. When the number of limit lines is set to 0 (clears the limit table), the variable <i>Data</i> is only required with <i>Data</i>(0). • <i>Data</i>(<i>n</i>×5-4) The type of the n-th line. Specify an integer 0 to 2 as follows. 0: OFF 1: Upper limit line 2: Lower limit line • <i>Data</i>(<i>n</i>×5-3) The value on the horizontal axis (frequency) of the start point of the n-th line. • <i>Data</i>(<i>n</i>×5-2) The value on the horizontal axis (frequency) of the end point of the n-th line. • <i>Data</i>(<i>n</i>×5-1) The value on the vertical axis of the start point of the n-th line. • <i>Data</i>(<i>n</i>×5) The value on the vertical axis of the end point of the n-th line. <p>The index of the array starts from 0.</p>
Data type	Variant type (Variant)
Note	<p>If there is no array data of 1+Num (number of set lines)×5 when setting a formatted memory array, an error occurs when executed and the object is ignored. For <i>Data</i>(<i>n</i>×5-4) in the array data, if you specify an integer other than 0, 1 or 2, an error occurs when executed. For <i>Data</i>(<i>n</i>×5-3), <i>Data</i>(<i>n</i>×5-2), <i>Data</i>(<i>n</i>×5-1), and <i>Data</i>(<i>n</i>×5) in the array data, if the specified value 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.</p>

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples (1)

```
Dim LimData As Variant
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.LIMit.DATA = Array(1,1,1e6,1e9,0,0)
LimData = SCPI.CALCulate(1).SElected.LIMit.DATA

SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.LIMit.DATA = Array(0) 'Clear Limit Table
```

Examples (2)

```
Dim LimData(5) As Variant
Dim Ref As Variant
LimData(0) = 1
LimData(1) = 1
LimData(2) = 1e6
LimData(3) = 1e9
LimData(4) = 0
LimData(5) = 0
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.LIMit.DATA = LimData
Ref = SCPI.CALCulate(1).SElected.LIMit.DATA

Dim LimData(0) As Variant
LimData(0) = 0
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.LIMit.DATA = LimData 'Clear Limit Table
```

Related objects

SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198
SCPI.CALCulate(Ch).SElected.LIMit.STATe on page 232
SCPI.CALCulate(Ch).SElected.LIMit.DISPlay.STATe on page 228

Equivalent key

[Analysis] - Limit Test - Edit Limit Line

SCPI.CALCulate(Ch).SElected.LIMit.DISPlay.STATe

Object type	Property
Syntax	SCPI.CALCulate(Ch).SElected.LIMit.DISPlay.STATe = <i>Status</i> <i>Status</i> = SCPI.CALCulate(Ch).SElected.LIMit.DISPlay.STATe
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), turns ON/OFF the limit line display.
Variable	

	<i>Status</i>
Description	Limit line display
Data type	Boolean type (Boolean)
Range	Select from the following. •True or -1 Turns ON the limit line display. •False or 0 Turns OFF the limit line display.
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim LimDisp As Boolean
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.LIMit.DISPlay.STATe = True
LimDisp = SCPI.CALCulate(1).SElected.LIMit.DISPlay.STATe
```

Related objects

SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198
SCPI.CALCulate(Ch).SElected.LIMit.STATe on page 232

Equivalent key **[Analysis] - Limit Test - Limit Line**

SCPI.CALCulate(*Ch*).SElected.LIMit.FAIL

Object type	Property
Syntax	<i>Status</i> = SCPI.CALCulate(<i>Ch</i>).SElected.LIMit.FAIL
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), reads out the limit test result. (Read only)
Variable	

	<i>Status</i>
Description	Limit test result
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 The limit test result is FAIL. •False or 0 The limit test result is PASS.
Note	When the limit test is set to OFF, False or 0 is always read out.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples	<pre>Dim Result As Boolean SCPI.CALCulate(1).PARAMeter(1).SElect SCPI.CALCulate(1).SElected.LIMit.STATe = True Result = SCPI.CALCulate(1).SElected.LIMit.FAIL</pre>
Related objects	<p>SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198</p> <p>SCPI.CALCulate(Ch).SElected.LIMit.STATe on page 232</p>
Equivalent key	No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.LIMit.REPort.DATA

Object type Property

Syntax *Data* = SCPI.CALCulate(*Ch*).SElected.LIMit.REPort.DATA

Description For the active trace of channels 1 to 9 (*Ch*), reads out the frequency values at all the measurement points that failed the limit test. (Read only)

Variable

	<i>Data</i>
Description	Indicates the array data (frequency values) for failed measurement points (can be read out with the SCPI.CALCulate(Ch).SElected.LIMit.REPort.POINts object).
Data type	Variant type (Variant)

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim FailData As Variant
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.LIMit.STATe = True
FailData = SCPI.CALCulate(1).SElected.LIMit.REPort.DATA
```

Related objects

SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198

SCPI.CALCulate(Ch).SElected.LIMit.REPort.POINts on page 231

SCPI.CALCulate(Ch).SElected.LIMit.STATe on page 232

Equivalent key No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.LIMit.REPort.POINts

- Object type** Property
- Syntax** *Value* = SCPI.CALCulate(*Ch*).SElected.LIMit.REPort.POINts
- Description** For the active trace of channels 1 to 9 (*Ch*), reads out the number of the measurement points that failed the limit test. (Read only)

Variable

	<i>Value</i>
Description	Number of measurement points that failed
Data type	Long integer type (Long)

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim FailPoin As Long
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.LIMit.STATE = True
FailPoin = SCPI.CALCulate(1).SElected.LIMit.REPort.POINts
```

Related objects

SCPI.CALCulate(*Ch*).PARAmeter(*Tr*).SElect on page 198
 SCPI.CALCulate(*Ch*).SElected.LIMit.STATE on page 232

Equivalent key

No equivalent key is available on the front panel.

SCPI.CALCulate(Ch).SElected.LIMit.STATe

Object type Property

Syntax SCPI.CALCulate(Ch).SElected.LIMit.STATe = *Status*
Status = SCPI.CALCulate(Ch).SElected.LIMit.STATe

Description For the active trace of channels 1 to 9 (*Ch*), turns ON/OFF the limit line function.

Variable

	<i>Status</i>
Description	ON/OFF of the limit test function
Data type	Boolean type (Boolean)
Range	Select from the following. •True or -1 Turns ON the limit test function. •False or 0 Turns OFF the limit test function.
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim LimTest As Boolean
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.LIMit.STATe = True
LimTest = SCPI.CALCulate(1).SElected.LIMit.STATe
```

Related objects

SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198
SCPI.CALCulate(Ch).SElected.LIMit.DISPlay.STATe on page 228
SCPI.DISPlay.FSIGN on page 289

Equivalent key

[Analysis] - Limit Test - Limit Test

SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).ACTivate

Object type	Method
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.MARKer(<i>Mk</i>).ACTivate
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), sets marker 1 to 9 (<i>Mk</i>) and reference marker (<i>Mk</i> :10) to the active marker. (No read)
NOTE	If you set a marker not displayed to the active marker, the marker display is automatically set to ON.

Variable

Table 7-10

Variable (*Mk*)

	<i>Mk</i>
Description	Marker number
Data type	Long integer type (Long)
Range	1 to 10 Notice that 10 is for the reference marker.
Preset value	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples
 SCPI.CALCulate(1).PARAmeter(1).SElect
 SCPI.CALCulate(1).SElected.MARKer(1).ACTivate

Related objects
 SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198
 SCPI.DISPlay.WINDow(Ch).ACTivate on page 297

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

SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth. DATA

Object type Property

Syntax *Data* = SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).BWIDth.DATA

Description For the active trace of channels 1 to 9 (*Ch*), reads out the bandwidth search result of marker 1 to 9 (*Mk*) and reference marker (*Mk*:10).

If the bandwidth search is impossible, an error occurs when executed and the object is ignored. (Read only)

Variable

	<i>Data</i>
Description	<p>Indicates 4-element array data (bandwidth search result).</p> <ul style="list-style-type: none"> • <i>Data</i>(0) The bandwidth. • <i>Data</i>(1) Center point frequency of the 2 cutoff frequency points. • <i>Data</i>(2) The Q value. • <i>Data</i>(3) Insertion loss <p>The index of the array starts from 0.</p>
Data type	Variant type (Variant)

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-10, “Variable (Mk),” on page 233, respectively.

Examples

```
Dim BandData As Variant
SCPI.CALCulate(1).PARAMeter(1).SElect
BandData = SCPI.CALCulate(1).SElected.MARKer(1).BWIDth.DATA
```

Related objects

SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198

SCPI.CALCulate(Ch).SElected.MARKer.BWIDth.STATe on page 235

SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth. THReshold on page 236

Equivalent key

No equivalent key is available on the front panel.

SCPI.CALCulate(*Ch*).SElected.MARKer.BWIDth.STATe

Object type Property

Syntax SCPI.CALCulate(*Ch*).SElected.MARKer.BWIDth.STATe = *Status*
Status = SCPI.CALCulate(*Ch*).SElected.MARKer.BWIDth.STATe

Description For the active trace of channels 1 to 9 (*Ch*), turns ON/OFF the bandwidth search result display.

Variable

	<i>Status</i>
Description	ON/OFF of the bandwidth search result display
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the bandwidth search result display. •False or 0 Turns OFF the bandwidth search result display.
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim BandSrch As Boolean
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.MARKer.BWIDth.STATe = True
BandSrch = SCPI.CALCulate(1).SElected.MARKer.BWIDth.STATe
```

Related objects SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198
SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth. DATA on page 234
SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth. THReshold on page 236

Equivalent key **[Marker Search] - Bandwidth**

SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth.THReshold

Object type	Property
Syntax	SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth.THReshold = <i>Value</i> <i>Value</i> = SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth.THReshold
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), sets the bandwidth definition value (the value to define the pass-band of the filter) of marker 1 to 9 (<i>Mk</i>) and reference marker (<i>Mk</i> :10).
Variable	

	<i>Value</i>
Description	Bandwidth definition value (the value to define the pass band of the filter)
Data type	Double precision floating point type (Double)
Range	-5E8 to 5E8
Preset value	-3
Unit	Varies depending on the data format. <ul style="list-style-type: none"> Log magnitude (MLOG) : dB (decibel) Phase (PHAS) or Expanded phase (UPH) : ° (degree) Group delay (GDEL) : s (second) Others : No unit
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-10, “Variable (Mk),” on page 233, respectively.

Examples	<pre>Dim BandVal As Double SCPI.CALCulate(1).PARAMeter(1).SElect SCPI.CALCulate(1).SElected.MARKer(1).BWIDth.THReshold = -6 BandVal = SCPI.CALCulate(1).SElected.MARKer(1).BWIDth.THReshold</pre>
Related objects	<p>SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198</p> <p>SCPI.CALCulate(Ch).SElected.MARKer.BWIDth.STATE on page 235</p>
Equivalent key	[Marker Search] - Bandwidth Value

SCPI.CALCulate(*Ch*).SElected.MARKer.COUPle

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.MARKer.COUPle = <i>Status</i> <i>Status</i> = SCPI.CALCulate(<i>Ch</i>).SElected.MARKer.COUPle
Description	For channels 1 to 9 (<i>Ch</i>), turns ON/OFF the marker coupling between traces.
Variable	

	<i>Status</i>
Description	ON/OFF of the marker coupling between traces
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the marker coupling. •False or 0 Turns OFF the marker coupling.
Preset value	True or -1

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim MkrCpl As Boolean
SCPI.CALCulate(1).SElected.MARKer.COUPle = False
MkrCpl = SCPI.CALCulate(1).SElected.MARKer.COUPle
```

Equivalent key **[Marker Fctn] - Couple**

SCPI.CALCulate(*Ch*).SElected.MARKer.DISCrete

Object type Property

Syntax SCPI.CALCulate(*Ch*).SElected.MARKer.DISCrete = *Status*
Status = SCPI.CALCulate(*Ch*).SElected.MARKer.DISCrete

Description For the active trace of channels 1 to 9 (*Ch*), turns ON/OFF the discrete mode (mode in which the marker moves only at the measurement points).

Variable

	<i>Status</i>
Description	ON/OFF of the marker discrete mode
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the discrete mode. •False or 0 Turns OFF the discrete mode.
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim MkrDsc As Boolean
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.MARKer.DISCrete = True
MkrDsc = SCPI.CALCulate(1).SElected.MARKer.DISCrete
```

Related objects SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198

Equivalent key **[Marker Fctn] - Discrete**

SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).FUNcTion. EXECute

Object type	Method
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.MARKer(<i>Mk</i>).FUNcTion.EXECute
Description	<p>For the active trace of channels 1 to 9 (<i>Ch</i>), executes search with marker 1 to 9 (<i>Mk</i>) and reference marker (<i>Mk</i>:10).</p> <p>To specify the type of the search, use the SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNcTion. TYPE object. (No read)</p>
Variable	For information on the variable (<i>Ch</i>) and the variable (<i>Mk</i>), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-10, “Variable (Mk),” on page 233, respectively.
Examples	<pre>SCPI.CALCulate(1).PARAmeter(1).SElect SCPI.CALCulate(1).SElected.MARKer(1).FUNcTion.TYPE = "maximum" SCPI.CALCulate(1).SElected.MARKer(1).FUNcTion.EXECute</pre>
Related objects	<p>SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198</p> <p>SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNcTion. TYPE on page 245</p>
Equivalent key	<p>[Marker Search] - Max Min</p> <p>[Marker Search] - Peak - Search Peak Search Left Search Right</p> <p>[Marker Search] - Target - Search Target Search Left Search Right</p>
NOTE	<hr/> <p>When performing the operation from the front panel, you select the search type and execute the search at the same time.</p> <hr/>

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction.PEXCursion

Object type	Property
Syntax	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction.PEXCursion = <i>Value</i> <i>Value</i> = SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction.PEXCursion
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), sets the lower limit of peak excursion value (the minimum value of the difference relative to the right and left adjacent measurement points) when executing the peak search with marker 1 to 9 (<i>Mk</i>) and reference marker (<i>Mk</i> :10). For information on the peak excursion value, see Section “Searching for the Peak“ in the <i>E5070A/E5071A User’s Guide</i> .

Variable

	<i>Value</i>
Description	Lower limit of peak excursion value
Data type	Double precision floating point type (Double)
Range	0 to 5E8
Preset value	3
Unit	Varies depending on the data format. <ul style="list-style-type: none"> Log magnitude (MLOG) : dB (decibel) Phase (PHAS) or Expanded phase (UPH) : ° (degree) Group delay (GDEL) : s (second) Others : No unit
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-10, “Variable (Mk),” on page 233, respectively.

Examples

```
Dim PeakExc As Double
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.MARKer(1).FUNction.TYPE = "peak"
SCPI.CALCulate(1).SElected.MARKer(1).FUNction.PEXCursion = 0.2
PeakExc = SCPI.CALCulate(1).SElected.MARKer(1).FUNction.PEXCursion
```

Related objects

SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198
 SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TYPE on page 245
 SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. PPOLarity on page 241

Equivalent key

[Marker Search] - Peak - Peak Excursion

SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).FUNction. PPOLarity

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.MARKer(<i>Mk</i>).FUNction.PPOLarity = <i>Param</i> <i>Param</i> = SCPI.CALCulate(<i>Ch</i>).SElected.MARKer(<i>Mk</i>).FUNction.PPOLarity
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), selects the polarity of the peak search with marker 1 to 9 (<i>Mk</i>) and reference marker (<i>Mk</i> :10).
Variable	

	<i>Param</i>
Description	Polarity for peak search
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"POSitive" Specifies the positive peak. •"NEGative" Specifies the negative peak. •"BOTH" Specifies both the positive peak and the negative peak.
Preset value	"POSitive"

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-10, "Variable (Mk)," on page 233, respectively.

Examples	<pre>Dim PeakPol As String SCPI.CALCulate(1).PARAmeter(1).SElect SCPI.CALCulate(1).SElected.MARKer(1).FUNction.TYPE = "peak" SCPI.CALCulate(1).SElected.MARKer(1).FUNction.PPOLarity = "both" PeakPol = SCPI.CALCulate(1).SElected.MARKer(1).FUNction.PPOLarity</pre>
Related objects	<p>SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198</p> <p>SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TYPE on page 245</p> <p>SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. PEXCursion on page 240</p>
Equivalent key	[Marker Search] - Peak - Peak Polarity

**SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).FUNction.
TARGet**

Object type Property

Syntax SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).FUNction.TARGet = *Value*
Value = SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).FUNction.TARGet

Description For the active trace of channels 1 to 9 (*Ch*), sets the target value to be searched with marker 1 to 9 (*Mk*) and reference marker (*Mk*:10).

Variable

	<i>Value</i>
Description	Target value for target search
Data type	Double precision floating point type (Double)
Range	-5E8 to 5E8
Preset value	0
Unit	Varies depending on the data format. <ul style="list-style-type: none"> • Log magnitude (MLOG) : dB (decibel) • Phase (PHAS) or Expanded phase (UPH) : ° (degree) • Group delay (GDEL) : s (second) • Others : No unit
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-10, “Variable (Mk),” on page 233, respectively.

Examples

```
Dim TargVal As Double
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.MARKer(1).FUNction.TARGet = -12.5
TargVal = SCPI.CALCulate(1).SElected.MARKer(1).FUNction.TARGet
```

Related objects

SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198
SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TYPE on page 245
SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TTRansition on page 244

Equivalent key

[Marker Search] - Target - Target Value

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TRACking

Object type	Property
Syntax	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction.TRACking = <i>Status</i> <i>Status</i> = SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction.TRACking
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), turns ON/OFF the search tracking (function to repeat search for each sweep) for marker 1 to 9 (<i>Mk</i>) and reference marker (<i>Mk</i> :10).
Variable	

	<i>Status</i>
Description	ON/OFF of the marker search tracing
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the search tracking. •False or 0 Turns OFF the search tracking.
Preset value	False or 0

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-10, “Variable (Mk),” on page 233, respectively.

Examples	<pre>Dim SrchTrac As Boolean SCPI.CALCulate(1).PARAMeter(1).SElect SCPI.CALCulate(1).SElected.MARKer(1).FUNction.TYPE = "targ" SCPI.CALCulate(1).SElected.MARKer(1).FUNction.TRACking = True SrchTrac = SCPI.CALCulate(1).SElected.MARKer(1).FUNction.TRACking</pre>
Related objects	<p>SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198</p> <p>SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TYPE on page 245</p> <p>SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. EXECute on page 239</p>
Equivalent key	[Marker Search] - Tracking

SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).FUNction. TTRansition

Object type Property

Syntax SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).FUNction.TTRansition = *Param*
Param = SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).FUNction.TTRansition

Description For marker 1 to 9 (*Mk*) and reference marker (*Mk*:10) of the active trace of channels 1 to 9 (*Ch*), selects the transition type of the target search. For more information on the transition type, see Section “Searching for the Target Value“ in the *E5070A/E5071A User’s Guide*.

Variable

	<i>Param</i>
Description	Transition type for search
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"POSitive" Specifies the positive transition. •"NEGative" Specifies the negative transition. •"BOTH" Specifies both the positive transition and the negative transition.
Preset value	"BOTH"

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-10, “Variable (Mk),” on page 233, respectively.

Examples

```
Dim TargTran As String
SCPI.CALCulate(1).PARAmeter(1).SELEct
SCPI.CALCulate(1).SELEcted.MARKer(1).FUNction.TYPE = "targ"
SCPI.CALCulate(1).SELEcted.MARKer(1).FUNction.TTRansition = "neg"
TargTran = SCPI.CALCulate(1).SELEcted.MARKer(1).FUNction.TTRansition
```

Related objects

SCPI.CALCulate(Ch).PARAmeter(Tr).SELEct on page 198

SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).FUNction. TYPE on page 245

SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).FUNction. TARGet on page 242

Equivalent key

[Marker Search] - Target - Target Transition

SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).FUNction. TYPE

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.MARKer(<i>Mk</i>).FUNction.TYPE = <i>Param</i> <i>Param</i> = SCPI.CALCulate(<i>Ch</i>).SElected.MARKer(<i>Mk</i>).FUNction.TYPE
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), selects the search type for marker 1 to 9 (<i>Mk</i>) and reference marker (<i>Mk</i> :10).
Variable	

	<i>Param</i>
Description	Search type of marker
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"MAXimum" Sets the search type to the maximum value. •"MINimum" Sets the search type to the minimum value. •"PEAK" Sets the search type to the peak search ^{*1}. •"LPEak" Sets the search type to the peak search ^{*1} to the left from the marker position. •"RPEak" Sets the search type to the peak search ^{*1} to the right from the marker position. •"TARGet" Sets the search type to the target search ^{*2}. •"LTARget" Sets the search type to the target search ^{*2} to the left from the marker position. •"RTARget" Sets the search type to the target search ^{*2} to the right from the marker position.
Preset value	"MAXimum"

*1. To specify the conditions of the peak, use the SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).FUNction. PEXCursion object and the SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).FUNction. PPOLarity object.

*2. To specify the conditions of the target, use the SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).FUNction. TARGet object and the SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).FUNction. TTRansition object.

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-10, "Variable (Mk)," on page 233, respectively.

Examples

```
Dim SrchType As String
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.MARKer(1).FUNction.TYPE = "targ"
SrchType = SCPI.CALCulate(1).SElected.MARKer(1).FUNction.TYPE
```

Related objects

SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. PEXCursion on page 240

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. PPOLarity on page 241

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TARGet on page 242

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TTRansition on page 244

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. EXECute on page 239

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.

SCPI.CALCulate(*Ch*).SElected.MARKer.REFerence. STATE

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.MARKer.REFerence.STATE = <i>Status</i> <i>Status</i> = SCPI.CALCulate(<i>Ch</i>).SElected.MARKer.REFerence.STATE
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), turns ON/OFF the reference marker mode.
Variable	

	<i>Status</i>
Description	ON/OFF of the reference marker mode
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> • True or -1 Turns ON the reference marker mode. • False or 0 Turns OFF the reference marker mode.
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim RefMode As Boolean
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.MARKer.REFerence.STATE = True
RefMode = SCPI.CALCulate(1).SElected.MARKer.REFerence.STATE
```

Related objects SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198

Equivalent key **[Marker] - Ref Marker Mode**

SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).SET

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.MARKer(<i>Mk</i>).SET = <i>Param</i>
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), sets the value at the position of marker 1 to 9 (<i>Mk</i>) and reference marker (<i>Mk</i> :10) to the value of the instrument setting item (<i>Param</i>).
Variable	

	<i>Param</i>
Description	Instrument setting item
Data type	Character string type (String)
Range	<p>Select from the following.</p> <ul style="list-style-type: none"> •"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.

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-10, "Variable (Mk)," on page 233, respectively.

Examples

```
Dim MkrTo As String
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.MARKer(1).SET = "cent"
```

Related objects

SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198
 SCPI.CALCulate(Ch).SElected.MARKer.REFERence. STATE on page 247

Equivalent key **[Marker Fctn] - Marker -> Start|Marker -> Stop|Marker -> Center|Marker -> Reference**

SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).STATe

Object type Property

Syntax SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).STATe = *Status*
Status = SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).STATe

Description For the active trace of channels 1 to 9 (*Ch*), turns ON/OFF the display of marker 1 to 9 (*Mk*) and reference marker (*Mk*:10).

Variable

	<i>Status</i>
Description	ON/OFF of display of markers 1 to 9 and reference marker
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the display of the marker. •False or 0 Turns OFF the display of the marker.
Preset value	False or 0

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, “Variable (*Ch*),” on page 163 and Table 7-10, “Variable (*Mk*),” on page 233, respectively.

Examples

```
Dim Mkr As Boolean
SCPI.CALCulate(1).PARAmeter(2).SElect
SCPI.CALCulate(1).SElected.MARKer(10).STATe = True
Mkr = SCPI.CALCulate(1).SElected.MARKer(10).STATe
```

Related objects SCPI.CALCulate(*Ch*).PARAmeter(*Tr*).SElect on page 198

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

SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).X

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SElected.MARKer(<i>Mk</i>).X = <i>Value</i> <i>Value</i> = SCPI.CALCulate(<i>Ch</i>).SElected.MARKer(<i>Mk</i>).X
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), sets the stimulus value for marker 1 to 9 (<i>Ch</i>) and reference marker (<i>Ch</i> :10).

Variable

	<i>Value</i>
Description	Stimulus value of the marker*1
Data type	Double precision floating point type (Double)
Range	Sweep start value to sweep stop value*2
Preset value	Sweep start value*3
Unit	Hz (hertz)*4
Note	If the specified variable 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.

*1. When the reference marker mode is ON ("True" is specified with the SCPI.CALCulate(Ch).SElected.MARKer.REFerence. STATE object), 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 preset value is 0.

*4. When the span value of the sweep range is 0, the unit is s (second).

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-10, "Variable (Mk)," on page 233, respectively.

Examples

```
Dim MkrX As Double
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.MARKer(1).X = 1E9
MkrX = SCPI.CALCulate(1).SElected.MARKer(1).X
```

Related objects

SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198
 SCPI.CALCulate(Ch).SElected.MARKer.REFerence. STATE on page 247
 SCPI.CALCulate(Ch).SElected.MARKer(Mk).Y on page 251

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.

SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).Y

- Object type** Property
- Syntax** *Data* = SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).Y
- Description** For the active trace of channels 1 to 9 (*Ch*), reads out the response value of marker 1 to 9 (*Mk*) and reference marker (*Mk*:10).
 When the reference marker mode is ON ("True" is specified with the SCPI.CALCulate(Ch).SElected.MARKer.REFERENCE.STATE object), the readout value is the value relative to the reference marker. (Read only)

Variable

	<i>Data</i>
Description	Indicates 2-element array data (response value of marker). <ul style="list-style-type: none"> • <i>Data</i>(0) Response value (primary value) at the marker position. • <i>Data</i>(1) Response value (secondary value) at the marker position. Always 0 when the data format is not the Smith chart format or the polar format. The index of the array starts from 0.
Data type	Variant type (Variant)

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-10, "Variable (Mk)," on page 233, respectively.

- Examples**
- ```
Dim MkrY As Variant
SCPI.CALCulate(1).PARAMeter(1).SElect
MkrY = SCPI.CALCulate(1).SElected.MARKer(1).Y
```

- Related objects**
- SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198
  - SCPI.CALCulate(Ch).SElected.MARKer.REFERENCE.STATE on page 247
  - SCPI.CALCulate(Ch).SElected.MARKer(Mk).X on page 250

- Equivalent key** No equivalent key is available on the front panel.

## SCPI.CALCulate(*Ch*).SElected.MATH.FUNcTion

**Object type** Property

**Syntax** SCPI.CALCulate(*Ch*).SElected.MATH.FUNcTion = *Param*  
*Param* = SCPI.CALCulate(*Ch*).SElected.MATH.FUNcTion

**Description** For the active trace of channels 1 to 9 (*Ch*), 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.

**Variable**

|              | <i>Param</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Math method between measurement data and memory trace data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"NORMal"                 Specifies <i>Data</i> (no math).</li> <li>•"DIVide"                 Specifies <i>Data / Mem</i>.</li> <li>•"MULTiply"             Specifies <i>Data × Mem</i>.</li> <li>•"SUBTract"             Specifies <i>Data - Mem</i>.</li> <li>•"ADD"                    Specifies <i>Data + Mem</i>.</li> </ul> Where <i>Data</i> is the measurement data (corrected data array) and <i>Mem</i> is the data stored in the memory trace (corrected memory array). |
| Preset value | "NORMal"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

**Examples**

```
Dim MathFunc As String
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.MATH.FUNcTion = "div"
MathFunc = SCPI.CALCulate(1).SElected.MATH.FUNcTion
```

**Related objects** SCPI.CALCulate(*Ch*).PARAmeter(*Tr*).SElect on page 198

**Equivalent key** **[Display] - Data Math - OFF|Data / Mem|Data \* Mem|Data – Mem|Data + Mem**



## SCPI.CALCulate(Ch).SElected.MATH.MEMorize

|                 |                                                                                                                                                   |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type     | Method                                                                                                                                            |
| Syntax          | SCPI.CALCulate(Ch).SElected.MATH.MEMorize                                                                                                         |
| Description     | For the active trace of channels 1 to 9 ( <i>Ch</i> ), copies the measurement data at the execution of this object to the memory trace. (No read) |
| Variable        | For information on the variable ( <i>Ch</i> ), see Table 7-6, “Variable (Ch),” on page 163.                                                       |
| Examples        | <pre>SCPI.CALCulate(1).PARAmeter(1).SElect SCPI.CALCulate(1).SElected.MATH.MEMorize</pre>                                                         |
| Related objects | SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198                                                                                               |
| Equivalent key  | <b>[Display] - Data → Mem</b>                                                                                                                     |

## SCPI.CALCulate(Ch).SElected.MSTatistics.DATA

|                    |                                                                                                                                                                                                               |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Object type</b> | Property                                                                                                                                                                                                      |
| Syntax             | <i>Data</i> = SCPI.CALCulate(Ch).SElected.MSTatistics.DATA                                                                                                                                                    |
| Description        | Reads out the statistics values (the mean vale, the standard deviation, and the difference between the maximum value and the minimum value) of the active trace of channels 1 to 9 ( <i>Ch</i> ). (Read only) |

**Variable**

|             | <i>Data</i>                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | <p>Indicates 3-element array data (statistics value).</p> <ul style="list-style-type: none"> <li>• <i>Data</i>(0)                      Mean value</li> <li>• <i>Data</i>(1)                      Standard deviation</li> <li>• <i>Data</i>(2)                      Difference between the maximum value and the minimum value (Peak to Peak)</li> </ul> <p>The index of the array starts from 0.</p> |
| Data type   | Variant type (Variant)                                                                                                                                                                                                                                                                                                                                                                               |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

|                 |                                                                                                                               |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Examples</b> | <pre>Dim MstData As Variant SCPI.CALCulate(1).PARAmeter(1).SElect MstData = SCPI.CALCulate(1).SElected.MSTatistics.DATA</pre> |
| Related objects | <p>SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198</p> <p>SCPI.CALCulate(Ch).SElected.MSTatistics.STATe on page 254</p>   |
| Equivalent key  | No equivalent key is available on the front panel.                                                                            |

## SCPI.CALCulate(*Ch*).SElected.MSTatistics.STATe

**Object type** Property

**Syntax** SCPI.CALCulate(*Ch*).SElected.MSTatistics.STATe = *Status*  
*Status* = SCPI.CALCulate(*Ch*).SElected.MSTatistics.STATe

**Description** For the active trace of channels 1 to 9 (*Ch*), turns ON/OFF the statistics values (the mean vale, the standard deviation, and the difference between the maximum value and the minimum value) display.

**Variable**

|              |                                                                                                                                                                                                                                           |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <b><i>Status</i></b>                                                                                                                                                                                                                      |
| Description  | ON/OFF of the statistics value display                                                                                                                                                                                                    |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                    |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns ON the statistics value display.</li> <li>•False or 0                      Turns OFF the statistics value display.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                                |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

**Examples**

```
Dim Mst As Boolean
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.MSTatistics.STATe = True
Mst = SCPI.CALCulate(1).SElected.MSTatistics.STATe
```

**Related objects** SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198  
SCPI.CALCulate(Ch).SElected.MSTatistics.DATA on page 253

**Equivalent key** **[Marker Fctn] - Statistics**

## SCPI.CALCulate(*Ch*).SElected.SMOothing.APERture

|             |                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                         |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.SMOothing.APERture = <i>Value</i><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.SMOothing.APERture |
| Description | Sets the smoothing aperture (percentage to the sweep span value) of the active trace of channels 1 to 9 ( <i>Ch</i> ).                           |
| Variable    |                                                                                                                                                  |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Smoothing aperture                                                                                                                                                                                           |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | 1 to 25                                                                                                                                                                                                      |
| Preset value | 1.5                                                                                                                                                                                                          |
| Unit         | % (percent)                                                                                                                                                                                                  |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

|                 |                                                                                                                                                                                    |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim SmoAper As Double SCPI.CALCulate(1).PARAMeter(1).SElect SCPI.CALCulate(1).SElected.SMOothing.APERture = 2.5 SmoAper = SCPI.CALCulate(1).SElected.SMOothing.APERture</pre> |
| Related objects | <p>SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198</p> <p>SCPI.CALCulate(Ch).SElected.SMOothing.STATe on page 256</p>                                                          |
| Equivalent key  | <b>[Avg] - Smo Aperture</b>                                                                                                                                                        |

## SCPI.CALCulate(*Ch*).SElected.SMOothing.STATe

|             |                                                                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                     |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.SMOothing.STATe = <i>Status</i><br><i>Status</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.SMOothing.STATe |
| Description | For the active trace of channels 1 to 9 ( <i>Ch</i> ), turns ON/OFF the smoothing.                                                           |
| Variable    |                                                                                                                                              |

|              | <i>Status</i>                                                                                                                                                                                               |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | ON/OFF of the smoothing                                                                                                                                                                                     |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                      |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns ON the smoothing.</li> <li>•False or 0                      Turns OFF the smoothing.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                  |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

|                 |                                                                                                                                                                        |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Smo As Boolean SCPI.CALCulate(1).PARAmeter(1).SElect SCPI.CALCulate(1).SElected.SMOothing.STATe = True Smo = SCPI.CALCulate(1).SElected.SMOothing.STATe</pre> |
| Related objects | <p>SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198</p> <p>SCPI.CALCulate(Ch).SElected.SMOothing.APERTure on page 255</p>                                           |
| Equivalent key  | <b>[Avg] - Smoothing</b>                                                                                                                                               |

## SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME. CENTER

- Object type** Property
- Syntax** SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME.CENTer = *Value*  
*Value* = SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME.CENTer
- Description** For the active trace of channels 1 to 9 (*Ch*), selects the center value used for the transformation function of the time domain function.
- Variable**

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Center value                                                                                                                                                                                                 |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | Varies depending on the frequency span and the number of points.                                                                                                                                             |
| Preset value | 0                                                                                                                                                                                                            |
| Unit         | s (second)                                                                                                                                                                                                   |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples**
- ```
Dim Cent As Double
SCPI.CALCulate(1).PARAmeter(1).SELEct
SCPI.CALCulate(1).SELEcted.TRANSform.GATE.TIME.CENTer = 1E-8
Cent = SCPI.CALCulate(1).SELEcted.TRANSform.GATE.TIME.CENTer
```
- Related objects**
- SCPI.CALCulate(Ch).SELEcted.TRANSform.GATE.TIME. SPAN on page 261
 - SCPI.CALCulate(Ch).SELEcted.TRANSform.GATE.TIME. STATE on page 263
 - SCPI.CALCulate(Ch).PARAmeter(Tr).SELEct on page 198
- Equivalent key** **[Analysis] - Transform - Center**

SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME.IMPulse.WIDTH

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SELEcted.TRANSform.GATE.TIME.IMPulse.WIDTH = <i>Value</i> <i>Value</i> = SCPI.CALCulate(<i>Ch</i>).SELEcted.TRANSform.GATE.TIME.IMPulse.WIDTH
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), sets the shape of the Kayser Bessel window using the impulse width used for the transformation function of the time domain function.

Variable

	<i>Value</i>
Description	Impulse width
Data type	Double precision floating point type (Double)
Range	Varies depending on the frequency span and transformation type.
Preset value	Varies depending on the frequency span and transformation type.
Unit	s (second)
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim ImpWid As Double
SCPI.CALCulate(1).PARAMeter(1).SELEct
SCPI.CALCulate(1).SELEcted.TRANSform.GATE.TIME.IMPulse.WIDTH = 1E-10
ImpWid = SCPI.CALCulate(1).SELEcted.TRANSform.GATE.TIME.IMPulse.WIDTH
```

Related objects

SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME. KBESsel on page 259
 SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME. STEP.RTIME on page 264
 SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME. STATE on page 263
 SCPI.CALCulate(*Ch*).PARAMeter(*Tr*).SELEct on page 198

Equivalent key

[Analysis] - Transform - Center

SCPI.CALCulate(*Ch*).SElected.TRANSform.GATE.TIME. **KBESsel**

- Object type** Property
- Syntax** SCPI.CALCulate(*Ch*).SElected.TRANSform.GATE.TIME.KBESsel = *Value*
Value = SCPI.CALCulate(*Ch*).SElected.TRANSform.GATE.TIME.KBESsel
- Description** For the active trace of channels 1 to 9 (*Ch*), sets the shape of the Kayser Bessel window using β used for the transformation function of the time domain function.
- Variable**

	<i>Value</i>
Description	The value of β
Data type	Double precision floating point type (Double)
Range	0 to 13
Preset value	6
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples**
- ```
Dim Beta As Double
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.TRANSform.GATE.TIME.KBESsel = 3
Beta = SCPI.CALCulate(1).SElected.TRANSform.GATE.TIME.KBESsel
```
- Related objects**
- SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. IMPulse.WIDTH on page 258
  - SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. STEP.RTIME on page 264
  - SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. STATE on page 263
  - SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198
- Equivalent key** **[Analysis] - Transform - Center**

**SCPI.CALCulate(*Ch*).SElected.TRANSform.GATE.TIME.LPFRequency**

|                 |                                                                                                                                                                                                         |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type     | Method                                                                                                                                                                                                  |
| Syntax          | SCPI.CALCulate( <i>Ch</i> ).SElected.TRANSform.GATE.TIME.LPFRequency = <i>Value</i>                                                                                                                     |
| Description     | For the active trace of channels 1 to 9 ( <i>Ch</i> ), changes the frequency range to match with the low-pass type transformation of the transformation function of the time domain function. (No read) |
| Variable        | For information on the variable ( <i>Ch</i> ), see Table 7-6, “Variable (Ch),” on page 163.                                                                                                             |
| Examples        | SCPI.CALCulate(1).PARAmeter(1).SElect<br>SCPI.CALCulate(1).SElected.TRANSform.GATE.TIME.LPFRequency                                                                                                     |
| Related objects | SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. TYPE on page 267<br>SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. STATE on page 263<br>SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198          |
| Equivalent key  | <b>[Analysis] - Transform - Set Freq Low pass</b>                                                                                                                                                       |



**SCPI.CALCulate(*Ch*).SElected.TRANSform.GATE.TIME.SPAN**

|             |                                                                                                                                                              |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                     |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.TRANSform.GATE.TIME.SPAN = <i>Value</i><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.TRANSform.GATE.TIME.SPAN |
| Description | For the active trace of channels 1 to 9 ( <i>Ch</i> ), selects the span value used for the transformation function of the time domain function.              |
| Variable    |                                                                                                                                                              |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Span value                                                                                                                                                                                                   |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | Varies depending on the frequency span and the number of points.                                                                                                                                             |
| Preset value | 2E-8                                                                                                                                                                                                         |
| Unit         | s (second)                                                                                                                                                                                                   |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

|                 |                                                                                                                                                                                                |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | Dim Span As Double<br>SCPI.CALCulate(1).PARAmeter(1).SElect<br>SCPI.CALCulate(1).SElected.TRANSform.GATE.TIME.SPAN = 1E-8<br>Cent = SCPI.CALCulate(1).SElected.TRANSform.GATE.TIME.SPAN        |
| Related objects | SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.CENTer on page 257<br>SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.STATE on page 263<br>SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198 |
| Equivalent key  | <b>[Analysis] - Transform - Center</b>                                                                                                                                                         |

**SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME. START**

Object type Property

Syntax SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME.START = *Value*  
*Value* = SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME.START

Description For the active trace of channels 1 to 9 (*Ch*), selects the start value used for the transformation function of the time domain function.

Variable

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Start value                                                                                                                                                                                                  |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | Varies depending on the frequency span and the number of points.                                                                                                                                             |
| Preset value | -1E-8                                                                                                                                                                                                        |
| Unit         | s (second)                                                                                                                                                                                                   |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim Star As Double
SCPI.CALCulate(1).PARAmeter(1).SELEct
SCPI.CALCulate(1).SELEcted.TRANSform.GATE.TIME.START = 0
Star = SCPI.CALCulate(1).SELEcted.TRANSform.GATE.TIME.START
```

Related objects

SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME. STOP on page 266  
 SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME. STATE on page 263  
 SCPI.CALCulate(*Ch*).PARAmeter(*Tr*).SELEct on page 198

Equivalent key

**[Analysis] - Transform - Start**

## SCPI.CALCulate(*Ch*).SElected.TRANSform.GATE.TIME.STATE

- Object type** Property
- Syntax** SCPI.CALCulate(*Ch*).SElected.TRANSform.GATE.TIME.STATE = *Status*  
*Status* = SCPI.CALCulate(*Ch*).SElected.TRANSform.GATE.TIME.STATE
- Description** For the active trace of channels 1 to 9 (*Ch*), 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.

**Variable**

|              | <i>Status</i>                                                                                                                                                                                                                           |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | ON/OFF of the gating function                                                                                                                                                                                                           |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                  |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns ON the transformation function.</li> <li>•False or 0                      Turns OFF the transformation function.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                              |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples**
- ```
Dim Trans As Boolean
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.TRANSform.GATE.TIME.STATE = True
Trans = SCPI.CALCulate(1).SElected.TRANSform.GATE.TIME.STATE
```
- Related objects**
- SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 198
 - SCPI.SENSE(Ch).SWEep.TYPE on page 408
 - SCPI.SENSE(Ch).SWEep.POINts on page 405
- Equivalent key** **[Analysis] - Transform - Transform**

SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.STEP.RTIME

Object type	Property
Syntax	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.STEP.RTIME = <i>Value</i> <i>Value</i> = SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME.STEP.RTIME
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), 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.

Variable

	<i>Value</i>
Description	The rise time of step signal
Data type	Double precision floating point type (Double)
Range	Varies depending on the frequency span.
Preset value	Varies depending on the frequency span.
Unit	s (second)
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples	<pre>Dim RTime As Double SCPI.CALCulate(1).PARAmeter(1).SElect SCPI.CALCulate(1).SElected.TRANSform.GATE.TIME.STEP.RTIME = 1E-10 RTime = SCPI.CALCulate(1).SElected.TRANSform.GATE.TIME.STEP.RTIME</pre>
Related objects	<p>SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. IMPulse.WIDTH on page 258</p> <p>SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. KBESsel on page 259</p> <p>SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. STATE on page 263</p> <p>SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198</p>
Equivalent key	[Analysis] - Transform - Center

SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME. STIMulus

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SELEcted.TRANSform.GATE.TIME.STIMulus = <i>Param</i> <i>Param</i> = SCPI.CALCulate(<i>Ch</i>).SELEcted.TRANSform.GATE.TIME.STIMulus
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), selects the stimulus type used for the transformation function of the time domain function.
Variable	

	<i>Param</i>
Description	The stimulus type
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"IMPulse" Specifies the impulse*1. •"STEP" Specifies the step*2.
Preset value	"IMPulse"

*1. You need to select the transformation type (band-pass or low-pass) with the SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME. TYPE object.

*2. You do not need to select the transformation type. Low-pass is selected automatically.

For information on the variable (*Ch*), see Table 7-6, "Variable (*Ch*)," on page 163.

Examples

```
Dim StimType As String
SCPI.CALCulate(1).PARAMeter(1).SELEct
SCPI.CALCulate(1).SELEcted.TRANSform.GATE.TIME.STIMulus = "step"
StimType = SCPI.CALCulate(1).SELEcted.TRANSform.GATE.TIME.STIMulus
```

Related objects

SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME. TYPE on page 267
 SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME. STATE on page 263
 SCPI.CALCulate(*Ch*).PARAMeter(*Tr*).SELEct on page 198

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.

SCPI.CALCulate(*Ch*).SELEcted.TRANSform.GATE.TIME. STOP

Object type	Property
Syntax	SCPI.CALCulate(<i>Ch</i>).SELEcted.TRANSform.GATE.TIME.STOP = <i>Value</i> <i>Value</i> = SCPI.CALCulate(<i>Ch</i>).SELEcted.TRANSform.GATE.TIME.STOP
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), selects the span value used for the transformation function of the time domain function.
Variable	

	<i>Value</i>
Description	Stop value
Data type	Double precision floating point type (Double)
Range	Varies depending on the frequency span and the number of points.
Preset value	1E-8
Unit	s (second)
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples	<pre>Dim Span As Double SCPI.CALCulate(1).PARAmeter(1).SELEct SCPI.CALCulate(1).SELEcted.TRANSform.GATE.TIME.STOP = 2E-8 Cent = SCPI.CALCulate(1).SELEcted.TRANSform.GATE.TIME.STOP</pre>
----------	---

Related objects	<p>SCPI.CALCulate(<i>Ch</i>).SELEcted.TRANSform.GATE.TIME. START on page 262</p> <p>SCPI.CALCulate(<i>Ch</i>).SELEcted.TRANSform.GATE.TIME. STATE on page 263</p> <p>SCPI.CALCulate(<i>Ch</i>).PARAmeter(<i>Tr</i>).SELEct on page 198</p>
-----------------	--

Equivalent key	[Analysis] - Transform - Stop
----------------	--------------------------------------

SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. TYPE

Object type	Property
Syntax	SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. TYPE = <i>Param</i> <i>Param</i> = SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. TYPE
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), selects the transformation type used for the transformation function of the time domain function.
Variable	

	<i>Param</i>
Description	The transformation type
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"BPASs" Specifies the band-pass^{*1}. •"LPASs" Specifies the low-pass^{*2}.
Preset value	"BPASs"

*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 SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. STIMulus object.

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 163.

Examples

```
Dim Typ As String
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.TRANSform.GATE.TIME.SHApe = "lpas"
Typ = SCPI.CALCulate(1).SElected.TRANSform.GATE.TIME.SHApe
```

Related objects

SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. STIMulus on page 265

SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. STATE on page 263

SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198

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.

SCPI.CONTRol.HANDler.A.DATA

Object type Property

Syntax SCPI.CONTRol.HANDler.A.DATA = *Value*

Description Outputs port information to output port A (A0 to A7) of the handler I/O. Port information is outputted as 8-bit binary data using A0 as LSB and A7 as MSB. (No read)

For more information on the handler I/O, see Chapter “Communication with External Instruments Using Handler I/O Port” in the *E5070A/E5071A Programmer’s Guide*.

Variable

	<i>Value</i>
Description	Port information (output)
Data type	Long integer type (Long)
Range	0 to 255
Note	If the specified variable 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.

Examples SCPI.CONTRol.HANDler.A.DATA = 15

Equivalent key No equivalent key is available on the front panel.

SCPI.CONTRol.HANDler.B.DATA

Object type	Property
Syntax	SCPI.CONTRol.HANDler.B.DATA = <i>Value</i>
Description	Outputs port information to output port B (B0 to B7) of the handler I/O. Port information is outputted as 8-bit binary data using B0 as LSB and B7 as MSB. (No read)

NOTE The bit 6 of the data outputted by this project is ignored when outputting the INDEX signal is turned ON (specifying True with the SCPI.CONTRol.HANDler.EXTension.INDEx.STATe object).

The bit 7 of the data outputted by this project is ignored when outputting the READY FOR TRIGGER signal is turned ON (specifying True with the SCPI.CONTRol.HANDler.EXTension.RTRigger.STATe object).

For more information on the handler I/O, see Chapter “Communication with External Instruments Using Handler I/O Port“ in the *E5070A/E5071A Programmer’s Guide*.

Variable

	<i>Value</i>
Description	Port information (output)
Data type	Long integer type (Long)
Range	0 to 255
Note	If the specified variable 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.

Examples SCPI.CONTRol.HANDler.B.DATA = 15

Equivalent key No equivalent key is available on the front panel.

SCPI.CONTRol.HANDler.C.DATA

Object type	Property
Syntax	SCPI.CONTRol.HANDler.C.DATA = <i>Value</i> (for output port) <i>Value</i> = SCPI.CONTRol.HANDler.C.DATA (for input port)
Description	<p>When input/output port C of the handler I/O is set to the output port, outputs port information to output port C (C0 to C3).</p> <p>When input/output port C of the handler I/O is set to the input port, reads out port information inputted to port C (C0 to C3).</p> <p>Port information is inputted/outputted as 4-bit binary data using C0 as LSB and C3 as MSB.</p> <p>For more information on the handler I/O, see Chapter “Communication with External Instruments Using Handler I/O Port“ in the <i>E5070A/E5071A Programmer’s Guide</i>.</p>

Variable

	<i>Value</i>
Description	Port information (output/input)
Data type	Long integer type (Long)
Range	0 to 15
Note	If the specified variable 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.

Examples (1)	<pre>SCPI.CONTRol.HANDler.C.MODE = "outp" SCPI.CONTRol.HANDler.C.DATA = 8</pre>
Examples (2)	<pre>Dim HdlCinp As Long SCPI.CONTRol.HANDler.C.MODE = "inp" HdlCinp = SCPI.CONTRol.HANDler.C.DATA</pre>
Related objects	SCPI.CONTRol.HANDler.C.MODE on page 271
Equivalent key	No equivalent key is available on the front panel.

SCPI.CONTRol.HANDler.C.MODE

Object type Property

Syntax SCPI.CONTRol.HANDler.C.MODE = *Param*
Param = SCPI.CONTRol.HANDler.C.MODE

Description Sets the input/output direction of port C of the handler I/O.
 For more information on the handler I/O, see Chapter “Communication with External Instruments Using Handler I/O Port” in the *E5070A/E5071A Programmer’s Guide*.

Variable

	<i>Param</i>
Description	Input/output direction of port C
Data type	Character string type (String)
Range	Select from the following. •"INPut" Sets the port C to input. •"OUTPut" Sets the port C to output.
Preset value	"INPut"

Examples

```
Dim HdlCmode As String
SCPI.CONTRol.HANDler.C.MODE = "outp"
HdlCmode = SCPI.CONTRol.HANDler.C.MODE
```

Related objects SCPI.CONTRol.HANDler.C.DATA on page 270

Equivalent key No equivalent key is available on the front panel.

SCPI.CONTrol.HANDler.D.DATA

Object type Property

Syntax SCPI.CONTrol.HANDler.D.DATA = *Value*(for output port)
Value = SCPI.CONTrol.HANDler.D.DATA (for input port)

Description When input/output port D of the handler I/O is set to the output port, outputs port information to output port D (D0 to D3).
 When input/output port D of the handler I/O is set to the input port, reads out port information inputted to port D (D0 to D3).
 Port information is outputted as 4-bit binary data using D0 as LSB and D3 as MSB.
 For more information on the handler I/O, see Chapter “Communication with External Instruments Using Handler I/O Port“ in the *E5070A/E5071A Programmer’s Guide*.

Variable

	<i>Value</i>
Description	Port information (output/input)
Data type	Long integer type (Long)
Range	0 to 15
Note	If the specified variable 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.

Examples (1) SCPI.CONTrol.HANDler.D.MODE = "outp"
 SCPI.CONTrol.HANDler.D.DATA = 8

Examples (2) Dim HdlDinp As Long
 SCPI.CONTrol.HANDler.D.MODE = "inp"
 HdlDinp = SCPI.CONTrol.HANDler.D.DATA

Related objects SCPI.CONTrol.HANDler.D.MODE on page 273

Equivalent key No equivalent key is available on the front panel.

SCPI.CONTRol.HANDler.D.MODE

Object type Property

Syntax `SCPI.CONTRol.HANDler.D.MODE = Param`
Param = SCPI.CONTRol.HANDler.D.MODE

Description Sets the input/output direction of port D of the handler I/O.
 For more information on the handler I/O, see Chapter “Communication with External Instruments Using Handler I/O Port” in the *E5070A/E5071A Programmer’s Guide*.

Variable

	<i>Param</i>
Description	Input/output direction of port D
Data type	Character string type (String)
Range	Select from the following. •"INPut" Sets the port D to input. •"OUTPut" Sets the port D to output.
Preset value	"INPut"

Examples

```
Dim HdlDmode As String
SCPI.CONTRol.HANDler.D.MODE = "outp"
HdlDmode = SCPI.CONTRol.HANDler.D.MODE
```

Related objects SCPI.CONTRol.HANDler.D.DATA on page 272

Equivalent key No equivalent key is available on the front panel.

SCPI.CONTrol.HANDler.E.DATA

Object type	Property
Syntax	SCPI.CONTrol.HANDler.E.DATA = <i>Value</i> (for output) <i>Value</i> = SCPI.CONTrol.HANDler.E.DATA (for input port)
Description	<p>When input/output port E (port C + port D) of the handler I/O is set to the output port, outputs port information to output port E (C0 to D3).</p> <p>When input/output port E of the handler I/O is set to the input port, reads out port information inputted to port E (C0 to D3).</p> <p>Port information is outputted as 8-bit binary data using C0 as LSB and D3 as MSB.</p> <p>For more information on the handler I/O, see Chapter “Communication with External Instruments Using Handler I/O Port“ in the <i>E5070A/E5071A Programmer’s Guide</i>.</p>

Variable

	<i>Value</i>
Description	Port information (output/input)
Data type	Long integer type (Long)
Range	0 to 255
Note	If the specified variable 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.

Examples (1)
SCPI.CONTrol.HANDler.C.MODE = "outp"
SCPI.CONTrol.HANDler.D.MODE = "outp"
SCPI.CONTrol.HANDler.E.DATA = 128

Examples (2)
Dim HdLEinp As Long
SCPI.CONTrol.HANDler.C.MODE = "inp"
SCPI.CONTrol.HANDler.D.MODE = "inp"
HdLEinp = SCPI.CONTrol.HANDler.E.DATA

Related objects
SCPI.CONTrol.HANDler.C.MODE on page 271
SCPI.CONTrol.HANDler.D.MODE on page 273
SCPI.CONTrol.HANDler.C.DATA on page 270
SCPI.CONTrol.HANDler.D.DATA on page 272

Equivalent key
No equivalent key is available on the front panel.

SCPI.CONTRol.HANDler.EXTension.INDEx.STATe

Object type Property

Syntax SCPI.CONTRol.HANDler.EXTension.INDEx.STATe = *Status*
Status = SCPI.CONTRol.HANDler.EXTension.INDEx.STATe

Description Turns ON/OFF outputting the INDEX signal to B6 of the handler I/O.
 For more information on the handler I/O and the INDEX signal, see Chapter “Communication with External Instruments Using Handler I/O Port“ in the *E5070A/E5071A Programmer’s Guide*.

NOTE When you use port B6 as the output port, turn OFF the INDEX signal output. When outputting the INDEX signal is turned ON, the bit 6 of the data outputted by the SCPI.CONTRol.HANDler.B.DATA object (the bit 14 of the data outputted by the SCPI.CONTRol.HANDler.F.DATA object) is ignored.

Variable

	<i>Status</i>
Description	ON/OFF of the INDEX signal output
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the INDEX signal output. •False or 0 Turns OFF the INDEX signal output.
Preset value	False or 0

Examples Dim Indx As Boolean
 SCPI.CONTRol.HANDler.EXTension.INDEx.STATe = True
 Indx = SCPI.CONTRol.HANDler.EXTension.INDEx.STATe

Related objects SCPI.CONTRol.HANDler.EXTension.RTRigger.STATe on page 276

Equivalent key No equivalent key is available on the front panel.

SCPI.CONTrol.HANDler.EXTension.RTRigger.STATe

Object type	Property
Syntax	SCPI.CONTrol.HANDler.EXTension.RTRigger.STATe = <i>Status</i> <i>Status</i> = SCPI.CONTrol.HANDler.EXTension.RTRigger.STATe
Description	Turns ON/OFF outputting the READY FOR TRIGGER signal to B7 of the handler I/O. For more information on the handler I/O and the INDEX signal, see Chapter “Communication with External Instruments Using Handler I/O Port” in the <i>E5070A/E5071A Programmer’s Guide</i> .

NOTE When you use port B7 as the output port, turn OFF the READY FOR TRIGGER signal output. When outputting the READY FOR TRIGGER signal is turned ON, the bit 7 of the data outputted by the SCPI.CONTrol.HANDler.B.DATA object (the bit 15 of the data outputted by the SCPI.CONTrol.HANDler.F.DATA object) is ignored.

Variable

	<i>Status</i>
Description	ON/OFF of the READY FOR TRIGGER signal output
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> • True or -1 Turns ON the READY FOR TRIGGER signal output. • False or 0 Turns OFF the READY FOR TRIGGER signal output.
Preset value	False or 0

Examples

```
Dim RdyTrig As Boolean
SCPI.CONTrol.HANDler.EXTension.RTRigger.STATe = True
RdyTrig = SCPI.CONTrol.HANDler.EXTension.RTRigger.STATe
```

Related objects SCPI.CONTrol.HANDler.EXTension.INDEX.STATe on page 275

Equivalent key No equivalent key is available on the front panel.

SCPI.CONTRol.HANDler.F.DATA

Object type Property

Syntax SCPI.CONTRol.HANDler.F.DATA = *Value*

Description Outputs port information to output port F (port A + port B) of the handler I/O. Port information is outputted as 16-bit binary using A0 as LSB and B7 as MSB. (No read)

NOTE The bit 14 of the data outputted by this project is ignored when outputting the INDEX signal is turned ON (specifying True with the SCPI.CONTRol.HANDler.EXTension.INDEx.STATe object).

The bit 15 of the data outputted by this project is ignored when outputting the READY FOR TRIGGER signal is turned ON (specifying True with the SCPI.CONTRol.HANDler.EXTension.RTRigger.STATe object).

For more information on the handler I/O, see Chapter “Communication with External Instruments Using Handler I/O Port“ in the *E5070A/E5071A Programmer’s Guide*.

Variable

	<i>Value</i>
Description	Port information (output)
Data type	Long integer type (Long)
Range	0 to 65535
Note	If the specified variable 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.

Examples SCPI.CONTRol.HANDler.F.DATA = 511

Related objects SCPI.CONTRol.HANDler.A.DATA on page 268
 SCPI.CONTRol.HANDler.B.DATA on page 269

Equivalent key No equivalent key is available on the front panel.

SCPI.CONTrol.HANDler.OUTPUT(*Num*).DATA

Object type	Property
Syntax	SCPI.CONTrol.HANDler.OUTPUT(<i>Num</i>) = <i>Value</i> <i>Value</i> = SCPI.CONTrol.HANDler.OUTPUT(<i>Num</i>)
Description	Sets HIGH / LOW of OUTPUT1 (<i>Num</i> :1) or OUTPUT2 (<i>Num</i> :2) of the handler I/O. For more information on the handler I/O, see Chapter “Communication with External Instruments Using Handler I/O Port“ in the <i>E5070A/E5071A Programmer’s Guide</i> .

Variable

	<i>Num</i>
Description	Number of the OUTPUT terminal
Data type	Long integer type (Long)
Range	1 to 2
Preset value	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

	<i>Value</i>
Description	Polarity (High/Low)
Data type	Long integer type (Long)
Range	Select from the following. <ul style="list-style-type: none"> •1 Specifies LOW. •0 Specifies HIGH.

Examples

```
Dim HdlPol As Long
SCPI.CONTrol.HANDler.OUTPUT(1).DATA = 1
HdlPol = SCPI.CONTrol.HANDler.OUTPUT(1).DATA
```

Equivalent key No equivalent key is available on the front panel.

SCPI.DISPlay.ANNotation.FREQuency.STATe

Object type	Property
Syntax	SCPI.DISPlay.ANNotation.FREQuency.STATe = <i>Status</i> <i>Status</i> = SCPI.DISPlay.ANNotation.FREQuency.STATe
Description	Turns ON/OFF the frequency display on the LCD display.
Variable	

	<i>Status</i>
Description	ON/OFF of the frequency display
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the frequency display. •False or 0 Turns OFF the frequency display.
Preset value	True or -1

Examples	Dim DispFreq As Boolean SCPI.DISPlay.ANNotation.FREQuency.STATe = False DispFreq = SCPI.DISPlay.ANNotation.FREQuency.STATe
Equivalent key	[Display] - Frequency

SCPI.DISPlay.CCLear

Object type	Method
Syntax	SCPI.DISPlay.CCLear
Description	Clears the error message display on the instrument status bar (at the bottom of the LCD display). (No read)
Examples	SCPI.DISPlay.CCLear
Equivalent key	No equivalent key is available on the front panel.

SCPI.DISPlay.CLOCK

Object type Property

Syntax SCPI.DISPlay.CLOCK = *Status*
Status = SCPI.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).

Variable

	<i>Status</i>
Description	ON/OFF of the clock display
Data type	Boolean type (Boolean)
Range	Select from the following. •True or -1 Turns ON the clock display. •False or 0 Turns OFF the clock display.
Preset value	True or -1

Examples

```
Dim DispTime As Boolean
SCPI.DISPlay.CLOCK = False
DispTime = SCPI.DISPlay.CLOCK
```

Equivalent key **[System] - Misc Setup - Clock Setup - Show Clock**

SCPI.DISPlay.COLOr(*Dnum*).BACK

Object type	Property
Syntax	SCPI.DISPlay.COLOr(<i>Dnum</i>).BACK = <i>Data</i> <i>Data</i> = SCPI.DISPlay.COLOr(<i>Dnum</i>).BACK
Description	Sets the background color for normal display (<i>Dnum</i> : 1) and inverted display (<i>Dnum</i> : 2) .
Variable	

Table 7-11

Variable(*Dnum*)

	<i>Dnum</i>
Description	The number of display mode 1: normal display 2: inverted display
Data type	Long integer type (Long)
Range	1 to 2
Preset value	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

	<i>Data</i>
Description	Indicates 3-element array data. <ul style="list-style-type: none"> • <i>Data</i>(0) Sets amount of red. • <i>Data</i>(1) Sets amount of green. • <i>Data</i>(2) Sets amount of blue. The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> • <i>Data</i>(0) 0 to 5 • <i>Data</i>(1) 0 to 5 • <i>Data</i>(2) 0 to 5
Resolution	1
Note	If the specified variable 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.

Examples

```
Dim BackColor As Variant
SCPI.DISPlay.COLOr(1).BACK = Array(1,2,3)
BackColor = SCPI.DISPlay.COLOr(1).BACK
```

Related objects SCPI.DISPlay.COLOr(*Dnum*).RESet on page 284

Equivalent key **[System] - Misc Setup - Color Setup - Normal|Invert - Background**

SCPI.DISPlay.COLOr(Dnum).GRATicule(Gnum)

Object type Property

Syntax SCPI.DISPlay.COLOr(Dnum).GRATicule(Gnum) = Data
 Data = SCPI.DISPlay.COLOr(Dnum).GRATicule(Gnum)

Description Sets the color of the graticule label and the outer frame line of the graph (*Gnum*: 1) and the color of the grid line of the graph (*Gnum*: 2) for normal display (*Dnum*: 1) and inverted display (*Dnum*: 2).

Variable

	<i>Gnum</i>
Description	The number of item 1: The outer frame line of the graph 2: The color of the grid line of the graph
Data type	Long integer type (Long)
Range	1 to 2
Preset value	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

	<i>Data</i>
Description	Indicates 3-element array data. <ul style="list-style-type: none"> • <i>Data</i>(0) Sets amount of red. • <i>Data</i>(1) Sets amount of green. • <i>Data</i>(2) Sets amount of blue. The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> • <i>Data</i>(0) 0 to 5 • <i>Data</i>(1) 0 to 5 • <i>Data</i>(2) 0 to 5
Resolution	1
Note	If the specified variable 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.

For information on the variable (*Dnum*), see Table 7-11, “Variable(Dnum),” on page 281.

Examples

```
Dim GritColor As Variant
SCPI.DISPlay.COLOr(1).GRATicule(1) = Array(1,2,3)
GritColor = SCPI.DISPlay.COLOr(1).GRATicule(1)
```

Related objects

SCPI.DISPlay.COLOr(Dnum).RESet on page 284

Equivalent key

[System] - Misc Setup - Color Setup - Normal|Invert - Graticule Main|Graticule Sub

SCPI.DISPLAY.COLOR(Dnum).LIMIT(Lnum)

Object type	Property
Syntax	SCPI.DISPLAY.COLOR(Dnum).LIMIT(Lnum) = Data Data = SCPI.DISPLAY.COLOR(Dnum).LIMIT(Lnum)
Description	Sets the fail display color used for the limit test result (<i>Lnum</i> : 1) and the color of the limit line (<i>Lnum</i> : 2) for normal display (<i>Dnum</i> : 1) and inverted display (<i>Dnum</i> : 2).

Variable

	<i>Lnum</i>
Description	The number of item 1: The limit test result 2: The limit line
Data type	Long integer type (Long)
Range	1 to 2
Preset value	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

	<i>Data</i>
Description	Indicates 3-element array data. <ul style="list-style-type: none"> • <i>Data</i>(0) Sets amount of red. • <i>Data</i>(1) Sets amount of green. • <i>Data</i>(2) Sets amount of blue. The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> • <i>Data</i>(0) 0 to 5 • <i>Data</i>(1) 0 to 5 • <i>Data</i>(2) 0 to 5
Resolution	1
Note	If the specified variable 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.

For information on the variable (*Dnum*), see Table 7-11, “Variable(Dnum),” on page 281.

Examples

```
Dim LimColor As Variant
SCPI.DISPLAY.COLOR(1).LIMIT(1) = Array(1,2,3)
LimColor = SCPI.DISPLAY.COLOR(1).LIMIT(1)
```

Related objects SCPI.DISPLAY.COLOR(Dnum).RESET on page 284

Equivalent key **[System] - Misc Setup - Color Setup - Normal|Invert - Limit Fail|Limit Line**

SCPI.DISPlay.COLOr(*Dnum*).RESet

Object type	Method
Syntax	SCPI.DISPlay.COLOr(<i>Dnum</i>).RESet
Description	Resets the display color settings for all the items to the factory preset state for normal display (<i>Dnum</i> : 1) and inverted display (<i>Dnum</i> : 2). (No read)
Variable	For information on the variable (<i>Dnum</i>), see Table 7-11, “Variable(<i>Dnum</i>),” on page 281.
Examples	<code>SCPI.DISPlay.COLOr(1).RESet</code>
Related objects	SCPI.DISPlay.COLOr(<i>Dnum</i>).BACK on page 281 SCPI.DISPlay.COLOr(<i>Dnum</i>).GRATicule(<i>Gnum</i>) on page 282 SCPI.DISPlay.COLOr(<i>Dnum</i>).LIMit(<i>Lnum</i>) on page 283 SCPI.DISPlay.COLOr(<i>Dnum</i>).TRACe(<i>Tr</i>).DATA on page 285 SCPI.DISPlay.COLOr(<i>Dnum</i>).TRACe(<i>Tr</i>).MEMory on page 286
Equivalent key	[System] - Misc Setup - Color Setup - Normal Invert - Reset Color - OK

SCPI.DISPlay.COLOr(*Dnum*).TRACe(*Tr*).DATA

Object type	Property
Syntax	SCPI.DISPlay.COLOr(<i>Dnum</i>).TRACe(<i>Tr</i>).DATA = <i>Data</i> <i>Data</i> = SCPI.DISPlay.COLOr(<i>Dnum</i>).TRACe(<i>Tr</i>).DATA
Description	Sets the color of the data trace of traces 1 to 9 (<i>Tr</i>) for normal display (<i>Dnum</i> : 1) and inverted display (<i>Dnum</i> : 2).
Variable	

	<i>Data</i>
Description	Indicates 3-element array data. <ul style="list-style-type: none"> • <i>Data</i>(0) Sets amount of red. • <i>Data</i>(1) Sets amount of green. • <i>Data</i>(2) Sets amount of blue. The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> • <i>Data</i>(0) 0 to 5 • <i>Data</i>(1) 0 to 5 • <i>Data</i>(2) 0 to 5
Resolution	1
Note	If the specified variable 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.

For information on the variable (*Dnum*) and the variable (*Tr*), see Table 7-11, “Variable(*Dnum*),” on page 281 and Table 7-9, “Variable (*Tr*),” on page 198, respectively.

Examples

```
Dim TrColor As Variant
SCPI.DISPlay.COLOr(1).TRACe(1).DATA = Array(1,2,3)
TrColor = SCPI.DISPlay.COLOr(1).TRACe(1).DATA
```

Related objects SCPI.DISPlay.COLOr(*Dnum*).RESEt on page 284

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**

SCPI.DISPlay.COLOr(Dnum).TRACe(Tr).MEMory

Object type	Property
Syntax	SCPI.DISPlay.COLOr(Dnum).TRACe(Tr).MEMory = <i>Data</i> <i>Data</i> = SCPI.DISPlay.COLOr(Dnum).TRACe(Tr).MEMory
Description	Sets the color of the memory trace of traces 1 to 9 (<i>Tr</i>) for normal display (<i>Dnum</i> : 1) and inverted display (<i>Dnum</i> : 2).
Variable	

	<i>Data</i>
Description	Indicates 3-element array data. <ul style="list-style-type: none"> • <i>Data</i>(0) Sets amount of red. • <i>Data</i>(1) Sets amount of green. • <i>Data</i>(2) Sets amount of blue. The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> • <i>Data</i>(0) 0 to 5 • <i>Data</i>(1) 0 to 5 • <i>Data</i>(2) 0 to 5
Resolution	1
Note	If the specified variable 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.

For information on the variable (*Dnum*) and the variable (*Tr*), see Table 7-11, “Variable(Dnum),” on page 281 and Table 7-9, “Variable (Tr),” on page 198, respectively.

Examples

```
Dim TrColor As Variant
SCPI.DISPlay.COLOr(1).TRACe(1).MEMory = Array(1,2,3)
TrColor = SCPI.DISPlay.COLOr(1).TRACe(1).MEMory
```

Related objects SCPI.DISPlay.COLOr(Dnum).RESet on page 284

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**

SCPI.DISPlay.ECHO.CLEAr

Object type	Method
Syntax	SCPI.DISPlay.ECHO.CLEAr
Description	Clears all character strings displayed in the echo window. (No read)
Examples	<code>SCPI.DISPlay.ECHO.CLEAr</code>
Related objects	ECHO on page 152 SCPI.DISPlay.ECHO.DATA on page 287
Equivalent key	[Macro Setup] - Clear Echo

SCPI.DISPlay.ECHO.DATA

Object type	Property
Syntax	SCPI.DISPlay.ECHO.DATA = <i>Cont</i>
Description	Displays a character string in the echo window. (No read) There is the following difference from the display with the ECHO object. <ul style="list-style-type: none"> • Displays a single character string.

Variable

	<i>Cont</i>
Description	String you want to display in the echo window.
Data type	Character string type (String)
Range	254 characters or less

Examples	<code>SCPI.DISPlay.ECHO.DATA = "Test Result"</code> <code>SCPI.DISPlay.TABLE.TYPE = "echo"</code> <code>SCPI.DISPlay.TABLE.STATe = True</code>
Related objects	ECHO on page 152 SCPI.DISPlay.TABLE.TYPE on page 296 SCPI.DISPlay.TABLE.STATe on page 295 SCPI.DISPlay.ECHO.CLEAr on page 287
Equivalent key	No equivalent key is available on the front panel.

SCPI.DISPlay.ENABLE

Object type	Property
Syntax	SCPI.DISPlay.ENABLE = <i>Status</i> <i>Status</i> = SCPI.DISPlay.ENABLE
Description	Turns ON/OFF the display update on the E5070A/E5071A measurement screen.
Variable	

	<i>Status</i>
Description	ON/OFF of the display update of the E5070A/E5071A measurement screen
Data type	Boolean type (Boolean)
Range	Select from the following. •True or -1 Turns ON the display update. •False or 0 Turns OFF the display update.
Preset value	True or -1

Examples

```
Dim DispUpdt As Boolean
SCPI.DISPlay.ENABLE = False
DispUpdt = SCPI.DISPlay.ENABLE
```

Equivalent key **[Display] - Update**

SCPI.DISPlay.FSIGN

- Object type** Property
- Syntax** SCPI.DISPlay.FSIGN = *Status*
Status = SCPI.DISPlay.FSIGN
- Description** Turns ON/OFF the “Fail“ display on the LCD screen when the limit test fails.
- Variable**

	<i>Status</i>
Description	ON/OFF of the “Fail“ display when the limit test fails
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> • True or -1 Turns ON the “Fail“ display. • False or 0 Turns OFF the “Fail“ display.
Preset value	True or -1

- Examples**
- ```
Dim DispFail As Boolean
SCPI.DISPlay.FSIGN = False
DispFail = SCPI.DISPlay.FSIGN
```
- Related objects** SCPI.CALCulate(Ch).SElected.LIMit.STATE on page 232
- Equivalent key** **[Analysis] - Limit Test - Fail Sign**

## SCPI.DISPlay.IMAGe

|             |                                                                        |
|-------------|------------------------------------------------------------------------|
| Object type | Property                                                               |
| Syntax      | SCPI.DISPlay.IMAGe = <i>Param</i><br><i>Param</i> = SCPI.DISPlay.IMAGe |
| Description | Selects the display type of the LCD display.                           |
| Variable    |                                                                        |

|              |                                                                                                                                                                                                                                                                      |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <b><i>Param</i></b>                                                                                                                                                                                                                                                  |
| Description  | Display type of the LCD display                                                                                                                                                                                                                                      |
| Data type    | Character string type (String)                                                                                                                                                                                                                                       |
| Range        | Select from the following. <ul style="list-style-type: none"><li>•"NORMal" Specifies the normal display (background color: black).</li><li>•"INVert" Specifies the display in which the color of the normal display is inversed (background color: white).</li></ul> |
| Preset value | "NORMal"                                                                                                                                                                                                                                                             |

**Examples**

```
Dim DispImg As String
SCPI.DISPlay.IMAGe = "inv"
DispImg = SCPI.DISPlay.IMAGe
```

**Equivalent key**     **[Display] - Invert Color**

## SCPI.DISPlay.MAXimize

**Object type** Property

**Syntax** SCPI.DISPlay.MAXimize = *Status*  
*Status* = SCPI.DISPlay.MAXimize

**Description** Turns ON/OFF the window maximization of the active channel.  
 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.

**Variable**

|              | <i>Status</i>                                                                                                                                                                                                                   |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | ON/OFF of the window maximization                                                                                                                                                                                               |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                          |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns ON the window maximization.</li> <li>•False or 0                      Turns OFF the window maximization.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                      |

**Examples**

```
Dim ChMax As Boolean
SCPI.DISPlay.SPLit = "d1_2"
SCPI.DISPlay.WINDow(2).ACTivate
SCPI.DISPlay.MAXimize = True
ChMax = SCPI.DISPlay.MAXimize
```

**Related objects** SCPI.DISPlay.WINDow(Ch).ACTivate on page 297

**Equivalent key** **[Channel Max]**

## **SCPI.DISPlay.SKEY.STATe**

|             |                                                                                    |
|-------------|------------------------------------------------------------------------------------|
| Object type | Property                                                                           |
| Syntax      | SCPI.DISPlay.SKEY.STATe = <i>Status</i><br><i>Status</i> = SCPI.DISPlay.SKEY.STATe |
| Description | Turns ON/OFF the display of the softkey menu bar.                                  |
| Variable    |                                                                                    |

|              |                                                                                                                                                                                   |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <b><i>Status</i></b>                                                                                                                                                              |
| Description  | ON/OFF of the softkey menu bar display                                                                                                                                            |
| Data type    | Boolean type (Boolean)                                                                                                                                                            |
| Range        | Select from the following.<br>•True or -1                      Turns ON the softkey menu bar display.<br>•False or 0                      Turns OFF the softkey menu bar display. |
| Preset value | True or -1                                                                                                                                                                        |

**Examples**

```
Dim DispSkey As Boolean
SCPI.DISPlay.SKEY.STATe = False
DispSkey = SCPI.DISPlay.SKEY.STATe
```

**Equivalent key**      **[Entry Off]**



## SCPI.DISPlay.SPLit

|             |                                                                        |
|-------------|------------------------------------------------------------------------|
| Object type | Property                                                               |
| Syntax      | SCPI.DISPlay.SPLit = <i>Param</i><br><i>Param</i> = SCPI.DISPlay.SPLit |
| Description | Sets the layout of the channel windows on the LCD display.             |
| Variable    |                                                                        |

|              | <i>Param</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Layout of channel windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"D1" See Figure 7-3.</li> <li>•"D12" See Figure 7-3.</li> <li>•"D1_2" See Figure 7-3.</li> <li>•"D112" See Figure 7-3.</li> <li>•"D1_1_2" See Figure 7-3.</li> <li>•"D123" See Figure 7-3.</li> <li>•"D1_2_3" See Figure 7-3.</li> <li>•"D12_33" See Figure 7-3.</li> <li>•"D11_23" See Figure 7-3.</li> <li>•"D13_23" See Figure 7-3.</li> <li>•"D12_13" See Figure 7-3.</li> <li>•"D1234" See Figure 7-3.</li> <li>•"D1_2_3_4" See Figure 7-3.</li> <li>•"D12_34" See Figure 7-3.</li> <li>•"D123_456" See Figure 7-3.</li> <li>•"D12_34_56" See Figure 7-3.</li> <li>•"D1234_5678" See Figure 7-3.</li> <li>•"D12_34_56_78" See Figure 7-3.</li> <li>•"D123_456_789" See Figure 7-3.</li> </ul> |
| Preset value | "D1"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

**Examples**

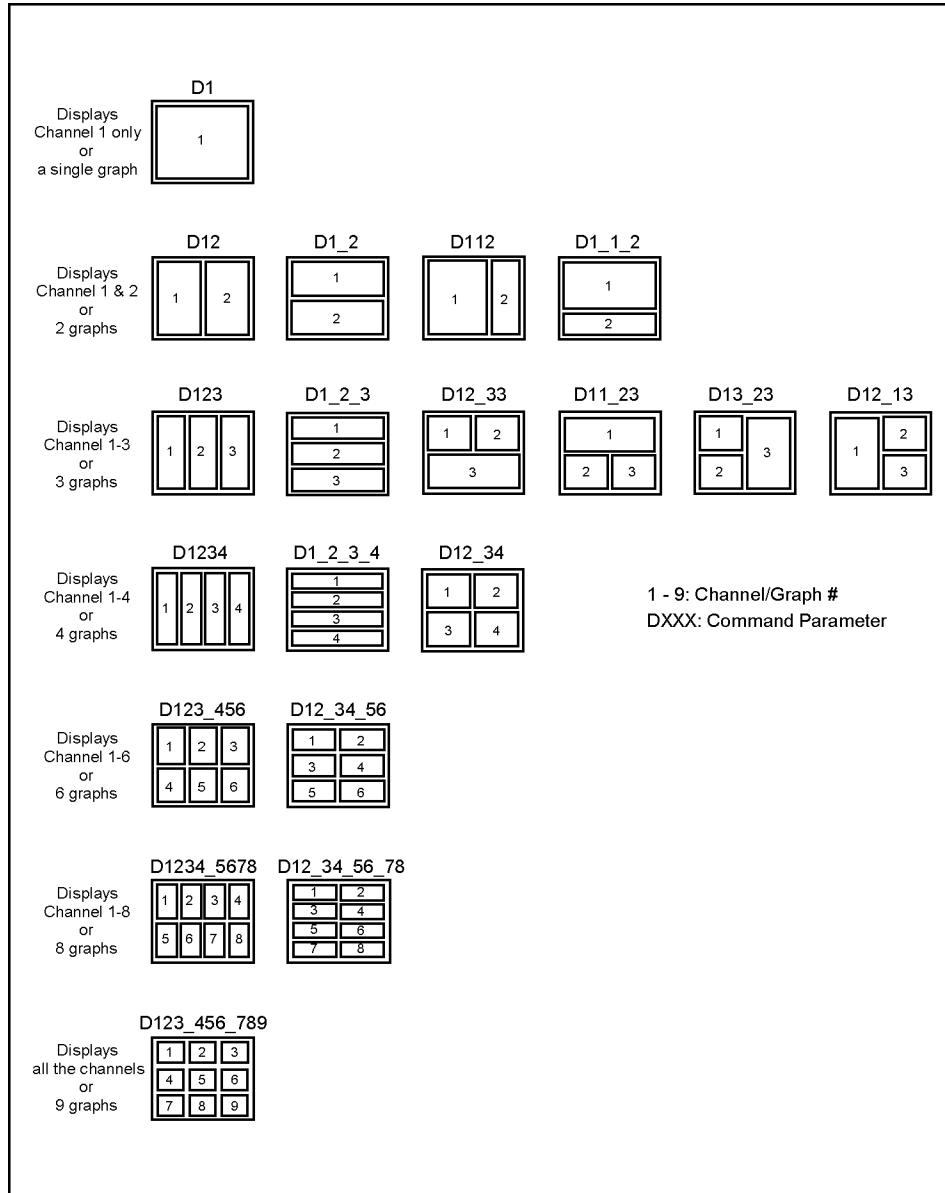
```
Dim ChanAlloc As String
SCPI.DISPlay.SPLit = "d12_34"
ChanAlloc = SCPI.DISPlay.SPLit
```

**Related objects** SCPI.DISPlay.WINDow(Ch).SPLit on page 300

**Equivalent key** **[Display] - Allocate Channels**

Figure 7-3

Channel/graph window layouts



e5070ape030

## SCPI.DISPlay.TABLe.STATe

|             |                                                                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                      |
| Syntax      | SCPI.DISPlay.TABLe.STATe = <i>Status</i><br><i>Status</i> = SCPI.DISPlay.TABLe.STATe                                                          |
| Description | Turns ON/OFF the display of the window that appears in the lower part of the LCD display (specified with the SCPI.DISPlay.TABLe.TYPE object). |
| Variable    |                                                                                                                                               |

|              | <i>Status</i>                                                                                                                                                                                           |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | ON/OFF of the display of the window that appears in the lower part of the LCD display                                                                                                                   |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                  |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns ON the display.</li> <li>•False or 0                      Turns OFF the display.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                              |

**Examples**

```
Dim DispTbl As Boolean
SCPI.DISPlay.TABLe.TYPE = "echo"
SCPI.DISPlay.TABLe.STATe = True
DispTbl = SCPI.DISPlay.TABLe.STATe
```

**Related objects**      SCPI.DISPlay.TABLe.TYPE on page 296

**Equivalent key**

- [Sweep Setup] - Edit Segment Table**
- [Marker Fctn] - Marker Table**
- [Analysis] - Limit Test - Edit Limit Line**
- [Macro Setup] - Echo Window**

---

**NOTE**                      When performing the operation from the front panel, you select the type of the window that appears in the lower part of the LCD display and turn ON/OFF the display at the same time.

---

## SCPI.DISPlay.TABLe.TYPE

|             |                                                                                   |
|-------------|-----------------------------------------------------------------------------------|
| Object type | Property                                                                          |
| Syntax      | SCPI.DISPlay.TABLe.TYPE = <i>Param</i><br><i>Param</i> = SCPI.DISPlay.TABLe.TYPE  |
| Description | Selects the type of the window that appears in the lower part of the LCD display. |
| Variable    |                                                                                   |

|              |                                                                                                                                                                                                                                                                                   |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <b><i>Param</i></b>                                                                                                                                                                                                                                                               |
| Description  | Window type                                                                                                                                                                                                                                                                       |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                    |
| Range        | Select from the following.<br>•"MARKer"                Specifies the marker table window.<br>•"LIMit"                 Specifies the limit test table window.<br>•"SEGment"              Specifies the segment table window.<br>•"ECHO"                 Specifies the echo window. |
| Preset value | "MARKer"                                                                                                                                                                                                                                                                          |

**Examples**

```
Dim TblType As String
SCPI.DISPlay.TABLe.TYPE = "echo"
SCPI.DISPlay.TABLe.STATe = True
TblType = SCPI.DISPlay.TABLe.TYPE
```

**Related objects**      SCPI.DISPlay.TABLe.STATe on page 295

**Equivalent key**

- [Sweep Setup] - Edit Segment Table**
- [Marker Fctn] - Marker Table**
- [Analysis] - Limit Test - Edit Limit Line**
- [Macro Setup] - Echo Window**

---

**NOTE**                      When performing the operation from the front panel, you select the type of the window that appears in the lower part of the LCD display and turn ON/OFF the display at the same time.

---

## SCPI.DISPlay.UPDate.IMMediate

|                 |                                                                                                                                                             |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type     | Method                                                                                                                                                      |
| Syntax          | SCPI.DISPlay.UPDate.IMMediate                                                                                                                               |
| Description     | When the display update of the LCD screen is set to OFF (specifying False with the SCPI.DISPlay.ENABLE object), executes the display update once. (No read) |
| Example of use  | <pre>SCPI.DISPlay.ENABLE = False SCPI.DISPlay.UPDate.IMMediate</pre>                                                                                        |
| Related objects | SCPI.DISPlay.ENABLE on page 288                                                                                                                             |
| Equivalent key  | No equivalent key is available on the front panel.                                                                                                          |

## SCPI.DISPlay.WINDow(*Ch*).ACTivate

|                 |                                                                                                                                                                                                                                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type     | Method                                                                                                                                                                                                                                                                                 |
| Syntax          | SCPI.DISPlay.WINDow( <i>Ch</i> ).ACTivate                                                                                                                                                                                                                                              |
| Description     | <p>Specifies channels 1 to 9 (<i>Ch</i>) to the active channel.</p> <p>You can set only a channel displayed to the active channel. If this object is used to set a channel not displayed to the active channel, an error occurs when executed and the object is ignored. (No read)</p> |
| Variable        | For information on the variable ( <i>Ch</i> ), see Table 7-6, “Variable (Ch),” on page 163.                                                                                                                                                                                            |
| Examples        | <pre>SCPI.DISPlay.SPLit = "d1_2" SCPI.DISPlay.WINDow(2).ACTivate</pre>                                                                                                                                                                                                                 |
| Related objects | SCPI.CALCulate( <i>Ch</i> ).PARAmeter( <i>Tr</i> ).SELEct on page 198                                                                                                                                                                                                                  |
| Equivalent key  | <b>[Channel Prev] / [Channel Next]</b>                                                                                                                                                                                                                                                 |

## SCPI.DISPlay.WINDow(Ch).LAbel

Object type

Property

Syntax

SCPI.DISPlay.WINDow(*Ch*).LAbel = *Status*

*Status* = SCPI.DISPlay.WINDow(*Ch*).LAbel

Description

Turns ON/OFF the graticule label display of the graph of channels 1 to 9 (*Ch*).

Variable

|              |                                                                                                                                                                                 |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <b><i>Status</i></b>                                                                                                                                                            |
| Description  | ON/OFF of the graticule label display of the graph                                                                                                                              |
| Data type    | Boolean type (Boolean)                                                                                                                                                          |
| Range        | Select from the following.<br>•True or -1                      Turns ON the graticule label display.<br>•False or 0                      Turns OFF the graticule label display. |
| Preset value | True or -1                                                                                                                                                                      |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim DispGrat As Boolean
SCPI.DISPlay.WINDow(1).LAbel = False
DispGrat = SCPI.DISPlay.WINDow(1).LAbel
```

Equivalent key

**[Display] - Graticule Label**

## SCPI.DISPlay.WINDow(Ch).MAXimize

Object type Property

Syntax SCPI.DISPlay.WINDow(Ch).MAXimize = *Status*  
*Status* = SCPI.DISPlay.WINDow(Ch).MAXimize

Description Turns ON/OFF the maximization of the active trace of channels 1 to 9 (*Ch*).  
 If you turned ON the maximization, only the maximized active trace is displayed in the window and the other traces are not displayed.

Variable

|              | <i>Status</i>                                                                                                                                                               |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | ON/OFF of the maximization of the active trace                                                                                                                              |
| Data type    | Boolean type (Boolean)                                                                                                                                                      |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>• True or -1 Turns ON the maxim display.</li> <li>• False or 0 Turns OFF the maxim display.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                  |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples  

```
Dim TracMax As Boolean
SCPI.CALCulate(1).PARAmeter(2).SElect
SCPI.DISPlay.WINDow(1).MAXimize = True
TracMax = SCPI.DISPlay.WINDow(1).MAXimize
```

Related objects SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198  
 SCPI.DISPlay.MAXimize on page 291

Equivalent key **[Trace Max]**

## SCPI.DISPlay.WINDow(*Ch*).SPLit

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                       |
| Syntax      | SCPI.DISPlay.WINDow( <i>Ch</i> ).SPLit = <i>Param</i><br><i>Param</i> = SCPI.DISPlay.WINDow( <i>Ch</i> ).SPLit |
| Description | Sets the graph layout of channels 1 to 9 ( <i>Ch</i> ).                                                        |
| Variable    |                                                                                                                |

|              | <i>Param</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Graph layout                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"D1"                    See Figure 7-3.</li> <li>•"D12"                   See Figure 7-3.</li> <li>•"D1_2"                   See Figure 7-3.</li> <li>•"D112"                   See Figure 7-3.</li> <li>•"D1_1_2"                See Figure 7-3.</li> <li>•"D123"                   See Figure 7-3.</li> <li>•"D1_2_3"                See Figure 7-3.</li> <li>•"D12_33"                See Figure 7-3.</li> <li>•"D11_23"                See Figure 7-3.</li> <li>•"D13_23"                See Figure 7-3.</li> <li>•"D12_13"                See Figure 7-3.</li> <li>•"D1234"                   See Figure 7-3.</li> <li>•"D1_2_3_4"              See Figure 7-3.</li> <li>•"D12_34"                See Figure 7-3.</li> <li>•"D123_456"              See Figure 7-3.</li> <li>•"D12_34_56"             See Figure 7-3.</li> <li>•"D1234_5678"            See Figure 7-3.</li> <li>•"D12_34_56_78"        See Figure 7-3.</li> <li>•"D123_456_789"        See Figure 7-3.</li> </ul> |
| Preset value | "D1"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

**Examples**

```
Dim TracAlloc As String
SCPI.DISPlay.WINDow(1).SPLit = "d1_2"
TracAlloc = SCPI.DISPlay.WINDow(1).SPLit
```

**Related objects**      SCPI.DISPlay.SPLit on page 293

**Equivalent key**      **[Display] - Allocate Traces**



## SCPI.DISPlay.WINDow(Ch).TITLe.DATA

- Object type** Property
- Syntax** SCPI.DISPlay.WINDow(*Ch*).TITLe.DATA = *Lbl*  
*Lbl* = SCPI.DISPlay.WINDow(*Ch*).TITLe.DATA
- Description** Sets the title label displayed in the title area of channels 1 to 9 (*Ch*).
- Variable**

|              |                                |
|--------------|--------------------------------|
|              | <i>Lbl</i>                     |
| Description  | Title label                    |
| Data type    | Character string type (String) |
| Range        | 254 characters or less         |
| Preset value | ""                             |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples**
- ```
Dim TtlLbl As String
SCPI.DISPlay.WINDow(1).TITLe.DATA = "Filter"
SCPI.DISPlay.WINDow(1).TITLe.STATe = True
TtlLbl = SCPI.DISPlay.WINDow(1).TITLe.DATA
```
- Related objects** SCPI.DISPlay.WINDow(Ch).TITLe.STATe on page 302
- Equivalent key** **[Display] - Edit Title Label**

SCPI.DISPlay.WINDow(Ch).TITLe.STATe

Object type	Property
Syntax	SCPI.DISPlay.WINDow(<i>Ch</i>).TITLe.STATe = <i>Status</i> <i>Status</i> = SCPI.DISPlay.WINDow(<i>Ch</i>).TITLe.STATe
Description	Turns ON/OFF the title label display in the title area of channels 1 to 9 (<i>Ch</i>).
Variable	

	<i>Status</i>
Description	ON/OFF of the title label display
Data type	Boolean type (Boolean)
Range	Select from the following. •True or -1 Turns ON the title label display. •False or 0 Turns ON the title label display.
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim DispTtl As Boolean
SCPI.DISPlay.WINDow(1).TITLe.DATA = "Filter"
SCPI.DISPlay.WINDow(1).TITLe.STATe = True
DispTtl = SCPI.DISPlay.WINDow(1).TITLe.STATe
```

Related objects SCPI.DISPlay.WINDow(Ch).TITLe.DATA on page 301

Equivalent key **[Display] - Title Label**

SCPI.DISPlay.WINDow(Ch).TRACe(Tr).MEMory. STATE

Object type	Property
Syntax	SCPI.DISPlay.WINDow(<i>Ch</i>).TRACe(<i>Tr</i>).MEMory.STATe = <i>Status</i> <i>Status</i> = SCPI.DISPlay.WINDow(<i>Ch</i>).TRACe(<i>Tr</i>).MEMory.STATe
Description	For traces 1 to 9 (<i>Tr</i>) of channels 1 to 9 (<i>Ch</i>), turns ON/OFF the memory trace display.
Variable	

	<i>Status</i>
Description	ON/OFF of the memory trace display
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the memory trace display. •False or 0 Turns OFF the memory trace display.
Preset value	False or 0

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-9, “Variable (Tr),” on page 198, respectively.

Examples	<pre>Dim DispMem As Boolean SCPI.DISPlay.WINDow(1).TRACe(2).MEMory.STATe = True DispMem = SCPI.DISPlay.WINDow(1).TRACe(2).MEMory.STATe</pre>
Related objects	SCPI.CALCulate(Ch).SELeCted.MATH.MEMorize on page 253 SCPI.DISPlay.WINDow(Ch).TRACe(Tr).STATe on page 304
Equivalent key	[Display] - Display - Mem (when the data trace display is OFF) [Display] - Display - Data & Mem (when the data trace display is ON)

SCPI.DISPlay.WINDow(Ch).TRACe(Tr).STATe

Object type	Property
Syntax	SCPI.DISPlay.WINDow(<i>Ch</i>).TRACe(<i>Tr</i>).STATe = <i>Status</i> <i>Status</i> = SCPI.DISPlay.WINDow(<i>Ch</i>).TRACe(<i>Tr</i>).STATe
Description	For traces 1 to 9 (<i>Tr</i>) of channels 1 to 9 (<i>Ch</i>), turns ON/OFF the data trace display.
Variable	

	<i>Status</i>
Description	ON/OFF of the data trace display
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the data trace display. •False or 0 Turns OFF the data trace display.
Preset value	True or -1

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-9, “Variable (Tr),” on page 198, respectively.

Examples	<pre>Dim DispTrac As Boolean SCPI.DISPlay.WINDow(1).TRACe(2).STATe = False DispTrac = SCPI.DISPlay.WINDow(1).TRACe(2).STATe</pre>
----------	---

Related objects	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).MEMory. STATe on page 303
-----------------	---

Equivalent key	[Display] - Display - Data (when the memory trace display is OFF) [Display] - Display - Data & Mem (when the memory trace display is ON)
----------------	---

SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.AUTO

Object type	Method
Syntax	SCPI.DISPlay.WINDow(<i>Ch</i>).TRACe(<i>Tr</i>).Y.SCALe.AUTO
Description	For traces 1 to 9 (<i>Tr</i>) of channels 1 to 9 (<i>Ch</i>), executes the auto scale (function to automatically adjust the value of the reference division line and the scale per division to display the trace appropriately). (No read)
Variable	For information on the variable (<i>Ch</i>) and the variable (<i>Tr</i>), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-9, “Variable (Tr),” on page 198, respectively.
Examples	SCPI.DISPlay.WINDow(1).TRACe(2).Y.SCALe.AUTO
Related objects	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. PDIVision on page 305 SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVel on page 306
Equivalent key	[Scale] - Auto Scale

SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.PDIVision

Object type Property

Syntax SCPI.DISPlay.WINDow(*Ch*).TRACe(*Tr*).Y.SCALe.PDIVision = *Value*
Value = SCPI.DISPlay.WINDow(*Ch*).TRACe(*Tr*).Y.SCALe.PDIVision

Description For traces 1 to 9 (*Tr*) of channels 1 to 9 (*Ch*), 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 circumference).

Variable

	<i>Value</i>
Description	Scale value
Data type	Double precision floating point type (Double)
Range	1E-18 to 1E8
Preset value	Varies depending the data format. <ul style="list-style-type: none"> • Log magnitude : 10 • Phase or Expanded phase : 90 • Group delay : 1E-8 • Smith chart or Polar or SWR : 1 • Linear magnitude : 0.1 • Real or Imaginary : 0.2
Unit	Varies depending on the data format. <ul style="list-style-type: none"> • Log magnitude (MLOG) : dB (decibel) • Phase (PHAS) or Expanded phase (UPH) : ° (degree) • Group delay (GDEL) : s (second) • Others : No unit
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-9, “Variable (Tr),” on page 198, respectively.

Examples

```
Dim Pdiv As Double
SCPI.CALCulate(1).PARAMeter(2).SElect
SCPI.CALCulate(1).SElected.FORMat = "gdel"
SCPI.DISPlay.WINDow(1).TRACe(2).Y.SCALe.PDIVision = 1E-9
Pdiv = SCPI.DISPlay.WINDow(1).TRACe(2).Y.SCALe.PDIVision
```

Related objects SCPI.CALCulate(Ch).SElected.FORMat on page 214
SCPI.DISPlay.WINDow(Ch).Y.SCALe.DIVisions on page 309
SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVel on page 306
SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RPOsition on page 307

Equivalent key **[Scale] - Scale/Div**

SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVel

Object type	Property
Syntax	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVel = <i>Value</i> <i>Value</i> = SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVel
Description	For traces 1 to 9 (<i>Tr</i>) of channels 1 to 9 (<i>Ch</i>), sets the value of the reference division line.
Variable	

	<i>Value</i>
Description	Value of reference division line
Data type	Double precision floating point type (Double)
Range	-5E8 to 5E8
Preset value	0*1
Unit	Varies depending on the data format. <ul style="list-style-type: none"> • Log magnitude (MLOG) : dB (decibel) • Phase (PHAS) or Expanded phase (UPH) : ° (degree) • Group delay (GDEL) : s (second) • Others : No unit
Note	If the specified variable 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.

*1. The preset value is 1 when the data format is SWR.

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-9, “Variable (Tr),” on page 198, respectively.

Examples

```
Dim RefLvl As Double
SCPI.CALCulate(1).PARAmeter(2).SElect
SCPI.CALCulate(1).SElected.FORMat = "phas"
SCPI.DISPlay.WINDow(1).TRACe(2).Y.SCALe.RLEVel = 90
Pdiv = SCPI.DISPlay.WINDow(1).TRACe(2).Y.SCALe.RLEVel
```

Related objects

- SCPI.CALCulate(Ch).SElected.FORMat on page 214
- SCPI.DISPlay.WINDow(Ch).Y.SCALe.DIVisions on page 309
- SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. PDIVision on page 305
- SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. RPOSITION on page 307

Equivalent key **[Scale] - Reference Value**

SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RPOsition

Object type	Property
Syntax	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RPOsition = <i>Value</i> <i>Value</i> = SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RPOsition
Description	For traces 1 to 9 (<i>Tr</i>) of channels 1 to 9 (<i>Ch</i>), specifies the position of a reference division line with its number (an integer assigned starting from 0 from the lowest division).
Variable	

	<i>Value</i>
Description	Position of reference division line
Data type	Long integer type (Long)
Range	0 to the number of divisions*1
Preset value	5*2
Note	If the specified variable 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.

*1. Set with the SCPI.DISPlay.WINDow(Ch).Y.SCALe.DIVisions object.

*2. The preset value is 0 when the data format is linear magnitude or SWR.

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-9, “Variable (Tr),” on page 198, respectively.

Examples	<pre>Dim RefPos As Long SCPI.DISPlay.WINDow(1).TRACe(2).Y.SCALe.RPOsition = 6 RefPos = SCPI.DISPlay.WINDow(1).TRACe(2).Y.SCALe.RPOsition</pre>
Related objects	<p>SCPI.CALCulate(Ch).SElected.FORMat on page 214</p> <p>SCPI.DISPlay.WINDow(Ch).Y.SCALe.DIVisions on page 309</p> <p>SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.PDIVision on page 305</p> <p>SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVel on page 306</p>
Equivalent key	[Scale] - Reference Position

SCPI.DISPlay.WINDow(Ch).X.SPACing

Object type	Property
Syntax	SCPI.DISPlay.WINDow(<i>Ch</i>).X.SPACing = <i>Param</i> <i>Param</i> = SCPI.DISPlay.WINDow(<i>Ch</i>).X.SPACing
Description	Selects the display type of the graph horizontal axis of channels 1 to 9 (<i>Ch</i>) for segment sweep.
Variable	

	<i>Param</i>
Description	Horizontal axis display type of the graph for segment sweep
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"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" Specifies the order base (axis in which the measurement point numbers are positioned evenly in the order of measurement).
Preset value	"OBASe"

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 163.

Examples

```
Dim DispSegm As String
SCPI.SENSE(1).SWEep.TYPE = "segm"
SCPI.DISPlay.WINDow(1).X.SPACing = "obas"
DispSegm = SCPI.DISPlay.WINDow(1).X.SPACing
```

Related objects SCPI.SENSE(Ch).SWEep.TYPE on page 408

Equivalent key **[Sweep Setup] - Segment Display**

SCPI.DISPLAY.WINDOW(*Ch*).Y.SCALE.DIVISIONS

Object type	Property
Syntax	SCPI.DISPLAY.WINDOW(<i>Ch</i>).Y.SCALE.DIVISIONS = <i>Value</i> <i>Value</i> = SCPI.DISPLAY.WINDOW(<i>Ch</i>).Y.SCALE.DIVISIONS
Description	For channels 1 to 9 (<i>Ch</i>), sets the number of divisions in all the graphs.
Variable	

	<i>Value</i>
Description	Number of divisions of graph
Data type	Long integer type (Long)
Range	4 to 30
Preset value	10
Resolution	2
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples	<pre>Dim Divs As Long SCPI.DISPLAY.WINDOW(1).Y.SCALE.DIVISIONS = 12 Divs = SCPI.DISPLAY.WINDOW(1).Y.SCALE.DIVISIONS</pre>
Related objects	SCPI.DISPLAY.WINDOW(<i>Ch</i>).TRACE(<i>Tr</i>).Y.SCALE. PDIVISION on page 305 SCPI.DISPLAY.WINDOW(<i>Ch</i>).TRACE(<i>Tr</i>).Y.SCALE.RLEVEL on page 306 SCPI.DISPLAY.WINDOW(<i>Ch</i>).TRACE(<i>Tr</i>).Y.SCALE. RPOSITION on page 307
Equivalent key	[Scale] - Divisions

SCPI.FORMat.BORDER

Object type	Property
Syntax	SCPI.FORMat.BORDER = <i>Param</i> <i>Param</i> = SCPI.FORMat.BORDER
Description	When the data transfer format is set to the binary transfer format (specify "REAL" with SCPI.FORMat.DATA object), sets the transfer order of each byte in data (byte order).

NOTE This object is NOT used when controlling the E5070A/E5071A using COM objects in the E5070A/E5071A VBA.

Variable

	<i>Param</i>
Description	Byte order
Data type	Character string type (String)
Range	Select from the following. •"NORMal" 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).
Preset value	"NORMal"

Examples

```
Dim BitOrd As String
SCPI.FORMat.BORDER "swap"
BitOrd = SCPI.FORMat.BORDER
```

Related objects SCPI.FORMat.DATA on page 311

Equivalent key No equivalent key is available on the front panel.

SCPI.FORMat.DATA

Object type	Property
Syntax	SCPI.FORMat.DATA = <i>Param</i> <i>Param</i> = SCPI.FORMat.DATA
Description	Use the following SCPI commands to set the format to read the data. <ul style="list-style-type: none"> • :CALC{1-9}:DATA:FDAT • :CALC{1-9}:DATA:FMEM • :CALC{1-9}:DATA:SDAT? • :CALC{1-9}:DATA:SMEM? • :CALC{1-9}:FUNC:DATA? • :SENS{1-9}:FREQ:DATA?

NOTE ASCII transfer format is specified when controlling the E5070A/E5071A using COM objects in the E5070A/E5071A VBA .

Variable

	<i>Param</i>
Description	Data transfer format
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"AScii" Specifies the ASCII transfer format. •"REAL" Specifies the binary transfer format.
Preset value	"NORMal"

Examples

```
Dim Fmt As String
SCPI.FORMat.DATA = "asc"
Fmt = SCPI.FORMat.DATA
```

Related objects SCPI.FORMat.BORDER on page 310
Parse on page 154

Equivalent key No equivalent key is available on the front panel.

SCPI.HCOPy.ABORT

Object type	Method
Syntax	SCPI.HCOPy.ABORT
Description	Aborts the print output. (No read)
Examples	SCPI.HCOPy.ABORT
Related objects	SCPI.HCOPy.IMMEDIATE on page 313
Equivalent key	[System] - Abort Printing

SCPI.HCOPy.IMAGe

Object type	Property
Syntax	SCPI.HCOPy.IMAGe = <i>Param</i> <i>Param</i> = SCPI.HCOPy.IMAGe
Description	Selects the print color for output to the printer.
Variable	

	<i>Param</i>
Description	Print color for output to the printer.
Data type	Character string type (String)
Range	Select from the following. •"NORMal" Specifies printing in close color to the display color. •"INVert" Specifies printing in the inverted color of the display color.
Preset value	"INVert"

Examples	<pre>Dim Img As String SCPI.HCOPy.IMAGe = "norm" Img = SCPI.HCOPy.IMAGe</pre>
Related objects	SCPI.HCOPy.IMMEDIATE on page 313
Equivalent key	[System] - Invert Image

SCPI.HCOPy.IMMediate

Object type	Method
Syntax	SCPI.HCOPy.IMMediate
Description	Outputs the display image on the LCD display to the printer connected to the E5070A/E5071A. (No read)
NOTE	When printing the E5070A/E5071A measurement screen, execute the VBA program with the Visual Basic editor closed. For the method, see “Running a Program from the E5070A/E5071A Measurement Screen” on page 48.
Examples	<code>SCPI.HCOPy.IMMediate</code>
Related objects	SCPI.HCOPy.ABORT on page 312 SCPI.HCOPy.IMAGe on page 312
Equivalent key	[System] - Print 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] ([System]) key is pressed) is printed. Notice that, if no image is memorized in the clipboard, in the same way as the SCPI.HCOPy.IMMediate object, the image on the LCD display at the execution is memorized in the clipboard and then it is printed.

SCPI.IEEE4882.CLS

Object type	Method
Syntax	SCPI.IEEE4882.CLS
Description	Clears the followings. (No read) <ul style="list-style-type: none">• Error Queue• Status Byte Register• Standard Event Status Register• Operation Status Event Register• Questionable Status Event Register• Questionable Limit Status Event Register• Questionable Limit Channel Status Event Register
Examples	SCPI.IEEE4882.CLS
Equivalent key	No equivalent key is available on the front panel.

SCPI.IEEE4882.ESE

Object type	Property
Syntax	SCPI.IEEE4882.ESE = <i>Value</i> <i>Value</i> = SCPI.IEEE4882.ESE
Description	Sets the value of the Standard Event Status Enable Register. For information on the structure of the status register, see Appendix “Status Reporting System“ in the <i>E5070A/E5071A Programmer’s Guide</i> .
Variable	

	<i>Value</i>
Description	Value of the Standard Event Status Enable Register
Data type	Long integer type (Long)
Range	0 to 255
Preset value	0
Note	If the specified variable is out of the allowable setup range, the result of bitwise AND with 255 (0xff) is set.

Examples	<pre>Dim Stat As Long SCPI.IEEE4882.ESE = 16 Stat = SCPI.IEEE4882.ESE</pre>
Related objects	SCPI.IEEE4882.SRE on page 318
Equivalent key	No equivalent key is available on the front panel.

SCPI.IEEE4882.ESR

- Object type** Property
- Syntax** *Value* = SCPI.IEEE4882.ESR
- Description** Reads out the value of the Standard Event Status Register. Executing this object clears the register value.
- For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*. (Read only)

Variable

	<i>Value</i>
Description	Value of the Standard Event Status Register
Data type	Long integer type (Long)

- Examples**
- ```
Dim Stat As Long
Stat = SCPI.IEEE4882.ESR
```

- Equivalent key** No equivalent key is available on the front panel.

## SCPI.IEEE4882.IDN

- Object type** Property
- Syntax** *Cont* = SCPI.IEEE4882.IDN
- Description** Reads out the product information (manufacturer, model number, serial number, and firmware version number) of the E5070A/E5071A. (Read only)

**Variable**

|             | <i>Cont</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | Product information ("{string 1},{string 2},{string 3},{string 4}") <ul style="list-style-type: none"> <li>• {string 1}                   Manufacturer. Agilent Technologies is always read out.</li> <li>• {string 2}                   Model number (example: E5070A).</li> <li>• {string 3}                   10-digit serial number (example: JP1KI00101).</li> <li>• {string 4}                   Firmware version number (example: 01.00).</li> </ul> |
| Data type   | Character string type (String)                                                                                                                                                                                                                                                                                                                                                                                                                              |

- Examples**
- ```
Dim Who As String
Who = SCPI.IEEE4882.IDN
```

- Equivalent key** **[System] - Firmware Revision**
[System] - Service Menu - Enable Options - Serial Number

SCPI.IEEE4882.OPC

Object type Property

Syntax (1) SCPI.IEEE4882.OPC
(2) *Value* = SCPI.IEEE4882.OPC

Description Case (1):
Specifies so that 1 is set to OPC bit (bit 0) of the Standard Event Status Register is set to 1 when all of pending operations complete. For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*.
Case (2):
Specifies so that 1 is read when all of pending operations complete.

Variable Case (2):

	<i>Value</i>
Description	1 returned when all pending operations are complete
Data type	Long integer type (Long)

Examples Case (1) :
SCPI.IEEE4882.OPC

Case (2) :
Dim Dmy As Long
Dmy = SCPI.IEEE4882.OPC

Related objects SCPI.SENSE(Ch).CORREction.COLLECT.ACQUIRE.ISOLation on page 341
SCPI.SENSE(Ch).CORREction.COLLECT.ACQUIRE.LOAD on page 342
SCPI.SENSE(Ch).CORREction.COLLECT.ACQUIRE.OPEN on page 343
SCPI.SENSE(Ch).CORREction.COLLECT.ACQUIRE.SHORT on page 343
SCPI.SENSE(Ch).CORREction.COLLECT.ACQUIRE.THROUGH on page 344
SCPI.TRIGGER.SEQUENCE.SINGLE on page 444

Equivalent key No equivalent key is available on the front panel.

SCPI.IEEE4882.OPT

Object type	Property
Syntax	<i>Cont</i> = SCPI.IEEE4882.OPT
Description	Reads out the identification numbers of options installed in the E5070A/E5071A. (Read only)

Variable

	<i>Cont</i>
Description	Identification numbers of installed options
Data type	Character string type (String)
Note	If there is no installed option, 0 is read out.

Examples

```
Dim OptNum As String
OptNum = SCPI.IEEE4882.OPT
```

Equivalent key No equivalent key is available on the front panel.

SCPI.IEEE4882.RST

Object type	Method
Syntax	SCPI.IEEE4882.RST
Description	Presets the setting state of the E5070A/E5071A. There is the following difference from the setting state preset with the SCPI.SYSTem.PRESet object. For details, see Appendix “List of Default Values“ in the <i>E5070A/E5071A User’s Guide or Programmer’s Guide</i> . (No read)

- The continuous initiation mode (see the SCPI.INITiate(Ch).CONTinuous object) of channel 1 is set to OFF.

Examples

```
SCPI.IEEE4882.RST
```

Related objects

SCPI.SYSTem.PRESet on page 439

SCPI.INITiate(Ch).CONTinuous on page 320

Equivalent key No equivalent key is available on the front panel.

SCPI.IEEE4882.SRE

Object type Property

Syntax SCPI.IEEE4882.SRE = *Value*

Value = SCPI.IEEE4882.SRE

Description Sets the value of the Service Request Enable Register.

For information on the structure of the status register, see Appendix “Status Reporting System” in the *E5070A/E5071A Programmer’s Guide*.

Variable

	<i>Value</i>
Description	Value of the Service Request Enable Register
Data type	Long integer type (Long)
Range	0 to 255
Preset value	0
Note	If the specified variable 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.

Examples

```
Dim Stat As Long
SCPI.IEEE4882.SRE = 8
Stat = SCPI.IEEE4882.SRE
```

Related objects

SCPI.IEEE4882.ESE on page 314
SCPI.STATus.OPERation.ENABLE on page 412
SCPI.STATus.QUESTionable.ENABLE on page 417

Equivalent key

No equivalent key is available on the front panel.

SCPI.IEEE4882.STB

- Object type** Property
- Syntax** *Value* = SCPI.IEEE4882.STB
- Description** Reads out the value of the Status Byte Register.
 For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*. (Read only)

Variable

	<i>Value</i>
Description	Value of the Status Byte Register
Data type	Long integer type (Long)

- Examples**

```
Dim Stat As Long
Stat = SCPI.IEEE4882.STB
```
- Equivalent key** No equivalent key is available on the front panel.

SCPI.IEEE4882.TRG

- Object type** Method
- Syntax** SCPI.IEEE4882.TRG
- Description** If the trigger source is set to GPIB/LAN (set to BUS with the SCPI.TRIGger.SEQuence.SOURce object), triggers the E5070A/E5071A waiting for trigger. For information on the waiting for trigger state, see Section “Trigger System“ in the *E5070A/E5071A Programmer’s Guide*. (No read)
- Examples**

```
SCPI.TRIGger.SEQuence.SOURce = "bus"
SCPI.IEEE4882.TRG
```
- Related objects** SCPI.TRIGger.SEQuence.SOURce on page 445
- Equivalent key** No equivalent key is available on the front panel.

SCPI.IEEE4882.WAI

- Object type** Method
- Syntax** SCPI.IEEE4882.WAI
- Description** Waits for the execution of all objects sent before this object to be completed. (No read)
- Examples**

```
SCPI.TRIGger.SEQuence.SOURce = "bus"
SCPI.TRIGger.SEQuence.SINGle
SCPI.IEEE4882.WAI
MsgBox "Done"
```
- Equivalent key** No equivalent key is available on the front panel.

SCPI.INITiate(*Ch*).CONTInuous

Object type Property

Syntax SCPI.INITiate(*Ch*).CONTInuous = *Status*
Status = SCPI.INITiate(*Ch*).CONTInuous

Description Turns ON/OFF of the continuous initiation mode (setting by which the trigger system initiates continuously) of channels 1 to 9 (*Ch*) in the trigger system.
 For more information on the trigger system, see Section “Trigger System“ in the *E5070A/E5071A Programmer’s Guide*.

Variable

	<i>Status</i>
Description	ON/OFF of the continuous initiation mode
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the continuous initiation mode. •False or 0 Turns OFF the continuous initiation mode.
Preset value	Varies depending on [variable (<i>Ch</i>)]*1

*1. Only channel 1 is initialized to ON at the execution of the SCPI.SYSTEM.PRESet object; all the channels are initialized to OFF at the execution of the SCPI.IEEE4882.RST object.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim ContMode As Boolean
SCPI.INITiate(2).CONTInuous = True
ContMode = SCPI.INITiate(2).CONTInuous
```

Related objects SCPI.INITiate(Ch).IMMEDIATE on page 321

Equivalent key **[Trigger] - Continuous** (continuous startup ON)
[Trigger] - Hold (continuous startup OFF)

SCPI.INITiate(Ch).IMMEDIATE

Object type	Method
Syntax	SCPI.INITiate(Ch).IMMEDIATE
Description	<p>Changes the state of each channel of channels 1 to 9 (<i>Ch</i>) to the initiation state in the trigger system.</p> <p>When this object is executed for a channel in the idle state in the trigger system, it goes into the initiation state immediately. Then, after measurement is executed once, it goes back to the idle state.</p> <p>If this object is executed for a channel that is not in the idle state or a channel for which the continuous initiation mode is set to ON (setting by which the trigger system initiates continuously) in the trigger system, an error occurs when executed and the object is ignored.</p> <p>For more information on the trigger system, see Section “Trigger System“ in the <i>E5070A/E5071A Programmer’s Guide</i>. (No read)</p>
Variable	For information on the variable (<i>Ch</i>), see Table 7-6, “Variable (Ch),” on page 163.
Examples	<pre>SCPI.INITiate(1).CONTinuous = False SCPI.INITiate(1).IMMEDIATE</pre>
Related objects	SCPI.INITiate(Ch).CONTinuous on page 320
Equivalent key	[Trigger] - Single

SCPI.MMEMory.CATalog(*Dir*)

Object type Property

Syntax *Cont* = SCPI.MMEMory.CATalog(*Dir*)

Description Reads out the following information on the built-in storage device of the E5070A/E5071A.

- Space in use
- Available space
- Name and size of all files (including directories) in the specified directory.

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 between directory names (file name) with "\" (back slash), or "/" (slash). (Read only)

Variable

	<i>Cont</i>
Description	Directory information ("{A},{B},{Name 1},{Size 1},{Name 2},{Size 2},...,{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. <ul style="list-style-type: none"> • {A} Space in use of the built-in storage device (byte)^{*1}. • {B} 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.
Data type	Character string type (String)

*1. If you specify a directory on the floppy disk drive, it is the capacity of the floppy disk in the drive.

	<i>Dir</i>
Description	Directory name whose information you want to read out
Data type	Character string type (String)
Range	254 characters or less

Examples

```
Dim DirCont As String
DirCont = SCPI.MMEMory.CATalog("a:\")
```

Equivalent key No equivalent key is available on the front panel.

SCPI.MMEMory.COPY

Object type Property

Syntax SCPI.MMEMory.COPY = *File*

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 names (folder names) and file name, separate them with "\" (back slash), or "/" (slash). (No read)

Variable

	<i>File</i>
Description	Indicates 2 file names (copy source and copy destination). <ul style="list-style-type: none"> • <i>File(0)</i> Copy source file name • <i>File(1)</i> Copy destination file name The index of the array starts from 0.
Data type	Variant type (Variant)
Range	254 characters or less
Note	If the specified copy source file does not exist, an error occurs when executed and the object is ignored. Notice that, if a file with the same name as the specified copy destination file name exists, its contents are overwritten.

Examples (1) `SCPI.MMEMory.COPY = Array("test/state01.sta", "a:test01.sta")`

Examples (2)
`Dim File(1) As Variant`
`File(0) = "test/state01.sta"`
`File(1) = "a:test01.sta"`
`SCPI.MMEMory.COPY = File`

Equivalent key **[Save/Recall] - Save State - File Dialog...**

SCPI.MMEMory.DElete

Object type Property

Syntax SCPI.MMEMory.DElete = *File*

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 "\" (back slash), or "/" (slash).

To delete all files in the directory (folder), specify "\" (backslash). (No read)

Variable

	<i>File</i>
Description	File name or directory name you want to delete
Data type	Character string type (String)
Range	254 characters or less
Note	If the specified file or directory does not exist, an error occurs when executed and the object is ignored.

Examples (1) SCPI.MMEMory.DElete = "a:\"

Examples (2) SCPI.MMEMory.DElete = "test/state01.sta"

Equivalent key **[Save/Recall] - Save State - File Dialog...**

SCPI.MMEMory.LOAD.CHANnel.STATe

- Object type** Property
- Syntax** SCPI.MMEMory.LOAD.CHANnel.STATe = *Register*
- Description** Recalls the instrument state for an individual channel (saved with the SCPI.MMEMory.STORe.CHANnel.STATe object) from the specified register as the setting of the active channel.
 It is possible to recall the register from a different channel where it was saved. (No read)

Variable

	<i>Register</i>
Description	Register
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"A" Specifies register A. •"B" Specifies register B. •"C" Specifies register C. •"D" Specifies register D.
Note	If no instrument state has been saved in the specified register, an error occurs and the command is ignored.

- Examples(1)** SCPI.MMEMory.LOAD.CHANnel.STATe = "a"
- Related objects** SCPI.MMEMory.STORe.CHANnel.STATe on page 330
 SCPI.DISPlay.WINDow(Ch).ACTivate on page 297
- Equivalent key** **[Save/Recall] - Recall Channel - A|B|C|D**

SCPI.MMEMory.LOAD.LIMit

Object type	Property
Syntax	SCPI.MMEMory.LOAD.LIMit = <i>File</i>
Description	<p>As the limit table for the active trace of the active channel, recalls the specified limit table file (file with the .csv extension saved with the SCPI.MMEMory.STORE.LIMit object).</p> <p>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 "\" (back slash), or "/" (slash). (No read)</p>

Variable

	<i>File</i>
Description	File name of limit table (extension ".csv")
Data type	Character string type (String)
Range	254 characters or less
Note	If the specified file does not exist, an error occurs when executed and the object is ignored.

Examples (1)
SCPI.DISPlay.WINDow(1).ACTivate
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.MMEMory.LOAD.LIMit = "a:\limit01.csv"

Examples (2)
SCPI.DISPlay.WINDow(1).ACTivate
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.MMEMory.LOAD.LIMit = "test/limit01.csv"

Related objects
SCPI.DISPlay.WINDow(Ch).ACTivate on page 297
SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198
SCPI.MMEMory.STORE.LIMit on page 333

Equivalent key **[Analysis] - Limit Test - Edit Limit Line - Import from CSV File**

SCPI.MMEMory.LOAD.SEGMent

Object type Property

Syntax SCPI.MMEMory.LOAD.SEGMent = *File*

Description As the segment sweep table of the active channel, recalls the specified segment sweep table file (file with the .csv extension saved with the SCPI.MMEMory.STORE.SEGMent object).
 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 "\" (back slash), or "/" (slash). (No read)

Variable

	<i>File</i>
Description	File name of segment sweep table (extension ".csv")
Data type	Character string type (String)
Range	254 characters or less
Note	If the specified file does not exist, an error occurs when executed and the object is ignored.

Examples (1)
 SCPI.DISPlay.WINDow(1).ACTivate
 SCPI.MMEMory.LOAD.SEGMent = "a:\segm01.csv"

Examples (2)
 SCPI.DISPlay.WINDow(1).ACTivate
 SCPI.MMEMory.LOAD.SEGMent = "test/segm01.csv"

Related objects
 SCPI.DISPlay.WINDow(Ch).ACTivate on page 297
 SCPI.MMEMory.STORE.SEGMent on page 334

Equivalent key **[Sweep Setup] - Edit Segment Table - Import from CSV File**

SCPI.MMEMory.LOAD.STATe

Object type Property

Syntax SCPI.MMEMory.LOAD.STATe = *File*

Description Recalls the specified instrument state file (file with the .sta extension saved with the SCPI.MMEMory.STORE.STATe object).

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 "\" (back slash), or "/" (slash). (No read)

Variable

	<i>File</i>
Description	File name of instrument state (extension ".sta")
Data type	Character string type (String)
Range	254 characters or less
Note	If the specified file does not exist, an error occurs when executed and the object is ignored.

Examples (1) SCPI.MMEMory.LOAD.STATe = "a:\state01.sta"

Examples (2) SCPI.MMEMory.LOAD.STATe = "test/state01.sta"

Related objects SCPI.MMEMory.STORE.STATe on page 335

Equivalent key **[Save/Recall] - Recall State**

SCPI.MMEMory.MDIRectory

Object type Property

Syntax SCPI.MMEMory.MDIRectory = *File*

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 "\" (back slash), or "/" (slash). (No read)

Variable

	<i>File</i>
Description	Directory name you want to create
Data type	Character string type (String)
Range	254 characters or less
Note	If a directory with the same name as the specified directory name exists, an error occurs when executed and the object is ignored.

Examples (1) SCPI.MMEMory.MDIRectory = "a:\test"

Examples (2) SCPI.MMEMory.MDIRectory = "test"

Equivalent key **[Save/Recall] - Save State - File Dialog...**

SCPI.MMEMory.STORe.CHANnel.CLEAr

Object type	Method
Syntax	SCPI.MMEMory.STORe.CHANnel.CLEAr
Description	Deletes the instrument state for each channel (saved with the SCPI.MMEMory.STORe.CHANnel.STATe object) in all the registers. (No read)
Examples	SCPI.MMEMory.STORe.CHANnel.CLEAr
Related objects	SCPI.MMEMory.STORe.CHANnel.STATe on page 330
Equivalent key	[Save/Recall] - Save Channel - Clear States - OK

SCPI.MMEMory.STORe.CHANnel.STATe

Object type	Property
Syntax	SCPI.MMEMory.STORe.CHANnel.STATe = <i>Register</i>
Description	Saves the instrument state of the items set for the active channel specific to that channel only into the specified register (volatile memory). (No read)

Variable

	<i>Register</i>
Description	Register
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"A" Specifies register A. •"B" Specifies register B. •"C" Specifies register C. •"D" Specifies register D.
Note	If an instrument state has been saved already in the specified register, its contents are overwritten.

Examples(1)	SCPI.MMEMory.STORe.CHANnel.STATe = "a"
Related objects	SCPI.MMEMory.LOAD.CHANnel.STATe on page 325 SCPI.DISPlay.WINDow(Ch).ACTivate on page 297
Equivalent key	[Save/Recall] - Save Channel - A B C D

SCPI.MMEMory.STORe.FDATa

- Object type** Property
- Syntax** SCPI.MMEMory.STORe.FDATa = *File*
- Description** For the active trace of the active channel, saves the formatted data array into a file in the CSV format (extension ".csv").
- 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 "\" (back slash), or "/" (slash). (No read)

Variable

	<i>File</i>
Description	File name in which you want to save the formatted data array (extension ".csv")
Data type	Character string type (String)
Range	254 characters or less
Note	If a file with the same name as the specified file name exists, its contents are overwritten.

Examples (1)

```
SCPI.DISPlay.WINDow(1).ACTivate
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.MMEMory.STORe.FDATa = "a:\trace01.csv"
```

Examples (2)

```
SCPI.DISPlay.WINDow(1).ACTivate
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.MMEMory.STORe.FDATa = "test/trace01.csv"
```

Related objects SCPI.DISPlay.WINDow(Ch).ACTivate on page 297
 SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198

Equivalent key **[Save/Recall] - Save Trace Data**

SCPI.MMEMory.STORe.IMAGe

Object type	Property
Syntax	SCPI.MMEMory.STORe.IMAGe = <i>File</i>
Description	<p>Saves the display image on the LCD display at the execution of the object into a file in the bitmap (extension ".bmp") or portable network graphics (extension ".png") format . When saving the E5070A/E5071A measurement screen, execute the VBA program with the Visual Basic editor closed. For more information, see “Running a Program from the E5070A/E5071A Measurement Screen” on page 48.</p> <p>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 "\" (back slash), or "/" (slash). (No read)</p>

Variable

	<i>File</i>
Description	File name in which you want to save the display image on the LCD display (extension ".bmp" or ".png")
Data type	Character string type (String)
Range	254 characters or less
Note	If a file with the same name as the specified file name exists, its contents are overwritten.

Examples (1) SCPI.MMEMory.STORe.IMAGe = "a:\image01.bmp"

Examples (2) SCPI.MMEMory.STORe.IMAGe = "test/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] ([System])** key is pressed) is saved. Notice that, if no image is memorized in the clipboard, in the same way as the SCPI.MMEMory.STORe.IMAGe object, the image on the LCD display at the execution is memorized in the clipboard and then it is saved.

SCPI.MMEMory.STORe.LIMit

- Object type** Property
- Syntax** SCPI.MMEMory.STORe.LIMit = *File*
- Description** Saves the limit table of the active trace of the active channel into a file in the CSV format (extension ".csv").
- 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 "\" (back slash), or "/" (slash). (No read)

Variable

	<i>File</i>
Description	File name to save the limit table (extension ".csv")
Data type	Character string type (String)
Range	254 characters or less
Note	If a file with the same name as the specified file name exists, its contents are overwritten.

Examples (1)

```
SCPI.DISPlay.WINDow(1).ACTivate
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.MMEMory.STORe.LIMit = "a:\limit01.csv"
```

Examples (2)

```
SCPI.DISPlay.WINDow(1).ACTivate
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.MMEMory.STORe.LIMit = "test/limit01.csv"
```

- Related objects**
- SCPI.DISPlay.WINDow(Ch).ACTivate on page 297
 - SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 198
 - SCPI.MMEMory.LOAD.LIMit on page 326

Equivalent key **[Analysis] - Limit Test - Edit Limit Line - Export to CSV File**

SCPI.MMEMory.STORe.SEGMent

Object type Property

Syntax SCPI.MMEMory.STORe.SEGMent = *File*

Description Saves the segment sweep table of the active channel into a file in the CSV format (extension ".csv").

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 "\" (back slash), or "/" (slash). (No read)

Variable

	<i>File</i>
Description	File name to save segment sweep table (extension ".csv")
Data type	Character string type (String)
Range	254 characters or less
Note	If a file with the same name as the specified file name exists, its contents are overwritten.

Examples (1) SCPI.DISPlay.WINDow(1).ACTivate
SCPI.MMEMory.STORe.SEGMent = "a:\segm01.csv"

Examples (2) SCPI.DISPlay.WINDow(1).ACTivate
SCPI.MMEMory.STORe.SEGMent = "test/segm01.csv"

Related objects SCPI.DISPlay.WINDow(Ch).ACTivate on page 297
SCPI.MMEMory.LOAD.SEGMent on page 327

Equivalent key **[Sweep Setup] - Edit Segment Table - Export to CSV File**

SCPI.MMEMemory.STORE.STATE

Object type	Property
Syntax	SCPI.MMEMemory.STORE.STATE = <i>File</i>
Description	<p>Saves the instrument state (contents to be saved specified with the SCPI.MMEMemory.STORE.STYPE object) into a file (file with the .sta extension).</p> <p>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 "\" (back slash), or "/" (slash). (No read)</p>
NOTE	The instrument setting file saved with the "autorec.sta" file name is automatically recalled when turning on the E5070A/E5071A.

Variable

	<i>File</i>
Description	File name to save the instrument state (extension ".sta")
Data type	Character string type (String)
Range	254 characters or less
Note	If a file with the same name as the specified file name exists, its contents are overwritten.

Examples (1)

```
Dim StaType As String
SCPI.MMEMemory.STORE.STYPE = "cdst"
SCPI.MMEMemory.STORE.STATE = "a:\state01.sta"
```

Examples (2)

```
Dim StaType As String
SCPI.MMEMemory.STORE.STYPE = "cdst"
SCPI.MMEMemory.STORE.STATE = "test/state01.sta"
```

Related objects

SCPI.MMEMemory.STORE.STYPE on page 336
 SCPI.MMEMemory.LOAD.STATE on page 328

Equivalent key **[Save/Recall] - Save State**

SCPI.MMEMory.STORe.STYPE

Object type	Property
Syntax	SCPI.MMEMory.STORe.STYPE = <i>Param</i> <i>Param</i> = SCPI.MMEMory.STORe.STYPE
Description	Selects the contents saved when saving the instrument state into a file with the SCPI.MMEMory.STORe.STATE object.
Variable	

	<i>Param</i>
Description	Data of instrument state
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"STAtE" Specifies the save of the measurement conditions *1 only. •"CSTAtE" 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.
Preset value	"CSTAtE"

*1. For information on the measurement conditions to be saved, see Appendix "List of Default Values" in the *E5070A/E5071A User's Guide or Programmer's Guide*.

Examples

```
Dim StaType As String
SCPI.MMEMory.STORe.STYPE = "cdst"
StaType = SCPI.MMEMory.STORe.STYPE
```

Related objects SCPI.MMEMory.STORe.STATE on page 335

Equivalent key **[Save/Recall] - Save Type - State Only|State & Cal|State & Trace|All**

SCPI.SENSE(*Ch*).AVERAge.CLEAr

Object type	Method
Syntax	SCPI.SENSE(<i>Ch</i>).AVERAge.CLEAr
Description	Resets the data count to 0 used for averaging of channels 1 to 9 (<i>Ch</i>). Measurement data before the execution of this object is not used for averaging. (No read)
Variable	For information on the variable (<i>Ch</i>), see Table 7-6, “Variable (Ch),” on page 163.
Examples	SCPI.SENSE(1).AVERAge.CLEAr
Related objects	SCPI.SENSE(Ch).AVERAge.COUNT on page 337 SCPI.SENSE(Ch).AVERAge.STATE on page 338
Equivalent key	[Avg] - Averaging Restart

SCPI.SENSE(*Ch*).AVERAge.COUNT

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).AVERAge.COUNT = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).AVERAge.COUNT
Description	Sets the averaging factor of channels 1 to 9 (<i>Ch</i>).
Variable	

	<i>Value</i>
Description	Averaging factor
Data type	Long integer type (Long)
Range	1 to 999
Preset value	16
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples	Dim AvgCnt As Long SCPI.SENSE(1).AVERAge.COUNT = 4 AvgCnt = SCPI.SENSE(1).AVERAge.COUNT
Related objects	SCPI.SENSE(Ch).AVERAge.STATE on page 338 SCPI.SENSE(Ch).AVERAge.CLEAr on page 337
Equivalent key	[Avg] - Avg Factor

SCPI.SENSE(*Ch*).AVERAge.STATE

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).AVERAge.STATE = <i>Status</i> <i>Status</i> = SCPI.SENSE(<i>Ch</i>).AVERAge.STATE
Description	Turns ON/OFF the averaging function of channels 1 to 9 (<i>Ch</i>).
Variable	

	<i>Status</i>
Description	ON/OFF of the averaging function
Data type	Boolean type (Boolean)
Range	Select from the following. •True or -1 Turns ON the averaging function. •False or 0 Turns OFF the averaging function.
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (*Ch*),” on page 163.

Examples	<pre>Dim Avg As Boolean SCPI.SENSE(1).AVERAge.STATE = True Avg = SCPI.SENSE(1).AVERAge.STATE</pre>
----------	--

Related objects	SCPI.SENSE(<i>Ch</i>).AVERAge.COUNT on page 337 SCPI.SENSE(<i>Ch</i>).AVERAge.CLEAr on page 337
-----------------	--

Equivalent key	[Avg] - Averaging
----------------	--------------------------

SCPI.SENSE(Ch).BANDwidth.RESolution

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).BANDwidth.RESolution = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).BANDwidth.RESolution
Description	Sets the IF bandwidth of channels 1 to 9 (<i>Ch</i>). This object provides the same function as the SCPI.SENSE(Ch).BWIDth.RESolution object.

Variable

	<i>Value</i>
Description	IF bandwidth
Data type	Double precision floating point type (Double)
Range	10 to 100000
Preset value	70000
Unit	Hz (hertz)
Resolution	In steps of 1, 1.5, 2, 3, 4, 5, or 7
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples	<pre>Dim IfBw As Double SCPI.SENSE(1).BANDwidth.RESolution = 1.5E3 IfBw = SCPI.SENSE(1).BANDwidth.RESolution</pre>
Related objects	SCPI.SENSE(Ch).BWIDth.RESolution on page 340
Equivalent key	[Avg] - IF Bandwidth

SCPI.SENSE(*Ch*).BWIDth.RESolution

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).BWIDth.RESolution = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).BWIDth.RESolution
Description	Sets the IF bandwidth of channels 1 to 9 (<i>Ch</i>). This object provides the same function as the SCPI.SENSE(<i>Ch</i>).BANDwidth.RESolution object.

Variable

	<i>Value</i>
Description	IF bandwidth
Data type	Double precision floating point type (Double)
Range	10 to 100000
Preset value	70000
Unit	Hz (hertz)
Resolution	In steps of 1, 1.5, 2, 3, 4, 5, or 7
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (*Ch*),” on page 163.

Examples	<pre>Dim IfBw As Double SCPI.SENSE(1).BWIDth.RESolution = 1.5E3 IfBw = SCPI.SENSE(1).BWIDth.RESolution</pre>
Related objects	SCPI.SENSE(<i>Ch</i>).BANDwidth.RESolution on page 339
Equivalent key	[Avg] - IF Bandwidth

SCPI.SENSE(*Ch*).CORREction.COLLECT.ACQUIRE.ISOLation

Object type Property

Syntax SCPI.SENSE(*Ch*).CORREction.COLLECT.ACQUIRE.ISOLation = *Ports*

Description For channels 1 to 9 (*Ch*), measures the calibration data of the isolation from the specified stimulus port to the specified response port. (No read)

Variable

Table 7-12

Variable (*Ports*)

	<i>Ports</i>
Description	Indicates 2-element array data (port number). <ul style="list-style-type: none"> • <i>Ports(0)</i> Specifies the response port number. • <i>Ports(1)</i> Specifies the stimulus port number. The index of the array starts from 0.
Data type	Variant type (Variant)
Range	1 to 4
Resolution	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed. If you specify the same port number to 2 port numbers, an error occurs when executed.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples (1)

```
Dim Dmy As Long
SCPI.SENSE(1).CORREction.COLLECT.ACQUIRE.ISOLation = Array(1,2)
Dmy = SCPI.IEEE4882.OPC
```

Examples (2)

```
Dim IsPort(1) As Variant
Dim Dmy As Long
IsPort(0) = 1
IsPort(1) = 2
SCPI.SENSE(1).CORREction.COLLECT.ACQUIRE.ISOLation = IsPort
Dmy = SCPI.IEEE4882.OPC
```

Related objects SCPI.IEEE4882.OPC on page 316

Equivalent key **[Cal] - Calibrate - Response (Thru) - Isolation (Optional)**
[Cal] - Calibrate - n-Port Cal - Isolation (Optional) - Port m-n Isol

SCPI.SENSE(*Ch*).CORRection.COLLect.ACQuire.LOAD

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.ACQuire.LOAD = <i>Port</i>
Description	For channels 1 to 9 (<i>Ch</i>), measures the calibration data of the load standard for the specified port. (No read)
Variable	

Table 7-13**Variable (*Port*)**

	<i>Port</i>
Description	Port number
Data type	Long integer type (Long)
Range	1 to 4
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim Dmy As Long
SCPI.SENSE(1).CORRection.COLLect.ACQuire.LOAD = 1
Dmy = SCPI.IEEE4882.OPC
```

Related objects SCPI.IEEE4882.OPC on page 316

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

SCPI.SENSE(*Ch*).CORRection.COLLect.ACQuire.OPEN

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.ACQuire.OPEN = <i>Port</i>
Description	For channels 1 to 9 (<i>Ch</i>), measures the calibration data of the open standard for the specified port. (No read)
Variable	For information on the variable (<i>Ch</i>) and the variable (<i>Port</i>), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-13, “Variable (Port),” on page 342, respectively.
Examples	<pre>Dim Dmy As Long SCPI.SENSE(1).CORRection.COLLect.ACQuire.OPEN = 1 Dmy = SCPI.IEEE4882.OPC</pre>
Related objects	SCPI.IEEE4882.OPC on page 316
Equivalent key	<p>[Cal] - Calibrate - Response (Open) 1-Port Cal - Open</p> <p>[Cal] - Calibrate - n-Port Cal - Reflection - Port m Open</p>

SCPI.SENSE(*Ch*).CORRection.COLLect.ACQuire.SHORT

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.ACQuire.SHORT = <i>Port</i>
Description	For channels 1 to 9 (<i>Ch</i>), measures the calibration data of the short standard for the specified port. (No read)
Variable	For information on the variable (<i>Ch</i>) and the variable (<i>Port</i>), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-13, “Variable (Port),” on page 342, respectively.
Examples	<pre>Dim Dmy As Long SCPI.SENSE(1).CORRection.COLLect.ACQuire.SHORT = 1 Dmy = SCPI.IEEE4882.OPC</pre>
Related objects	SCPI.IEEE4882.OPC on page 316
Equivalent key	<p>[Cal] - Calibrate - Response (Short) 1-Port Cal - Short</p> <p>[Cal] - Calibrate - n-Port Cal - Reflection - Port m Short</p>

SCPI.SENSE(*Ch*).CORRection.COLLeCt.ACQuire.THRU

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLeCt.ACQuire.THRU = <i>Ports</i>
Description	For channels 1 to 9 (<i>Ch</i>), measures the calibration data of the thru standard from the specified stimulus port to the specified response port. (No read)
Variable	For information on the variable (<i>Ch</i>) and the variable (<i>Ports</i>), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-12, “Variable (Ports),” on page 341, respectively.
Examples (1)	<pre>Dim Dmy As Long SCPI.SENSE(1).CORRection.COLLeCt.ACQuire.THRU = Array(2,1) Dmy = SCPI.IEEE4882.OPC</pre>
Examples (2)	<pre>Dim ThruPort(1) As Variant Dim Dmy As Long ThruPort(0) = 2 ThruPort(1) = 1 SCPI.SENSE(1).CORRection.COLLeCt.ACQuire.THRU = ThruPort Dmy = SCPI.IEEE4882.OPC</pre>
Related objects	SCPI.IEEE4882.OPC on page 316
Equivalent key	[Cal] - Calibrate - Response (Thru) - Thru [Cal] - Calibrate - n-Port Cal - Transmission - Port m-n Thru

SCPI.SENSE(*Ch*).CORRection.COLLect.CKIT.LABel

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.CKIT.LABel = <i>Lbl</i> <i>Lbl</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.CKIT.LABel
Description	Sets a calibration kit name for the calibration kit selected for channels 1 to 9 (<i>Ch</i>).
Variable	

	<i>Lbl</i>
Description	Calibration kit name
Data type	Character string type (String)
Range	254 characters or less
Preset value	Varies depending on the calibration kit number. <ul style="list-style-type: none"> • 1: "85032F" • 2: "85033E" • 3: "85032B" • 4: "85033D" • 5 to 10: "User"

Examples	<pre>Dim CalLbl As String SCPI.SENSE(1).CORRection.COLLect.CKIT.LABel = "User 1" CalLbl = SCPI.SENSE(1).CORRection.COLLect.CKIT.LABel</pre>
Related objects	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.CKIT.SELect on page 350
Equivalent key	[Cal] - Modify Cal Kit - Label Kit

SCPI.SENSE(*Ch*).CORRection.COLLect.CKIT.ORDer.LOAD(*Cpt*)

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.CKIT.ORDer.LOAD(<i>Cpt</i>) = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.CKIT.ORDer.LOAD(<i>Cpt</i>)
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), selects the standard used for the load measurement of the specified port (<i>Cpt</i>).

Variable

Table 7-14**Variable (*Cpt*)**

	<i>Cpt</i>
Description	Port number
Data type	Long integer type (Long)
Range	1 to 4
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

NOTE

Since the variable (*Cpt*) has no preset value, you cannot omit it. If you omit the variable (*Cpt*), an error occurs when executed.

	<i>Value</i>
Description	Standard number
Data type	Long integer type (Long)
Range	1 to 21
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim StanLoad As Long
SCPI.SENSE(1).CORRection.COLLect.CKIT.ORDer.LOAD(1) = 10
StanLoad = SCPI.SENSE(1).CORRection.COLLect.CKIT.ORDer.LOAD(1)
```

Related objects SCPI.SENSE(*Ch*).CORRection.COLLect.CKIT.SELect on page 350

Equivalent key **[Cal] - Modify Cal Kit - Specify CLSs - Load - Port 1|Port 2|Port 3|Port 4**

SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.ORDer. **OPEN(*Cpt*)**

Object type Property

Syntax SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.ORDer.OPEN(*Cpt*) = *Value*
Value = SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.ORDer.OPEN(*Cpt*)

Description For the calibration kit selected for channels 1 to 9 (*Ch*), selects the standard used for the open measurement of the specified port (*Cpt*).

Variable

	<i>Value</i>
Description	Standard number
Data type	Long integer type (Long)
Range	1 to 21
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

For information on the variable (*Ch*) and the variable (*Cpt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-14, “Variable (Cpt),” on page 346, respectively.

NOTE Since the variable (*Cpt*) has no preset value, you cannot omit it. If you omit the variable (*Cpt*), an error occurs when executed.

Examples

```
Dim StanOpen As Long
SCPI.SENSE(1).CORRection.COLLEct.CKIT.ORDer.OPEN(1) = 10
StanOpen = SCPI.SENSE(1).CORRection.COLLEct.CKIT.ORDer.OPEN(1)
```

Related objects SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.SELEct on page 350

Equivalent key **[Cal] - Modify Cal Kit - Specify CLSs - Open - Port 1|Port 2|Port 3|Port 4**

SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.ORDer.SHORt(*Cpt*)

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.ORDer.SHORt(<i>Cpt</i>) = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.ORDer.SHORt(<i>Cpt</i>)
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), selects the standard used for the short measurement of the specified port (<i>Cpt</i>).

Variable

	<i>Value</i>
Description	Standard number
Data type	Long integer type (Long)
Range	1 to 21
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

For information on the variable (*Ch*) and the variable (*Cpt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-14, “Variable (Cpt),” on page 346, respectively.

NOTE

Since the variable (*Cpt*) has no preset value, you cannot omit it. If you omit the variable (*Cpt*), an error occurs when executed.

Examples

```
Dim StanShor As Long
SCPI.SENSE(1).CORRection.COLLEct.CKIT.ORDer.SHORt(1) = 10
StanShor = SCPI.SENSE(1).CORRection.COLLEct.CKIT.ORDer.SHORt(1)
```

Related objects

SCPI.SENSE(Ch).CORRection.COLLEct.CKIT.SELect on page 350

Equivalent key

[Cal] - Modify Cal Kit - Specify CLSs - Short - Port 1|Port 2|Port 3|Port 4

SCPI.SENSE(Ch).CORRection.COLLECT.CKIT.ORDER.THRU(Cpt_m,Cpt_n)

Object type	Property
Syntax	SCPI.SENSE(Ch).CORRection.COLLECT.CKIT.ORDER.THRU(Cpt_m,Cpt_n) = <i>Value</i> <i>Value</i> = SCPI.SENSE(Ch).CORRection.COLLECT.CKIT.ORDER.THRU(Cpt_m,Cpt_n)
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), selects the standard used for the thru measurement between the specified 2 ports (<i>Cpt_m</i> and <i>Cpt_n</i>).

Variable

	<i>Cpt_m, Cpt_n</i>
Description	Port number
Data type	Long integer type (Long)
Range	1 to 4
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

NOTE

Since the variables (*Cpt_m* and *Cpt_n*) have no preset value, you cannot omit them. If you omit the variables (*Cpt_m* and *Cpt_n*) or if you specify the same port number to 2 port numbers, an error occurs when executed. Notice that when you specify 2 ports with the variables (*Cpt_m* and *Cpt_n*), the order of the 2 port numbers is arbitrary.

	<i>Value</i>
Description	Standard number
Data type	Long integer type (Long)
Range	1 to 21
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim StanThru As Long
SCPI.SENSE(1).CORRection.COLLECT.CKIT.ORDER.THRU(1,2) = 10
StanThru = SCPI.SENSE(1).CORRection.COLLECT.CKIT.ORDER.THRU(1,2)
```

Related objects

SCPI.SENSE(Ch).CORRection.COLLECT.CKIT.SELECT on page 350

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

SCPI.SENSE(*Ch*).CORRection.COLLect.CKIT.RESet

Object type	Method
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.CKIT.RESet
Description	Resets the calibration kit selected for channels 1 to 9 (<i>Ch</i>) to the factory setting state. (No read)
Variable	For information on the variable (<i>Ch</i>), see Table 7-6, “Variable (Ch),” on page 163.
Examples	SCPI.SENSE(1).CORRection.COLLect.CKIT.RESet
Related objects	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.SELect on page 350
Equivalent key	No equivalent key is available on the front panel.

SCPI.SENSE(*Ch*).CORRection.COLLect.CKIT.SELect

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.CKIT.SELect = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.CKIT.SELect
Description	Selects the calibration kit of channels 1 to 9 (<i>Ch</i>).
Variable	

	<i>Value</i>
Description	Number of calibration kit*1
Data type	Long integer type (Long)
Range	1 to 10
Preset value	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

*1. The numbers of 1 to 10 assigned from the top to the calibration kit names displayed on the softkey labels when performing **[Cal] - Cal Kit**.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples	Dim CalKit As Long SCPI.SENSE(1).CORRection.COLLect.CKIT.SELect = 3 CalKit = SCPI.SENSE(1).CORRection.COLLect.CKIT.SELect
Equivalent key	[Cal] - Cal Kit

SCPI.SENSE(*Ch*).CORRection.COLLect.CKIT.STAN(*Std*).ARBITrary

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.CKIT.STAN(<i>Std</i>).ARBITrary = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.CKIT.STAN(<i>Std</i>).ARBITrary
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), sets the value of the arbitrary impedance of the standards 1 to 21 (<i>Std</i>).

Variable

Table 7-15

Variable (*Std*)

	<i>Std</i>
Description	Standard number
Data type	Long integer type (Long)
Range	1 to 21
Preset value	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

	<i>Value</i>
Description	Value of arbitrary impedance
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	Varies depending on the specified calibration kit and standard.
Unit	Ω (ohm)
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim StanArbt As Double
SCPI.SENSE(1).CORRection.COLLect.CKIT.STAN(5).ARBITrary = 50.5
StanArbt = SCPI.SENSE(1).CORRection.COLLect.CKIT.STAN(5).ARBITrary
```

Related objects

SCPI.SENSE(*Ch*).CORRection.COLLect.CKIT.SELECT on page 350

Equivalent key

[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - Arb. Impedance

*1.no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).C0

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).C0 = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).C0
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), sets the value of the C0 value of the standards 1 to 21 (<i>Std</i>).

Variable

	<i>Value</i>
Description	C0
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	Varies depending on the specified calibration kit and standard.
Unit	fF (femto farad) : 1E-15 F (farad)
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Std*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-15, “Variable (Std),” on page 351, respectively.

Examples	Dim StanC0 As Double SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).C0 = 12.3 StanC0 = SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).C0
Related objects	SCPI.SENSE(Ch).CORRection.COLLEct.CKIT.SELect on page 350
Equivalent key	[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - C0

*1. no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).C1

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).C1 = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).C1
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), sets the value of the C1 value of the standards 1 to 21 (<i>Std</i>).

Variable

	<i>Value</i>
Description	C1
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	Varies depending on the specified calibration kit and standard.
Unit	1E-27 F/Hz (1E-27 farad / hertz)
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Std*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-15, “Variable (Std),” on page 351, respectively.

Examples	Dim StanC1 As Double SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).C1 = 12.3 StanC1 = SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).C1
Related objects	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.SELect on page 350
Equivalent key	[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - C1

*1.no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).C2

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).C2 = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).C2
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), sets the value of the C2 value of the standards 1 to 21 (<i>Std</i>).

Variable

	<i>Value</i>
Description	C2
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	Varies depending on the specified calibration kit and standard.
Unit	1E-36 F/Hz ² (1E-36 farad /hertz ²)
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Std*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-15, “Variable (Std),” on page 351, respectively.

Examples

```
Dim StanC2 As Double
SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).C2 = 12.3
StanC2 = SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).C2
```

Related objects SCPI.SENSE(Ch).CORRection.COLLEct.CKIT.SELect on page 350

Equivalent key **[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - C2**

*1. no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).C3

Object type Property

Syntax SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).C3 = *Value*
Value = SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).C3

Description For the calibration kit selected for channels 1 to 9 (*Ch*), sets the value of the C3 value of the standards 1 to 21 (*Std*).

Variable

	<i>Value</i>
Description	C3
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	Varies depending on the specified calibration kit and standard.
Unit	1E-45 F/Hz ³ (1E-45 farad / hertz ³)
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Std*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-15, “Variable (Std),” on page 351, respectively.

Examples

```
Dim StanC3 As Double
SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).C3 = 12.3
StanC3 = SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).C3
```

Related objects SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.SELect on page 350

Equivalent key **[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - C3**

^{*1}no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).DELay

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).DELay = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).DELay
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), sets the value of the offset delay of the standards 1 to 21 (<i>Std</i>).

Variable

	<i>Value</i>
Description	Offset delay
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	Varies depending on the specified calibration kit and standard.
Unit	s (second)
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Std*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-15, “Variable (Std),” on page 351, respectively.

Examples	Dim StanDel As Double SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).DELay = 12.3 StanDel = SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).DELay
Related objects	SCPI.SENSE(Ch).CORRection.COLLEct.CKIT.SELect on page 350
Equivalent key	[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - Offset Delay

*1. no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).L0

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).L0 = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).L0
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), sets the value of the L0 value of the standards 1 to 21 (<i>Std</i>).
Variable	

	<i>Value</i>
Description	L0
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	Varies depending on the specified calibration kit and standard.
Unit	pH (pico henry)
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Std*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-15, “Variable (Std),” on page 351, respectively.

Examples	Dim StanL0 As Double SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).L0 = 12.3 StanL0 = SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).L0
Related objects	SCPI.SENSE(Ch).CORRection.COLLEct.CKIT.SELect on page 350
Equivalent key	[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - L0

*1.no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).L1

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).L1 = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).L1
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), sets the value of the L1 value of the standards 1 to 21 (<i>Std</i>).

Variable

	<i>Value</i>
Description	L1
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	Varies depending on the specified calibration kit and standard.
Unit	1E-24 H/Hz (1E-24 henry / hertz)
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Std*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-15, “Variable (Std),” on page 351, respectively.

Examples

```
Dim StanL1 As Double
SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).L1 = 12.3
StanL1 = SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).L1
```

Related objects SCPI.SENSE(Ch).CORRection.COLLEct.CKIT.SELect on page 350

Equivalent key **[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - L1**

*1.no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).L2

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).L2 = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).L2
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), sets the value of the L2 value of the standards 1 to 21 (<i>Std</i>).

Variable

	<i>Value</i>
Description	L2
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	Varies depending on the specified calibration kit and standard.
Unit	1E-33 H/Hz ² (1E-33 henry / hertz ²)
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Std*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-15, “Variable (Std),” on page 351, respectively.

Examples	Dim StanL2 As Double SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).L2 = 12.3 StanL2 = SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).L2
Related objects	SCPI.SENSE(Ch).CORRection.COLLEct.CKIT.SELect on page 350
Equivalent key	[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - L2

*1.no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).L3

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).L3 = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).L3
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), sets the value of the L3 value of the standards 1 to 21 (<i>Std</i>).

Variable

	<i>Value</i>
Description	L3
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	Varies depending on the specified calibration kit and standard.
Unit	1E-42 H/Hz ³ (1E-42 henry / hertz ³)
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Std*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-15, “Variable (Std),” on page 351, respectively.

Examples

```
Dim StanL3 As Double
SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).L3 = 12.3
StanL3 = SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).L3
```

Related objects SCPI.SENSE(Ch).CORRection.COLLEct.CKIT.SELect on page 350

Equivalent key **[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - L3**

*1. no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLECT.CKIT.STAN(*Std*).LAbel

Object type Property

Syntax SCPI.SENSE(*Ch*).CORRection.COLLECT.CKIT.STAN(*Std*).LAbel = *Lbl*
Lbl = SCPI.SENSE(*Ch*).CORRection.COLLECT.CKIT.STAN(*Std*).LAbel

Description For the calibration kit selected for channels 1 to 9 (*Ch*), sets the name of the standards 1 to 21 (*Std*).

Variable

	<i>Lbl</i>
Description	Standard name
Data type	Character string type (String)
Range	254 characters or less
Preset value	Varies depending on the specified calibration kit and standard.

For information on the variable (*Ch*) and the variable (*Std*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-15, “Variable (Std),” on page 351, respectively.

Examples

```
Dim StanLbl As Double
SCPI.SENSE(1).CORRection.COLLECT.CKIT.STAN(5).LAbel = "OPEN 3.5mm"
StanLbl = SCPI.SENSE(1).CORRection.COLLECT.CKIT.STAN(5).LAbel
```

Related objects SCPI.SENSE(Ch).CORRection.COLLECT.CKIT.SELect on page 350

Equivalent key **[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - Label**

*1.no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLect.CKIT.STAN(*Std*).LOSS

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.CKIT.STAN(<i>Std</i>).LOSS = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.CKIT.STAN(<i>Std</i>).LOSS
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), sets the value of the offset loss of the standards 1 to 21 (<i>Std</i>).

Variable

	<i>Value</i>
Description	Offset loss
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	Varies depending on the specified calibration kit and standard.
Unit	Ω/s (ohm/second)
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Std*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-15, “Variable (Std),” on page 351, respectively.

Examples	<pre>Dim StanLoss As Double SCPI.SENSE(1).CORRection.COLLect.CKIT.STAN(5).LOSS = 12.3 StanLoss = SCPI.SENSE(1).CORRection.COLLect.CKIT.STAN(5).LOSS</pre>
Related objects	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.SELect on page 350
Equivalent key	[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - Offset Loss

*1. no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).TYPE

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).TYPE = <i>Param</i> <i>Param</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).TYPE
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), sets the standard type of the standards 1 to 21 (<i>Std</i>).
Variable	

	<i>Param</i>
Description	Standard type
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"OPEN" Specifies open. •"SHORT" Specifies short. •"LOAD" Specifies load. •"THRU" Specifies thru. •"ARBI" Specifies arbitrary impedance. •"NONE" Specifies DUT of which theoretical value is 0.
Preset value	Varies depending on the specified calibration kit and standard.

For information on the variable (*Ch*) and the variable (*Std*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-15, "Variable (Std)," on page 351, respectively.

Examples	<pre>Dim StanType As String SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).TYPE = "OPEN" StanType = SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).TYPE</pre>
Related objects	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.SELect on page 350
Equivalent key	[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - STD Type

*1. no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).Z0

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).Z0 = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.CKIT.STAN(<i>Std</i>).Z0
Description	For the calibration kit selected for channels 1 to 9 (<i>Ch</i>), sets the value of the offset Z0 of the standards 1 to 21 (<i>Std</i>).

Variable

	<i>Value</i>
Description	Offset Z0
Data type	Double precision floating point type (Double)
Range	-1E18 to 1E18
Preset value	Varies depending on the specified calibration kit and standard.
Unit	Ω (ohm)
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Std*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-15, “Variable (Std),” on page 351, respectively.

Examples	Dim StanZ0 As Double SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).Z0 = 50 StanZ0 = SCPI.SENSE(1).CORRection.COLLEct.CKIT.STAN(5).Z0
Related objects	SCPI.SENSE(Ch).CORRection.COLLEct.CKIT.SELect on page 350
Equivalent key	[Cal] - Modify Cal Kit - Define STDs - no. name^{*1} - Offset Z0

*1. no: standard number (1 to 21), name: standard name (variable)

SCPI.SENSE(*Ch*).CORRection.COLLEct.ECAL.ISOLation.STATe

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.ECAL.ISOLation.STATe = <i>Status</i> <i>Status</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.ECAL.ISOLation.STATe
Description	For channels 1 to 9 (<i>Ch</i>), turns ON/OFF the isolation measurement when executing Ecal (Electronic Calibration).
Variable	

	<i>Status</i>
Description	ON/OFF of the isolation measurement when executing ECal
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the isolation measurement. •False or 0 Turns OFF the isolation measurement.
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples	<pre>Dim EcalIso As Boolean SCPI.SENSE(1).CORRection.COLLEct.ECAL.ISOLation.STATe = True EcalIso = SCPI.SENSE(1).CORRection.COLLEct.ECAL.ISOLation.STATe</pre>
Related objects	<p>SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.ECAL.SOLT1 on page 367</p> <p>SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.ECAL.SOLT2 on page 368</p> <p>SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.ECAL.SOLT3 on page 369</p> <p>SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.ECAL.SOLT4 on page 370</p>
Equivalent key	[Cal] - ECal - Isolation

SCPI.SENSE.CORRection.COLLect.ECAL.PATH(*Cpt*)

Object type	Property
Syntax	<i>Ept</i> = SCPI.SENSE.CORRection.COLLect.ECAL.PATH(<i>Cpt</i>)
Description	Reads out which port of the ECal module is connected with the specified port of the E5070A/E5071A. (Read only)
Variable	

	<i>Ept</i>
Description	Port of ECal module.
Data type	Long integer type (Long)
Range	One of the following is read out. <ul style="list-style-type: none">• 0 Nothing is connected.• 1 Port A is connected.• 2 Port B is connected.• 3 Port C is connected.• 4 Port D is connected.

For information on the variable (*Cpt*), see Table 7-14, “Variable (*Cpt*),” on page 346.

Examples

```
Dim ECalPort As Long  
ECalPort = SCPI.SENSE(1).CORRection.COLLect.ECAL.PATH(1)
```

Equivalent key No equivalent key is available on the front panel.

SCPI.SENSE(*Ch*).CORRection.COLLect.ECAL.SOLT1

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.ECAL.SOLT1 = <i>Eport</i>
Description	<p>Executes full 1-port calibration of the specified port of channels 1 to 9 (<i>Ch</i>) using the ECal (Electronic Calibration) module.</p> <p>If you execute this object when the ECal module is not connected, an error occurs when executed and the object is ignored. (No read)</p>

Variable

	<i>Eport</i>
Description	Port number
Data type	Long integer type (Long)
Range	1 to 4
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples `SCPI.SENSE(1).CORRection.COLLect.ECAL.SOLT1 = 1`

Equivalent key **[Cal] - ECal - 1Port ECal - Port 1|Port 2|Port 3|Port 4**

SCPI.SENSE(*Ch*).CORRection.COLLect.ECAL.SOLT2

Object type Property

Syntax SCPI.SENSE(*Ch*).CORRection.COLLect.ECAL.SOLT2 = *Eports*

Description Executes full 2-port calibration between the specified 2 ports of channels 1 to 9 (*Ch*) using the ECal (Electronic Calibration) module.

If you execute this object when the ECal module is not connected, an error occurs when executed and the object is ignored. (No read)

Variable

	<i>Eports</i>
Description	Indicates 2-element array data (port number). <ul style="list-style-type: none"> • <i>EPorts(0)</i> <i>EPorts(1)</i> Specifies the port numbers for 2-port ECal. The index of the array starts from 0.
Data type	Variant type (Variant)
Range	1 to 4
Resolution	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed. If you specify the same port number to 2 port numbers, an error occurs when executed. the order of the 2 port numbers to be specified is arbitrary.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples (1) SCPI.SENSE(1).CORRection.COLLect.ECAL.SOLT2 = Array(1,2)

Examples (2)

```
Dim EcalPort(1) As Variant
EcalPort(0) = 1
EcalPort(1) = 2
SCPI.SENSE(1).CORRection.COLLect.ECAL.SOLT2 = EcalPort
```

Equivalent key **[Cal] - ECal - 2Port ECal - Port 1-2|Port 1-3|Port 1-4|Port 2-3|Port 2-4|Port 3-4**

SCPI.SENSE(*Ch*).CORRection.COLLect.ECAL.SOLT3

Object type Property

Syntax SCPI.SENSE(*Ch*).CORRection.COLLect.ECAL.SOLT3 = *Eports*

Description Executes full 3-port calibration between the specified 3 ports of channels 1 to 9 (*Ch*) using the ECal (Electronic Calibration) module.

If you execute this object when the 4-port ECal module is not connected, an error occurs when executed and the object is ignored. (No read)

Variable

	<i>Eports</i>
Description	Indicates 3-element array data (port number). <ul style="list-style-type: none"> • <i>EPorts(0)</i> <i>EPorts(1)</i> <i>EPorts(2)</i> <p style="text-align: right;">Specifies the port numbers for 3-port ECal.</p> <p>The index of the array starts from 0.</p>
Data type	Variant type (Variant)
Range	1 to 4
Resolution	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed. If you specify the same port number to more than 2 port numbers, an error occurs when executed. the order of the 3 port numbers to be specified is arbitrary.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples (1) SCPI.SENSE(1).CORRection.COLLect.ECAL.SOLT3 = Array(1,2,3)

Examples (2)

```
Dim EcalPort(2) As Variant
EcalPort(0) = 1
EcalPort(1) = 2
EcalPort(2) = 3
SCPI.SENSE(1).CORRection.COLLect.ECAL.SOLT3 = EcalPort
```

Equivalent key **[Cal] - ECal - 3Port ECal - Port 1-2-3|Port 1-2-4|Port 1-3-4|Port 2-3-4**

SCPI.SENSE(*Ch*).CORRection.COLLect.ECAL.SOLT4

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.ECAL.SOLT4 = <i>Eports</i>
Description	<p>Executes full 4-port calibration for channels 1 to 9 (<i>Ch</i>) using the ECal (Electronic Calibration) module.</p> <p>If you execute this object when the 4-port ECal module is not connected, an error occurs when executed and the object is ignored. (No read)</p>

Variable

	<i>Eports</i>
Description	<p>Indicates 4-element array data (port number).</p> <ul style="list-style-type: none"> • <i>EPorts(0)</i> <i>EPorts(1)</i> <i>EPorts(2)</i> <i>EPorts(3)</i> <p style="text-align: right;">Specifies the port numbers for 4-port ECal.</p> <p>The index of the array starts from 0.</p>
Data type	Variant type (Variant)
Range	1 to 4
Resolution	1
Note	<p>If the specified variable is out of the allowable setup range, an error occurs when executed.</p> <p>If you specify the same port number to more than 2 port numbers, an error occurs when executed. the order of the 4 port numbers to be specified is arbitrary.</p>

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples (1) SCPI.SENSE(1).CORRection.COLLect.ECAL.SOLT4 = Array(1,2,3,4)

Examples (2)

```
Dim EcalPort(3) As Variant
EcalPort(0) = 1
EcalPort(1) = 2
EcalPort(2) = 3
EcalPort(3) = 4
SCPI.SENSE(1).CORRection.COLLect.ECAL.SOLT4 = EcalPort
```

Equivalent key **[Cal] - ECal - 4Port ECal**

SCPI.SENSE(Ch).CORRection.COLLect.ECAL.THru

Object type Property

Syntax SCPI.SENSE(Ch).CORRection.COLLect.ECAL.THru = *Eports*

Description Executes response calibration (thru) between the specified 2 ports of channels 1 to 9 (*Ch*) using the ECal (Electronic Calibration) module.

If you execute this object when the ECal module is not connected, an error occurs when executed and the object is ignored. (No read)

Variable

	<i>Eports</i>
Description	Indicates 2-element array data (port number). <ul style="list-style-type: none"> • <i>Ports(0)</i> Specifies the response port number. • <i>Ports(1)</i> Specifies the stimulus port number. The index of the array starts from 0.
Data type	Variant type (Variant)
Range	1 to 4
Resolution	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed. If you specify the same port number to 2 port numbers, an error occurs when executed. the order of the 2 port numbers to be specified is arbitrary.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples (1) SCPI.SENSE(1).CORRection.COLLect.ECAL.THru = Array(1,2)

Examples (2)

```
Dim EcalPort(1) As Variant
EcalPort(0) = 1
EcalPort(1) = 2
SCPI.SENSE(1).CORRection.COLLect.ECAL.THru = EcalPort
```

Equivalent key **[Cal] - ECal - Thru ECal - 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)**

**SCPI.SENSE(*Ch*).CORRection.COLLect.METHod.
RESPonse.OPEN**

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.METHod.RESPonse.OPEN = <i>Port</i>
Description	For channels 1 to 9 (<i>Ch</i>), sets the calibration type to the response calibration (open) of the specified port. (No read)
Variable	For information on the variable (<i>Ch</i>) and the variable (<i>Port</i>), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-13, “Variable (Port),” on page 342, respectively.
Examples	SCPI.SENSE(1).CORRection.COLLect.METHod.RESPonse.OPEN = 1
Related objects	SCPI.SENSE(Ch).CORRection.COLLect.METHod.TYPE on page 377
Equivalent key	[Cal] - Calibrate - Response (Open) - Select Port

**SCPI.SENSE(*Ch*).CORRection.COLLect.METHod.
RESPonse.SHORt**

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.METHod.RESPonse.SHORt = <i>Port</i>
Description	For channels 1 to 9 (<i>Ch</i>), sets the calibration type to the response calibration (short) of the specified port. (No read)
Variable	For information on the variable (<i>Ch</i>) and the variable (<i>Port</i>), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-13, “Variable (Port),” on page 342, respectively.
Examples	SCPI.SENSE(1).CORRection.COLLect.METHod.RESPonse.SHORt = 1
Related objects	SCPI.SENSE(Ch).CORRection.COLLect.METHod.TYPE on page 377
Equivalent key	[Cal] - Calibrate - Response (Short) - Select Port

SCPI.SENSE(*Ch*).CORREction.COLLECT.METHOD.RESPonse.THRU

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORREction.COLLECT.METHOD.RESPonse.THRU = <i>Ports</i>
Description	For channels 1 to 9 (<i>Ch</i>), sets the calibration type to the response calibration (thru) between the specified 2 ports. (No read)
Variable	For information on the variable (<i>Ch</i>) and the variable (<i>Ports</i>), see Table 7-6, “Variable (<i>Ch</i>),” on page 163 and Table 7-12, “Variable (<i>Ports</i>),” on page 341, respectively.
Examples (1)	<code>SCPI.SENSE(1).CORREction.COLLECT.METHOD.RESPonse.THRU = Array(2,1)</code>
Examples (2)	<code>Dim ThruPort(1) As Variant ThruPort(0) = 2 ThruPort(1) = 1 SCPI.SENSE(1).CORREction.COLLECT.METHOD.RESPonse.THRU = ThruPort</code>
Related objects	SCPI.SENSE(<i>Ch</i>).CORREction.COLLECT.METHOD.TYPE on page 377
Equivalent key	[Cal] - Calibrate - Response (Thru) - Select Ports

SCPI.SENSE(*Ch*).CORREction.COLLECT.METHOD.SOLT1

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORREction.COLLECT.METHOD.SOLT1 = <i>Port</i>
Description	For channels 1 to 9 (<i>Ch</i>), sets the calibration type to the full 1-port calibration of the specified port. (No read)
Variable	For information on the variable (<i>Ch</i>) and the variable (<i>Port</i>), see Table 7-6, “Variable (<i>Ch</i>),” on page 163 and Table 7-13, “Variable (<i>Port</i>),” on page 342, respectively.
Examples	<code>SCPI.SENSE(1).CORREction.COLLECT.METHOD.SOLT1 = 1</code>
Related objects	SCPI.SENSE(<i>Ch</i>).CORREction.COLLECT.METHOD.TYPE on page 377
Equivalent key	[Cal] - Calibrate - 1-Port Cal - Select Port

SCPI.SENSE(*Ch*).CORRection.COLLect.METHod. SOLT2

Object type Property

Syntax SCPI.SENSE(*Ch*).CORRection.COLLect.METHod.SOLT2 = *Ports*

Description For channels 1 to 9 (*Ch*), sets the calibration type to the full 2-port calibration between the specified 2 ports. (No read)

Variable

	<i>Ports</i>
Description	Indicates 2-element array data (port number). <ul style="list-style-type: none"> • <i>Ports(0)</i> Specifies a port for full 2-port calibration. • <i>Ports(1)</i> Specifies the other port for full 2-port calibration. The index of the array starts from 0.
Data type	Variant type (Variant)
Range	1 to 4
Resolution	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed. If you specify the same port number to 2 port numbers, an error occurs when executed. The order of the 2 port numbers to be specified is arbitrary.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples (1) SCPI.SENSE(1).CORRection.COLLect.METHod.SOLT2 = Array(1,2)

Examples (2) Dim CalPort(1) As Variant
 CalPort(0) = 1
 CalPort(1) = 2
 SCPI.SENSE(1).CORRection.COLLect.METHod.SOLT2 = CalPort

Related objects SCPI.SENSE(Ch).CORRection.COLLect.METHod.TYPE on page 377

Equivalent key **[Cal] - Calibrate - 2-Port Cal - Select Ports**

SCPI.SENSE(*Ch*).CORRection.COLLect.METHod. SOLT3

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.METHod.SOLT3 = <i>Ports</i>
Description	For channels 1 to 9 (<i>Ch</i>), sets the calibration type to the full 3-port calibration between the specified 3 ports. (No read)
Variable	

	<i>Ports</i>
Description	Indicates 3-element array data (port number). <ul style="list-style-type: none"> • <i>Ports</i>(0) Specifies a port for full 3-port calibration. • <i>Ports</i>(1) Specifies a port for full 3-port calibration. • <i>Ports</i>(2) Specifies a port for full 3-port calibration. The index of the array starts from 0.
Data type	Variant type (Variant)
Range	1 to 4
Resolution	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed. If you specify the same port number to 2 or more port numbers, an error occurs when executed. The order of the 3 port numbers to be specified is arbitrary.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples (1) `SCPI.SENSE(1).CORRection.COLLect.METHod.SOLT3 = Array(1,2,3)`

Examples (2)

```
Dim CalPort(2) As Variant
CalPort(0) = 1
CalPort(1) = 2
CalPort(2) = 3
SCPI.SENSE(1).CORRection.COLLect.METHod.SOLT3 = CalPort
```

Related objects SCPI.SENSE(Ch).CORRection.COLLect.METHod.TYPE on page 377

Equivalent key **[Cal] - Calibrate - 3-Port Cal - Select Ports**

SCPI.SENSE(*Ch*).CORRection.COLLect.METHod. SOLT4

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.METHod.SOLT4 = <i>Ports</i>
Description	For channels 1 to 9 (<i>Ch</i>), sets the calibration type to the full 4-port calibration. (No read)
Variable	

	<i>Ports</i>
Description	<p>Indicates 4-element array data (port number).</p> <ul style="list-style-type: none"> • <i>Ports(0)</i> Specifies a port for full 4-port calibration. • <i>Ports(1)</i> Specifies a port for full 4-port calibration. • <i>Ports(2)</i> Specifies a port for full 4-port calibration. • <i>Ports(3)</i> Specifies a port for full 4-port calibration. <p>The index of the array starts from 0.</p>
Data type	Variant type (Variant)
Range	1 to 4
Resolution	1
Note	If the specified variable is out of the allowable setup range, an error occurs when executed. If you specify the same port number to 2 or more port numbers, an error occurs when executed. The order of the 4 port numbers to be specified is arbitrary.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples (1) SCPI.SENSE(1).CORRection.COLLect.METHod.SOLT4 = Array(1,2,3,4)

Examples (2) Dim CalPort(3) As Variant
 CalPort(0) = 1
 CalPort(1) = 2
 CalPort(2) = 3
 CalPort(3) = 4
 SCPI.SENSE(1).CORRection.COLLect.METHod.SOLT4 = CalPort

Related objects SCPI.SENSE(Ch).CORRection.COLLect.METHod.TYPE on page 377

Equivalent key **[Cal] - Calibrate - 4-Port Cal**

SCPI.SENSE(*Ch*).CORRection.COLLect.METHod.TYPE

Object type	Property
Syntax	<i>Param</i> = SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.METHod.TYPE
Description	Reads out the calibration type of channels 1 to 9 (<i>Ch</i>). (Read only)
Variable	

	<i>Param</i>
Description	Calibration type
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"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 full 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.

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 163.

Examples

```
Dim CalType As String
CalType = SCPI.SENSE(1).CORRection.COLLect.METHod.TYPE
```

Equivalent key No equivalent key is available on the front panel.

SCPI.SENSE(*Ch*).CORRection.COLLect.SAVE

Object type	Method
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.COLLect.SAVE
Description	<p>From the measured calibration data, calculates the calibration factor depending on the calibration type setting.</p> <p>Calculating the calibration coefficients clears all the measured calibration data whether or not used for the calculation and also clears the calibration type setting.</p> <p>If you execute this command before all necessary calibration data for calculating the calibration factor is measured, an error occurs when executed. (No read)</p>
Variable	For information on the variable (<i>Ch</i>), see Table 7-6, “Variable (Ch),” on page 163.
Examples	<pre>Dim Dmy As Long SCPI.SENSE(1).CORRection.COLLect.METHod.RESPOse.THRU = Array(2,1) SCPI.SENSE(1).CORRection.COLLect.ACQuire.THRU = Array(2,1) Dmy = SCPI.IEEE4882.OPC SCPI.SENSE(1).CORRection.COLLect.SAVE</pre>
Related objects	<p>SCPI.SENSE(Ch).CORRection.COLLect.ACQuire. ISOLation on page 341</p> <p>SCPI.SENSE(Ch).CORRection.COLLect.ACQuire.LOAD on page 342</p> <p>SCPI.SENSE(Ch).CORRection.COLLect.ACQuire.OPEN on page 343</p> <p>SCPI.SENSE(Ch).CORRection.COLLect.ACQuire. SHORt on page 343</p> <p>SCPI.SENSE(Ch).CORRection.COLLect.ACQuire.THRU on page 344</p>
Equivalent key	[Cal] - Calibrate - Response n-Port Cal - Done

SCPI.SENSE(Ch).CORRection.EXTension.PORT(Pt).TIME

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.EXTension.PORT(<i>Pt</i>).TIME = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.EXTension.PORT(<i>Pt</i>).TIME
Description	For channels 1 to 9 (<i>Ch</i>), sets the delay time for the port extension of ports 1 and 4 (<i>Pt</i>).
Variable	

	<i>Value</i>
Description	Delay time
Data type	Double precision floating point type (Double)
Range	-10 to 10
Preset value	0
Unit	s (second)
Note	If the specified variable 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.

For information on the variable (*Ch*) and the variable (*Pt*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-8, “Variable (Pt),” on page 183, respectively.

Examples	<pre>Dim PortExt As Double SCPI.SENSE(1).CORRection.EXTension.PORT(1).TIME = 1E-3 PortExt = SCPI.SENSE(1).CORRection.EXTension.PORT(1).TIME</pre>
Related objects	SCPI.SENSE(Ch).CORRection.EXTension.STATE on page 380
Equivalent key	[Cal] - Port Extensions - Extension Port N

SCPI.SENSE(*Ch*).CORRection.EXTEnsion.STATe

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.EXTEnsion.STATe = <i>Status</i> <i>Status</i> = SCPI.SENSE(<i>Ch</i>).CORRection.EXTEnsion.STATe
Description	For channels 1 to 9 (<i>Ch</i>), turns ON/OFF the port extension.
Variable	

	<i>Status</i>
Description	ON/OFF of the port extension correction
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the port extension. •False or 0 Turns OFF the port extension.
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim Ext As Boolean
SCPI.SENSE(1).CORRection.EXTEnsion.STATe = True
Ext = SCPI.SENSE(1).CORRection.EXTEnsion.STATe
```

Related objects SCPI.SENSE(Ch).CORRection.EXTEnsion.PORT(Pt).TIME on page 379

Equivalent key **[Cal] - Port Extensions - Extensions**

SCPI.SENSE(*Ch*).CORRection.PROPerTy

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.PROPerTy = <i>Status</i> <i>Status</i> = SCPI.SENSE(<i>Ch</i>).CORRection.PROPerTy
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), turns ON/OFF the display of the calibration property.
Variable	

	<i>Status</i>
Description	ON/OFF of the display of the calibration property
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the display of the calibration property. •False or 0 Turns OFF the display of the calibration property.
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples	<pre>Dim CalProp As Boolean SCPI.SENSE(1).CORRection.PROPerTy = True CalProp = SCPI.SENSE(1).CORRection.PROPerTy</pre>
Equivalent key	[Cal] - Propety

SCPI.SENSE(*Ch*).CORRection.RVELocity.COAX

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORRection.RVELocity.COAX = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).CORRection.RVELocity.COAX
Description	For channels 1 to 9 (<i>Ch</i>), sets the velocity factor.
Variable	

	<i>Value</i>
Description	Velocity factor
Data type	Double precision floating point type (Double)
Range	0 to 10
Preset value	1
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim Vel As Double
SCPI.SENSE(1).CORRection.RVELocity.COAX = 0.5
Vel = SCPI.SENSE(1).CORRection.RVELocity.COAX
```

Equivalent key **[Cal] - Velocity Factor**

SCPI.SENSE(*Ch*).CORREction.STATe

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).CORREction.STATe = <i>Status</i> <i>Status</i> = SCPI.SENSE(<i>Ch</i>).CORREction.STATe
Description	For the active trace of channels 1 to 9 (<i>Ch</i>), turns ON/OFF the error correction.
Variable	

	<i>Status</i>
Description	ON/OFF of the error correction
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the error correction. •False or 0 Turns OFF the error correction.
Preset value	False or 0

Examples

```
Dim Corr As Boolean
SCPI.SENSE(1).CORREction.STATe = True
Corr = SCPI.SENSE(1).CORREction.STATe
```

Equivalent key **[Cal] - Correction**

SCPI.SENSE(Ch).CORRection.TYPE(Tr)

Object type	Properties
Syntax	<i>Data</i> = SCPI.SENSE(<i>Ch</i>).CORRection.TYPE(<i>Tr</i>)
Description	Reads out the calibration type applied to traces 1 to 9 (<i>Tr</i>) of channels 1 to 9 (<i>Ch</i>). (Read only)
Variable	

	<i>Data</i>
Description	<p>Indicates 5 array data items (the calibration type and the port information to which the calibration is applied).</p> <ul style="list-style-type: none"> • <i>Data</i>(0) The calibration type applied. For detail, refer to the Range section. • <i>Data</i>(1) The port number to which the calibration is applied (0 when the calibration type is NONE). • <i>Data</i>(2) The port number to which the calibration is applied (0 when the calibration type is not SOLT2, SOLT3, or SOLT4). • <i>Data</i>(3) The port number to which the calibration is applied (0 when the calibration type is not SOLT3 or SOLT4). • <i>Data</i>(4) The port number to which the calibration is applied (0 when the calibration type is not SOLT4). <p>The array index starts from 0.</p>
Range	<p>One of the following is read out as <i>Data</i>(0).</p> <ul style="list-style-type: none"> • "NONE" Nothing is applied. • "RESPO" The response calibration (open) is applied. • "RESPS" The response calibration (short) is applied. • "RESPT" The response calibration (thru) is applied. • "SOLT1" The full 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.
Data type	Variant type (Variant)

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-9, “Variable (Tr),” on page 198, respectively.

Example of use `Dim CalType As Variant`
 `CalType = SCPI.SENSE(1).CORRection.TYPE(1)`

Equivalent key No equivalent key is available on the front panel.

SCPI.SENSE(*Ch*).FREQUENCY.CENTER

- Object type Property
- Syntax SCPI.SENSE(*Ch*).FREQUENCY.CENTER = *Value*
Value = SCPI.SENSE(*Ch*).FREQUENCY.CENTER
- Description Sets the center value of the sweep range of channels 1 to 9 (*Ch*).
- Variable

	<i>Value</i>
Description	Center value
Data type	Double precision floating point type (Double)
Range	3E5 to 8.5E9
Preset value	4.25015E9
Unit	Hz (hertz)
Resolution	0.5
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples `Dim Cntr As Double`
`SCPI.SENSE(1).FREQUENCY.CENTER = 2E9`
`Cntr = SCPI.SENSE(1).FREQUENCY.CENTER`
- Related objects SCPI.SENSE(*Ch*).FREQUENCY.SPAN on page 387
- Equivalent key **[Center]**

SCPI.SENSE(*Ch*).FREQUENCY.DATA

Object type	Property
Syntax	<i>Data</i> = SCPI.SENSE(Ch).FREQUENCY.DATA
Description	Reads out the frequencies at all measurement points of channels 1 to 9 (Ch). (Read only)
Variable	

	<i>Data</i>
Description	<p>Indicates the array data (frequency) of NOP (number of measurement points). Where n is an integer between 1 and NOP.</p> <ul style="list-style-type: none"> • <i>Data(n-1)</i> Frequency at the n-th measurement point <p>The index of the array starts from 0.</p>
Data type	Variant type (Variant)

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim FreqData As Variant
SCPI.SENSE(1).SWEep.POINTs = 201
FreqData = SCPI.SENSE(1).FREQUENCY.DATA
```

Related objects SCPI.SENSE(Ch).SWEep.POINTs on page 405

Equivalent key No equivalent key is available on the front panel.

SCPI.SENSE(*Ch*).FREQUENCY.SPAN

Object type

Property

Syntax

SCPI.SENSE(*Ch*).FREQUENCY.SPAN = *Value*

Value = SCPI.SENSE(*Ch*).FREQUENCY.SPAN

Description

Sets the span value of the sweep range of channels 1 to 9 (*Ch*).

Variable

	<i>Value</i>
Description	Span value
Data type	Double precision floating point type (Double)
Range	0 to 8.4997E9
Preset value	8.4997E9
Unit	Hz (hertz)
Resolution	1
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples

```
Dim Span As Double
SCPI.SENSE(1).FREQUENCY.SPAN = 1E9
Span = SCPI.SENSE(1).FREQUENCY.SPAN
```

Related objects

SCPI.SENSE(*Ch*).FREQUENCY.CENTER on page 385

Equivalent key

[Span]

SCPI.SENSE(*Ch*).FREQUENCY.START

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).FREQUENCY.START = <i>Value</i> <i>Value</i> = SCPI.SENSE(<i>Ch</i>).FREQUENCY.START
Description	Sets the start value of the sweep range of channels 1 to 9 (<i>Ch</i>).
Variable	

	<i>Value</i>
Description	Start value
Data type	Double precision floating point type (Double)
Range	3E5 to 8.5E9
Preset value	3E5
Unit	Hz (hertz)
Resolution	1
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

Examples	<pre>Dim Start As Double SCPI.SENSE(1).FREQUENCY.START = 100E6 Start = SCPI.SENSE(1).FREQUENCY.START</pre>
Related objects	SCPI.SENSE(<i>Ch</i>).FREQUENCY.STOP on page 389
Equivalent key	[Start]

SCPI.SENSE(*Ch*).FREQUENCY.STOP

- Object type** Property
- Syntax** SCPI.SENSE(*Ch*).FREQUENCY.STOP = *Value*
Value = SCPI.SENSE(*Ch*).FREQUENCY.STOP
- Description** Sets the stop value of the sweep range of channels 1 to 9 (*Ch*).
- Variable**

	<i>Value</i>
Description	Stop value
Data type	Double precision floating point type (Double)
Range	3E5 to 8.5E9
Preset value	8.5E9
Unit	Hz (hertz)
Resolution	1
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples**
- ```
Dim Stp As Double
SCPI.SENSE(1).FREQUENCY.STOP = 3E9
Stp = SCPI.SENSE(1).FREQUENCY.STOP
```
- Related objects** SCPI.SENSE(*Ch*).FREQUENCY.START on page 388
- Equivalent key** **[Stop]**

## SCPI.SENSE.MULTIplexer(*Id*).COUNT

|             |                                                                                      |
|-------------|--------------------------------------------------------------------------------------|
| Object type | Property                                                                             |
| Syntax      | <i>Value</i> = SCPI.SENSE.MULTIplexer( <i>Id</i> ).COUNT                             |
| Description | Reads the number of ports (7 or 9) of the E5091A whose ID is <i>Id</i> . (Read only) |
| Variable    |                                                                                      |

**Table 7-16**

### Variable(*Id*)

|              | <i>Id</i>                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------|
| Description  | ID of the E5091A                                                                              |
| Data type    | Long integer type (Long)                                                                      |
| Range        | 1 to 2                                                                                        |
| Preset value | 1                                                                                             |
| Note         | If the specified variable is out of the allowable setup range, an error occurs when executed. |

|             | <i>Value</i>                                |
|-------------|---------------------------------------------|
| Description | The number of ports                         |
| Data type   | Long integer type (Long)                    |
| Note        | 0 is read when the E5091A is not connected. |

**Examples**

```
Dim NPort As Long
NPort = SCPI.SENSE.MULTIplexer(1).COUNT
```

**Equivalent key** No equivalent key is available on the front panel.

## SCPI.SENSE.MULTIplexer(*Id*).DISPlay.STATe

|             |                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                               |
| Syntax      | SCPI.SENSE.MULTIplexer( <i>Id</i> ).DISPlay.STATe = <i>Status</i><br><i>Status</i> = SCPI.SENSE.MULTIplexer( <i>Id</i> ).DISPlay.STATe |
| Description | Turns ON/OFF the property display (the state of the port assignment) of the E5091A whose ID is <i>Id</i> .                             |
| Variable    |                                                                                                                                        |

|              | <i>Status</i>                                                                                                                                                                                                             |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | ON/OFF of the property display                                                                                                                                                                                            |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                    |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns ON the property display.</li> <li>•False or 0                      Turns OFF the property display.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                |

For information on the variable (*Id*), see Table 7-16, “Variable(Id),” on page 390.

|                 |                                                                                                                                                                                                                                                         |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Prop As Boolean SCPI.SENSE.MULTIplexer(1).DISPlay.STATe = True Prop = SCPI.SENSE.MULTIplexer(1).DISPlay.STATe</pre>                                                                                                                            |
| Related objects | <p>SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT1 on page 394</p> <p>SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT2 on page 395</p> <p>SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT3 on page 396</p> <p>SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT4 on page 397</p> |
| Equivalent key  | <b>[System] - E5091A Setup - E5091A Property</b>                                                                                                                                                                                                        |

## SCPI.SENSE.MULTIplexer(*Id*).STATE

|             |                                                                                                                                                                 |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                        |
| Syntax      | SCPI.SENSE.MULTIplexer( <i>Id</i> ).STATE = <i>Status</i><br><i>Status</i> = SCPI.SENSE.MULTIplexer( <i>Id</i> ).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 <i>Id</i> . |
| Variable    |                                                                                                                                                                 |

|              |                                                                                                                                                                                                                                     |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <i>Status</i>                                                                                                                                                                                                                       |
| Description  | ON/OFF of the control of the E5091A                                                                                                                                                                                                 |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                              |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns ON the control of the E5091A.</li> <li>•False or 0                      Turns OFF the control of the E5091A.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                          |

For information on the variable (*Id*), see Table 7-16, “Variable(*Id*),” on page 390.

|                 |                                                                                                                                                                                                                                                                                                                                                   |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | Dim Cont As Boolean<br>SCPI.SENSE.MULTIplexer(1).DISPlay.STATe = True<br>Cont = SCPI.SENSE.MULTIplexer(1).DISPlay.STATe                                                                                                                                                                                                                           |
| Related objects | SCPI.SENSE(Ch).MULTIplexer( <i>Id</i> ).TSET9.PORT1 on page 394<br>SCPI.SENSE(Ch).MULTIplexer( <i>Id</i> ).TSET9.PORT2 on page 395<br>SCPI.SENSE(Ch).MULTIplexer( <i>Id</i> ).TSET9.PORT3 on page 396<br>SCPI.SENSE(Ch).MULTIplexer( <i>Id</i> ).TSET9.PORT4 on page 397<br>SCPI.SENSE(Ch).MULTIplexer( <i>Id</i> ).TSET9.OUTPUT.DATA on page 393 |
| Equivalent key  | <b>[System] - E5091A Setup - E5091A Control</b>                                                                                                                                                                                                                                                                                                   |

## SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.OUTPut.DATA

Object type      Property

Syntax            SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.OUTPut.DATA = *Value*  
*Value* = SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.OUTPut.DATA

Description      Sets the HIGH/LOW of all the control line of the E5091A whose ID is *Id* when measuring channels 1 to 9 (*Ch*) 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.

Variable

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Setting value the control line                                                                                                                                                                               |
| Data type    | Long integer type (Long)                                                                                                                                                                                     |
| Range        | 0 to 255                                                                                                                                                                                                     |
| Preset value | 0                                                                                                                                                                                                            |
| Resolution   | 1                                                                                                                                                                                                            |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*) and the variable (*Id*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-16, “Variable(Id),” on page 390, respectively.

Examples            Dim C\_line As Long  
SCPI.SENSE(1).MULTiplexer(1).TSET9.OUTPut.DATA = 5  
C\_line = SCPI.SENSE(1).MULTiplexer(1).TSET9.OUTPut.DATA

Related objects    SCPI.SENSE.MULTiplexer(Id).STATE on page 392

Equivalent key     **[System] - E5091A Setup - Control Lines**

**SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.PORT1**

|             |                                                                                                                                                                                                                                                                                                                   |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                                                                                                                          |
| Syntax      | SCPI.SENSE( <i>Ch</i> ).MULTiplexer( <i>Id</i> ).TSET9.PORT1 = <i>Param</i><br><i>Param</i> = SCPI.SENSE( <i>Ch</i> ).MULTiplexer( <i>Id</i> ).TSET9.PORT1                                                                                                                                                        |
| Description | Selects a port assigned to Port 1 of the E5091A whose ID is <i>Id</i> when measuring channels 1 to 9 ( <i>Ch</i> ) in the measurement using the E5091A.<br><br>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. |

## Variable

|             | <i>Param</i>                                                                                                                                                                                                                                            |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | The port assigned to Port 1                                                                                                                                                                                                                             |
| Data type   | Character string type (String)                                                                                                                                                                                                                          |
| Range       | Select from the following.<br><ul style="list-style-type: none"> <li>•"A"                                 Selects A as the port assigned to Port 1.</li> <li>•"T1"                                Selects T1 as the port assigned to Port 1.</li> </ul> |

For information on the variable (*Ch*) and the variable (*Id*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-16, "Variable(Id)," on page 390, respectively.

## Examples

```
Dim Port As String
SCPI.SENSE(1).MULTiplexer(1).TSET9.PORT1 = "T1"
Port = SCPI.SENSE(1).MULTiplexer(1).TSET9.PORT1
```

|                 |                                                                                                                                                                                                                                                                                           |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Related objects | SCPI.SENSE.MULTiplexer( <i>Id</i> ).STATE on page 392<br>SCPI.SENSE( <i>Ch</i> ).MULTiplexer( <i>Id</i> ).TSET9.PORT2 on page 395<br>SCPI.SENSE( <i>Ch</i> ).MULTiplexer( <i>Id</i> ).TSET9.PORT3 on page 396<br>SCPI.SENSE( <i>Ch</i> ).MULTiplexer( <i>Id</i> ).TSET9.PORT4 on page 397 |
| Equivalent key  | <b>[System] - E5091A Setup - Port1 - A T1</b>                                                                                                                                                                                                                                             |

## SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT2

- Object type** Property
- Syntax** SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.PORT2 = *Param*  
*Param* = SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.PORT2
- Description** Selects a port assigned to Port 2 of the E5091A whose ID is *Id* when measuring channels 1 to 9 (*Ch*) 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.

**Variable**

|             | <i>Param</i>                                                                                                                                                                                                                         |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | The port assigned to Port 2                                                                                                                                                                                                          |
| Data type   | Character string type (String)                                                                                                                                                                                                       |
| Range       | Select from the following.<br><ul style="list-style-type: none"> <li>•"T1"                      Selects T1 as the port assigned to Port 2.</li> <li>•"T2"                      Selects T2 as the port assigned to Port 2.</li> </ul> |

For information on the variable (*Ch*) and the variable (*Id*), see Table 7-6, “Variable (Ch),” on page 163 and Table 7-16, “Variable(Id),” on page 390, respectively.

- Examples**  

```
Dim Port As String
SCPI.SENSE(1).MULTiplexer(1).TSET9.PORT2 = "T2"
Port = SCPI.SENSE(1).MULTiplexer(1).TSET9.PORT2
```
- Related objects**  
 SCPI.SENSE.MULTiplexer(Id).STATE on page 392  
 SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT1 on page 394  
 SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT3 on page 396  
 SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT4 on page 397
- Equivalent key** **[System] - E5091A Setup - Port2 - T1|T2**

## SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.PORT3

|             |                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                   |
| Syntax      | SCPI.SENSE( <i>Ch</i> ).MULTiplexer( <i>Id</i> ).TSET9.PORT3 = <i>Param</i><br><i>Param</i> = SCPI.SENSE( <i>Ch</i> ).MULTiplexer( <i>Id</i> ).TSET9.PORT3 |
| Description | Selects a port assigned to Port 3 of the E5091A whose ID is <i>Id</i> when measuring channels 1 to 9 ( <i>Ch</i> ) in the measurement using the E5091A.    |
| Variable    |                                                                                                                                                            |

|             | <i>Param</i>                                                                                                                                                                                                                                                                                                             |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | The port assigned to Port 3                                                                                                                                                                                                                                                                                              |
| Data type   | Character string type (String)                                                                                                                                                                                                                                                                                           |
| Range       | Select from the following.<br><ul style="list-style-type: none"> <li>•"R1"                      Selects R1+ as the port assigned to Port 3.</li> <li>•"R2"                      Selects R2+ as the port assigned to Port 3.</li> <li>•"R3"                      Selects R3+*1 as the port assigned to Port 3.</li> </ul> |

\*1. For Option 007 (7 ports), R2+.

For information on the variable (*Ch*) and the variable (*Id*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-16, "Variable(Id)," on page 390, respectively.

**Examples**

```
Dim Port As String
SCPI.SENSE(1).MULTiplexer(1).TSET9.PORT3 = "R2"
Port = SCPI.SENSE(1).MULTiplexer(1).TSET9.PORT3
```

**Related objects**

SCPI.SENSE.MULTiplexer(*Id*).STATE on page 392  
 SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.PORT1 on page 394  
 SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.PORT2 on page 395  
 SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.PORT4 on page 397

**Equivalent key**      **[System] - E5091A Setup - Port3 - R1+|R2+|R3+**



## SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT4

|             |                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                   |
| Syntax      | SCPI.SENSE( <i>Ch</i> ).MULTiplexer( <i>Id</i> ).TSET9.PORT3 = <i>Param</i><br><i>Param</i> = SCPI.SENSE( <i>Ch</i> ).MULTiplexer( <i>Id</i> ).TSET9.PORT3 |
| Description | Selects a port assigned to Port 4 of the E5091A whose ID is <i>Id</i> when measuring channels 1 to 9 ( <i>Ch</i> ) in the measurement using the E5091A.    |
| Variable    |                                                                                                                                                            |

|             | <i>Param</i>                                                                                                                                                                                                                                                                                                                        |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | The port assigned to Port 4                                                                                                                                                                                                                                                                                                         |
| Data type   | Character string type (String)                                                                                                                                                                                                                                                                                                      |
| Range       | Select from the following.<br><ul style="list-style-type: none"> <li>•"R1"                      Selects R1- as the port assigned to Port 4.</li> <li>•"R2"                      Selects R2- as the port assigned to Port 4.</li> <li>•"R3"                      Selects R3-<sup>*1</sup> as the port assigned to Port 4.</li> </ul> |

\*1. For Option 007 (7 ports), R2-.

For information on the variable (*Ch*) and the variable (*Id*), see Table 7-6, "Variable (Ch)," on page 163 and Table 7-16, "Variable(Id)," on page 390, respectively.

|                 |                                                                                                                                                                                                                            |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Port As String SCPI.SENSE(1).MULTiplexer(1).TSET9.PORT4 = "R2" Port = SCPI.SENSE(1).MULTiplexer(1).TSET9.PORT4</pre>                                                                                              |
| Related objects | SCPI.SENSE.MULTiplexer(Id).STATE on page 392<br>SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT1 on page 394<br>SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT2 on page 395<br>SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT3 on page 396 |
| Equivalent key  | <b>[System] - E5091A Setup - Port4 - R1- R2- R3-</b>                                                                                                                                                                       |

## SCPI.SENSE(*Ch*).ROSCillator.SOURce

|             |                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                           |
| Syntax      | <i>Param</i> = SCPI.SENSE( <i>Ch</i> ).ROSCillator.SOURce                                                          |
| Description | Reads out whether the external reference signal is inputted to the Ref In connector on the rear panel. (Read only) |
| Variable    |                                                                                                                    |

|             | <i>Param</i>                                                                                                                                                           |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | Whether the external reference signal is inputted or not.                                                                                                              |
| Data type   | Character string type (String)                                                                                                                                         |
| Range       | Select from the following.<br>•"INTernal"           The external reference signal is not inputted.<br>•"EXTernal"           The external reference signal is inputted. |

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 163.

|          |                                                                     |
|----------|---------------------------------------------------------------------|
| Examples | <pre>Dim Ref As String Ref = SCPI.SENSE(1).ROSCillator.SOURce</pre> |
|----------|---------------------------------------------------------------------|

|                |                                                                            |
|----------------|----------------------------------------------------------------------------|
| Equivalent key | Displayed on the instrument status bar (at the bottom of the LCD display). |
|----------------|----------------------------------------------------------------------------|

## SCPI.SENSE(Ch).SEGMENT.DATA

|             |                                                                                        |
|-------------|----------------------------------------------------------------------------------------|
| Object type | Property                                                                               |
| Syntax      | SCPI.SENSE(Ch).SEGMENT.DATA = <i>Data</i><br><i>Data</i> = SCPI.SENSE(Ch).SEGMENT.DATA |
| Description | Creates the segment sweep table of channels 1 to 9 ( <i>Ch</i> ).                      |
| Variable    |                                                                                        |

|             | <i>Data</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | <p>Indicates the array data arranged in the following order (for the segment sweep table). Where N is the number of segments (specified with &lt;segm&gt;) and n is an integer between 1 and N.</p> <p><i>Data</i> = {&lt;buf&gt;,&lt;stim&gt;,&lt;ifbw&gt;,&lt;pow&gt;,&lt;del&gt;,&lt;swp&gt;,&lt;time&gt;,&lt;segm&gt;,&lt;star 1&gt;,&lt;stop 1&gt;,&lt;nop 1&gt;,&lt;ifbw 1&gt;,&lt;pow 1&gt;,&lt;del 1&gt;,&lt;swp 1&gt;,&lt;time 1&gt;,...,&lt;star n&gt;,&lt;stop n&gt;,&lt;nop n&gt;,&lt;ifbw n&gt;,&lt;pow n&gt;,&lt;del n&gt;,&lt;swp n&gt;,&lt;time n&gt;,...,&lt;star N&gt;,&lt;stop N&gt;,&lt;nop N&gt;,&lt;ifbw N&gt;,&lt;pow N&gt;,&lt;del N&gt;,&lt;swp N&gt;,&lt;time N&gt;}</p> <p>Each parameter in the above array data is detailed below.</p> <ul style="list-style-type: none"> <li>• &lt;buf&gt; Always specify 5 or 6. You have to specify 6 if you need to set up the sweep mode setting for each segment.</li> <li>• &lt;stim&gt; Stimulus setting mode<br/>0: Specifies with start/stop values<br/>1: Specifies with center/span values</li> <li>• &lt;ifbw&gt; ON/OFF of the IF bandwidth setting for each segment<br/>0: OFF, 1: ON</li> <li>• &lt;pow&gt; ON/OFF of the power setting for each segment<br/>0: OFF, 1: ON</li> <li>• &lt;del&gt; ON/OFF of the sweep delay time setting for each segment<br/>0: OFF, 1: ON</li> <li>• &lt;swp&gt; ON/OFF of the sweep mode setting for each segment<br/>0: OFF, 1: ON<br/>Not necessary when &lt;buf&gt; is 5.</li> <li>• &lt;time&gt; ON/OFF of the sweep time setting for each segment<br/>0: OFF, 1: ON</li> <li>• &lt;segm&gt; Number of segments<br/>Specify an integer ranging 1 to 201.</li> <li>• &lt;star n&gt; Start value/center value of the n-th segment</li> <li>• &lt;stop n&gt; Stop value/span value of the n-th segment</li> <li>• &lt;nop n&gt; Number of measurement points of the n-th segment</li> <li>• &lt;ifbw n&gt; IF bandwidth of the n-th segment Not necessary when the IF bandwidth setting for each segment is OFF (&lt;ifbw&gt;:0).</li> <li>• &lt;pow n&gt; Power of the n-th segment Not necessary when the power setting for each segment is OFF (&lt;pow&gt;:0).</li> <li>• &lt;del n&gt; Sweep delay time of the n-th segment Not necessary when the sweep delay time setting for each segment is OFF (&lt;del&gt;:0).</li> </ul> |

COM Object Reference  
**SCPI.SENSE(Ch).SEGMENT.DATA**

|             | <i>Data</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | <ul style="list-style-type: none"> <li>• &lt;swp n&gt; Sweep mode of the n-th segment<br/>           0: Stepped mode<br/>           1: Swept mode<br/>           2: Fast stepped mode<br/>           3: Fast swept mode<br/>           Not necessary when &lt;buf&gt; is 5 or the sweep mode setting for each segment is OFF (&lt;del&gt;:0).</li> <li>• &lt;time n&gt; Sweep time of the n-th segment Not necessary when the sweep time setting for each segment is OFF (&lt;time&gt;:0).</li> </ul>                                                                                                                                  |
| Data type   | Variant type (Variant)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Note        | If there is not the necessary amount of array data for the specified number of segments when setting the segment sweep table, an error occurs when executed and the object is ignored. For <stim>, <ifbw>, <pow>, <del>, <swp>, and <time>, if the specified value is not the allowable integer, an error occurs when executed. For <star n>, <stop n>, <nop n>, <ifbw n>, <pow n>, <del n>, and <time n> in the array data, if the specified value 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

**Examples (1)**

```
Dim SegmData As Variant
SCPI.SENSE(1).SEGMENT.DATA = Array(5,0,0,1,0,0,2, _
100E6,1E9,31,0,2E9,3E9,51,-10)
SegmData = SCPI.SENSE(1).SEGMENT.DATA
```

**Examples (2)**

```
Dim SegmData(14) As Variant
Dim Ref As Variant
SegmData(0) = 5
SegmData(1) = 0
SegmData(2) = 0
SegmData(3) = 1
SegmData(4) = 0
SegmData(5) = 0
SegmData(6) = 2
SegmData(7) = 100E6
SegmData(8) = 1E9
SegmData(9) = 31
SegmData(10) = 0
SegmData(11) = 2E9
SegmData(12) = 3E9
SegmData(13) = 51
SegmData(14) = -10
SCPI.SENSE(1).SEGMENT.DATA = SegmData
Ref = SCPI.SENSE(1).SEGMENT.DATA
```

**Related objects**

SCPI.SENSE(Ch).SWEep.TYPE on page 408

**Equivalent key**

**[Sweep Setup] - Edit Segment Table**

## SCPI.SENSE(*Ch*).SEGMENT.SWEep.POINTs

- Object type** Property
- Syntax** *Value* = SCPI.SENSE(*Ch*).SEGMENT.SWEep.POINTs
- Description** For the segment sweep table of channels 1 to 9 (*Ch*), reads out the total number of the measurement points of all segments. (Read only)

**Variable**

|             | <i>Value</i>                                       |
|-------------|----------------------------------------------------|
| Description | Total number of measurement points of all segments |
| Data type   | Long integer type (Long)                           |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples**  

```
Dim SegmPoin As Long
SegmPoin = SCPI.SENSE(1).SEGMENT.SWEep.POINTs
```
- Related objects** SCPI.SENSE(*Ch*).SEGMENT.DATA on page 399
- Equivalent key** No equivalent key is available on the front panel.

## SCPI.SENSE(*Ch*).SEGMENT.SWEep.TIME.DATA

- Object type** Property
- Syntax** *Value* = SCPI.SENSE(*Ch*).SEGMENT.SWEep.TIME.DATA
- Description** For the segment sweep table of channels 1 to 9 (*Ch*), reads out the total sweep time(including sweep delay time) of all segments. (Read only)

**Variable**

|             | <i>Value</i>                                  |
|-------------|-----------------------------------------------|
| Description | Total sweep time of all segments              |
| Data type   | Double precision floating point type (Double) |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples**  

```
Dim SegmTime As Double
SegmTime = SCPI.SENSE(1).SEGMENT.SWEep.TIME.DATA
```
- Related objects** SCPI.SENSE(*Ch*).SEGMENT.DATA on page 399
- Equivalent key** No equivalent key is available on the front panel.

## SCPI.SENSE(*Ch*).SWEep.ASPurious

|             |                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                           |
| Syntax      | SCPI.SENSE( <i>Ch</i> ).SWEep.ASPurious = <i>Status</i><br><i>Status</i> = SCPI.SENSE( <i>Ch</i> ).SWEep.ASPurious |
| Description | Turns ON/OFF the spurious avoidance mode of channels 1 to 9 ( <i>Ch</i> ).                                         |
| Variable    |                                                                                                                    |

|              |                                                                                                                                                                                   |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <i>Status</i>                                                                                                                                                                     |
| Description  | ON/OFF of the spurious avoidance mode                                                                                                                                             |
| Data type    | Boolean type (Boolean)                                                                                                                                                            |
| Range        | Select from the following.<br>• True or -1                      Turns ON the spurious avoidance mode.<br>• False or 0                      Turns OFF the spurious avoidance mode. |
| Preset value | True or -1                                                                                                                                                                        |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

|          |                                                                                                                     |
|----------|---------------------------------------------------------------------------------------------------------------------|
| Examples | <pre>Dim ASpurious As Boolean SCPI.SENSE(1).SWEep.ASPurious = False ASpurious = SCPI.SENSE(1).SWEep.ASPurious</pre> |
|----------|---------------------------------------------------------------------------------------------------------------------|

|                |                                                 |
|----------------|-------------------------------------------------|
| Equivalent key | <b>[System] - Service Menu - Avoid Spurious</b> |
|----------------|-------------------------------------------------|

## SCPI.SENSE(*Ch*).SWEep.DELay

- Object type      Property
- Syntax            SCPI.SENSE(*Ch*).SWEep.DELay = *Value*  
*Value* = SCPI.SENSE(*Ch*).SWEep.DELay
- Description      Sets the sweep delay time of channels 1 to 9 (*Ch*).
- Variable

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Sweep delay time                                                                                                                                                                                             |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | 0 to 1                                                                                                                                                                                                       |
| Preset value | 0                                                                                                                                                                                                            |
| Unit         | s (second)                                                                                                                                                                                                   |
| Resolution   | 0.001                                                                                                                                                                                                        |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples
- ```
Dim SweDel As Double
SCPI.SENSE(1).SWEep.DELay = 0.05
SweDel = SCPI.SENSE(1).SWEep.DELay
```

- Equivalent key **[Sweep Setup] - Sweep Delay**

SCPI.SENSE(*Ch*).SWEep.GENERation

Object type	Property
Syntax	SCPI.SENSE(<i>Ch</i>).SWEep.GENERation = <i>Param</i> <i>Param</i> = SCPI.SENSE(<i>Ch</i>).SWEep.GENERation
Description	Selects the sweep mode of channels 1 to 9 (<i>Ch</i>).
Variable	

	<i>Param</i>
Description	Sweep mode
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"STEPped" Sets the sweep mode to the stepped mode. •"ANALog" Sets the sweep mode to the swept mode. •"FSTepped" Sets the sweep mode to the fast stepped mode. •"FANalog" Sets the sweep mode to the fast swept mode.
Preset value	"STEPped"

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 163.

Examples

```
Dim SwptMode As String
SCPI.SENSE(1).SWEep.GENERation = "anal"
SwptMode = SCPI.SENSE(1).SWEep.GENERation
```

Equivalent key **[Sweep Setup] - Sweep Mode - Std Stepped|Std Swept|Fast Stepped|Fast Swept**

SCPI.SENSE(*Ch*).SWEp.POINTs

- Object type Property
- Syntax SCPI.SENSE(*Ch*).SWEp.POINTs = *Value*
Value = SCPI.SENSE(*Ch*).SWEp.POINTs
- Description Sets the number of measurement points of channels 1 to 9 (*Ch*).
- Variable

	<i>Value</i>
Description	Number of measurement points
Data type	Long integer type (Long)
Range	2 to 1601
Preset value	201
Note	If the specified variable 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.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples
- ```
Dim Nop As Long
SCPI.SENSE(1).SWEp.POINTs = 801
Nop = SCPI.SENSE(1).SWEp.POINTs
```

- Equivalent key    **[Sweep Setup] - Points**

## **SCPI.SENSE(*Ch*).SWEep.TIME.AUTO**

|             |                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                           |
| Syntax      | SCPI.SENSE( <i>Ch</i> ).SWEep.TIME.AUTO = <i>Status</i><br><i>Status</i> = SCPI.SENSE( <i>Ch</i> ).SWEep.TIME.AUTO |
| Description | Sets whether to automatically set the sweep time of channels 1 to 9 ( <i>Ch</i> ).                                 |
| Variable    |                                                                                                                    |

|              |                                                                                                                                                             |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <b><i>Status</i></b>                                                                                                                                        |
| Description  | ON/OFF of the auto setting of the sweep time                                                                                                                |
| Data type    | Boolean type (Boolean)                                                                                                                                      |
| Range        | Select from the following.<br>• True or -1                      Turns ON the auto setting.<br>• False or 0                      Turns OFF the auto setting. |
| Preset value | True or -1                                                                                                                                                  |

For information on the variable (*Ch*), see Table 7-6, “Variable (*Ch*),” on page 163.

**Examples**

```
Dim SweAuto As Boolean
SCPI.SENSE(1).SWEep.TIME.AUTO = False
SweAuto = SCPI.SENSE(1).SWEep.TIME.AUTO
```

**Related objects**      SCPI.SENSE(*Ch*).SWEep.TIME.DATA on page 407

**Equivalent key**      **[Sweep Setup] - Sweep Time**

---

**NOTE**                      When performing the operation from the front panel, the auto setting of the sweep time is turned ON by setting the sweep time to 0 s.

---

## SCPI.SENSE(*Ch*).SWEep.TIME.DATA

|             |                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                         |
| Syntax      | SCPI.SENSE( <i>Ch</i> ).SWEep.TIME.DATA = <i>Value</i><br><i>Value</i> = SCPI.SENSE( <i>Ch</i> ).SWEep.TIME.DATA |
| Description | Sets the sweep time of channels 1 to 9 ( <i>Ch</i> ).                                                            |

**NOTE** Before using this object to set the sweep time, turns OFF the auto setting of the sweep time (specify False with the SCPI.SENSE(*Ch*).SWEep.TIME.AUTO object).

### Variable

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Sweep time                                                                                                                                                                                                   |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | Varies depending on the measurement conditions                                                                                                                                                               |
| Preset value | Varies depending on the measurement conditions                                                                                                                                                               |
| Unit         | s (second)                                                                                                                                                                                                   |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (*Ch*),” on page 163.

**Examples**

```
Dim SweTime As Double
SCPI.SENSE(1).SWEep.TIME.AUTO = False
SCPI.SENSE(1).SWEep.TIME.DATA = 1.5
SweTime = SCPI.SENSE(1).SWEep.TIME.DATA
```

**Related objects** SCPI.SENSE(*Ch*).SWEep.TIME.AUTO on page 406

**Equivalent key** **[Sweep Setup] - Sweep Time**

## SCPI.SENSE(*Ch*).SWEep.TYPE

|             |                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                               |
| Syntax      | SCPI.SENSE( <i>Ch</i> ).SWEep.TYPE = <i>Param</i><br><i>Param</i> = SCPI.SENSE( <i>Ch</i> ).SWEep.TYPE |
| Description | Sets the sweep type of channels 1 to 9 ( <i>Ch</i> ).                                                  |
| Variable    |                                                                                                        |

|              |                                                                                                                                                                                                                                    |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <b><i>Param</i></b>                                                                                                                                                                                                                |
| Description  | Sweep type                                                                                                                                                                                                                         |
| Data type    | Character string type (String)                                                                                                                                                                                                     |
| Range        | Select from the following.<br>•"LINear"                Sets the sweep type to the linear sweep.<br>•"LOGarithmic"        Sets the sweep type to the log sweep.<br>•"SEGment"             Sets the sweep type to the segment sweep. |
| Preset value | "LINear"                                                                                                                                                                                                                           |

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 163.

|          |                                                                                                       |
|----------|-------------------------------------------------------------------------------------------------------|
| Examples | <pre>Dim SweType As String SCPI.SENSE(1).SWEep.TYPE = "segm" SweType = SCPI.SENSE(1).SWEep.TYPE</pre> |
|----------|-------------------------------------------------------------------------------------------------------|

|                |                                                               |
|----------------|---------------------------------------------------------------|
| Equivalent key | <b>[Sweep Setup] - Sweep Type - Lin Freq Log Freq Segment</b> |
|----------------|---------------------------------------------------------------|

## SCPI.SOURce(Ch).POWer.ATTenuation.DATA

**Object type** Property

**Syntax** SCPI.SOURce(Ch).POWer.ATTenuation.DATA = *Value*  
*Value* = SCPI.SOURce(Ch).POWer.ATTenuation.DATA

**Description** Selects the attenuator used for channels 1 to 9 (*Ch*). The power ranges are determined depending on the attenuator to be used.

**NOTE** This object is available only when extended power range function (Option 214, 314, 414) is installed.

**Variable**

|                     | <i>Value</i>                                                                                                                                                                                                 |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>  | Power ranges                  Setting                                                                                                                                                                        |
|                     | -15 to 0[dB]                      0                                                                                                                                                                          |
|                     | -20 to -5[dB]                    5                                                                                                                                                                           |
|                     | -25 to -10[dB]                  10                                                                                                                                                                           |
|                     | -30 to -15[dB]                  15                                                                                                                                                                           |
|                     | -35 to -20[dB]                  20                                                                                                                                                                           |
|                     | -40 to -25[dB]                  25                                                                                                                                                                           |
|                     | -45 to -30[dB]                  30                                                                                                                                                                           |
|                     | -50 to -35[dB]                  35                                                                                                                                                                           |
| <b>Data type</b>    | Long integer type (Long)                                                                                                                                                                                     |
| <b>Range</b>        | 0 to 35                                                                                                                                                                                                      |
| <b>Preset value</b> | 0                                                                                                                                                                                                            |
| <b>Unit</b>         | dB                                                                                                                                                                                                           |
| <b>Resolution</b>   | 5                                                                                                                                                                                                            |
| <b>Note</b>         | If the specified variable 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

**Examples**

```
Dim Att As Long
SCPI.SOURce(1).POWer.ATTenuation.DATA = 10
Att = SCPI.SOURce(1).POWer.ATTenuation.DATA
```

**Related objects** SCPI.SOURce(Ch).POWer.LEVel.IMMEDIATE.AMPLitude on page 410

**Equivalent key** **[Sweep Setup] - Power Ranges**

## SCPI.SOURce(*Ch*).POWER.LEVel.IMMediate. AMPLitude

|             |                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                           |
| Syntax      | SCPI.SOURce( <i>Ch</i> ).POWER.LEVel.IMMediate.AMPLitude = <i>Value</i><br><i>Value</i> = SCPI.SOURce( <i>Ch</i> ).POWER.LEVel.IMMediate.AMPLitude |
| Description | Sets the power level of channels 1 to 9 ( <i>Ch</i> ).                                                                                             |
| Variable    |                                                                                                                                                    |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Power level                                                                                                                                                                                                  |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | Varies depending on the power range.                                                                                                                                                                         |
| Preset value | 0                                                                                                                                                                                                            |
| Unit         | dBm                                                                                                                                                                                                          |
| Resolution   | 0.05                                                                                                                                                                                                         |
| Note         | If the specified variable 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. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

|                 |                                                                                                                                              |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim PowLev As Double SCPI.SOURce(1).POWER.LEVel.IMMediate.AMPLitude = -10 PowLev = SCPI.SOURce(1).POWER.LEVel.IMMediate.AMPLitude</pre> |
| Related objects | SCPI.SOURce( <i>Ch</i> ).POWER.ATTenuation.DATA on page 409                                                                                  |
| Equivalent key  | <b>[Sweep Setup] - Power</b>                                                                                                                 |

## SCPI.STATus.OPERation.CONDition

Object type Property

Syntax *Value* = SCPI.STATus.OPERation.CONDition

Description Reads out the value of the Operation Status Condition Register.  
 For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*. (Read only)

Variable

|             | <i>Value</i>                                     |
|-------------|--------------------------------------------------|
| Description | Value of the Operation Status Condition Register |
| Data type   | Long integer type (Long)                         |

Examples  

```
Dim Stat As Long
Stat = SCPI.STATus.OPERation.CONDition
```

Related objects  
 SCPI.STATus.OPERation.NTRansition on page 414  
 SCPI.STATus.OPERation.PTRansition on page 415

Equivalent key No equivalent key is available on the front panel.

## SCPI.STATus.OPERation.ENABLE

Object type      Property

Syntax            SCPI.STATus.OPERation.ENABLE = *Value*  
*Value* = SCPI.STATus.OPERation.ENABLE

Description      Sets the value of the Operation Status Enable Register.  
For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*.

Variable

|              | <i>Value</i>                                               |
|--------------|------------------------------------------------------------|
| Description  | Value of the Operation Status Enable Register              |
| Data type    | Long integer type (Long)                                   |
| Range        | 0 to 65535                                                 |
| Preset value | 0                                                          |
| Note         | The bit 0 to 3, bit 6 to13 and bit 15 can not be set to 1. |

Examples         

```
Dim Stat As Long
SCPI.STATus.OPERation.ENABLE = 16
Stat = SCPI.STATus.OPERation.ENABLE
```

Related objects    SCPI.IEEE4882.SRE on page 318

Equivalent key    No equivalent key is available on the front panel.



## SCPI.STATus.OPERation.EVENT

Object type Property

Syntax *Value* = SCPI.STATus.OPERation.EVENT

Description Reads out the value of the Operation Status Event Register.  
 For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*. (Read only)

Variable

|             | <i>Value</i>                                 |
|-------------|----------------------------------------------|
| Description | Value of the Operation Status Event Register |
| Data type   | Long integer type (Long)                     |

Examples  

```
Dim Stat As Long
Stat = SCPI.STATus.OPERation.EVENT
```

Related objects  
 SCPI.IEEE4882.CLS on page 314  
 SCPI.STATus.OPERation.NTRansition on page 414  
 SCPI.STATus.OPERation.PTRansition on page 415

Equivalent key No equivalent key is available on the front panel.

## SCPI.STATus.OPERation.NTRansition

|             |                                                                                                                                                                                                                                    |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                                           |
| Syntax      | SCPI.STATus.OPERation.NTRansition = <i>Value</i><br><i>Value</i> = SCPI.STATus.OPERation.NTRansition                                                                                                                               |
| Description | Sets the value of negative transition filter of the Operation Status Register.<br>For information on the structure of the status register, see Appendix “Status Reporting System“ in the <i>E5070A/E5071A Programmer’s Guide</i> . |

### Variable

|              | <i>Value</i>                                               |
|--------------|------------------------------------------------------------|
| Description  | Value of the negative transition filter                    |
| Data type    | Long integer type (Long)                                   |
| Range        | 0 to 65535                                                 |
| Preset value | 0                                                          |
| Note         | The bit 0 to 3, bit 6 to13 and bit 15 can not be set to 1. |

**Examples**

```
Dim Stat As Long
SCPI.STATus.OPERation.NTRansition = 16
Stat = SCPI.STATus.OPERation.NTRansition
```

**Related objects**

SCPI.STATus.OPERation.EVENT on page 413  
SCPI.STATus.OPERation.PTRansition on page 415

**Equivalent key**

No equivalent key is available on the front panel.

## SCPI.STATus.OPERation.PTRansition

Object type Property

Syntax SCPI.STATus.OPERation.PTRansition = *Value*  
*Value* = SCPI.STATus.OPERation.PTRansition

Description Sets the value of positive transition filter of the Operation Status Register.  
 For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*.

Variable

|              | <i>Value</i>                                               |
|--------------|------------------------------------------------------------|
| Description  | Value of the positive transition filter                    |
| Data type    | Long integer type (Long)                                   |
| Range        | 0 to 65535                                                 |
| Preset value | 16432                                                      |
| Note         | The bit 0 to 3, bit 6 to13 and bit 15 can not be set to 1. |

Examples  

```
Dim Stat As Long
SCPI.STATus.OPERation.PTRansition = 0
Stat = SCPI.STATus.OPERation.PTRansition
```

Related objects SCPI.STATus.OPERation.EVENT on page 413  
 SCPI.STATus.OPERation.NTRansition on page 414

Equivalent key No equivalent key is available on the front panel.

## SCPI.STATus.PRESet

Object type Method

Syntax SCPI.STATus.PRESet

Description Initialize the Operation Status Register, Questionable Status Register, Questionable Limit Status Register, and Questionable Limit Chnel Status Register. (No read)

Examples  

```
SCPI.STATus.PRESet
```

Equivalent key No equivalent key is available on the front panel.

## SCPI.STATus.QUEStionable.CONDition

Object type Property

Syntax *Value* = SCPI.STATus.QUEStionable.CONDition

Description Reads out the value of the Questionable Status Condition Register.  
For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*. (Read only)

Variable

|             | <i>Value</i>                                        |
|-------------|-----------------------------------------------------|
| Description | Value of the Questionable Status Condition Register |
| Data type   | Long integer type (Long)                            |

Examples  

```
Dim Stat As Long
Stat = SCPI.STATus.QUEStionable.CONDition
```

Related objects  
SCPI.STATus.QUEStionable.NTRansition on page 429  
SCPI.STATus.QUEStionable.PTRansition on page 430

Equivalent key No equivalent key is available on the front panel.

## SCPI.STATus.QUEStionable.ENABLE

Object type Property

Syntax SCPI.STATus.QUEStionable.ENABLE = *Value*  
*Value* = SCPI.STATus.QUEStionable.ENABLE

Description Sets the value of the Questionable Status Enable Register.  
 For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*.

Variable

|              | <i>Value</i>                                         |
|--------------|------------------------------------------------------|
| Description  | Value of the Questionable Status Enable Register     |
| Data type    | Long integer type (Long)                             |
| Range        | 0 to 65535                                           |
| Preset value | 0                                                    |
| Note         | The bit 0 to 9 and bit 11 to 15 can not be set to 1. |

Examples  

```
Dim Stat As Long
SCPI.STATus.QUEStionable.ENABLE = 6
Stat = SCPI.STATus.QUEStionable.ENABLE
```

Related objects SCPI.IEEE4882.SRE on page 318

Equivalent key No equivalent key is available on the front panel.

## SCPI.STATus.QUEStionable.EVENT

Object type Property

Syntax *Value* = SCPI.STATus.QUEStionable.EVENT

Description Reads out the value of the Questionable Status Event Register.  
For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*. (Read only)

Variable

|             | <i>Value</i>                                    |
|-------------|-------------------------------------------------|
| Description | Value of the Questionable Status Event Register |
| Data type   | Long integer type (Long)                        |

Examples  

```
Dim Stat As Long
Stat = SCPI.STATus.QUEStionable.EVENT
```

Related objects  
SCPI.IEEE4882.CLS on page 314  
SCPI.STATus.QUEStionable.NTRansition on page 429  
SCPI.STATus.QUEStionable.PTRansition on page 430

Equivalent key No equivalent key is available on the front panel.

## **SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). CONDition**

**Object type** Property

**Syntax** *Value* = SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).CONDition

**Description** Reads out the value of the Questionable Limit Channel Status Condition Register of channels 1 to 9 (*Ch*).  
 For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*. (Read only)

**Variable**

|             | <i>Value</i>                                                      |
|-------------|-------------------------------------------------------------------|
| Description | Value of the Questionable Limit Channel Status Condition Register |
| Data type   | Long integer type (Long)                                          |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

**Examples**

```
Dim Stat As Long
Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).CONDition
```

**Related objects** SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). NTRansition on page 422  
 SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). PTRansition on page 423

**Equivalent key** No equivalent key is available on the front panel.

**SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).ENABLE**

|             |                                                                                                                                                                                                                                                                   |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                                                                          |
| Syntax      | SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).ENABLE = <i>Value</i><br><i>Value</i> = SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).ENABLE                                                                                                                              |
| Description | Sets the value of the Questionable Limit Channel Status Enable Register of channels 1 to 9 ( <i>Ch</i> ).<br><br>For information on the structure of the status register, see Appendix “Status Reporting System” in the <i>E5070A/E5071A Programmer’s Guide</i> . |

## Variable

|              | <i>Value</i>                                                   |
|--------------|----------------------------------------------------------------|
| Description  | Value of the Questionable Limit Channel Status Enable Register |
| Data type    | Long integer type (Long)                                       |
| Range        | 0 to 65535                                                     |
| Preset value | 1022                                                           |
| Note         | The bit 0 and bit 10 to 15 can not be set to 1.                |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

|                 |                                                                                                                                           |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Stat As Long SCPI.STATus.QUEStionable.LIMit.CHANnel(1).ENABLE = 16 Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).ENABLE</pre> |
| Related objects | SCPI.STATus.QUEStionable.LIMit.ENABLE on page 425                                                                                         |
| Equivalent key  | No equivalent key is available on the front panel.                                                                                        |



## SCPI.STATus.QUEStionable.LIMit.CHANnel(*Ch*).EVENT

- Object type** Property
- Syntax** *Value* = SCPI.STATus.QUEStionable.LIMit.CHANnel(*Ch*).EVENT
- Description** Reads out the value of the Questionable Limit Channel Status Event Register of channels 1 to 9 (*Ch*).  
 For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*. (Read only)

**Variable**

|             | <i>Value</i>                                                                           |
|-------------|----------------------------------------------------------------------------------------|
| Description | Value of the Questionable Limit Channel Status Event Register of the specified channel |
| Data type   | Long integer type (Long)                                                               |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples**  

```
Dim Stat As Long
Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).EVENT
```
- Related objects** SCPI.IEEE4882.CLS on page 314
- Equivalent key** No equivalent key is available on the front panel.

**SCPI.STATus.QUEStionable.LIMit.CHANnel(*Ch*).  
NTRansition**

|             |                                                                                                                                                                                                                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                                                                                                     |
| Syntax      | SCPI.STATus.QUEStionable.LIMit.CHANnel( <i>Ch</i> ).NTRansition = <i>Value</i><br><i>Value</i> = SCPI.STATus.QUEStionable.LIMit.CHANnel( <i>Ch</i> ).NTRansition                                                                                                                             |
| Description | Sets the value of the negative transition filter of the Questionable Limit Channel Status Register of channels 1 to 9 ( <i>Ch</i> ).<br><br>For information on the structure of the status register, see Appendix “Status Reporting System“ in the <i>E5070A/E5071A Programmer’s Guide</i> . |
| Variable    |                                                                                                                                                                                                                                                                                              |

|              | <i>Value</i>                                    |
|--------------|-------------------------------------------------|
| Description  | Value of the negative transition filter         |
| Data type    | Long integer type (Long)                        |
| Range        | 0 to 65535                                      |
| Preset value | 0                                               |
| Note         | The bit 0 and bit 10 to 15 can not be set to 1. |

For information on the variable (*Ch*), see Table 7-6, “Variable (*Ch*),” on page 163.

|                 |                                                                                                                                                       |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | Dim Stat As Long<br>SCPI.STATus.QUEStionable.LIMit.CHANnel(1).NTRansition = 16<br>Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).NTRansition        |
| Related objects | SCPI.STATus.QUEStionable.LIMit.CHANnel( <i>Ch</i> ).EVENT on page 421<br>SCPI.STATus.QUEStionable.LIMit.CHANnel( <i>Ch</i> ). PTRansition on page 423 |
| Equivalent key  | No equivalent key is available on the front panel.                                                                                                    |

## SCPI.STATus.QUEStionable.LIMit.CHANnel(*Ch*). **PTRansition**

- Object type** Property
- Syntax** SCPI.STATus.QUEStionable.LIMit.CHANnel(*Ch*).PTRansition = *Value*  
*Value* = SCPI.STATus.QUEStionable.LIMit.CHANnel(*Ch*).PTRansition
- Description** Sets the value of the positive transition filter of the Questionable Limit Channel Status Register of channels 1 to 9 (*Ch*).  
 For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*.

**Variable**

|              | <i>Value</i>                                    |
|--------------|-------------------------------------------------|
| Description  | Value of the positive transition filter         |
| Data type    | Long integer type (Long)                        |
| Range        | 0 to 65535                                      |
| Preset value | 1022                                            |
| Note         | The bit 0 and bit 10 to 15 can not be set to 1. |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 163.

- Examples**  

```
Dim Stat As Long
SCPI.STATus.QUEStionable.LIMit.CHANnel(1).PTRansition = 0
Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).PTRansition
```
- Related objects** SCPI.STATus.QUEStionable.LIMit.CHANnel(*Ch*).EVENT on page 421  
 SCPI.STATus.QUEStionable.LIMit.CHANnel(*Ch*). NTRansition on page 422
- Equivalent key** No equivalent key is available on the front panel.

## SCPI.STATus.QUEStionable.LIMit.CONDiTion

- Object type** Property
- Syntax** *Value* = SCPI.STATus.QUEStionable.LIMit.CONDiTion
- Description** Reads out the value of the Questionable Limit Status Condition Register.  
For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*. (Read only)

**Variable**

|             | <i>Value</i>                                              |
|-------------|-----------------------------------------------------------|
| Description | Value of the Questionable Limit Status Condition Register |
| Data type   | Long integer type (Long)                                  |

- Examples**  
`Dim Stat As Long`  
`Stat = SCPI.STATus.QUEStionable.LIMit.CONDiTion`
- Related objects** SCPI.STATus.QUEStionable.LIMit.NTRansition on page 427  
SCPI.STATus.QUEStionable.LIMit.PTRansition on page 428
- Equivalent key** No equivalent key is available on the front panel.

## SCPI.STATus.QUEStionable.LIMit.ENABLE

Object type Property

Syntax SCPI.STATus.QUEStionable.LIMit.ENABLE = *Value*  
*Value* = SCPI.STATus.QUEStionable.LIMit.ENABLE

Description Sets the value of the Questionable Limit Status Enable Register.  
 For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*.

Variable

|              | <i>Value</i>                                           |
|--------------|--------------------------------------------------------|
| Description  | Value of the Questionable Limit Status Enable Register |
| Data type    | Long integer type (Long)                               |
| Range        | 0 to 65535                                             |
| Preset value | 1022                                                   |
| Note         | The bit 0 and bit 10 to 15 can not be set to 1.        |

Examples  

```
Dim Stat As Long
SCPI.STATus.QUEStionable.LIMit.ENABLE = 16
Stat = SCPI.STATus.QUEStionable.LIMit.ENABLE
```

Related objects SCPI.STATus.QUEStionable.ENABLE on page 417

Equivalent key No equivalent key is available on the front panel.

## **SCPI.STATUS.QUESTIONABLE.LIMIT.EVENT**

Object type Property

Syntax *Value* = SCPI.STATUS.QUESTIONABLE.LIMIT.EVENT

Description Reads out the value of the Questionable Limit Status Event Register.  
For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*. (Read only)

Variable

|             | <i>Value</i>                                          |
|-------------|-------------------------------------------------------|
| Description | Value of the Questionable Limit Status Event Register |
| Data type   | Long integer type (Long)                              |

Examples  

```
Dim Stat As Long
Stat = SCPI.STATUS.QUESTIONABLE.LIMIT.EVENT
```

Related objects SCPI.IEEE4882.CLS on page 314

Equivalent key No equivalent key is available on the front panel.

## SCPI.STATus.QUEStionable.LIMit.NTRansition

- Object type** Property
- Syntax** SCPI.STATus.QUEStionable.LIMit.NTRansition = *Value*  
*Value* = SCPI.STATus.QUEStionable.LIMit.NTRansition
- Description** Sets the value of negative transition filter of the Questionable Limit Status Register.  
 For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*.

**Variable**

|              | <i>Value</i>                                    |
|--------------|-------------------------------------------------|
| Description  | Value of the negative transition filter         |
| Data type    | Long integer type (Long)                        |
| Range        | 0 to 65535                                      |
| Preset value | 0                                               |
| Note         | The bit 0 and bit 10 to 15 can not be set to 1. |

- Examples**
- ```
Dim Stat As Long
SCPI.STATus.QUEStionable.LIMit.NTRansition = 6
Stat = SCPI.STATus.QUEStionable.LIMit.NTRansition
```
- Related objects** SCPI.STATus.QUEStionable.LIMit.EVENT on page 426
 SCPI.STATus.QUEStionable.LIMit.PTRansition on page 428
- Equivalent key** No equivalent key is available on the front panel.

SCPI.STATUS.QUESTIONABLE.LIMIT.PTRANSITION

- Object type** Property
- Syntax** SCPI.STATUS.QUESTIONABLE.LIMIT.PTRANSITION = *Value*
Value = SCPI.STATUS.QUESTIONABLE.LIMIT.PTRANSITION
- Description** Sets the value of positive transition filter of the Questionable Limit Status Register.
For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*.

Variable

	<i>Value</i>
Description	Value of the positive transition filter
Data type	Long integer type (Long)
Range	0 to 65535
Preset value	1022
Note	The bit 0 and bit 10 to 15 can not be set to 1.

- Examples**

```
Dim Stat As Long
SCPI.STATUS.QUESTIONABLE.LIMIT.PTRANSITION = 6
Stat = SCPI.STATUS.QUESTIONABLE.LIMIT.PTRANSITION
```
- Related objects** SCPI.STATUS.QUESTIONABLE.LIMIT.EVENT on page 426
SCPI.STATUS.QUESTIONABLE.LIMIT.NTRANSITION on page 427
- Equivalent key** No equivalent key is available on the front panel.

SCPI.STATus.QUEStionable.NTRansition

Object type Property

Syntax SCPI.STATus.QUEStionable.NTRansition = *Value*
Value = SCPI.STATus.QUEStionable.NTRansition

Description Sets the value of negative transition filter of the Questionable Status Register.
 For information on the structure of the status register, see Appendix “Status Reporting System“ in the *E5070A/E5071A Programmer’s Guide*.

Variable

	<i>Value</i>
Description	Value of the negative transition filter
Data type	Long integer type (Long)
Range	0 to 65535
Preset value	0
Note	The bit 0 to 9 and bit 11 to 15 can not be set to 1.

Examples

```
Dim Stat As Long
SCPI.STATus.QUEStionable.NTRansition = 6
Stat = SCPI.STATus.QUEStionable.NTRansition
```

Related objects SCPI.STATus.QUEStionable.EVENT on page 418
 SCPI.STATus.QUEStionable.PTRansition on page 430

Equivalent key No equivalent key is available on the front panel.

SCPI.STATUS.QUESTIONABLE.PTRANSITION

- Object type** Property
- Syntax** SCPI.STATUS.QUESTIONABLE.PTRANSITION = *Value*
Value = SCPI.STATUS.QUESTIONABLE.PTRANSITION
- Description** Sets the value of positive transition filter of the Questionable Status Register.
For information on the structure of the status register, see Appendix “Status Reporting System” in the *E5070A/E5071A Programmer’s Guide*.

Variable

	<i>Value</i>
Description	Value of the positive transition filter
Data type	Long integer type (Long)
Range	0 to 65535
Preset value	1024
Note	The bit 0 to 9 and bit 11 to 15 can not be set to 1.

- Examples**

```
Dim Stat As Long
SCPI.STATUS.QUESTIONABLE.PTRANSITION = 6
Stat = SCPI.STATUS.QUESTIONABLE.PTRANSITION
```
- Related objects** SCPI.STATUS.QUESTIONABLE.EVENT on page 418
SCPI.STATUS.QUESTIONABLE.NTRANSITION on page 429
- Equivalent key** No equivalent key is available on the front panel.

SCPI.SYSTem.BACKlight

Object type	Property
Syntax	SCPI.SYSTem.BACKlight = <i>Status</i> <i>Status</i> = SCPI.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.
Variable	

	<i>Status</i>
Description	ON/OFF of the backlight
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Turns ON the backlight. •False or 0 Turns OFF the backlight.
Preset value	True or -1

Examples

```
Dim BckLght As Boolean
SCPI.SYSTem.BACKlight = False
BckLght = SCPI.SYSTem.BACKlight
```

Equivalent key **[System] - Backlight**

NOTE To turn the backlight ON, press any key on the front panel.

SCPI.SYSTem.BEEPer.COMplete.IMMediate

Object type	Method
Syntax	SCPI.SYSTem.BEEPer.COMplete.IMMediate
Description	Generates a beep for the notification of the completion of the operation. (No read)
Examples	SCPI.SYSTem.BEEPer.COMplete.IMMediate
Related objects	SCPI.SYSTem.BEEPer.COMplete.STATe on page 432 SCPI.SYSTem.BEEPer.WARning.IMMediate on page 432
Equivalent key	[System] - Misc Setup - Beeper - Test Beep Complete

SCPI.SYSTem.BEEPer.COMPLete.STATe

Object type	Property
Syntax	SCPI.SYSTem.BEEPer.COMPLete.STATe = <i>Status</i> <i>Status</i> = SCPI.SYSTem.BEEPer.COMPLete.STATe
Description	Turns ON/OFF the beeper for the notification of the completion of the operation.
Variable	

	<i>Status</i>
Description	ON/OFF of the beeper for the notification of the completion of the operation
Data type	Boolean type (Boolean)
Range	Select from the following. •True or -1 Turns ON the beeper for the notification of the completion of the operation. •False or 0 Turns OFF the beeper for the notification of the completion of the operation.
Preset value	True or -1

Examples

```
Dim BeepComp As Boolean  
SCPI.SYSTem.BEEPer.COMPLete.STATe = False  
BeepComp = SCPI.SYSTem.BEEPer.COMPLete.STATe
```

Related objects
SCPI.SYSTem.BEEPer.COMPLete.IMMEDIATE on page 431
SCPI.SYSTem.BEEPer.WARNIng.STATe on page 433

Equivalent key **[System] - Misc Setup - Beeper - Beep Complete**

SCPI.SYSTem.BEEPer.WARNIng.IMMEDIATE

Object type	Method
Syntax	SCPI.SYSTem.BEEPer.WARNIng.IMMEDIATE
Description	Generates a beep for the notification of warning/limit test result. (No read)
Examples	<pre>SCPI.SYSTem.BEEPer.WARNIng.IMMEDIATE</pre>
Related objects	SCPI.SYSTem.BEEPer.WARNIng.STATe on page 433 SCPI.SYSTem.BEEPer.COMPLete.IMMEDIATE on page 431
Equivalent key	[System] - Misc Setup - Beeper - Test Beep Warning

SCPI.SYSTem.BEEPer.WARning.STATe

- Object type Property
- Syntax SCPI.SYSTem.BEEPer.WARning.STATe = *Status*
Status = SCPI.SYSTem.BEEPer.WARning.STATe
- Description Turns ON/OFF the beeper for the notification of warning/limit test result.
- Variable

	<i>Status</i>
Description	ON/OFF of the beeper for the notification of warning/limit test result
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> • True or -1 Turns ON the beeper for the notification of warning/limit test result. • False or 0 Turns OFF the beeper for the notification of warning/limit test result.
Preset value	True or -1

- Examples Dim BeepWarn As Boolean
SCPI.SYSTem.BEEPer.WARning.STATe = False
BeepWarn = SCPI.SYSTem.BEEPer.WARning.STATe
- Related objects SCPI.SYSTem.BEEPer.WARning.IMMEDIATE on page 432
SCPI.SYSTem.BEEPer.COMPLete.STATe on page 432
- Equivalent key **[System] - Misc Setup - Beeper - Beep Warning**

SCPI.SYSTem.CORRection.STATe

Object type	Property
Syntax	SCPI.SYSTem.CORRection.STATe = <i>Status</i> <i>Status</i> = SCPI.SYSTem.CORRection.STATe
Description	Turns ON/OFF the system correction.
Variable	

	<i>Status</i>
Description	ON/OFF of the system correction
Data type	Boolean type (Boolean)
Range	Select from the following. •True or -1 Turns ON the system correction. •False or 0 Turns OFF the system correction.
Preset value	True or -1

Examples

```
Dim SysCal As Boolean  
SCPI.SYSTem.CORRection.STATe = False  
SysCal = SCPI.SYSTem.CORRection.STATe
```

Equivalent key **[System] - Misc Setup - Service Menu - System Correction**

SCPI.SYSTem.DATE

Object type	Property
Syntax	SCPI.SYSTem.DATE = <i>Data</i> <i>Data</i> = SCPI.SYSTem.DATE
Description	Sets the date of the clock built in the E5070A/E5071A.
Variable	

	<i>Data</i>
Description	Indicates 3-element array data (date of the built-in clock). <ul style="list-style-type: none"> • <i>Data(0)</i> Sets year. • <i>Data(1)</i> Sets month. • <i>Data(2)</i> Sets day. The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> • <i>Data(0)</i> 1980 to 2099 • <i>Data(1)</i> 1 to 12 • <i>Data(2)</i> 1 to 31
Resolution	1
Note	If the specified variable 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.

Examples (1)
 Dim Day As Variant
 SCPI.SYSTem.DATE = Array(2001,12,24)
 Day = SCPI.SYSTem.DATE

Examples (2)
 Dim Day(2) As Variant
 Dim Ref As Variant
 Day(0) = 2001
 Day(1) = 12
 Day(2) = 24
 SCPI.SYSTem.DATE = Day
 Ref = SCPI.SYSTem.DATE

Related objects
 SCPI.SYSTem.TIME on page 442
 SCPI.DISPlay.CLOCK on page 280

Equivalent key **[System] - Misc Setup - Clock Setup - Set Date and Time**

SCPI.SYSTem.ERROR

Object type	Property
Syntax	<i>Err</i> = SCPI.SYSTem.ERROR
Description	Reads out the oldest error of the errors stored in the error queue of the E5070A/E5071A. The read-out error is deleted from the error queue. The size of the error queue is 100. Executing the SCPI.IEEE4882.CLS object clears the errors stored in the error queue. (Read only)

NOTE This object can not return an error that occurs by the manual operation or the SCPI command used in controlling the E5070A/E5071A from the external controller.

Variable

	<i>Err</i>
Description	Indicates 2-element array data (for error). <ul style="list-style-type: none">• <i>Err(0)</i> Error number• <i>Err(1)</i> Error message The index of the array starts from 0.
Data type	Variant type (Variant)
Note	If no error is stored in the error queue, 0 and "No error" are read out as the error number and the error message.

Examples

```
Dim Err As Variant
Err = SCPI.SYSTem.ERROR
```

Related objects SCPI.IEEE4882.CLS on page 314

Equivalent key No equivalent key is available on the front panel.

SCPI.SYSTem.KLOCK.KBD

Object type	Property
Syntax	SCPI.SYSTem.KLOCK.KBD = <i>Status</i> <i>Status</i> = SCPI.SYSTem.KLOCK.KBD
Description	Sets whether to lock the operation of the front panel (key and rotary knob) and keyboard.
Variable	

	<i>Status</i>
Description	ON/OFF of lock
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Specifies lock. •False or 0 Specifies unlock.
Preset value	False or 0

Examples

```
Dim FKLock As Boolean
SCPI.SYSTem.KLOCK.KBD = True
FKLock = SCPI.SYSTem.KLOCK.KBD
```

Related objects SCPI.SYSTem.KLOCK.MOUSE on page 438

Equivalent key **[System] - Misc Setup - Front Panel & Keyboard Lock**

SCPI.SYSTem.KLOCK.MOUsE

Object type	Property
Syntax	SCPI.SYSTem.KLOCK.MOUsE = <i>Status</i> <i>Status</i> = SCPI.SYSTem.KLOCK.MOUsE
Description	Sets whether to lock the operation of the mouse and touch screen.
Variable	

	<i>Status</i>
Description	ON/OFF of lock
Data type	Boolean type (Boolean)
Range	Select from the following. •True or -1 Specifies lock. •False or 0 Specifies unlock.
Preset value	False or 0

Examples	<pre>Dim MTLock As Boolean SCPI.SYSTem.KLOCK.MOUsE = True MTLock = SCPI.SYSTem.KLOCK.MOUsE</pre>
Related objects	SCPI.SYSTem.KLOCK.KBD on page 437
Equivalent key	[System] - Key Lock - Mouse Lock

SCPI.SYSTem.POFF

Object type	Method
Syntax	SCPI.SYSTem.POFF
Description	Turns OFF the E5070A/E5071A. (No read)
Examples	<pre>SCPI.SYSTem.POFF</pre>
Equivalent key	Standby switch

SCPI.SYSTem.PRESet

Object type	Method
Syntax	SCPI.SYSTem.PRESet
Description	<p>Presets the setting state of the E5070A/E5071A. There is the following difference from the setting state preset with the SCPI.IEEE4882.RST object. For details, see Appendix “List of Default Values“ in the <i>E5070A/E5071A User’s Guide or Programmer’s Guide</i>. (No read)</p> <ul style="list-style-type: none"> The continuous startup mode (see the SCPI.INITiate(Ch).CONTinuous object) of channel 1 is set to ON.
Examples	<code>SCPI.SYSTem.PRESet</code>
Related objects	SCPI.IEEE4882.RST on page 317
Equivalent key	[Preset] - OK

SCPI.SYSTem.SERVice

Object type	Property
Syntax	<i>Status</i> = SCPI.SYSTem.SERVice
Description	Reads out whether to be in the service mode. (Read only)
Variable	

	<i>Status</i>
Description	Whether to be in the service mode
Data type	Boolean type (Boolean)
Range	<p>Select from the following.</p> <ul style="list-style-type: none"> •True or -1 In the service mode. •False or 0 Not in the service mode.

Examples	<pre>Dim SvMode As Boolean SvMode = SCPI.SYSTem.SERVice</pre>
Equivalent key	Displayed on the instrument status bar (at the bottom of the LCD display).

SCPI.SYSem.TEMPerature.HIGH

Object type Property

Syntax SCPI.SYSem.TEMPerature.HIGH = *Status*
Status = SCPI.SYSem.TEMPerature.HIGH

Description Turns ON/OFF the high temperature mode.

Variable

	<i>Status</i>
Description	ON/OFF of the high temperature mode
Data type	Boolean type (Boolean)
Range	Select from the following. •True or -1 Turns ON the high temperature mode. •False or 0 Turns OFF the high temperature mode.
Preset value	False or 0

Examples

```
Dim TempMode As Boolean
SCPI.SYSem.TEMPerature.HIGH = True
TempMode = SCPI.SYSem.TEMPerature.HIGH
```

Equivalent key **[System] - Service Menu - High Temperature**

SCPI.SYSTem.TEMPerature.STATe

Object type Property

Syntax *Status* = SCPI.SYSTem.TEMPerature.STATe

Description Reads out whether the warm-up is enough to satisfy the specifications of the E5070A/E5071A. (Read only)

Variable

	<i>Status</i>
Description	Whether the warm-up is enough or not.
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> •True or -1 Enough warm-up •False or 0 Not enough warm-up

Examples

```
Dim WarmUp As Boolean
WarmUp = SCPI.SYSTem.TEMPerature.STATe
```

Equivalent key Displayed on the instrument status bar (at the bottom of the LCD display).

SCPI.SYSem.TIME

Object type	Property
Syntax	SCPI.SYSem.TIME = <i>Data</i> <i>Data</i> = SCPI.SYSem.TIME
Description	Sets the time of the clock built in the E5070A/E5071A.
Variable	

	<i>Data</i>
Description	Indicates 3-element array data (time of the built-in clock). <ul style="list-style-type: none"> • <i>Data</i>(0) Sets hour (24-hour basis) • <i>Data</i>(1) Sets minute. • <i>Data</i>(2) Sets second. The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> • <i>Data</i>(0) 0 to 23 • <i>Data</i>(1) 0 to 59 • <i>Data</i>(2) 0 to 59
Resolution	1
Note	If the specified variable 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.

Examples (1)

```
Dim Time As Variant
SCPI.SYSem.TIME = Array(21,30,0)
Time = SCPI.SYSem.TIME
```

Examples (2)

```
Dim Time(2) As Variant
Dim Ref As Variant
Time(0) = 21
Time(1) = 30
Time(2) = 0
SCPI.SYSem.TIME = Time
Ref = SCPI.SYSem.TIME
```

Related objects
 SCPI.SYSem.DATE on page 435
 SCPI.DISPlay.CLOCK on page 280

Equivalent key **[System] - Misc Setup - Clock Setup - Set Date and Time**

SCPI.TRIGger.SEQuence.IMMediate

Object type	Method
Syntax	SCPI.TRIGger.SEQuence.IMMediate
Description	<p>Regardless of the setting of the trigger mode, generates a trigger immediately and executes a measurement.</p> <p>There is the following difference from the trigger with the SCPI.TRIGger.SEQuence.SINGle object.</p> <ul style="list-style-type: none">• The execution of the command finishes at the time of a trigger. <p>If you execute this object when the trigger system is not in the trigger wait state (trigger event detection state), an error occurs when executed and the object is ignored.</p> <p>For details about the trigger system, see Section “Trigger System“ in the <i>E5070A/E5071A Programmer’s Guide</i>. (No read)</p>
Examples	<pre>SCPI.TRIGger.SEQuence.SOURce = "bus" SCPI.INITiate(1).CONTinuous = True SCPI.TRIGger.SEQuence.IMMediate</pre>
Related objects	SCPI.TRIGger.SEQuence.IMMediate on page 443
Equivalent key	No equivalent key is available on the front panel.

SCPI.TRIGger.SEQuence.SINGle

Object type	Method
Syntax	SCPI.TRIGger.SEQuence.SINGle
Description	<p>Regardless of the setting of the trigger mode, generates a trigger immediately and executes a measurement.</p> <p>There is the following difference from the trigger with the SCPI.TRIGger.SEQuence.IMMEDIATE object.</p> <ul style="list-style-type: none">• The execution of the object finishes when the measurement (all of the sweep) initiated with this object is complete. In other words, you can wait for the end of the measurement using the SCPI.IEEE4882.OPC object. <p>If you execute this object when the trigger system is not in the trigger wait state (trigger event detection state), an error occurs when executed and the object is ignored.</p> <p>For details about the trigger system, see Section “Trigger System“ in the <i>E5070A/E5071A Programmer’s Guide</i>. (No read)</p>
Examples	<pre>Dim Dmy As Long SCPI.TRIGger.SEQuence.SOURce = "bus" SCPI.INITiate(1).CONTinuous = True SCPI.TRIGger.SEQuence.SINGle Dmy = SCPI.IEEE4882.OPC</pre>
Related objects	SCPI.TRIGger.SEQuence.IMMEDIATE on page 443 SCPI.IEEE4882.OPC on page 316
Equivalent key	No equivalent key is available on the front panel.

SCPI.TRIGger.SEQuence.SOURce

- Object type** Property
- Syntax** SCPI.TRIGger.SEQuence.SOURce = *Param*
Param = SCPI.TRIGger.SEQuence.SOURce
- Description** Selects the trigger source from the following 4 types.
- Internal trigger** Uses the internal trigger to generate continuous triggers automatically.
 - External trigger** Generates a trigger when the trigger signal is inputted externally via the Ext Trig connector or the handler interface.
 - Manual trigger** Generates a trigger when the key operation of **[Trigger] - Trigger** is executed from the front panel.
 - Bus trigger** Generates a trigger when the SCPI.IEEE4882.TRG object is executed.
- When you change the trigger source during sweep, the sweep is aborted.

Variable

	<i>Param</i>
Description	Trigger source
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> •"INTernal" Specifies internal trigger. •"EXTernal" Specifies external trigger. •"MANual" Specifies manual trigger. •"BUS" Specifies bus trigger.
Preset value	"INTernal"

Examples

```
Dim TrigSour As String
SCPI.TRIGger.SEQuence.SOURce = "bus"
TrigSour = SCPI.TRIGger.SEQuence.SOURce
```

Equivalent key **[Trigger] - Trigger Source - Internal|External|Manual|Bus**

COM Object Reference
SCPI.TRIGger.SEQuence.SOURce

8**Waveform Analysis Library**

This chapter describes how to use the ripple analysis library and the procedures in the ripple analysis library.

Ripple Analysis Library

By combining the COM objects provided for the E5070A/E5071A and the ripple analysis library, you can easily perform the ripple analysis of waveforms.

Flow of Programming Using the Ripple Analysis Library

Below table shows the flow of program development using the ripple analysis library. First, set up the analysis range and peak definition to use the procedures for ripple analysis .

STEP 1. Condition setting before using the ripple analysis library
<input type="checkbox"/> Specifying the analysis range
<input type="checkbox"/> Setting the peak definition
STEP 2. Using the ripple analysis library

Condition Setting Before Using the Ripple Analysis Library

Since the analysis conditions are not specified in the ripple analysis library, before using the procedure for ripple analysis, set up the analysis range and the peak definition using COM objects.

Specifying the Analysis Range

Use the following COM objects to specify the analysis range for ripple analysis. For more information on each object, see Chapter 7, “COM Object Reference.”.

- **SCPI.CALCulate(Ch).SElected.FUNcTion.DOMain.START** on page 216
- **SCPI.CALCulate(Ch).SElected.FUNcTion.DOMain.STOP** on page 218
- **SCPI.CALCulate(Ch).SElected.FUNcTion.DOMain.STATe** on page 217

Setting the Peak Definition

Use the following COM objects to set up the peak definition for ripple analysis. For more information on each object, see Chapter 7, “COM Object Reference.”.

- **SCPI.CALCulate(Ch).SElected.FUNcTion.PEXCursion** on page 220
- **SCPI.CALCulate(Ch).SElected.FUNcTion.PPOLarity** on page 222

List of the Ripple Analysis Library

Use the provided procedures for ripple analysis to analyze the ripple of waveforms and output the result. All procedures perform analysis only within the stimulus range for the specified channel.

For more information on the E5070A/E5071A ripple analysis library, refer to **Procedure Reference** on page 451.

List of ripple analysis library
<ul style="list-style-type: none"> Returns the maximum value of the difference between a positive peak and a negative peak. MaxPeakToPeak(Chan) on page 459
<ul style="list-style-type: none"> Returns the maximum value of the difference between a positive peak and its right adjacent negative peak. MaxRightGap(Chan) on page 460
<ul style="list-style-type: none"> Returns the maximum value of the difference between a positive peak and its left adjacent negative peak. MaxLeftGap(Chan) on page 458
<ul style="list-style-type: none"> Returns the maximum value of the difference between a positive peak and its adjacent negative peak. MaxGap(Chan) on page 457
<ul style="list-style-type: none"> Returns the maximum value of the vertical distance between a line segment connecting 2 adjacent positive peaks and the negative peak between them. MaxEnvelopeGap(Chan) on page 456
<ul style="list-style-type: none"> Returns the mean value of the differences between a negative peak and its right and left adjacent positive peaks. GapMean(Chan) on page 455
<ul style="list-style-type: none"> Returns the maximum value of the total of the differences between a negative peak and its right and left adjacent positive peaks. MaxRippleValue(Chan) on page 462
<ul style="list-style-type: none"> Returns the maximum value of the total of the differences between a negative peak and its right and left adjacent positive peaks and the stimulus value (<i>Stim</i>) of the valley of the ripple. MaxRipplePoint(Chan,Stim) on page 461
<ul style="list-style-type: none"> Returns the values (<i>LeftValue</i> and <i>RightValue</i>) and the stimulus values (<i>LeftStimulus</i> and <i>RightStimulus</i>) of the right and left negative peaks detected first below the specified value (<i>D</i>) relative to the maximum value. Pole(Chan,D,LeftStim,LeftValue,RightStim,RightValue) on page 463
<ul style="list-style-type: none"> Returns the difference between the positive peak detected first when searched from the left edge toward the right edge and its right adjacent negative peak. FirstRightGap(Chan) on page 453

List of ripple analysis library
<ul style="list-style-type: none">Returns the difference between the positive peak detected first when searched from the right edge toward the left edge and its left adjacent negative peak. FirstLeftGap(Chan) on page 451
<ul style="list-style-type: none">Returns the difference of the stimulus value between the positive peak detected first when searched from the left edge toward the right edge and its right adjacent negative peak. FirstRightInterval(Chan) on page 454
<ul style="list-style-type: none">Returns the difference of the stimulus value between the positive peak detected first when searched from the left edge toward the right edge and its left adjacent negative peak. FirstLeftInterval(Chan) on page 452

Simple Use Example

Here is a simple sample program using the ripple analysis procedures.

```
Sub Sample()  
  
Dim Val As Double (1)  
  
SCPI.CALCulate(1).SElected.FUNction.PEXCursion = 1.5 (2)  
SCPI.CALCulate(1).SElected.FUNction.PPOLarity = "BOTH" (2)  
SCPI.CALCulate(1).SElected.FUNction.DOMain.START = 935E6 (3)  
SCPI.CALCulate(1).SElected.FUNction.DOMain.STOP = 960E6 (3)  
SCPI.CALCulate(1).SElected.FUNction.DOMain.STATE = True (3)  
.  
.  
Val = MaxPeakToPeak(1) (4)  
  
End Sub
```

Let us break down the code into a number of blocks and see what they do.

1. Defines a variable Val as Double.
2. Sets the lower limit of the peak excursion value and polarity for the peak search to 1.5 and both of positive peak and negative peak, respectively.
3. Sets the analysis range for channel 1 to 935 MHz to 960 MHz.
4. For channel 1, substitutes the return value from the MaxPeakToPeak function (procedure) into the ripple analysis library to the Val variable.

Procedure Reference

This section describes the procedures in the ripple analysis library provided by the E5070A/E5071A in alphabetical order.

FirstLeftGap(*Chan*)

Syntax

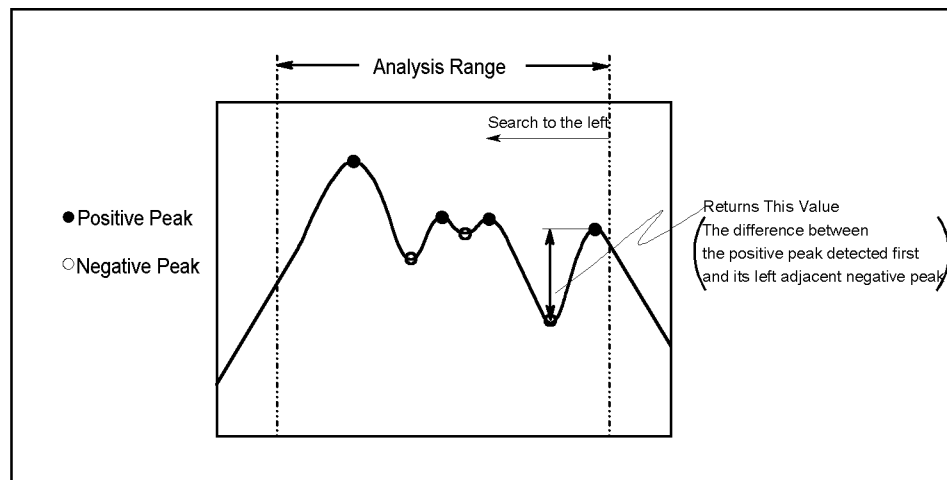
Value = FirstLeftGap(*Chan*)

Description

Returns the response difference between the positive peak detected first when searched from the right edge toward the left edge within the analysis range and its left adjacent negative peak.

Figure 8-1

FirstLeftGap



e5070ave031

Variable

	<i>Chan</i>
Description	Specifies the channel number.
Data type	Integer type (Integer)
Range	1 to 9
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

Return value

	<i>Value</i>
Description	Returns the response difference between the positive peak detected first when searched from the right edge toward the left edge within the analysis range and its left adjacent negative peak.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

Example of use

```
Dim Value As Double

Value = FirstLeftGap(1)
MsgBox "First Left Gap =" & Value
```

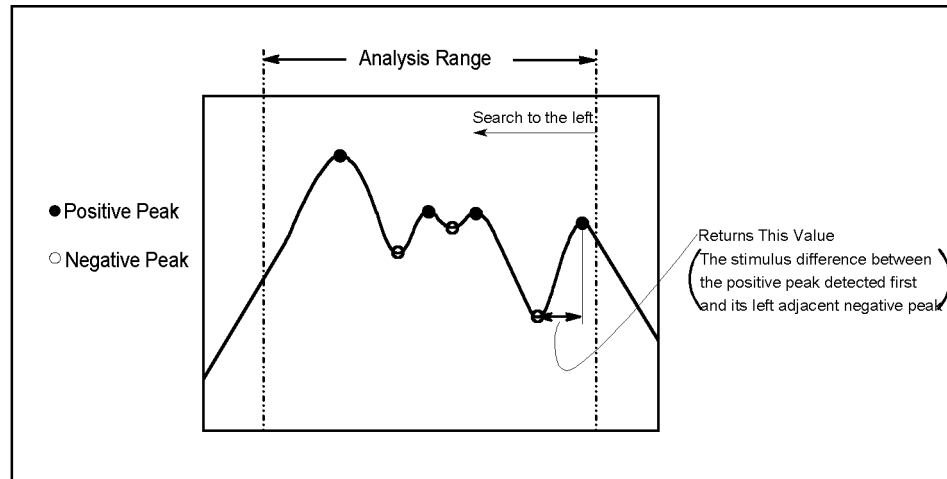
FirstLeftInterval(*Chan*)

Syntax *Value* = FirstLeftInterval(*Chan*)

Description Returns the stimulus difference between the positive peak detected first when searched from the right edge toward the left edge within the analysis range and its left adjacent negative peak.

Figure 8-2

FirstLeftInterval



e5070ave032

Variable

	<i>Chan</i>
Description	Specifies the channel number.
Data type	Integer type (Integer)
Range	1 to 9
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

Return value

	<i>Value</i>
Description	Returns the stimulus difference between the positive peak detected first when searched from the right edge toward the left edge within the analysis range and its left adjacent negative peak.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

Example of use

```
Dim Value As Double
Value = FirstLeftInterval(1)
MsgBox "First Left Interval =" & Value
```

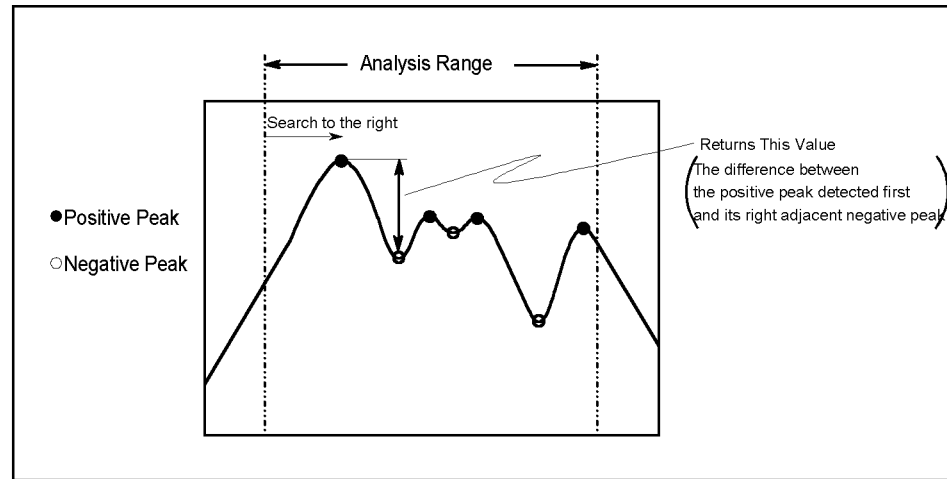

FirstRightGap(*Chan*)

Syntax *Value* = FirstRightGap(*Chan*)

Description Returns the response difference between the positive peak detected first when searched from the left edge toward the right edge within the analysis range and its right adjacent negative peak.

Figure 8-3

FirstRightGap



Variable

	<i>Chan</i>
Description	Specifies the channel number.
Data type	Integer type (Integer)
Range	1 to 9
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

Return value

	<i>Value</i>
Description	Returns the response difference between the positive peak detected first when searched from the left edge toward the right edge within the analysis range and its right adjacent negative peak.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

Example of use

```
Dim Value As Double
Value = FirstRightGap(1)
MsgBox "First Right Gap =" & Value
```

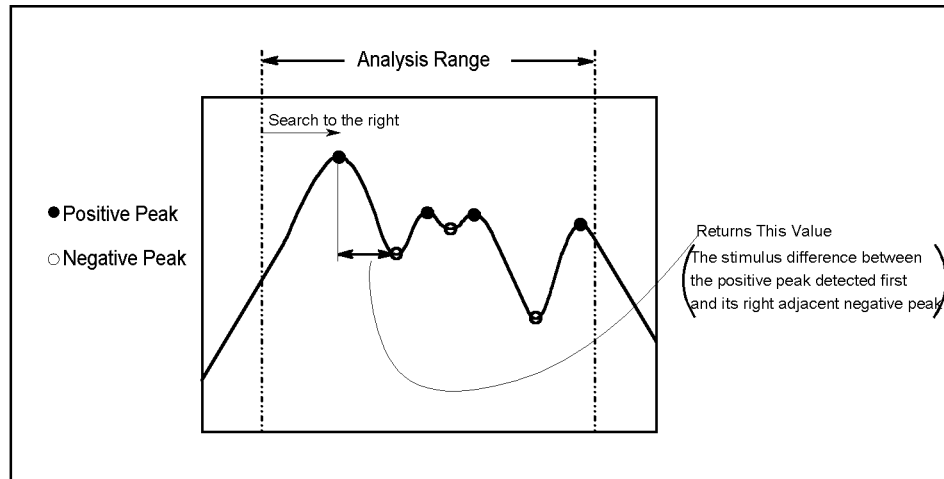
FirstRightInterval(Chan)

Syntax $Value = \text{FirstRightInterval}(Chan)$

Description Returns the stimulus difference between the positive peak detected first when searched from the left edge toward the right edge within the analysis range and its right adjacent negative peak.

Figure 8-4

FirstRightInterval



Variable

	<i>Chan</i>
Description	Specifies the channel number.
Data type	Integer type (Integer)
Range	1 to 9
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

Return value

	<i>Value</i>
Description	Returns the stimulus difference between the positive peak detected first when searched from the left edge toward the right edge within the analysis range and its right adjacent negative peak.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

Example of use

```
Dim Value As Double
Value = FirstRightInterval(1)
MsgBox "First Right Interval =" & Value
```

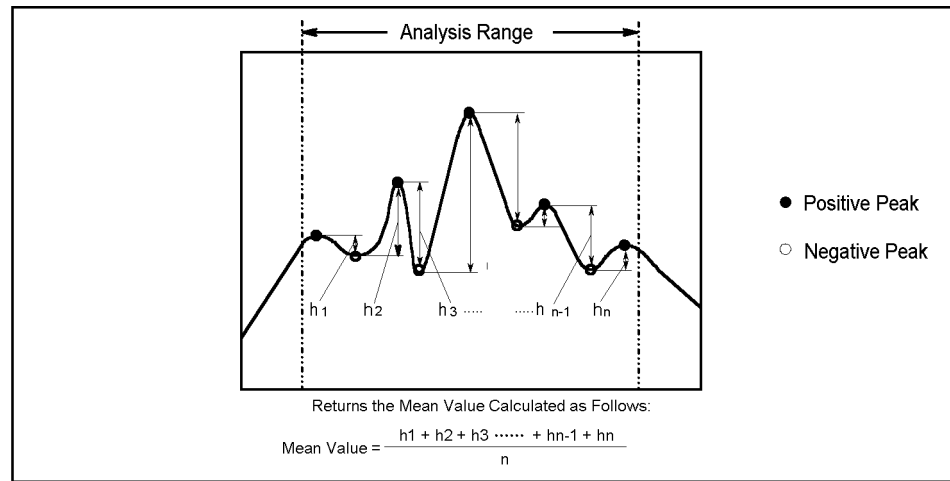
GapMean(*Chan*)

Syntax *Value* = GapMean(*Chan*)

Description Returns the mean value of the response differences between the negative peaks and its adjacent positive peaks within the analysis range.

Figure 8-5

GapMean



e5070ave027

Variable

	<i>Chan</i>
Description	Specifies the channel number.
Data type	Integer type (Integer)
Range	1 to 9
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

Return value

	<i>Value</i>
Description	Returns the mean value of the response differences between the negative peaks and its right and left adjacent positive peaks.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

Example of use

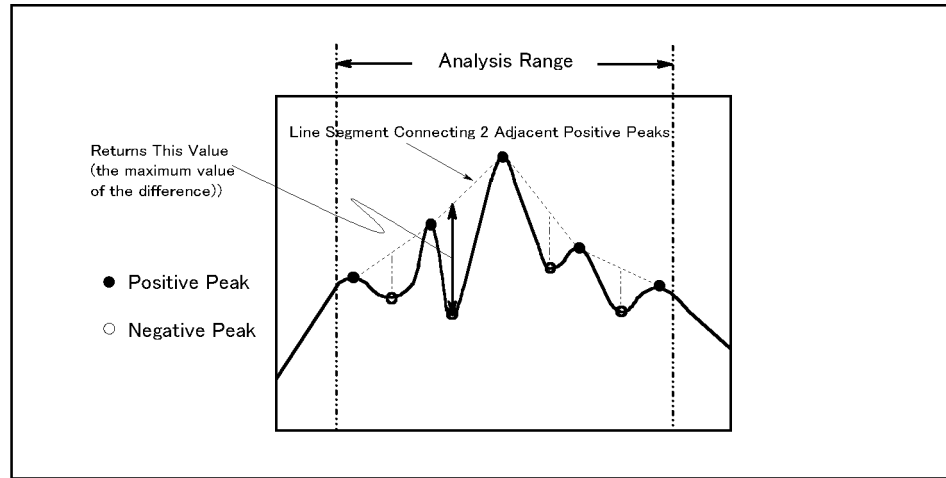
```
Dim Value As Double
Value = GapMean(1)
MsgBox "Gap Mean =" & Value
```

MaxEnvelopeGap(*Chan*)

Syntax *Value* = MaxEnvelopeGap(*Chan*)

Description Returns the maximum value of the vertical distance between the line segments connecting 2 adjacent positive peaks and the negative peaks between them within the analysis range.

Figure 8-6 MaxEnvelopeGap



e5070ave026

Variable

	<i>Chan</i>
Description	Specifies the channel number.
Data type	Integer type (Integer)
Range	1 to 9
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

Return value

	<i>Value</i>
Description	Returns the maximum value of the vertical distance between the line segments connecting 2 adjacent positive peaks and the negative peaks between them.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

Example of use

```
Dim Value As Double
Value = MaxEnvelopeGap(1)
MsgBox "Max Envelope Gap =" & Value
```

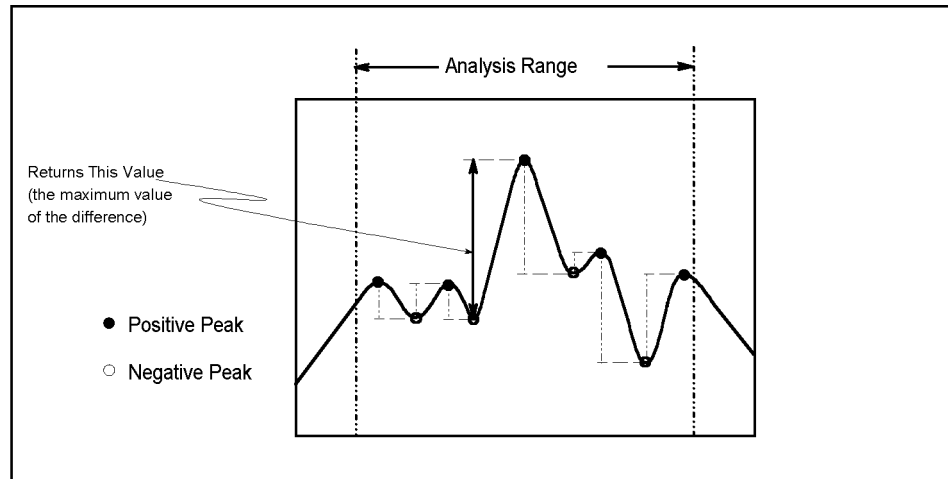
MaxGap(*Chan*)

Syntax *Value* = MaxGap(*Chan*)

Description Returns the maximum value of the response differences between the positive peaks and its adjacent negative peaks within the analysis range.

Figure 8-7

MaxGap



e5070ave025

Variable

	<i>Chan</i>
Description	Specifies the channel number.
Data type	Integer type (Integer)
Range	1 to 9
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

Return value

	<i>Value</i>
Description	Returns the maximum value of the response differences between the positive peaks and its adjacent negative peaks.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

Example of use

```
Dim Value As Double
Value = MaxGap(1)
MsgBox "Max Gap =" & Value
```

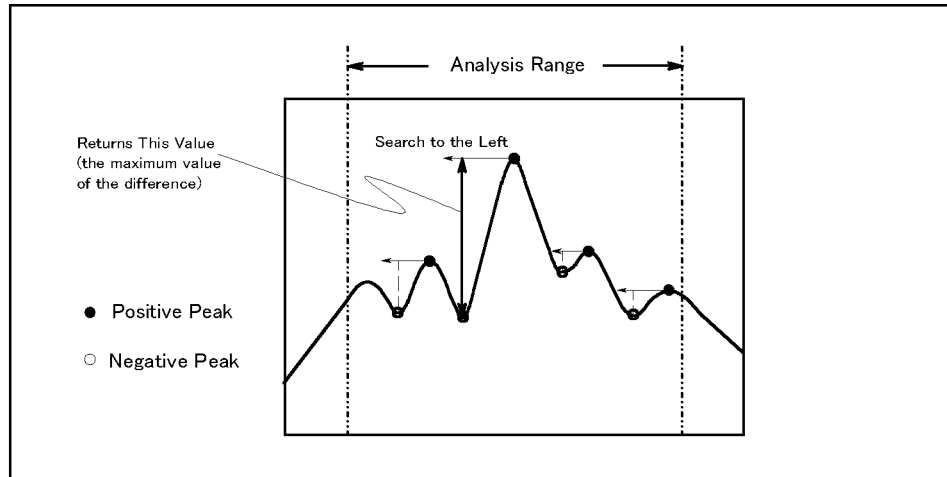
MaxLeftGap(*Chan*)

Syntax *Value* = MaxLeftGap(*Chan*)

Description Returns the maximum value of the response differences between the positive peaks and its left adjacent negative peaks within the analysis range.

Figure 8-8

MaxLeftGap



e5070ave024

Variable

	<i>Chan</i>
Description	Specifies the channel number.
Data type	Integer type (Integer)
Range	1 to 9
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

Return value

	<i>Value</i>
Description	Returns the maximum value of the response differences between the positive peaks and its left adjacent negative peaks.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

Example of use

```
Dim Value As Double
Value = MaxLeftGap(1)
MsgBox "Max Left Gap =" & Value
```

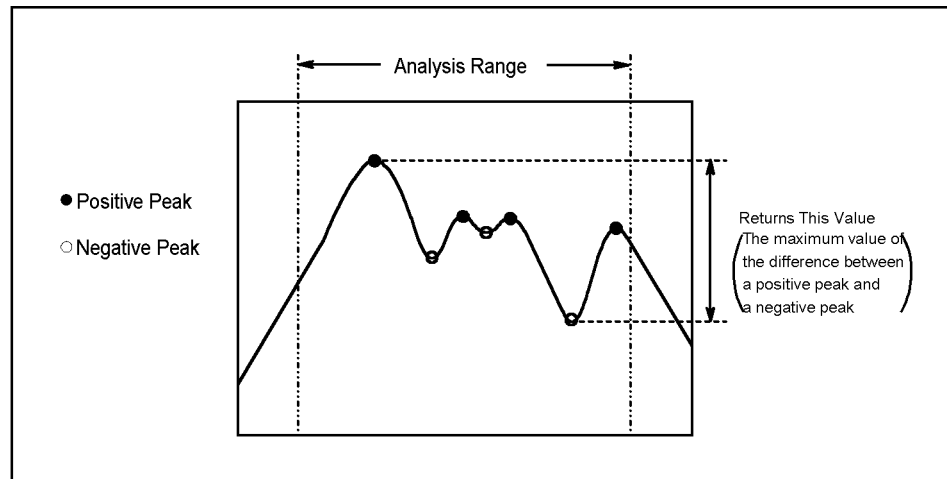
MaxPeakToPeak(*Chan*)

Syntax *Value* = MaxPeakToPeak(*Chan*)

Description Returns the maximum value of the response differences between the positive peaks and the negative peaks within the analysis range.

Figure 8-9

MaxPeakToPeak



Variable

	<i>Chan</i>
Description	Specifies the channel number.
Data type	Integer type (Integer)
Range	1 to 9
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

Return value

	<i>Value</i>
Description	Returns the maximum value of the response differences between the positive peaks and the negative peaks.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

Example of use

```
Dim Value As Double
Value = MaxPeakToPeak(1)
MsgBox "Max Peak To Peak =" & Value
```

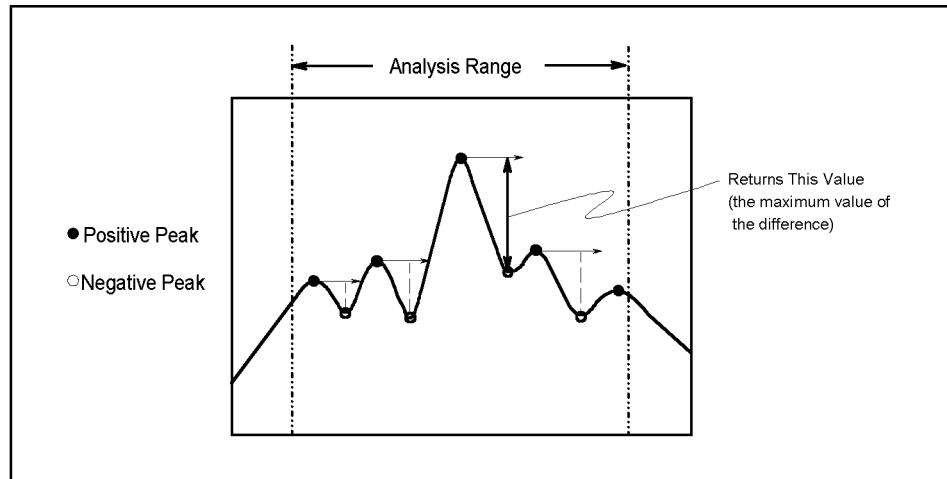
MaxRightGap(*Chan*)

Syntax *Value* = MaxRightGap(*chan*)

Description Returns the maximum value of the response differences between the positive peaks and its right adjacent negative peaks within the analysis range.

Figure 8-10

MaxRightGap



e5070ave023

Variable

	<i>Chan</i>
Description	Specifies the channel number.
Data type	Integer type (Integer)
Range	1 to 9
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

Return value

	<i>Value</i>
Description	Returns the maximum value of the response differences between the positive peaks and its right adjacent negative peaks.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

Example of use

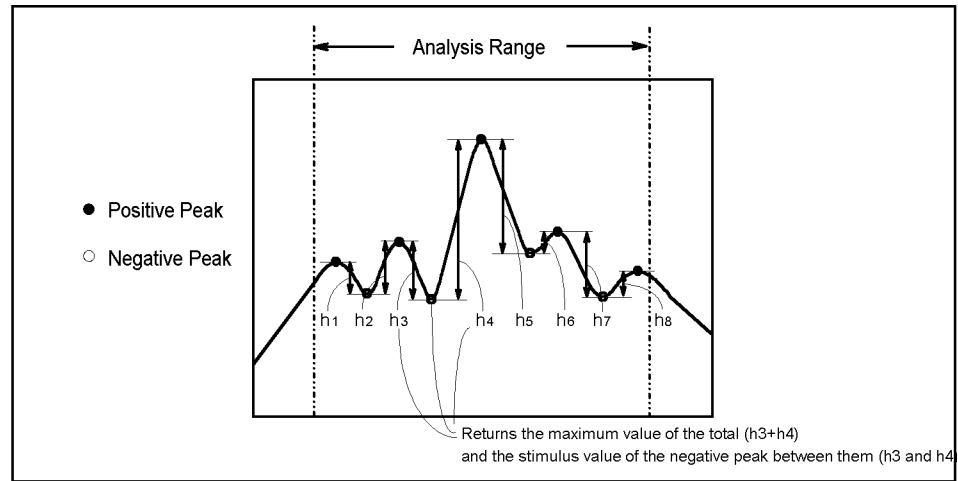
```
Dim Value As Double
Value = MaxRightGap(1)
MsgBox "Max Right Gap =" & Value
```


MaxRipplePoint(*Chan,Stim*)

Syntax *Value* = MaxRipplePoint(*Chan,Stim*)

Description Returns the maximum value of the sum of the response differences between the negative peaks and its adjacent positive peaks and the stimulus value of the applicable negative peaks within the analysis range.

Figure 8-11 MaxRipplePoint



e5070ave028

Variable

	<i>Chan</i>
Description	Specifies the channel number.
Data type	Integer type (Integer)
Range	1 to 9
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

Return value

	<i>Value</i>
Description	Returns the maximum value of the sum of the response differences between the negative peaks and its adjacent positive peaks.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

	<i>Stim</i>
Description	Returns the stimulus value of the negative peak at which the sum of the response differences between the negative peak and its adjacent positive peaks is maximum.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

Example of use

```
Dim Value As Double
Dim Stim As Double

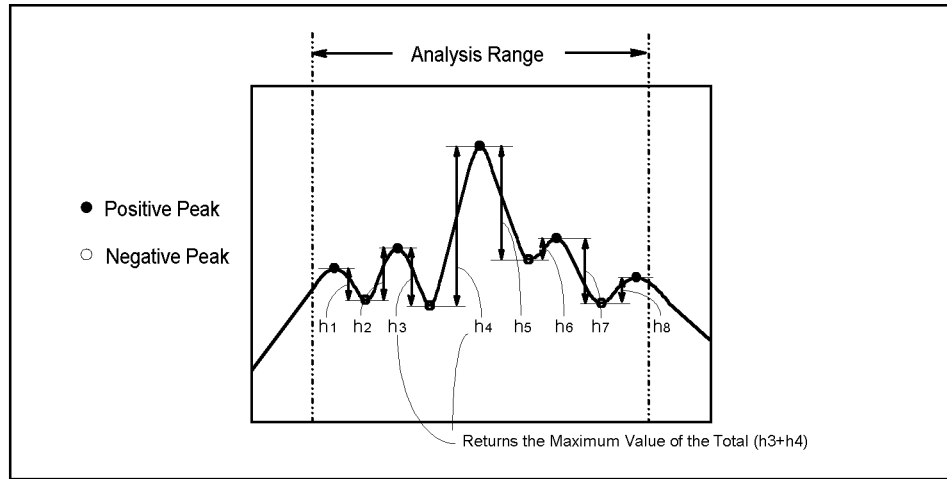
Value = MaxRipplePoint(1, Stim)
MsgBox "Max Ripple Value =" & Value & " , Stimulus =" & Stim
```

MaxRippleValue(Chan)

Syntax $Value = \text{MaxRippleValue}(Chan)$

Description Returns the maximum value of the sum of the response differences between the negative peaks and its adjacent positive peaks within the analysis range.

Figure 8-12 MaxRippleValue



Variable

	<i>Chan</i>
Description	Specifies the channel number.
Data type	Integer type (Integer)
Range	1 to 9
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

Return value

	<i>Value</i>
Description	Returns the maximum value of the sum of the response differences between the negative peaks and its adjacent positive peaks.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

Example of use

```
Dim Value As Double
Value = MaxRippleValue(1)
MsgBox "Max Ripple Value =" & Value
```

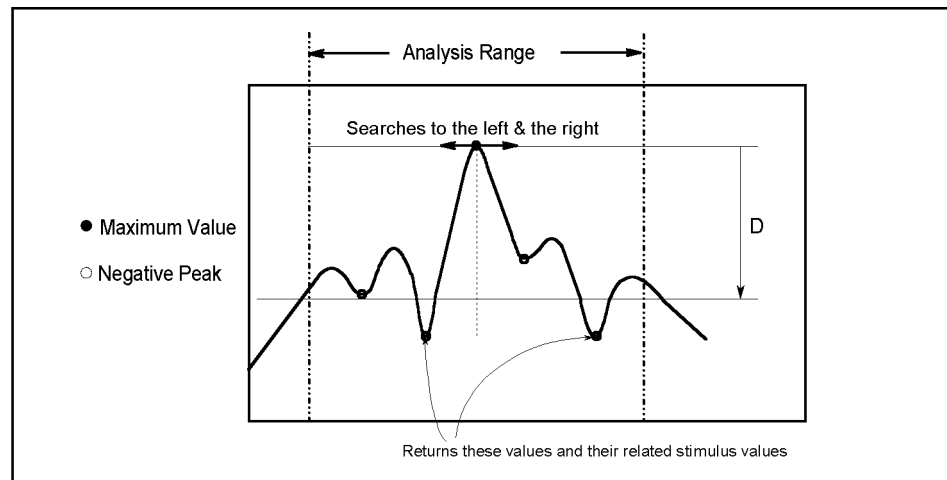
Pole(Chan,D,LeftStim,LeftValue,RightStim,RightValue)

Syntax Call Pole(*Chan,D,LeftStim,LeftValue,RightStim,RightValue*)

Description For the negative peaks below the specified value (*D*) relative to the maximum value of the positive peaks within the analysis range, returns the response value (*LeftValue*) and stimulus value (*LeftStimulus*) of the negative peak first detected when searched to the left from the maximum value of the positive peaks, and the response value (*RightValue*) and stimulus value (*RightStimulus*) of the negative peak first detected when searched to the right from the maximum value of the positive peaks.

Figure 8-13

Pole



e5070ave030

Variable

	<i>Chan</i>
Description	Specifies the channel number.
Data type	Integer type (Integer)
Range	1 to 9
Note	If the specified variable is out of the allowable setup range, an error occurs when executed.

	<i>D</i>
Description	Specifies the difference from the maximum value.
Data type	Double precision floating point type (Double)

Waveform Analysis Library
Pole(Chan,D,LeftStim,LeftValue,RightStim,RightValue)

**Return value
(arguments)**

	<i>LeftStim</i>
Description	Returns the stimulus value of the negative peak first detected to the left from the maximum value of the positive peaks.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

	<i>LeftValue</i>
Description	Returns the response value of the negative peak first detected to the left from the maximum value of the positive peaks.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

	<i>RightStim</i>
Description	Returns the stimulus value of the negative peak first detected to the right from the maximum value of the positive peaks.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

	<i>RightValue</i>
Description	Returns the response value of the negative peak first detected to the right from the maximum value of the positive peaks.
Data type	Double precision floating point type (Double)
Note	If no applicable point is detected, 0 is returned.

Example of use

```
Dim LeftStim As Double
Dim LeftValue As Double
Dim RightStim As Double
Dim RightValue As Double

Call Pole(1, 1, LeftStim, LeftValue, RightStim, RightValue)

MsgBox "Left Pole =" & LeftStim & ":" & LeftValue
MsgBox "Right Pole =" & RightStim & ":" & RightValue
```

9

Complex Operation Library

This chapter describes the complex operation library.

Complex operation library

By using the complex operation library, you can perform operations of complex numbers.

Data of the complex type

In the complex operation library, you can use the complex type (Complex) as a data type. Data of the complex type consists of a real part (.real) and an imaginary part (.imag) as shown in the following example.

```
Dim Num as Complex
Num.real=1.0
Num.imag=2.0
```

List of procedures

The following table lists the procedures included in the complex operation library.

Procedure name	Function
ComplexSet(x,y) on page 470	Sets a complex number. (Specify a real part and an imaginary part.)
ComplexPolar(x,y) on page 470	Sets a complex number. (Specify an absolute value and a phase angle.)
ComplexSetArray(x) on page 471	Converts a variant type or double floating point type array to a complex type array.
ComplexAdd(x,y) on page 467	Returns the result of the addition.
ComplexSub(x,y) on page 472	Returns the result of the subtraction.
ComplexMul(x,y) on page 469	Returns the result of the multiplication.
ComplexDiv(x,y) on page 468	Returns the result of the division.
ComplexAbs(x) on page 467	Returns the absolute value.
ComplexArg(x) on page 467	Returns the phase angle.
ComplexNorm(x) on page 470	Returns the square of the absolute value.
ComplexConj(x) on page 468	Returns the conjugate complex number.
ComplexCos(x) on page 468	Returns the cosine.
ComplexCosh(x) on page 468	Returns the hyperbolic cosine.
ComplexSin(x) on page 471	Returns the sine.
ComplexSinh(x) on page 471	Returns the hyperbolic sine.
ComplexExp(x) on page 469	Returns e^x .
ComplexLog(x) on page 469	Returns the natural logarithm.
ComplexLog10(x) on page 469	Returns the common logarithm.
ComplexSqrt(x) on page 472	Returns the square root.

Procedure Reference

This section describes the procedures in the complex operation library in alphabetical order.

ComplexAbs(x)

Syntax	<i>Result</i> = ComplexAbs(x)
Description	Returns the absolute value of a complex number <i>x</i> .
Data type	<i>x</i> Complex type (Complex) <i>Result</i> Double precision floating point type (Double)
Example of use	Dim a As Complex, b As Double a = ComplexSet(1.5, 2.0) b = ComplexAbs(a)

ComplexAdd(x,y)

Syntax	<i>Result</i> = ComplexAdd(x,y)
Description	Returns the result of the addition of a complex number <i>x</i> and another <i>y</i> .
Data type	<i>x</i> Complex type (Complex) <i>y</i> Complex type (Complex) <i>Result</i> Complex type (Complex)
Example of use	Dim a As Complex, b As Complex, c As Complex a = ComplexSet(1.5, 2.0) b = ComplexSet(0.5, 3.5) c = ComplexAdd(a, b)

ComplexArg(x)

Syntax	<i>Result</i> = ComplexArg(x)
Description	Returns the phase angle of a complex number <i>x</i> .
Data type	<i>x</i> Complex type (Complex) <i>Result</i> Double precision floating point type (Double)
Example of use	Dim a As Complex, b As Double a = ComplexSet(1.5, 2.0) b = ComplexAbs(a)

ComplexConj(x)

Syntax	<i>Result</i> = ComplexConj(<i>x</i>)	
Description	Returns the conjugate complex number of a complex number <i>x</i> .	
Data type	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
Example of use	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexConj(a)</pre>	

ComplexCos(x)

Syntax	<i>Result</i> = ComplexCos(<i>x</i>)	
Description	Returns the cosine (cos(<i>x</i>)) of a complex number <i>x</i> .	
Data type	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
Example of use	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexCos(a)</pre>	

ComplexCosh(x)

Syntax	<i>Result</i> = ComplexCosh(<i>x</i>)	
Description	Returns the hyperbolic cosine (cosh(<i>x</i>)) of a complex number <i>x</i> .	
Data type	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
Example of use	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexCosh(a)</pre>	

ComplexDiv(x,y)

Syntax	<i>Result</i> = ComplexDiv(<i>x</i> , <i>y</i>)	
Description	Returns the result of the division of a complex number <i>x</i> and another <i>y</i> .	
Data type	<i>x</i>	Complex type (Complex)
	<i>y</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
Example of use	<pre>Dim a As Complex, b As Complex, c As Complex a = ComplexSet(1.5, 2.0) b = ComplexSet(0.5, 3.5) c = ComplexDiv(a, b)</pre>	

ComplexExp(x)

Syntax	<i>Result</i> = ComplexExp(<i>x</i>)	
Description	Returns e^x .	
Data type	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
Example of use	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexExp(a)</pre>	

ComplexLog(x)

Syntax	<i>Result</i> = ComplexLog(<i>x</i>)	
Description	Returns the natural logarithm ($\log(x)$) of a complex number <i>x</i> .	
Data type	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
Example of use	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexLog(a)</pre>	

ComplexLog10(x)

Syntax	<i>Result</i> = ComplexLog(<i>x</i>)	
Description	Returns the common logarithm ($\log_{10}(x)$) of a complex number <i>x</i> .	
Data type	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
Example of use	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexLog10(a)</pre>	

ComplexMul(x,y)

Syntax	<i>Result</i> = ComplexMul(<i>x</i> , <i>y</i>)	
Description	Returns the result of the multiplication of a complex number <i>x</i> and another <i>y</i> .	
Data type	<i>x</i>	Complex type (Complex)
	<i>y</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
Example of use	<pre>Dim a As Complex, b As Complex, c As Complex a = ComplexSet(1.5, 2.0) b = ComplexSet(0.5, 3.5) c = ComplexMul(a, b)</pre>	

ComplexNorm(x)

Syntax	<i>Result</i> = ComplexNorm(<i>x</i>)	
Description	Returns the square of the absolute value of a complex number <i>x</i> .	
Data type	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Double precision floating point type (Double)
Example of use	<pre>Dim a As Complex, b As Double a = ComplexSet(1.5, 2.0) b = ComplexNorm(a)</pre>	

ComplexPolar(x,y)

Syntax	<i>z</i> = ComplexPolar(<i>x</i> , <i>y</i>)	
Description	Sets a complex number to a complex type variable <i>z</i> . Specify a complex number with an absolute value <i>x</i> and a phase angle <i>y</i> .	
Data type	<i>x</i>	Double precision floating point type (Double)
	<i>y</i>	Double precision floating point type (Double)
	<i>z</i>	Complex type (Complex)
Example of use	<pre>Dim a as Complex a = ComplexPolar(2.5, 60.0)</pre>	

ComplexSet(x,y)

Syntax	<i>z</i> = ComplexSet(<i>x</i> , <i>y</i>)	
Description	Sets a complex number to a complex type variable <i>z</i> . Specify a complex number with a real part <i>x</i> and an imaginary part <i>y</i> .	
Data type	<i>x</i>	Double precision floating point type (Double)
	<i>y</i>	Double precision floating point type (Double)
	<i>z</i>	Complex type (Complex)
Example of use	<pre>Dim a as Complex a = ComplexSet(1.5, 2.0)</pre>	

ComplexSetArray(x)

Syntax	$y = \text{ComplexMul}(x)$				
Description	Converts a variant type or double floating point type array x that contains complex numbers using 2 elements to store each complex number in the order of the real part and imaginary part to a complex type array y .				
Data type	<table> <tr> <td>x</td> <td>Variant type (Variant) array or Double precision floating point type (Double) array</td> </tr> <tr> <td>y</td> <td>Complex type (Complex) array</td> </tr> </table>	x	Variant type (Variant) array or Double precision floating point type (Double) array	y	Complex type (Complex) array
x	Variant type (Variant) array or Double precision floating point type (Double) array				
y	Complex type (Complex) array				
Example of use	<pre>Dim a as Variant, b as Complex a = SCPI.CALCulate(1).SElected.DATA.SDATA b = ComplexSetArray(a)</pre>				

ComplexSin(x)

Syntax	$Result = \text{ComplexSin}(x)$				
Description	Returns the sine ($\sin(x)$) of a complex number x .				
Data type	<table> <tr> <td>x</td> <td>Complex type (Complex)</td> </tr> <tr> <td><i>Result</i></td> <td>Complex type (Complex)</td> </tr> </table>	x	Complex type (Complex)	<i>Result</i>	Complex type (Complex)
x	Complex type (Complex)				
<i>Result</i>	Complex type (Complex)				
Example of use	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexSin(a)</pre>				

ComplexSinh(x)

Syntax	$Result = \text{ComplexSinh}(x)$				
Description	Returns the hyperbolic sine ($\sinh(x)$) of a complex number x .				
Data type	<table> <tr> <td>x</td> <td>Complex type (Complex)</td> </tr> <tr> <td><i>Result</i></td> <td>Complex type (Complex)</td> </tr> </table>	x	Complex type (Complex)	<i>Result</i>	Complex type (Complex)
x	Complex type (Complex)				
<i>Result</i>	Complex type (Complex)				
Example of use	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexSinh(a)</pre>				

ComplexSqrt(x)

Syntax	<i>Result</i> = ComplexSqrt(<i>x</i>)	
Description	Returns the square root of a complex number <i>x</i> .	
Data type	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
Example of use	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexSqrt(a)</pre>	

ComplexSub(x,y)

Syntax	<i>Result</i> = ComplexSub(<i>x</i> , <i>y</i>)	
Description	Returns the result of the subtraction of a complex number <i>x</i> and another <i>y</i> .	
Data type	<i>x</i>	Complex type (Complex)
	<i>y</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
Example of use	<pre>Dim a As Complex, b As Complex, c As Complex a = ComplexSet(1.5, 2.0) b = ComplexSet(0.5, 3.5) c = ComplexSub(a, b)</pre>	

Manual Changes

To adapt this manual to your E5070A/E5071A, refer to Table A-1 and Table A-2.

Table A-1 Manual Changes by Serial Number

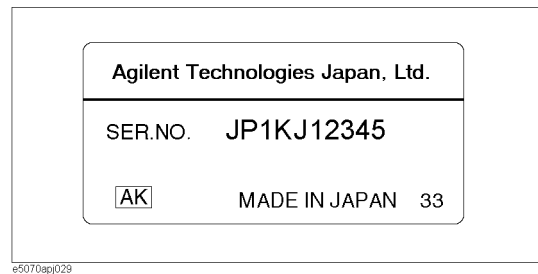
Serial Prefix or Number	Make Manual Changes

Table A-2 Manual Changes by Firmware Version

Version	Make Manual Changes
1.xx	Change 1

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.

Figure A-1 Example of Serial Number Plate



Change 1

The firmware revision 1.xx does not support the following COM objects. Please delete their descriptions in this manual.

- **SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion. BPORT(Bpt).Z0.R** on page 163
- **SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion. STATE** on page 165
- **SCPI.CALCulate(Ch).SElected.CONVersion.FUNcTION** on page 199
- **SCPI.CALCulate(Ch).SElected.CONVersion.STATE** on page 200
- **SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. CENTER** on page 207
- **SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. SHAPE** on page 208
- **SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. SPAN** on page 209
- **SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. START** on page 210
- **SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STATE** on page 211
- **SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STOP** on page 212
- **SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. TYPE** on page 213
- **SCPI.CALCulate(Ch).SElected.TRANSform.GATE.TIME. CENTER** on page 257

- **SCPI.CALCulate(Ch).SELEcted.TRANSform.GATE.TIME. IMPulse.WIDTH** on page 258
- **SCPI.CALCulate(Ch).SELEcted.TRANSform.GATE.TIME. KBESsel** on page 259
- **SCPI.CALCulate(Ch).SELEcted.TRANSform.GATE.TIME. LPFRequency** on page 260
- **SCPI.CALCulate(Ch).SELEcted.TRANSform.GATE.TIME. SPAN** on page 261
- **SCPI.CALCulate(Ch).SELEcted.TRANSform.GATE.TIME. START** on page 262
- **SCPI.CALCulate(Ch).SELEcted.TRANSform.GATE.TIME. STATE** on page 263
- **SCPI.CALCulate(Ch).SELEcted.TRANSform.GATE.TIME. STEP.RTIME** on page 264
- **SCPI.CALCulate(Ch).SELEcted.TRANSform.GATE.TIME. STIMulus** on page 265
- **SCPI.CALCulate(Ch).SELEcted.TRANSform.GATE.TIME. STOP** on page 266
- **SCPI.CALCulate(Ch).SELEcted.TRANSform.GATE.TIME. TYPE** on page 267
- **SCPI.DISPLAY.COLor(Dnum).BACK** on page 281
- **SCPI.DISPLAY.COLor(Dnum).GRATicule(Gnum)** on page 282
- **SCPI.DISPLAY.COLor(Dnum).LIMit(Lnum)** on page 283
- **SCPI.DISPLAY.COLor(Dnum).RESet** on page 284
- **SCPI.DISPLAY.COLor(Dnum).TRACe(Tr).DATA** on page 285
- **SCPI.DISPLAY.COLor(Dnum).TRACe(Tr).MEMory** on page 286
- **SCPI.MMEMory.LOAD.CHANnel.STATE** on page 325
- **SCPI.MMEMory.STORe.CHANnel.CLEar** on page 330
- **SCPI.MMEMory.STORe.CHANnel.STATE** on page 330
- **SCPI.SENSE.CORRection.COLLEct.ECAL.PATH(Cpt)** on page 366
- **SCPI.SENSE(Ch).CORRection.COLLEct.ECAL.THURU** on page 371
- **SCPI.SENSE.MULTiplexer(Id).COUNT** on page 390
- **SCPI.SENSE.MULTiplexer(Id).DISPlay.STATE** on page 391
- **SCPI.SENSE.MULTiplexer(Id).STATE** on page 392
- **SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.OUTPut.DATA** on page 393
- **SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT1** on page 394
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- **SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT3** on page 396
- **SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT4** on page 397
- **SCPI.SENSE(Ch).SWEep.ASPurious** on page 402

Manual Changes
Manual Changes

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