

**Agilent E5070B/E5071B ENA Series RF Network Analyzers**

# **VBA Programmer's Guide**

**Second Edition**

**FIRMWARE REVISIONS**

This manual applies directly to instruments that have the firmware revision 3.5x.

For additional information about firmware revisions, see Appendix A.



**Agilent Technologies**

**HP Part No. E5070-90043**

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## Manual Printing History

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

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## Typeface Conventions

<b>Sample (bold)</b>	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.
<b>[Sample]</b>	Indicates the hardkey whose key label is “Sample”.
<b>[Sample] - Item</b>	Indicates a series of key operations in which you press the <b>[Sample]</b> key, make the item called “Item” on the displayed menu blink by using the <b>[↓]</b> or in other ways, and then press the <b>[Enter]</b> key.

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## Sample Program Disk

A VBA sample program disk (Agilent part number: E5070-180x1) is furnished with this manual. The disk contains the sample programs used in this manual.

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## E5070B/E5071B Documentation Map

The following manuals are available for the E5070B/E5071B.

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

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

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

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

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

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

- ***VBA Programmer's Guide (Part Number: E5070-900x3, attached to option 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.

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**NOTE**

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

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# 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

This is a VBA programming guide with Agilent E5070B/E5071B.

This guide describes programming method mainly aiming at learning how to write a program that controls the E5070B/E5071B using COM objects, focusing on the macro function of the E5070B/E5071B and sample usage with the built-in VBA.

Controlling the E5070B/E5071B using an external controller is not covered by this guide; it is described in *Programmer's Guide*. For remote control using an external controller, see *Programmer's Guide*.

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

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

### Chapter 1, "Making Effective Use of This Manual."

This chapter 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 E5070B/E5071B'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 E5070B/E5071B.

### Chapter 3, "Operation Basics of the E5070B/E5071B's VBA."

This chapter provides descriptive information on basic operations for creating VBA programs within the E5070B/E5071B's VBA environment; topics include launching Visual Basic Editor, creating, saving, and running VBA programs, and so on.

### Chapter 4, "Controlling the E5070B/E5071B."

This chapter describes how to use the E5070B/E5071B's VBA to control the E5070B/E5071B itself.

### Chapter 5, "Controlling Peripherals."

This chapter explains how to control peripherals connected to the E5070B/E5071B with GPIB by using the software (VISA library) installed in the E5070B/E5071B.

### 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 E5070B/E5071B 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 E5070B/E5071B 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 E5070B/E5071B 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 132 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 146 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 E5070B/E5071B VBA, see Section “Loading a VBA Program” on page 45 in the Chapter 3 “Operation Basics of the E5070B/E5071B'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_fem.vba	mdlFemMeas	Standard module	Application program for the measurement using the E5091A
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
map_drive.vba	Module1 frmMapDrive	Standard module UserForm	Program for connecting a hard disk (a shared folder) of an external PC to the E5070B/E5071B.
meas_sing.vba	mdlSingMeas frmSingMeas	Standard module UserForm	Program for detecting the end of the measurement using <b>SCPI.TRIGger.SEQuence.SINGle</b> object and <b>SCPI.IEEE4882.OPC</b> 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)
pow_cal.vba	mdlPowCal Module1 Module2	Standard module Standard module Standard module	Program for performing the power calibration
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.”

Making Effective Use of This Manual  
**How To Use This Manual**

---

## 2 Introduction to VBA Programming

This chapter introduces you to the E5070B/E5071B'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 E5070B/E5071B.

## Introduction of the E5070B/E5071B Macro Function

The E5070B/E5071B has a built-in macro function that allows a single instruction to substitute for multiple instructions. You can have the E5070B/E5071B 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 E5070B/E5071B 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 E5070B/E5071B VBA is added features for controlling the E5070B/E5071B. 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 E5070B/E5071B's VBA, see Chapter 3, "Operation Basics of the E5070B/E5071B's VBA," on page 29. 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 E5070B/E5071B itself as well as various peripherals. You can do the following:

1. Automate repetitive tasks

You can use the E5070B/E5071B'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 E5070B/E5071B VBA supports user forms (see "User Form" on page 33) 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 E5070B/E5071B, thus minimizing the possibility of human error.

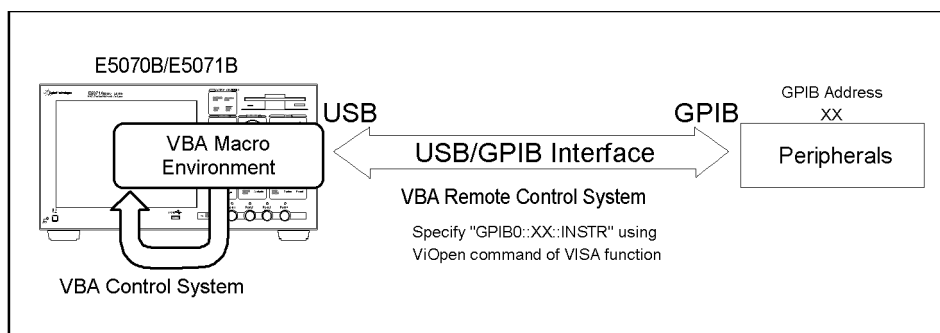
## An Overview of a Control System Based on the Macro Function

This section describes how you can use the E5070B/E5071B's built-in VBA macro function to implement a system that controls the E5070B/E5071B 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 E5070B/E5071B itself while a VBA remote control system controls peripherals. When you use the macro function to control peripherals, you must connect the E5070B/E5071B with the peripherals through USB/GPIB interface, and configure them to communicate over VISA (Virtual Instrument Software Architecture). For information on programming using the VISA library, refer to “Programming with VISA” on page 83.

Figure 2-1 Configuration example of control system using macro environment



### Required Equipment

1. E5070B/E5071B
2. Peripherals and/or other instruments that serve your purpose
3. USB/GPIB interface

**NOTE** To use the VBA remote control system, you need to set the USB/GPIB interface correctly. For detail, refer to *User's Guide*.

**NOTE** Do not connect two or more USB/GPIB interfaces.

## **Control Methods**

The command set you can use differs depending on whether you use the macro function to control the E5070B/E5071B or a peripheral.

### **Controlling the E5070B/E5071B**

When you want to control the E5070B/E5071B itself, you can create a program using COM objects within the E5070B/E5071B VBA environment. COM objects that come with the E5070B/E5071B include seven objects specific to the COM interface and COM objects that correspond to SCPI commands.

For information on using E5070B/E5071B's COM objects, see Chapter 7, “COM Object Reference,” on page 129. For information on using SCPI commands, see the “SCPI Command Reference” in the *E5070B/E5071B Programmer's Guide*.

### **Controlling a Peripheral**

When you want to control a peripheral, you can create a program using VISA library functions within the E5070B/E5071B VBA environment.

For information on using the VISA library, see Chapter 5, “Controlling Peripherals,” on page 81. 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 E5070B/E5071B COM Object

The E5070B/E5071B VBA environment provides COM objects that support controlling the E5070B/E5071B. This section provides an overview of COM objects as well as considerations for using the E5070B/E5071B's COM objects. For more information on the E5070B/E5071B's COM objects and the comparison with SCPI commands, refer to Chapter 7, “COM Object Reference,” on page 129.

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 E5070B/E5071B through the macro function, you can use COM objects as components of your application. The functionality of the E5070B/E5071B'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 E5070B/E5071B, you can use properties to set or read the settings of the E5070B/E5071B.

You can find properties in the list of object types in Chapter 7, “COM Object Reference,” on page 129.

#### Method

A method allows you to manipulate an object in a particular way. With the E5070B/E5071B, 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 129.

#### Event

An event means an operation from outside that the program can recognize such as clicking a mouse. The E5070B/E5071B detects events that a specific softkey is pressed using the **UserMenu\_OnPress(ByVal Key\_id As Long)** on page 177 procedure to execute the assigned procedure.

### Using COM Object to Control the E5070B/E5071B

When you want to control the E5070B/E5071B, you can use COM objects alone or in conjunction with SCPI commands and the **Parse** on page 173 object. The latter method is a little slower than the former method because the **Parse** on page 173 object is used to parse the messages of SCPI commands. For instructions on using the E5070B/E5071B's VBA Editor to create a program that uses COM objects, refer to Chapter 3, “Operation Basics of the E5070B/E5071B's VBA,” on page 29.

### **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 E5070B/E5071B is put into the desired state. For a detailed example of use, see “WaitOnSRQ” on page 180.



---

## **3      Operation Basics of the E5070B/E5071B's VBA**

This chapter provides descriptive information on basic operations for creating VBA programs within the E5070B/E5071B'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 E5070B/E5071B measurement screen, launch Visual Basic Editor using one of the following methods:

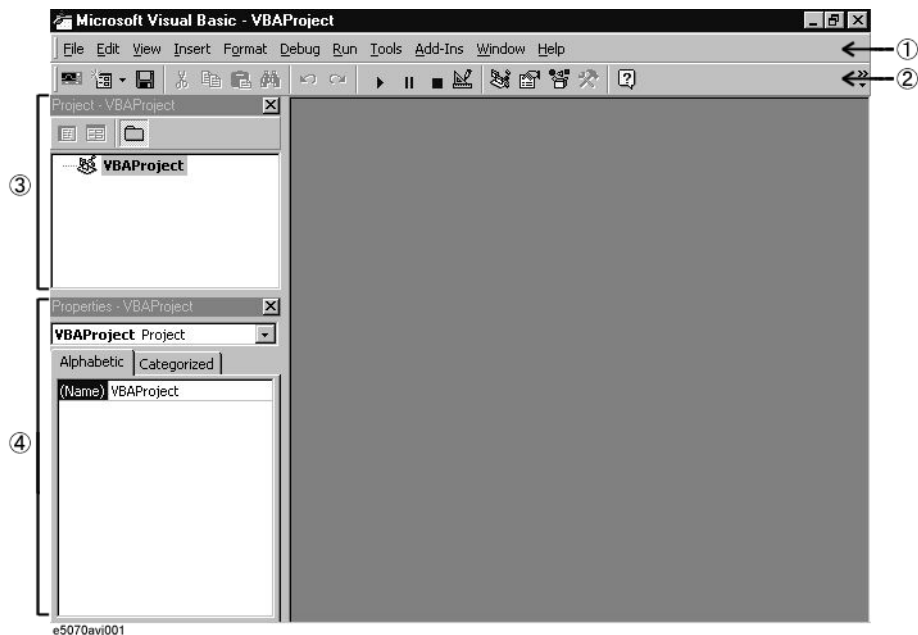
- **[Macro Setup] - VBA Editor**
- Press **[Alt] + [F11]** on the keyboard.

## 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

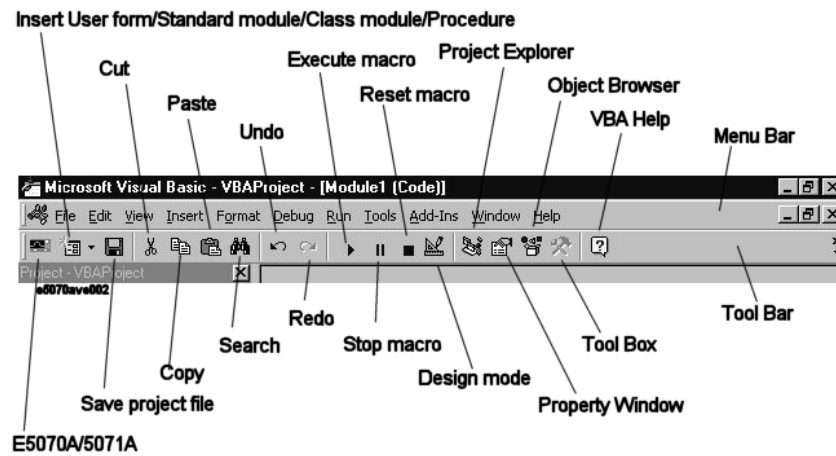
Clicking one of the menu labels brings up the corresponding menu. The menu bar can be used as the primary method to navigate through E5070B/E5071B's VBA environment.

### 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 E5070B/E5071B'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 33.

**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 33.

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**(E5070B/E5071B 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 E5070B/E5071B, 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 E5070B/E5071B Measurement Screen

You can switch to the E5070B/E5071B measurement screen without closing Visual Basic Editor.

- Step 1.** To switch to the E5070B/E5071B measurement screen, do one of the following:
- On the **View** menu, click **E5070**.
  - Press **[Alt] + [F11]** on the keyboard.
  - On the toolbar, click “E5070B/E5071B” icon (Figure 3-2).
  - Press the **[Focus]** key on the E5070B/E5071B 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 E5070B/E5071B 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 E5070B/E5071B'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 E5070B/E5071B'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 E5070B/E5071B 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 42). For saving the project, see “Saving a Project” on page 42.

---

## 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**.

---

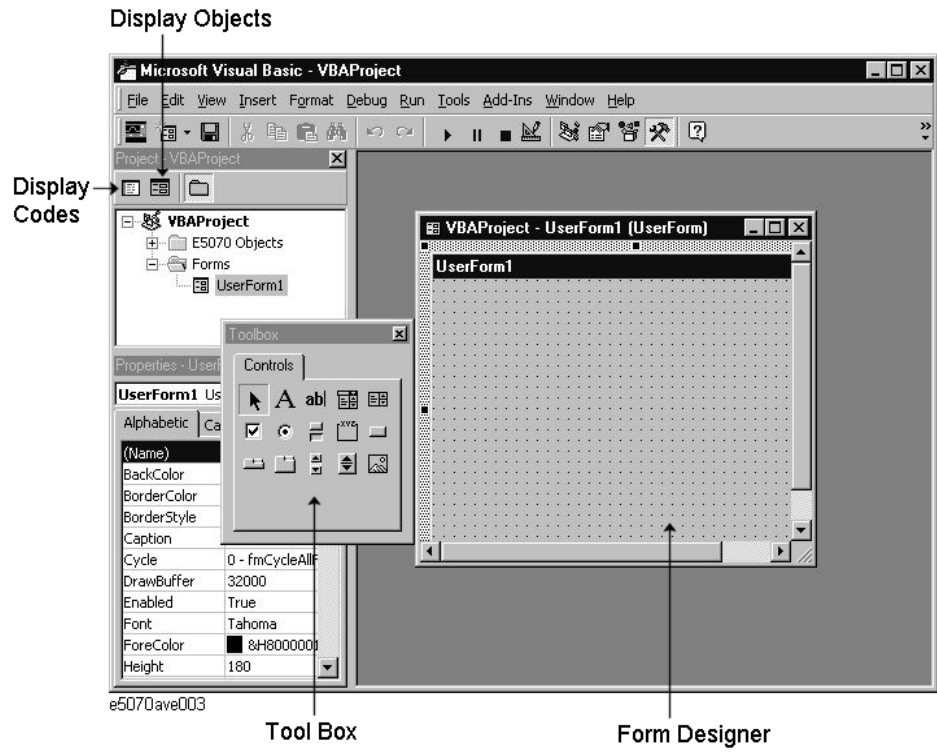
### NOTE

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 E5070B/E5071B's VBA

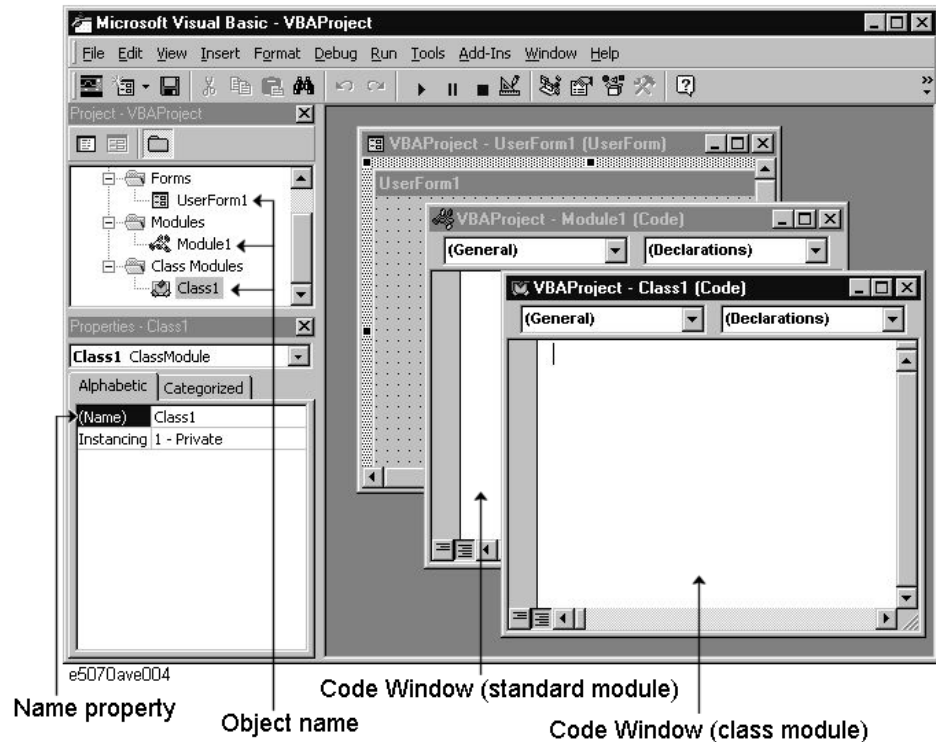
### Making a Preparation Before Coding

#### 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

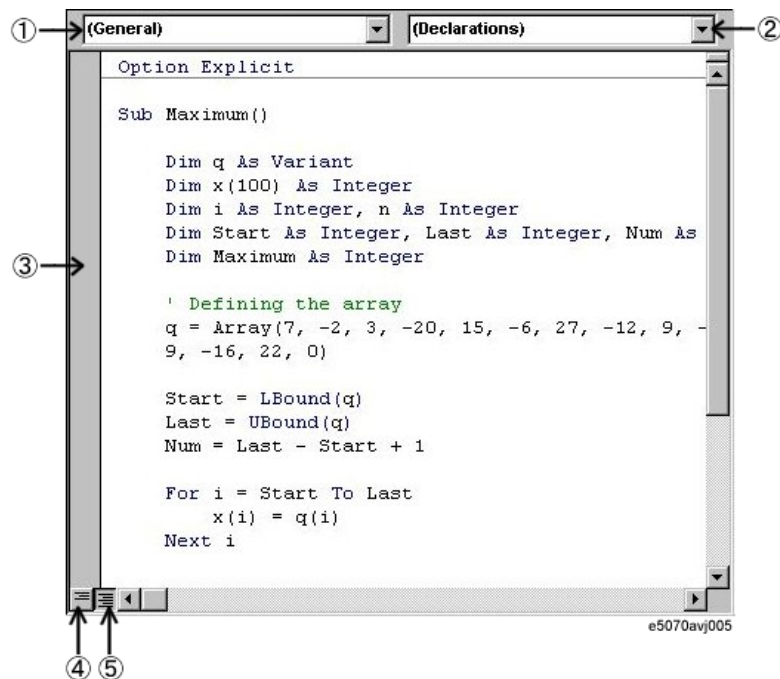
This section provides descriptive information on the user interface elements of a code window that lets you code a VBA program, and walks through a sample program (procedure) that finds the maximum value contained in an array so you can gain insight into how to create your own programs.

### 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 E5070B/E5071B's VBA Coding a 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 E5070B/E5071B'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 352 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:

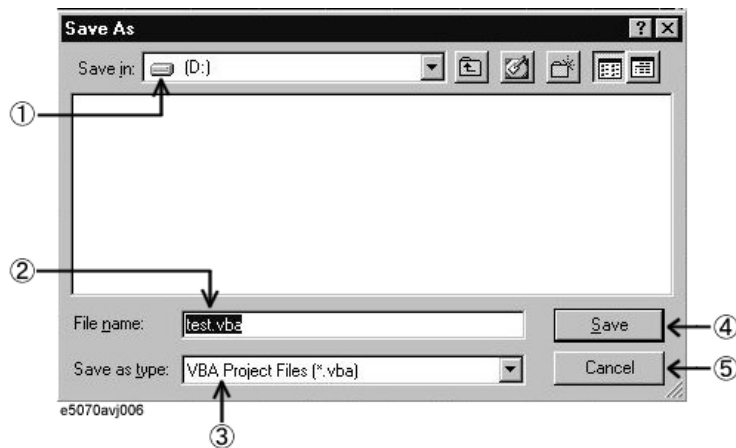
- On the **File** menu, click **Save xxx.VBA**. "xxx" represents the file name.
- On the toolbar, click "Save Project File" icon (Figure 3-2).
- Press **[Ctrl] + [S]** on the keyboard.

**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.

### E5070B/E5071B Saving a Project from the E5070B/E5071B Measurement Screen

- Step 1.** Display the E5070B/E5071B measurement screen following the instructions given in “Switching to the E5070B/E5071B Measurement Screen” on page 32.
- 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)

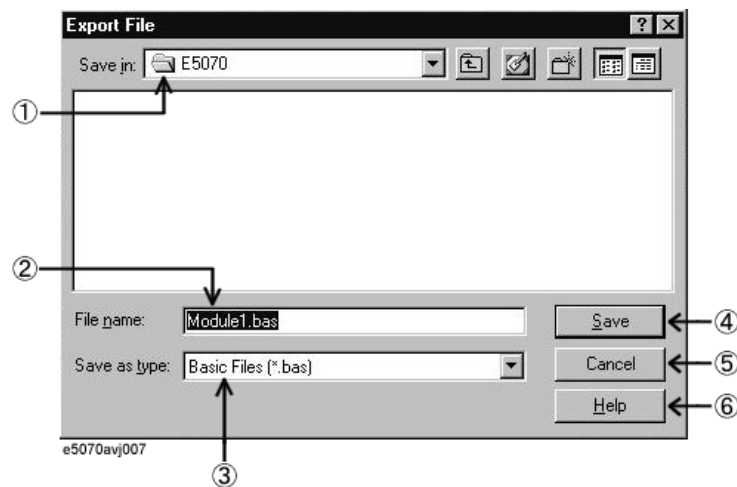
Alternatively, you can save each module (user form, standard, or class) of your VBA program individually. To save a module, you must use Visual Basic Editor. User forms are saved as .frm files, standard modules as .bas files, and class modules as .cls files.

- 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 VBA program**

- 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 E5070B/E5071B measurement screen or by specifying that the project file be automatically loaded when the power is turned on.

#### Loading a Project from the E5070B/E5071B Measurement Screen

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

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

#### NOTE

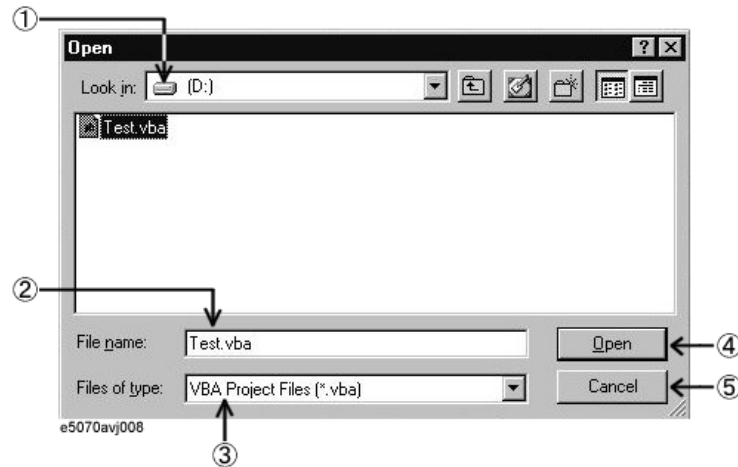
When the another project has already been loaded on the Visual Basic Editor, the message whether or not the current project is saved may appear. If you want to save the project, click **Yes** button to display a dialog box for saving (Figure 3-6 on page 42). For saving the project, see “Saving a Project” on page 42.

**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 E5070B/E5071B's VBA

### Loading a VBA Program

#### 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:

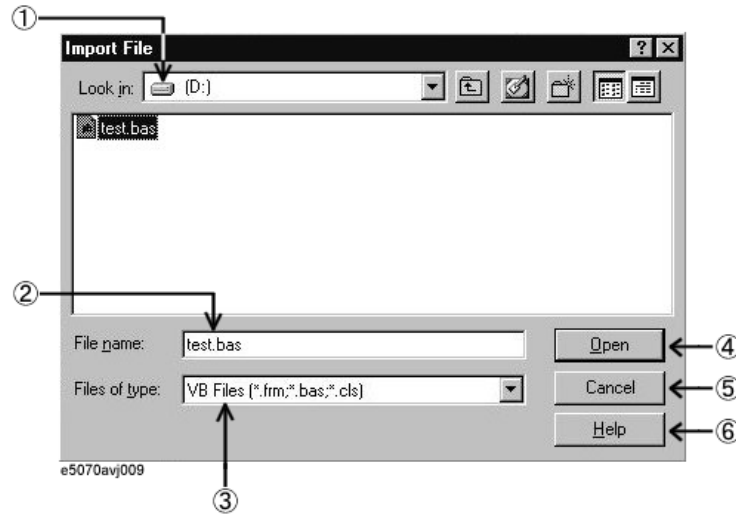
- On the **File** menu, click **Import File...**
- In Project Explorer (Figure 3-1), right-click the “VBAProject” icon, and click **Import File...**
- Press **[Ctrl] + [M]** on the keyboard.

**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 E5070B/E5071A provides 2 methods to execute a VBA program: executing a program that you previously loaded and loading and executing a program in a batch process. 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 previous loaded VBA program

The E5070B/E5071B allows you to run a previous loaded VBA program using one of the four methods listed below.

#### 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

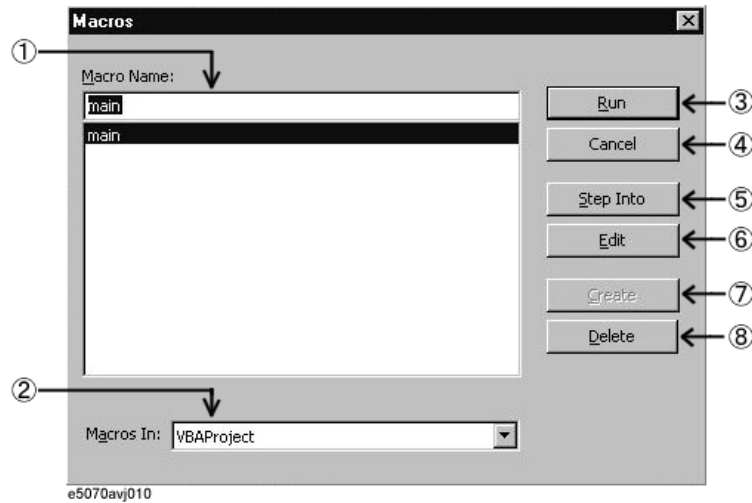
Doing the above steps with the cursor positioned within a procedure in the code window immediately runs the program without displaying the Macros dialog box.

**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 54.
- 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.

## Operation Basics of the E5070B/E5071B's VBA

### Running a VBA Program

#### Running a Program from the E5070B/E5071B Measurement Screen

The E5070B/E5071B allows you to run a program from E5070B/E5071B screen using one of the four methods listed below.

**Step 1.** Display the E5070B/E5071B measurement screen following the instructions given in “Switching to the E5070B/E5071B Measurement Screen” on page 32.

**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 36) and “**xxx**” is the procedure name.

- Press the **[Macro Run]** key on the E5070B/E5071B 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 E5070B/E5071B measurement screen, the E5070B/E5071B'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.

---

#### Loading and executing program in batch process

---

**NOTE**

This feature is available for E5070B/E5071B Rev. 3.5 or later.

This section describes how to load and execute a program (VBA project) in a batch process by pressing the softkey corresponding to the program name.

**Step 1.** Save the VBA program (VBA project file) into the following folder.

**D:\VBA**

---

**NOTE**

This feature is available only for programs saved in D:\VBA. This feature is not available for programs saved in subfolders of D:\VBA.

---

---

**NOTE**

When copying a VBA program to D:\VBA from another folder, copy all the files necessary to execute the program to appropriate folders. When copying a factory-installed VBA program into D:\VBA, choose only its VBA project file.

---

**Step 2.** Press **Macro Setup**

**Step 3.** Press **Load & Run**.

**Step 4.** Press the softkey corresponding to the VBA project file name of the program you want to execute. The pressed VBA project is loaded and the program whose procedure name is set to "Main" (subprogram enclosed between Sub Main() and End Sub) and whose object name (Name property as displayed in the property window) is set to "Module" is executed.

**NOTE**

There is no limit to the number of VBA project files that can be saved in D:\VBA. However, the maximum number of programs that can be displayed as softkeys is 50.

- File names of the VBA projects saved in D:\VBA are displayed as softkeys in alphabetical order.
- The maximum number of characters that can be displayed in a softkey is 12. If a file name has 13 or more characters, "..." is added to the 12th character from the beginning of the program name and displayed. In this case a .vba extension is omitted.

---

## 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).

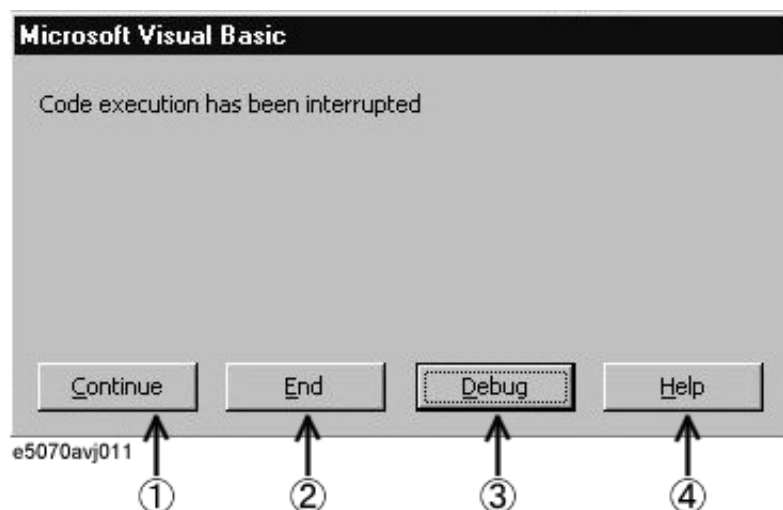
**Step 1.** To break the running VBA program, do one of the following:

- 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**(E5070B/E5071B measurement screen)
- Press the **[Macro Break]** key on the E5070B/E5071B 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**



## Operation Basics of the E5070B/E5071B's VBA

### Stopping a VBA Program

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 E5070B/E5071B 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 93.

---

## Using a Debug Tool

The E5070B/E5071B'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.

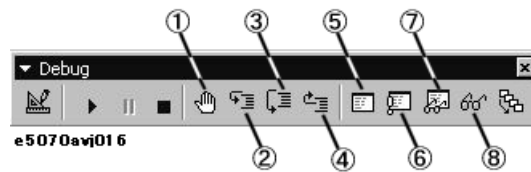
### Debug Toolbar

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.

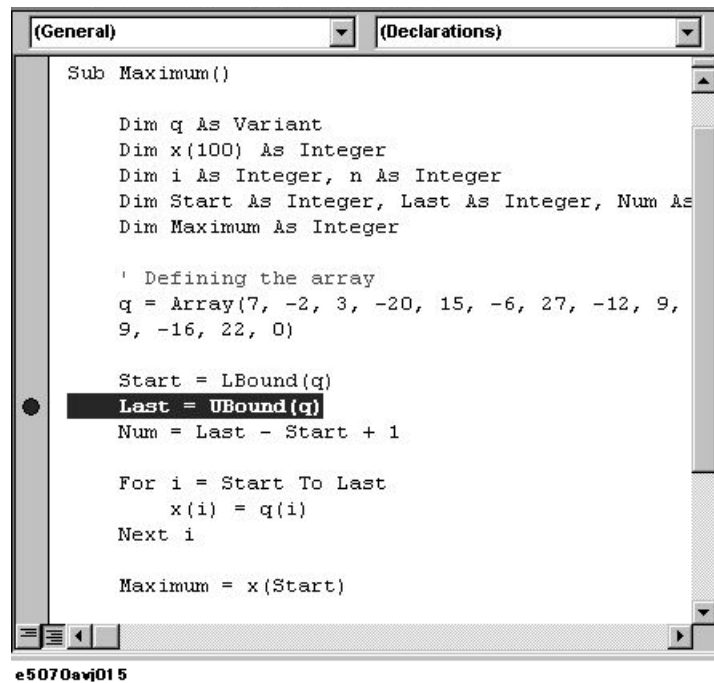
### Setting a Break Point

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

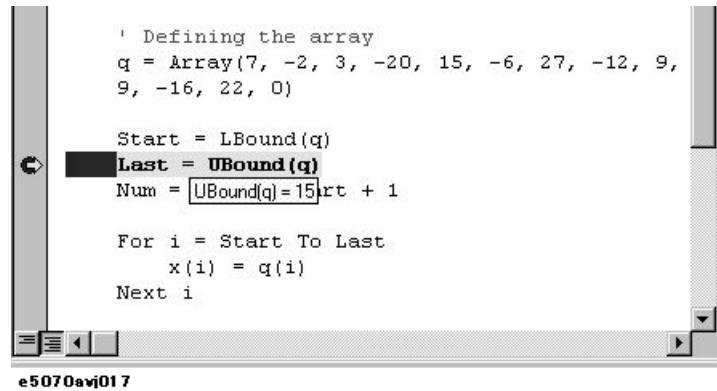
With your VBA program suspended, you can use the following debug tool to monitor variables or properties. To do this, you must set a break point, run the VBA program, and suspend it.

#### 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

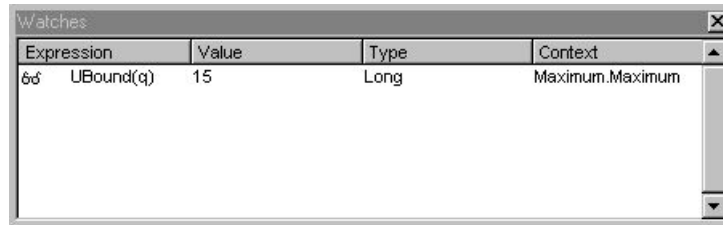


### Watch Window

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:

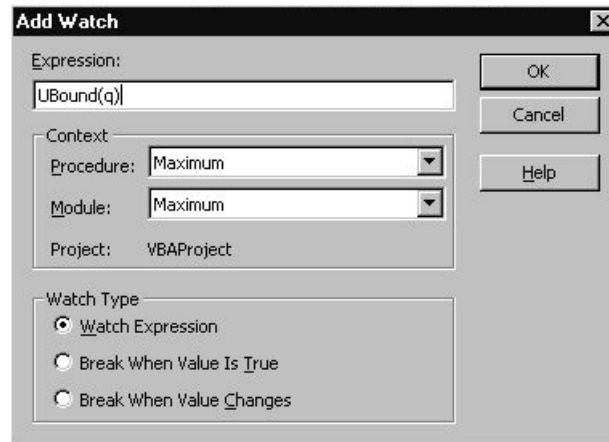
- On the **Debug** menu, click **Add Watch...**

**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



e5070avj020

### 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



e5070avi021

## Printing Output Values in the Echo Window

The echo window, which appears in the lower part of the E5070B/E5071B 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 171
- **SCPI.DISPlay.ECHO.DATA** on page 319

### 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 328
- **SCPI.DISPlay.TABLE.STATE** on page 327

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 319

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.

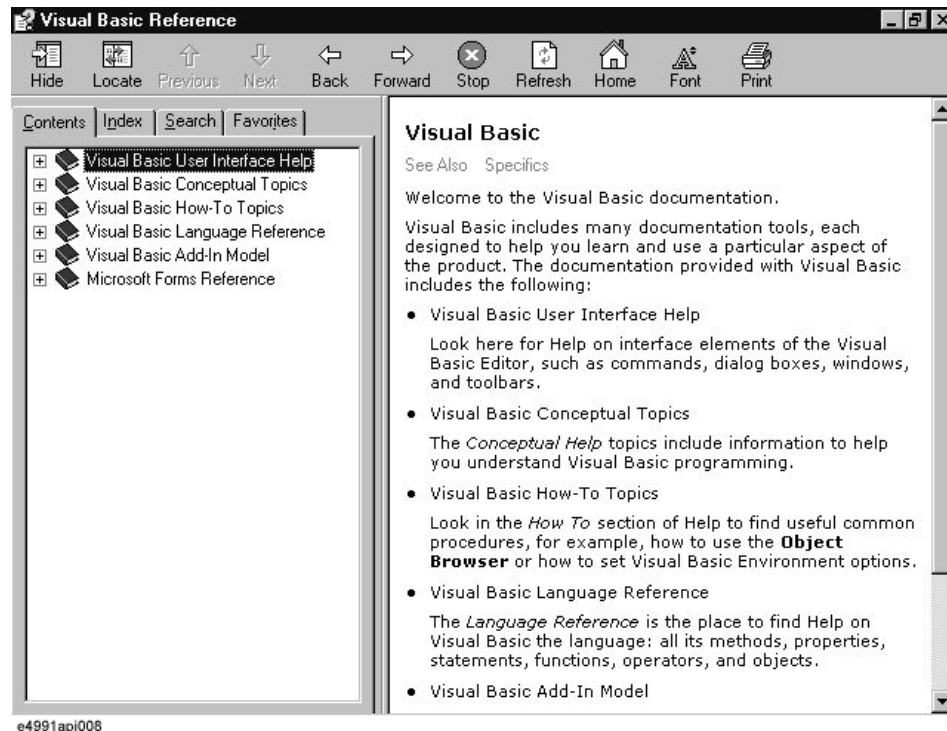
### Accessing VBA Online Help

**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





### Using the Contents Tab

**Step 1.** Clicking the **Contents** tab in the VBA Online Help screen brings up the items listed below. The E5070B/E5071B 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 E5070B/E5071B COM Objects

The E5070B/E5071B VBA environment provides COM objects that support controlling the E5070B/E5071B. When you are developing a program using E5070B/E5071B COM objects, you can access a list of E5070B/E5071B 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).

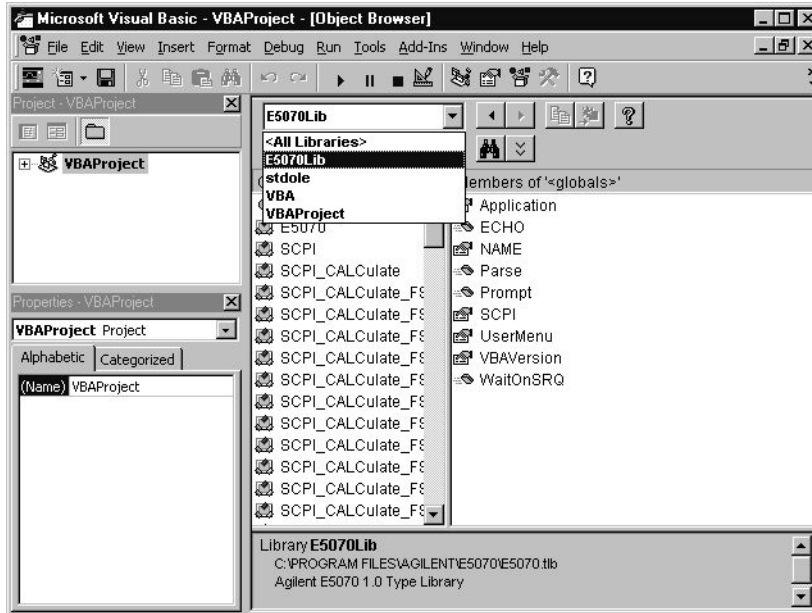
**Step 2.** Select **E5070Lib** from the Project/Library box to display the E5070B/E5071B library as shown in Figure 3-21.

#### NOTE

There are some COM objects NOT used in controlling with E5070B/E5071B VBA in the list of the E5070B/E5071B COM objects displayed on the Object Browser. The COM objects NOT used in controlling with E5070B/E5071B VBA are not described in the Chapter 7, “COM Object Reference,” on page 129.

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.

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.

---

Operation Basics of the E5070B/E5071B's VBA  
**Uses Advanced Techniques**

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**4**

## **Controlling the E5070B/E5071B**

This chapter describes how to use the E5070B/E5071B's VBA to control the E5070B/E5071B 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 *E5070B/E5071B 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 515 object.

### Using the Status Register

The status of the E5070B/E5071B 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 *E5070B/E5071B 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 *E5070B/E5071B 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 180

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 45.

---

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

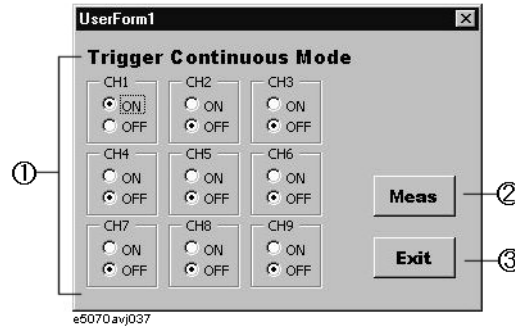
---

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

---

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 E5070B/E5071B 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 515 object, you can use the **SCPI.IEEE4882.OPC** on page 348 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 515 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 <b>SCPI.TRIGger.SEQUENCE.SINGLE</b> and <b>SCPI.IEEE4882.OPC</b> objects to suspend the program until the end of measurement.
mdlSingMeas	Standard module	Invokes a UserForm.

### NOTE

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

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 E5070B/E5071B 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 E5070B/E5071B'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 *E5070B/E5071B Programmer's Guide*.

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

- **SCPI.CALCulate(Ch).SELEcted.DATA.FDATA** on page 230
- **SCPI.CALCulate(Ch).SELEcted.DATA.FMEMORY** on page 231
- **SCPI.CALCulate(Ch).SELEcted.DATA.SDATA** on page 232
- **SCPI.CALCulate(Ch).SELEcted.DATA.SMEMORY** on page 233

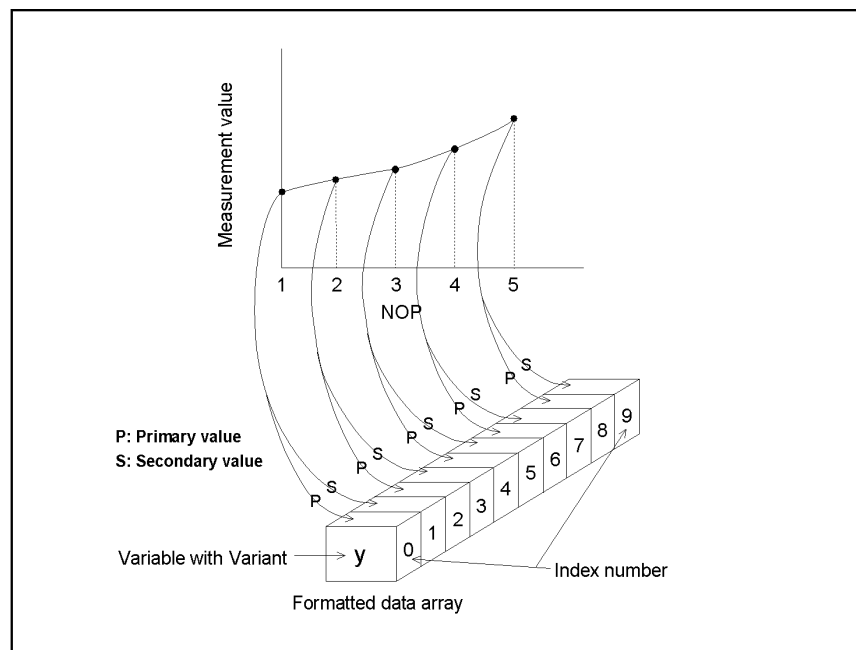
To read a c stimulus data array, use the following objects:

- **SCPI.SENSE(Ch).FREQuency.DATA** on page 431

The E5070B/E5071B 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 *E5070B/E5071B 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 E5070B/E5071B 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.

---

**NOTE**

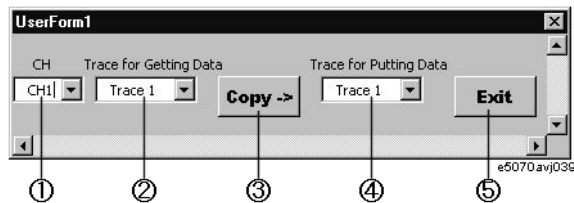
This sample program correctly runs when the maximum number of channels/traces is set 9 channels/9 traces.

---

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 E5070B/E5071B 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 E5070B/E5071B 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.

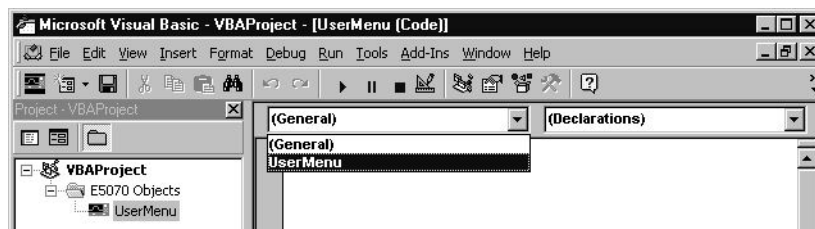
### Preparation for Using the User Menu Function

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 Key\_id As Long)** on page 177 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 79.

---

### 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(Key\_id).Caption** on page 175

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(Key\_id).Enabled** on page 176

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 177

---

#### NOTE

The above user menu setting is also preset by pressing **[Macro Setup] - Preset User Menu** on the E5070B/E5071B 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(Key\_id)** on page 178

## 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 E5070B/E5071B 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 E5070B/E5071B

### 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 E5070B/E5071B with GPIB by using the software (VISA library) installed in the E5070B/E5071B.

## Overview

The E5070B/E5071B macro function (E5070B/E5071B VBA) can be used not only to automate measurements but also to control external measurement instruments connected via USB/GPIB interface cable by acting as a self-contained system controller (see “An Overview of a Control System Based on the Macro Function” on page 25).

The E5070B/E5071B macro function (E5070B/E5071B VBA) performs communications via the COM interface when controlling the E5070B/E5071B itself, but it communicates via VISA (Virtual Instrument Software Architecture) when controlling external measurement instruments.

To control peripherals connected to the E5070B/E5071B via USB/GPIB interface cable, the following preparation is required.

## Preparation

### Importing Definition Files

To use the VISA library in the E5070B/E5071B macro (E5070B/E5071B 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 43).

- visa32.bas
- vpptype.bas

## Programming with VISA

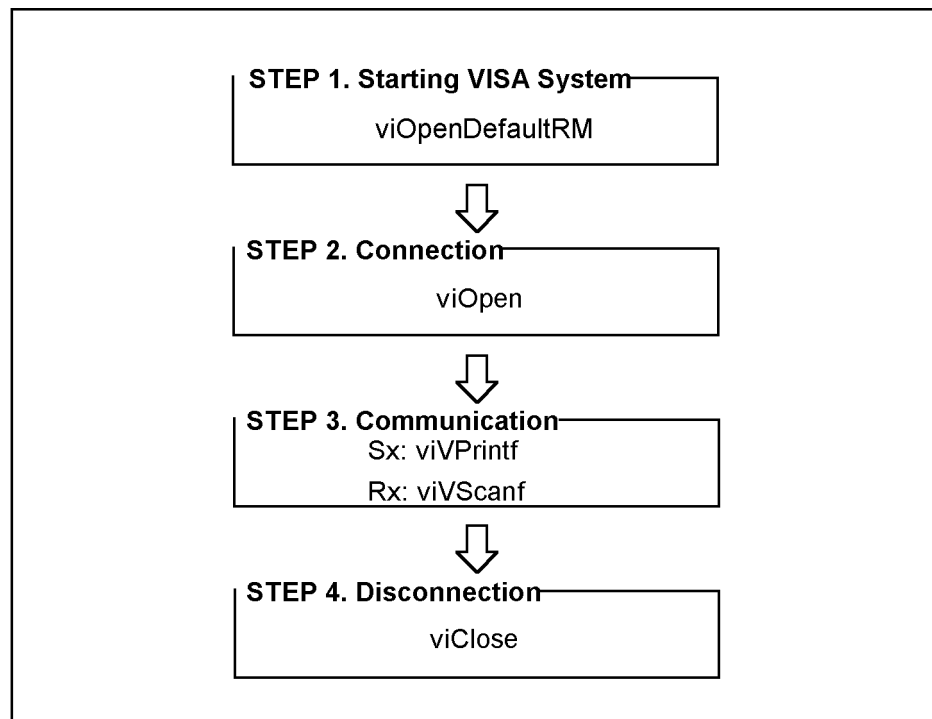
Figure 5-1 shows the flow of controlling the instrument with VISA. When developing a VISA program in the Visual Basic language, a special programming notice (in the readme text file listed below) must be reviewed.

For details on the use of the VISA library and the programming notice for using the VISA library with the E5070B/E5071B macro (E5070B/E5071B 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> ] <sup>*1</sup> :: <i>primary address</i> <sup>*2</sup> ::INSTR

\*1. GPIB0 for the E5070B/E5071B.

\*2. The GPIB address of the instrument controlled by the E5070B/E5071B.

	<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) <sup>*1</sup>
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 <sup>*1</sup>
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 USB/GPIB interface cable using the E5070B/E5071B 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 E5070B/E5071B VBA, use the GPIB commands provided for the instrument to communicate over VISA. On the other hand, when you control the E5070B/E5071B itself from E5070B/E5071B VBA, use the COM objects provided for the E5070B/E5071B 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 USB/GPIB interface cable using 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 E5070B/E5071B. 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.

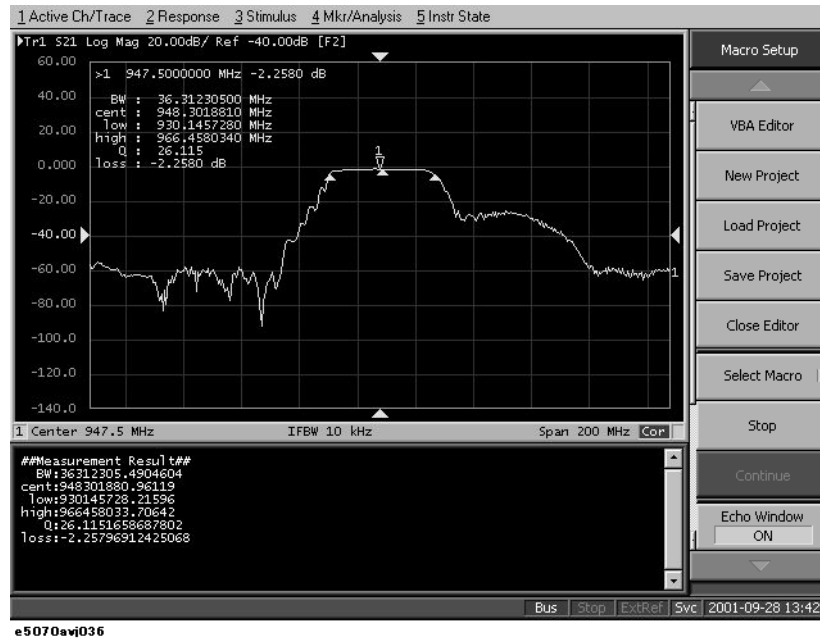
#### NOTE

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 E5070B/E5071B 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

### Basic measurement (measuring a band-pass filter)

- 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

### Basic measurement (measuring a band-pass filter)

```
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 E5070B/E5071B
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 cali
bration.", vbOKCancel, "Full" & SoltType & "-port calibration")
1270|
1280| If Buff = vbCancel Then

```

## Application Programs

### Basic measurement (measuring a band-pass filter)

```
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)) & ".", _
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)) & ".", _
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)) & ".", _
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 Por
t " & 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.THROUGH = Array(Port(I - 1
), Port(J - 1))
1790|                 Dmy = SCPI.IEEE4882.OPC
1800|
SCPI.SENSE(Chan).CORRection.COLLECT.ACQUIRE.THROUGH = 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" & Solt
Type & "-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 E5070B/E5071B with Option 213 or 214 (2-port S-parameter test set), a runtime error occurs because there are parameters that it cannot measure.

---

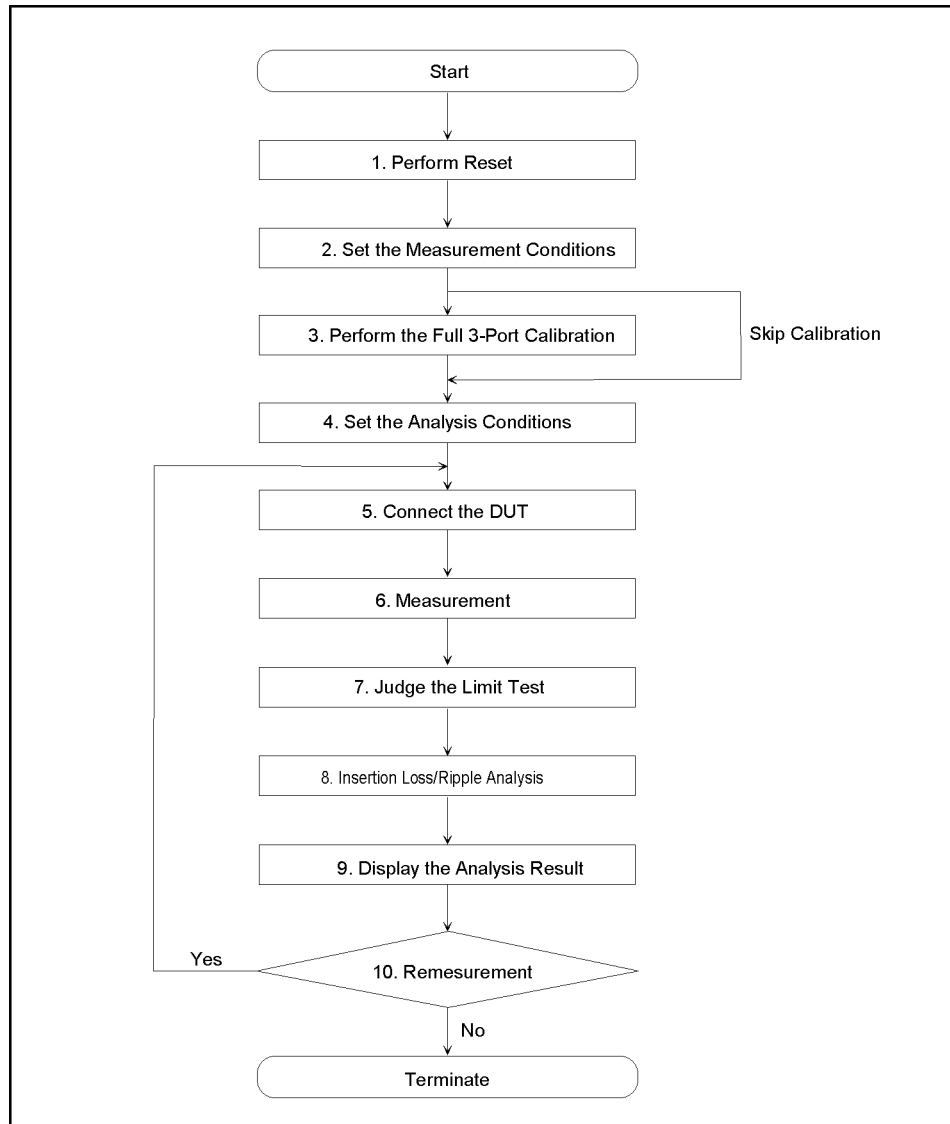
Object name	Module type	Description
frmDupRes	User form	Displays the analysis result.
mdlDupMeas	Standard module	Performs duplexer measurement.

### 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.

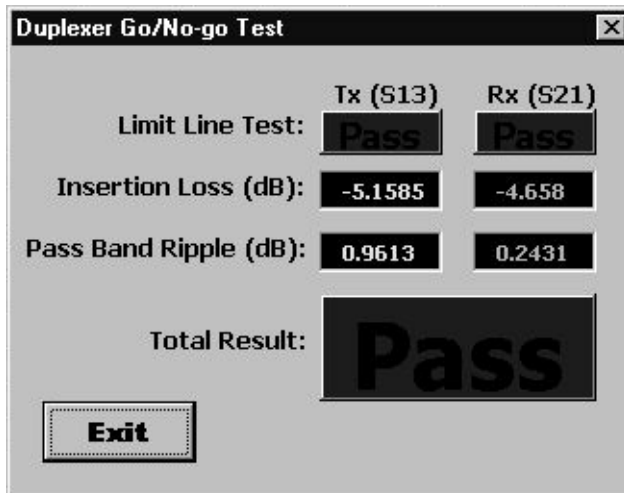
Then, the limit line is set and the setting required for the limit test judgment is performed.

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 E5070B/E5071B 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 93 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

### Measuring a multi-port device

- 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 93.

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

### Measuring a multi-port device

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 ( $\text{Test\_Tr1} = 2$ ), 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 ( $\text{Test\_Tr1} \neq 2$ ), 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 ( $\text{Test\_Tr2} = 4$ ), 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 ( $\text{Test\_Tr2} \neq 4$ ), 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 ( $\text{Test\_Ch1} = 2$ ), 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 ( $\text{Test\_Ch1} \neq 2$ ), 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 E5070B/E5071B
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

### Measuring a multi-port device

```
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 seg
ment 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 calib
ration.", 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 " & CS
tr(Port(I - 1)) & ".", vbOKCancel, "Full" & SoltType & "-port calibr
ation")

```

## Application Programs

### Measuring a multi-port device

```
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 " & C
Str(Port(I - 1)) & ".", vbOKCancel, "Full" & SoltType & "-port calib
ration")
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 " & CS
tr(Port(I - 1)) & ".", vbOKCancel, "Full" & SoltType & "-port calibr
ation")
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 Por
t " & CStr(Port(I - 1)) & " and Port " & CStr(Port(J - 1)) & ".", vb
OKCancel, "Full" & SoltType & "-port calibration")
2070|             If Buff = vbOK Then
2080|
SCPI.SENSE(Chan).CORRection.COLLECT.ACQUIRE.THRU = Array(Port(I -
1), Port(J - 1))
2090|                 Dmy = SCPI.IEEE4882.OPC
2100|
SCPI.SENSE(Chan).CORRection.COLLECT.ACQUIRE.THRU = 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

### Measuring a multi-port device

```
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|       ")
3580|       frmDupRes.txtIlossS21.Text = Format(IlossRx(0), "0.####
3590|       ")
3600|       frmDupRes.txtRipS13.Text = Format(RipTx, "0.####")
3610|       frmDupRes.txtRipS21.Text = Format(RipRx, "0.####")
3620| End Sub
```

## Measurement using E5091A (measuring FEM)

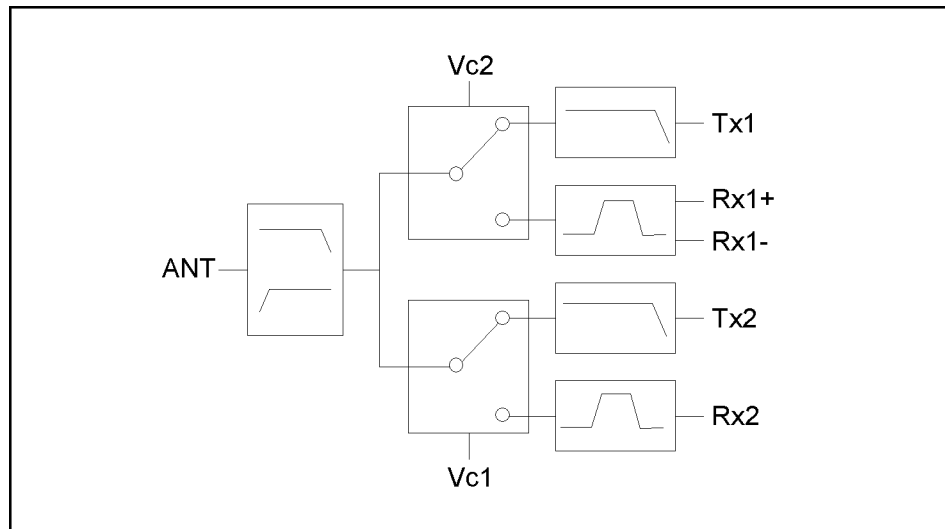
Example 6-3 shows a sample program of front end module (FEM) measurement as a sample program of measurement using the E5091A. You can find the source file of this program, named `apl_fem.vba`, on the sample program disk.

**NOTE**

For the E5070B/E5071B 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.

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.



e5070buj073

When you start the program, “Connect A and T1 to ECal Module.” is displayed. Connect the cables connected to A and T1 of the E5091A to the ECal module and 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.

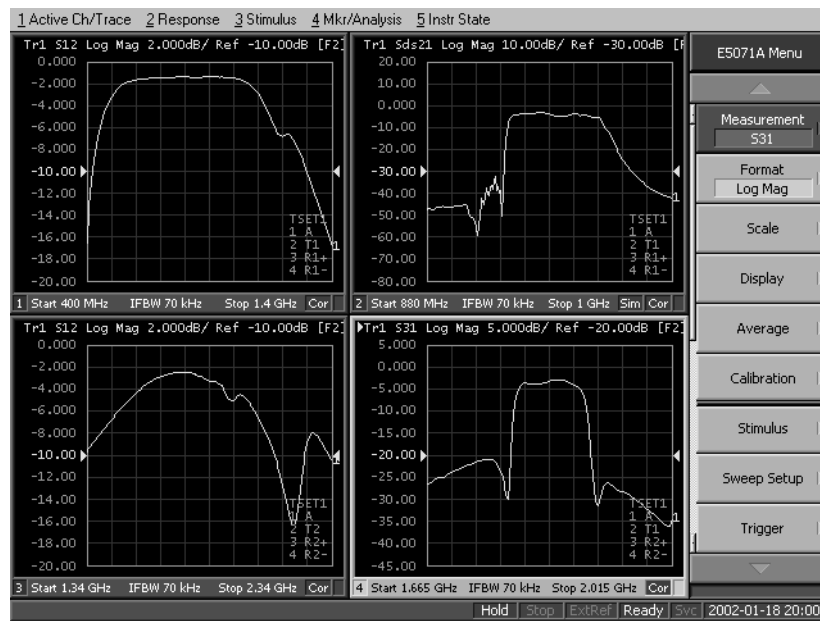
When the calibration is complete, “Set DUT.” is displayed. Connect the DUT (FEM) and the E5091A as shown below and click the **OK** button to start the measurement.

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  
**Measurement using E5091A (measuring FEM)**

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.

## Measurement using E5091A (measuring FEM)

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|  '
370|  Freq_star(0) = 400000000# '[Ch1]   ' 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.PPOR
ts = Tpl(Ch - 1)
940| SCPI.CALCulate(CH).FSIMulator.BALun.PARAMeter(1).STATE = Tr
ue
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

### Measurement using E5091A (measuring FEM)

```
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
```

## Executing Power Calibration

Example 6-4 shows a sample program (VBA program) to execute power calibration using the E4418B power meter and the E4412A power sensor. You can find the source file of this program, named pow\_cal.vba, on the sample program disk. This VBA program consists of the following modules:

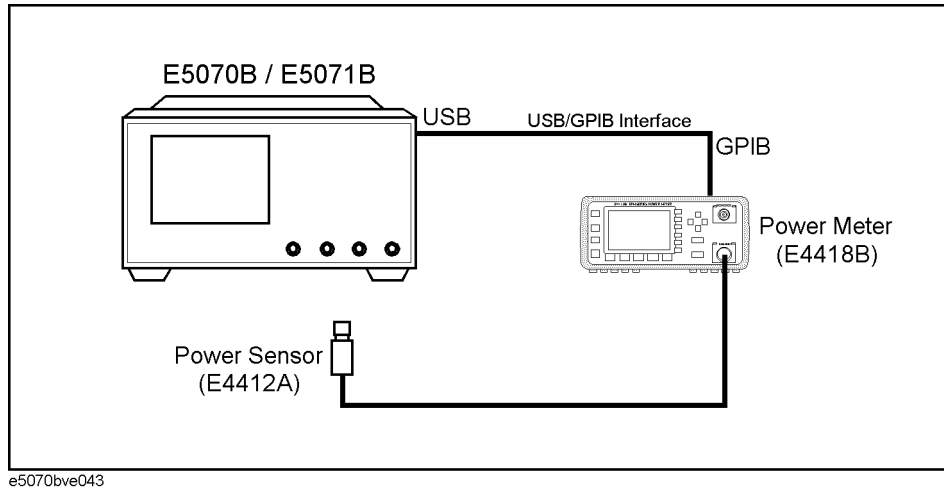
Object name	Module type	Description
mdlPowCal	Standard module	Executes power calibration.
Module1	Standard module	The definition files when using the VISA library.
Module2		

### Program overview

The program connects the E5070B/E5071B and the E4418B (GPIB address: 13) through the USB/GPIB interface as shown in Figure 6-5 and then executes the zero adjustment and calibration of the power sensor (E4412A) connected to the power meter (E4418B) as necessary. Then, it executes the power calibration of the E5070B/E5071B and saves the obtained power calibration data array into a file.

Figure 6-5

Connection between E5070B/E5071B and power meter



## Program description

When you run this VBA program, reset is performed, the GPIB address of the power meter to be controlled and the measurement conditions of the E5070B/E5071B are set, and a message “Do you perform zeroing and calibrating the power meter on channel A?” is displayed. If you want to execute the zero adjustment and the calibration of the power sensor, click the **Yes** button; to skip them, click the **No** button.

If you want to execute the zero adjustment and calibration of the power sensor, follow the displayed messages to connect the power sensor connected to the A channel of the power meter to the POWER RF port of the power meter and click the **OK** button. When the zero adjustment and calibration of the power sensor is complete, a message “Zeroing and calibrating the power sensor is complete.” is displayed.

When a message that prompts you to connect the power sensor to port 1 of the E5070B/E5071B is displayed, make the connection and then click the **OK** button. The power calibration data measurement is executed immediately and the obtained power calibration data array is saved in a file named "CORR\_DATA."

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

- Lines 100 to 150    Assigns the sweep type (power sweep), the number of points (41), the power range (-20 to +12 dBm), the sweep start value (-20 dBm), the sweep stop value (-10 dBm), and the fixed frequency (1 GHz) to the Swp\_type, Nop, Pow\_rang, Start\_p, Stop\_p, and Cw\_freq variables, respectively.
- Lines 160 to 170    Assigns the number of power calibration data measurements for each measurement point (4) and the limit value of the power calibration data array (10 dBm) into the Num\_avg and Limit variables, respectively.
- Line 200            Returns the E5070B/E5071B to the preset state.
- Line 230            Sets the power meter's GPIB address (13) in the E5070B/E5071B.
- Lines 260 to 310    For channel 1, assigns the sweep type to the Swp\_type variable, the number of points to the Nop variable, the power range to the Pow\_rang variable, the sweep start value to the Start\_p variable, the sweep stop value to the Stop\_p variable, and the fixed frequency to the Cw\_freq variable.
- Lines 340 to 370    Displays a message asking you whether to execute the zero adjustment and calibration of the power sensor. If the **Yes** button is clicked, calls the procedure: Control\_PowerMeter (Line 900 to Line 1340). For information on the Control\_PowerMeter procedure, see the description later. On the other hand, if the **No** button is clicked, skips the zero adjustment and calibration of the power sensor.
- Lines 410 to 420    Clears the error queue. Then, prompts you to connect the power sensor to port 1 of the E5070B/E5071B and waits for clicking the **OK** button after the connection.

## Application Programs

### Executing Power Calibration

- Lines 450 to 470 For port 1 of channel 1, sets the number of power calibration data measurements for each measurement point to the Num\_avg variable and then starts the measurement of the power calibration data and waits for the completion of the measurement.
- Line 500 Reads out an error that has occurred in the E5070B/E5071B during the measurement of the power calibration data and sets it in the Err variable.
- Lines 510 to 590 If no error has occurred, reads out the power calibration data array and sets it in the Corr\_data variable. In addition, uses the Limit\_Test function to check whether the read out power calibration data array exceeds the specified limit value. If the limit value is exceeded, the return value of the Limit\_Test function, False, is returned. Then, displays a message asking you whether to perform the power calibration again. Click the **Yes** button to return to the start of the power calibration data measurement. Click the **No** button to terminate the program. For information on the Limit\_Test function (Line 1360 to Line 1530), see the description later.
- Lines 610 to 660 If an error occurs, displays an error message and a message asking you whether to execute the power calibration again. Click the **Yes** button to return to the start of the power calibration data measurement. Click the **No** button to terminate the program.
- Lines 690 to 790 Writes the read out power calibration data array into a file named "CORR\_DATA." Then, displays a message that notifies you that saving into a file is successfully complete.
- Procedure: Control\_PowerMeter (lines 900 to 1340).
- Lines 990 to 1000 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 1260 to 1300).
- Lines 1030 to 1040 Establishes the connection to the power meter in use (GPIB address: 13) and outputs the connection information to the E4418 variable. During this process, if an error occurs, the program goes to the error handling routine (Lines 1260 to 1300).
- Lines 1070 to 1090 Returns the power meter to the preset state through VISA and clears the status byte register and the standard event status register. Then, enables the standard event status register's bit 0.
- Line 1100 Prompts you to connect the power sensor to the POWER REF port of the power meter and waits for clicking the **OK** button after the connection.
- Lines 1110 to 1120 Executes the zero adjustment and calibration of the power sensor through VISA. Makes the setting so that 1 is set to bit 0 of the standard event status register when all pending operations are complete.

- Lines 1130 to 1190 Retrieves the value of the status byte register through VISA and sets it into the Rgst variable. Sets the AND of the read-out value and 32 (the value in which only bit 5 is 1) into the Rslt variable and displays a message that notifies you that the zero adjustment and calibration of the power sensor is complete when Rslt becomes 1 (when the zero adjustment and calibration of the power sensor is complete).
- Line 1220 Breaks the communication and terminates the VISA system.
- Lines 1260 to 1300 If an error occurs in a VISA function, displays the detail of the error and terminates the program.
- Function: Limit\_Test (Lines 1360 to 1530)
- Lines 1420 to 1470 If the absolute value of the read out power calibration data array exceeds the specified limit value, turns off the power calibration function and returns the value of False. Otherwise, returns the value of True.

**Example 6-4**

**Measurement of power calibration (object name: mdlPowCal)**

```

10| Sub Main()
20|
30|   Dim Swp_type As String, File As String
40|   Dim Start_p As Double, Stop_p As Double, Cw_freq As Double, Limit As Double
50|   Dim Nop As Long, Pow_rang As Long, Num_avg As Long, Data_size As Long, Buff As Long, Dmy As Long
60|   Dim Corr_data As Variant, Err As Variant
70|   Dim Verifier As Boolean
80|   Dim FileNo As Integer, I As Integer
90|
100|   Swp_type = "POW"           'Sweep type           : POWER
110|   Nop = 41                   'Number of points      : 41
120|   Pow_rang = 0               'Power range           : -20 to +12
dBm
130|   Start_p = -20#            'Start power           : -20 dBm
140|   Stop_p = -10#             'Stop power            : -10 dBm
150|   Cw_freq = 1000000000#     'CW frequency          : 1 GHz
160|   Num_avg = 4               'Number of averaging   : 4
170|   Limit = 10#              'limit for corrected data : 10 dBm
180|
190|   '''Presetting the E5070/71B
200|   SCPI.SYSTem.PRESet
210|
220|   '''Setting GPIB address of the power meter to E5070/71B
230|   SCPI.SYSTem.COMMunicate.GPIB.PMETer.address = 13
240|
250|   '''Setting measurement conditions
260|   SCPI.SENSE(1).SWEep.TYPE = Swp_type
270|   SCPI.SENSE(1).SWEep.POINTs = Nop
280|   SCPI.Source(1).POWER.ATTenuation.DATA = Pow_rang
290|   SCPI.Source(1).POWER.STARt = Start_p
300|   SCPI.Source(1).POWER.STOP = Stop_p
310|   SCPI.SENSE(1).FREQuency.CW = Cw_freq
320|
330|   '''Performing a calibration in the power meter
340|   Buff = MsgBox("Do you perform zeroing and calibrating the power sensor?", vbYesNo, "Power meter calibration")
350|   If Buff = vbYes Then
360|       Control_PowerMeter
370|   End If

```

## Application Programs

### Executing Power Calibration

```
380|
390| Meas_Start:
400|   '''Connecting the power sensor to the port 1 in the E5070/71B
410|   SCPI.IEEE4882.CLS
420|   MsgBox "Set the power sensor connected to the port 1 in the E507
0/71B.", vbOKOnly, "Power meter calibration"
430|
440|   '''Performing power calibration measurement
450|   SCPI.Source(1).POWER.PORT(1).CORRection.COLlect.AVERAge.count =
Num_avg
460|   SCPI.Source(1).POWER.PORT(1).CORRection.COLlect.ACQuire = "ASEN
"
470|   Dmy = SCPI.IEEE4882.OPC
480|
490|   '''Error handling at power meter calibration
500|   Err = SCPI.SYSTem.Error
510|   If Err(0) = 0 Then
520|     Corr_data = SCPI.Source(1).POWER.PORT(1).CORRection.DATA
530|     Verifier = Limit_Test(Nop, Limit, Corr_data)
540|     If Verifier = False Then
550|       Buff = MsgBox("Do you perform the power meter calibration me
asurement again?", vbYesNo, "Power meter calibration")
560|       If Buff = vbYes Then GoTo Meas_Start
570|       If Buff = vbNo Then GoTo Prog_Stop
580|     End If
590|     MsgBox "Power meter calibration measurement is complete.", vbO
KOnly, "Power meter calibration"
600|
610|   Else
620|     MsgBox "Error: " & Err(1)
630|     Buff = MsgBox("Do you perform the power meter calibration meas
urement again?", vbYesNo, "Power meter calibration")
640|     If Buff = vbYes Then GoTo Meas_Start
650|     If Buff = vbNo Then GoTo Prog_Stop
660|   End If
670|
680|   '''Installing the corrected data to a file
690|   FileNo = FreeFile
700|   File = "CORR_DATA"
710|
720|   Open File For Output As FileNo
730|
740|   For I = 0 To Nop - 1
750|     Write #FileNo, Val(Corr_data(I))
760|   Next I
770|   Close #FileNo
780|
790|   MsgBox "Installing the corrected data to the file is DONE.", vbO
KOnly, "Power meter calibration"
800|
810|   GoTo Prog_End
820|
830| Prog_Stop:
840|   MsgBox "Program Interruption", vbOKOnly, "Power meter calibratio
n"
850|
860| Prog_End:
870|
880| End Sub
890|
900| Private Sub Control_PowerMeter()
910|
920|   Dim Status As Long           'VISA function status return
930|   Dim Defrm As Long           'Session to default resource code
```



```

940| Dim E4418 As Long           'Session to power meter
950| Dim Rslt As Integer
960| Dim Rgst As String * 10
970|
980| '''Initializing the VISA system
990| Status = viOpenDefaultRM(Defrm)
1000| If (Status <> VI_SUCCESS) Then GoTo VisaErrorHandler
1010|
1020| '''Opening the session to the power meter
1030| Status = viOpen(Defrm, "GPIB0::13::INSTR", 0, 0, E4418)
1040| If (Status <> VI_SUCCESS) Then GoTo VisaErrorHandler
1050|
1060| '''Zeroing and calibrating the power meter
1070| Status = viVPrintf(E4418, "SYST:PRES" & Chr$(10), 0)
1080| Status = viVPrintf(E4418, "*CLS" & Chr$(10), 0)
1090| Status = viVPrintf(E4418, "*ESE 1" & Chr$(10), 0)
1100| MsgBox "Set the power sensor connected to the POWER REF port in
the power meter.", vbOKOnly, "Power meter calibration"
1110| Status = viVPrintf(E4418, "CAL1:ALL" & Chr$(10), 0)
1120| Status = viVPrintf(E4418, "*OPC" & Chr$(10), 0)
1130| Do While Rslt = 0
1140| Status = viVPrintf(E4418, "*STB?" & Chr$(10), 0)
1150| Status = viVScanf(E4418, "%t", Rgst)
1160| Rslt = CInt(CInt(Rgst) And 32)
1170| Loop
1180|
1190| MsgBox "Zeroing and Calibrating the power sensor is complete.",
vbOKOnly, "Power meter calibration"
1200|
1210| '''Closing the resource manager session
1220| Call viClose(Defrm)
1230|
1240| GoTo Prog_End
1250|
1260| VisaErrorHandler:
1270| Dim VisaErr As String * 200
1280| Call viStatusDesc(Defrm, Status, VisaErr)
1290| MsgBox "Error : " & VisaErr, vbExclamation
1300| End
1310|
1320| Prog_End:
1330|
1340| End Sub
1350|
1360| Function Limit_Test(Nop As Long, Limit As Double, Corr_data As Var
iant) As Boolean
1370|
1380| Dim I As Integer
1390|
1400| For I = 0 To Nop - 1
1410|
1420| If Abs(Corr_data(I)) > Limit Then
1430| SCPI.Source(1).POWER.PORT(1).CORRection.STATe = False
1440| MsgBox "The corrected data is out of limit!", vbExclamation,
"Power meter calibration"
1450| Limit_Test = False
1460| Exit Function
1470| End If
1480|
1490| Next I
1500|
1510| Limit_Test = True
1520|
1530| End Function
    
```

## Connecting Hard Disk (Shared Folder) of External PC

Example 6-5 shows a sample program (VBA program) that demonstrates how to connect a hard disk (a shared folder) of an external PC to the E5070B/E5071B. You can find the source file of this program, named “map\_drive.vba”, on the sample program disk. This VBA program consists of the following modules:

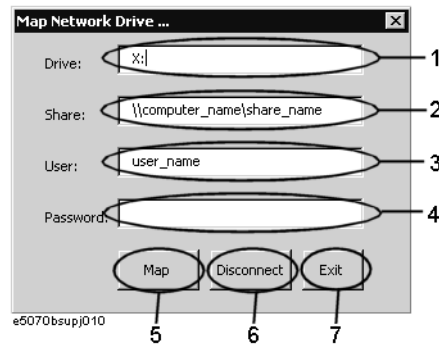
Object name	Module type	Description
frmMapDrive	User form	Connects or disconnects a hard disk.
Module1	Standard module	Displays frmMapDrive.

### Using VBA program

**Step 1.** Load the map\_drive.vba and press **[Macro Run]**. The following macro appears.

Figure 6-6

Shared folder connection macro



### Step 2. Connecting (Mapping)

Enter the drive letter for the shared folder (1 in Figure 6-6), the share name of the shared folder (2 in Figure 6-6), the user name (3 in Figure 6-6) and the password (4 in Figure 6-6) in the external PC. And then click the **Map** button (5 in Figure 6-6).

#### NOTE

Consult your network administrator and enter the settings in the same way as the Windows 2000® PC. If you enter an incorrect setting, an error occurs and the program is interrupted.

### Disconnecting

Enter the drive letter for the shared folder (1 in Figure 6-6), and then click the **Disconnect** button (6 in Figure 6-6).

**Step 3.** Click the **Exit** button (7 in Figure 6-6) to exit from the program.

## Description of operation in VBA program

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

### Sub CommandButton1\_Click

This procedure is called when the user clicks the **Map** button. This procedure checks if the drive letter is used using the IsDriveNameInUse procedure. And then this procedure connects the shared folder using the MapDrive procedure if the drive letter is not used, or displays a message to show the drive letter is used if the drive letter is used.

### Sub CommandButton2\_Click

This procedure is called when the user clicks the **Disconnect** button. This procedure disconnects the shared folder using the DisconnectDrive procedure.

### Function IsDriveNameInUse

This procedure checks if the txtDrive.Text (the drive letter specified by 1 in Figure 6-6) is used.

### Sub MapDrive

This procedure connects the shared folder as the txtDrive.Text (the drive letter specified by 1 in Figure 6-6) drive using the parameters: txtShare.Text (the share name specified by 2 in Figure 6-6), txtUser.Text (the user name specified by 3 in Figure 6-6), and txtPasswd.Text (the password specified by 4 in Figure 6-6).

### Sub DisconnectDrive

This procedure disconnects the txtDrive.Text (the drive letter specified by 1 in Figure 6-6) drive.

### Sub CommandButton3\_Click

This procedure is called when the user clicks the **Exit** button. This procedure ends the program.

## Application Programs

### Connecting Hard Disk (Shared Folder) of External PC

#### Example 6-5

#### Connecting a hard disk of external PC (Object name: frmMapDrive)

```
Private Sub CommandButton1_Click()
    If Not IsDriveNameInUse Then
        Call MapDrive
    Else
        MsgBox "Drive "" & txtDrive.Text & "" is Already used", vb
Critical
    End If
End Sub

Private Sub CommandButton2_Click()
    Call DisconnectDrive
End Sub

Private Function IsDriveNameInUse() As Boolean
    Set fso = CreateObject("Scripting.FileSystemObject")
    IsDriveNameInUse = fso.DriveExists(txtDrive.Text)
End Function

Private Sub MapDrive()
    Set network = CreateObject("wscript.network")
    Call network.MapNetworkDrive(txtDrive.Text, txtShare.Text, vbFal
se, txtUser.Text, txtPasswd.Text)
End Sub

Private Sub DisconnectDrive()
    Set network = CreateObject("wscript.network")
    network.RemoveNetworkDrive txtDrive.Text
End Sub

Private Sub CommandButton3_Click()
    Unload Me
End Sub
```

---

**7****COM Object Reference**

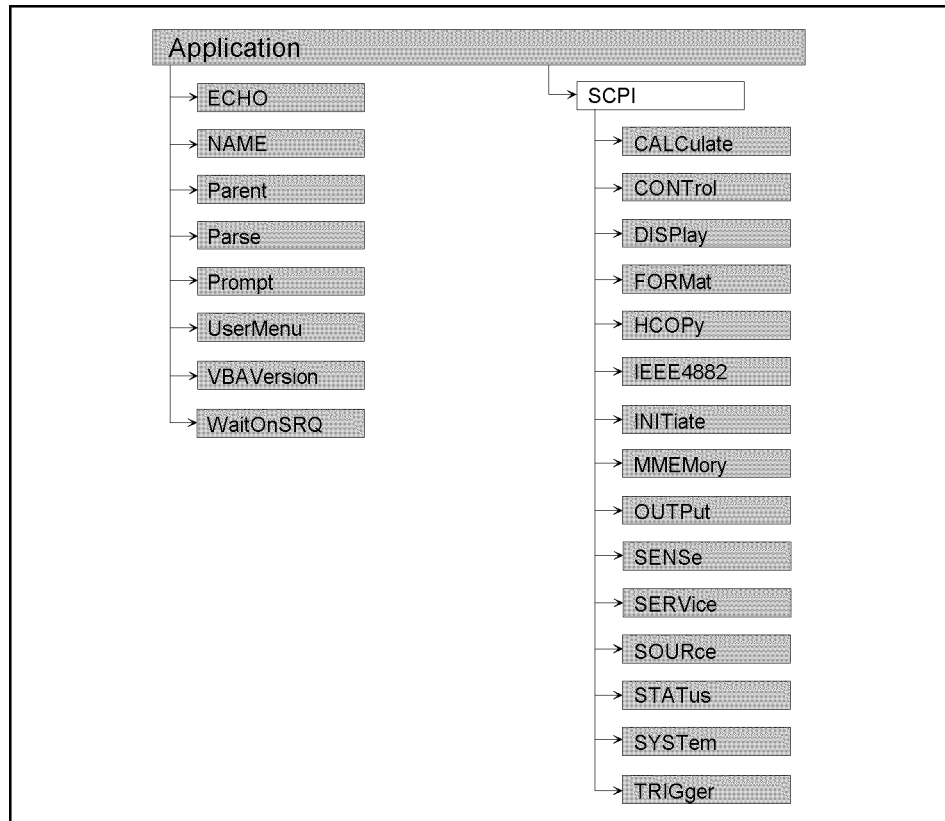
This chapter describes the COM object model of the Agilent E5070B/E5071B and the COM object reference in alphabetical order. If you want to look up COM objects by their function, see “COM object list by function.”

## COM Object Model

The COM objects provided for the E5070B/E5071B are structured hierarchically as shown in Figure 7-1.

Figure 7-1

E5070B/E5071B COM object model



e5070bvj012

## Application Objects

The Application objects are at the top of the hierarchy of the E5070B/E5071B 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 130.

## SCPI Objects

The SCPI objects are created to realize the SCPI commands of the E5070B/E5071B with the COM interface. For information on the basic use of the SCPI objects, see “SCPI Objects” on page 131.

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 E5070B/E5071B COM objects by function**

Function	Item to be set/executed			COM Object	
Measurement Conditions	Preset			SCPI.IEEE4882.RST on page 349 SCPI.SYSem.PRESet on page 510	
	Selects active channel.			SCPI.DISPlay.WINDow(Ch).ACTivate on page 329	
	Checks active channel.			SCPI.SERvice.CHANnel.ACTive on page 455	
	Selects active trace.			SCPI.CALCulate(Ch).PARAmeter(Tr).SELEct on page 225	
	Checks active trace.			SCPI.SERvice.CHANnel(Ch).TRACe.ACTive on page 456	
	Number of traces			SCPI.CALCulate(Ch).PARAmeter.COUNT on page 223	
	Measurement parameter			SCPI.CALCulate(Ch).PARAmeter(Tr).DEFine on page 224	
	Data format			SCPI.CALCulate(Ch).SELEcted.FORMat on page 241	
	On/Off of the stimulus signal output			SCPI.OUTPUT.STATe on page 376	
	Power level	Power level for all port		SCPI.SOURce(Ch).POWER.LEVel.IMMEdiate. AMPLitude on page 460	
		Power level for each port		SCPI.SOURce(Ch).POWER.PORT(Pt).LEVel.IMMEdiate. AMPLitude on page 474	
		On/Off of port coupling		SCPI.SOURce(Ch).POWER.PORT.COUPLE on page 473	
	Power range			SCPI.SOURce(Ch).POWER.ATTenuation.DATA on page 458	
	Power slope	On/Off		SCPI.SOURce(Ch).POWER.LEVel.SLOPe.STATe on page 462	
		Coefficient		SCPI.SOURce(Ch).POWER.LEVel.SLOPe.DATA on page 461	
	Fixed frequency (CW frequency)			SCPI.SENSE(Ch).FREQuency.CW on page 430 SCPI.SENSE(Ch).FREQuency.FIXed on page 432	
	Sweep	Range	Frequency sweep	Start	SCPI.SENSE(Ch).FREQuency.START on page 434
				Stop	SCPI.SENSE(Ch).FREQuency.STOP on page 435
				Center	SCPI.SENSE(Ch).FREQuency.CENTer on page 429
				Span	SCPI.SENSE(Ch).FREQuency.SPAN on page 433
Power sweep			Start	SCPI.SOURce(Ch).POWER.START on page 476	
			Stop	SCPI.SOURce(Ch).POWER.STOP on page 477	
			Center	SCPI.SOURce(Ch).POWER.CENTer on page 459	
			Span	SCPI.SOURce(Ch).POWER.SPAN on page 475	
Number of measurement points			SCPI.SENSE(Ch).SWEep.POINts on page 451		
Time		Turns on/off the automatic setting.		SCPI.SENSE(Ch).SWEep.TIME.AUTO on page 452	
		Sets sweep time.		SCPI.SENSE(Ch).SWEep.TIME.DATA on page 453	
Delay time			SCPI.SENSE(Ch).SWEep.DELay on page 449		
Type			SCPI.SENSE(Ch).SWEep.TYPE on page 454		
sweep mode			SCPI.SENSE(Ch).SWEep.GENERation on page 450		
Segment sweep	Edits the table.			SCPI.SENSE(Ch).SEGMENT.DATA on page 445	
	Reads total number of measurement points.			SCPI.SENSE(Ch).SEGMENT.SWEep.POINts on page 447	
	Reads total sweep time.			SCPI.SENSE(Ch).SEGMENT.SWEep.TIME.DATA on page 447	



**Table 7-1 E5070B/E5071B COM objects by function**

Function	Item to be set/executed	COM Object	
Measurement Conditions (Continued)	IF bandwidth	SCPI.SENSE(Ch).BANDwidth.RESolution on page 379 SCPI.SENSE(Ch).BWIDth.RESolution on page 380	
	Averaging	On/Off	SCPI.SENSE(Ch).AVERage.STATE on page 378
		Averaging counts	SCPI.SENSE(Ch).AVERage.COUNT on page 377
		Clears the counts.	SCPI.SENSE(Ch).AVERage.CLEar on page 377
	Smoothing	On/Off	SCPI.CALCulate(Ch).SELEcted.SMOothing.STATE on page 288
		Smoothing aperture	SCPI.CALCulate(Ch).SELEcted.SMOothing.APERture on page 287
Display	Window (Channel) allocation	SCPI.DISPlay.SPLit on page 325	
	Selects active channel.	SCPI.DISPlay.WINDow(Ch).ACTivate on page 329	
	Checks active channel.	SCPI.SERVice.CHANnel.ACTive on page 455	
	Maximizes active channel's window.	SCPI.DISPlay.MAXimize on page 323	
	Number of traces to be displayed	SCPI.CALCulate(Ch).PARAmeter.COUNT on page 223	
	Measurement parameter	SCPI.CALCulate(Ch).PARAmeter(Tr).DEFine on page 224	
	Data format	SCPI.CALCulate(Ch).SELEcted.FORMat on page 241	
	Graph (Trace) allocation	SCPI.DISPlay.WINDow(Ch).SPLit on page 332	
	Selects active trace.	SCPI.CALCulate(Ch).PARAmeter(Tr).SELEct on page 225	
	Checks active trace.	SCPI.SERVice.CHANnel(Ch).TRACe.ACTive on page 456	
	Maximizes active trace's graph.	SCPI.DISPlay.WINDow(Ch).MAXimize on page 331	
	Turns on/off the backlight.	SCPI.SYSTem.BACKlight on page 501	
	Turns on/off the display update.	SCPI.DISPlay.ENABLE on page 320	
	Updates the display once when the update is off.	SCPI.DISPlay.UPDate.IMMEDIATE on page 329	
	Clears the display of error message.	SCPI.DISPlay.CCLEar on page 311	
	Data trace	Turn on/off the display.	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).STATE on page 336
		Calculated data	SCPI.CALCulate(Ch).SELEcted.MATH.FUNcTION on page 284
	Memory trace	Turns on/off the display.	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).MEMory.STATE on page 335
		Copy the measurement data	SCPI.CALCulate(Ch).SELEcted.MATH.MEMorize on page 285
	Turns on/off the display of division label.	SCPI.DISPlay.WINDow(Ch).LABEl on page 330	
	Turns on/off the clock display.	SCPI.DISPlay.CLOCK on page 312	
	Turns on/off the frequency display.	SCPI.DISPlay.ANNotation.FREQUency.STATE on page 311	
	Turns on/off the display in softkey area.	SCPI.DISPlay.SKEY.STATE on page 324	
	Title display	On/Off	SCPI.DISPlay.WINDow(Ch).TITLe.STATE on page 334
		Enters title label.	SCPI.DISPlay.WINDow(Ch).TITLe.DATA on page 333
	Table display	On/Off	SCPI.DISPlay.TABLe.STATE on page 327
		Selects table type.	SCPI.DISPlay.TABLe.TYPE on page 328
	ECHO Window	Outputs data.	ECHO on page 171 SCPI.DISPlay.ECHO.DATA on page 319
		Clears data.	SCPI.DISPlay.ECHO.CLEar on page 319
	Display type (Normal/Inverted)		SCPI.DISPlay.IMAGE on page 322
	Display color	Data trace	SCPI.DISPlay.COLor(Dnum).TRACe(Tr).DATA on page 317
		Memory trace	SCPI.DISPlay.COLor(Dnum).TRACe(Tr).MEMory on page 318
		Graph	SCPI.DISPlay.COLor(Dnum).GRATicule(Gnum) on page 314
		Limit test	SCPI.DISPlay.COLor(Dnum).LIMit(Lnum) on page 315
Background		SCPI.DISPlay.COLor(Dnum).BACK on page 313	
Reset		SCPI.DISPlay.COLor(Dnum).RESet on page 316	

COM Object Reference  
List by Function

**Table 7-1 E5070B/E5071B COM objects by function**

Function	Item to be set/executed	COM Object	
Display (Continued)	Horizontal axis display type at segment sweep (Frequency base/Order base)	SCPI.DISPlay.WINDow(Ch).X.SPACing on page 340	
	Electrical delay time	SCPI.CALCulate(Ch).SElected.CORRection.EDELay. TIME on page 228	
	Velocity factor	SCPI.SENSE(Ch).CORRection.RVELocity.COAX on page 426	
	Phase offset	SCPI.CALCulate(Ch).SElected.CORRection.OFFSet. PHASE on page 229	
	Scale	Executes auto scale.	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.AUTO on page 336
		Number of division	SCPI.DISPlay.WINDow(Ch).Y.SCALe.DIVisions on page 341
		Scale value per division	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. PDIVision on page 337
		Reference scale line's position	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. RPOSITION on page 339
		Reference scale line's value	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVEL on page 338
		Full scale value (data format: smith chart/polar chart)	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. PDIVision on page 337
Calibration	On/Off	SCPI.SENSE(Ch).CORRection.STATe on page 427	
	Selects calibration kit.	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.SELect on page 390	
	Selects calibration type.	Response calibration (Open)	SCPI.SENSE(Ch).CORRection.COLlect.METHod. RESPonSe.OPEN on page 414
		Response calibration (Short)	SCPI.SENSE(Ch).CORRection.COLlect.METHod. RESPonSe.SHORT on page 414
		Response calibration (Thru)	SCPI.SENSE(Ch).CORRection.COLlect.METHod. RESPonSe.THRU on page 415
		Full 1-port calibration	SCPI.SENSE(Ch).CORRection.COLlect.METHod. SOLT1 on page 415
		Full 2-port calibration	SCPI.SENSE(Ch).CORRection.COLlect.METHod. SOLT2 on page 416
		Full 3-port calibration	SCPI.SENSE(Ch).CORRection.COLlect.METHod. SOLT3 on page 417
		Full 4-port calibration	SCPI.SENSE(Ch).CORRection.COLlect.METHod. SOLT4 on page 418
	Reads the calibration type.	SCPI.SENSE(Ch).CORRection.COLlect.METHod.TYPE on page 419	
	Reads calibration type applied for specified trace.	SCPI.SENSE(Ch).CORRection.TYPE(Tr) on page 428	
	Turns on/off the display of calibration property.	SCPI.SENSE(Ch).CORRection.PROPerTy on page 425	
	Measures calibration data.	Open standard	SCPI.SENSE(Ch).CORRection.COLlect.ACQuire.OPEN on page 383
		Short standard	SCPI.SENSE(Ch).CORRection.COLlect.ACQuire. SHORT on page 383
		Load standard	SCPI.SENSE(Ch).CORRection.COLlect.ACQuire.LOAD on page 382
		Thru standard	SCPI.SENSE(Ch).CORRection.COLlect.ACQuire.THRU on page 384
Isolation		SCPI.SENSE(Ch).CORRection.COLlect.ACQuire. ISOLation on page 381	
Calculates calibration coefficient	SCPI.SENSE(Ch).CORRection.COLlect.SAVE on page 420		

**Table 7-1 E5070B/E5071B 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 390
		Calibration kit label	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.LABel on page 385
	Defines standards.	Label	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).LABel on page 401
		Standard type	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).TYPE on page 403
		C0	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).C0 on page 392
		C1	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).C1 on page 393
		C2	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).C2 on page 394
		C3	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).C3 on page 395
		L0	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).L0 on page 397
		L1	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).L1 on page 398
		L2	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).L2 on page 399
		L3	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).L3 on page 400
		Offset delay	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).DELay on page 396
		Offset loss	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).LOSS on page 402
		Offset Z0	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).Z0 on page 404
		Arbitrary impedance	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.STAN(Std).ARBiTrary on page 391
	Specifies calibration class.	Open	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.ORDer.OPEN(Cpt) on page 387
		Short	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.ORDer.SHORT(Cpt) on page 388
		Load	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.ORDer.LOAD(Cpt) on page 386
		Thru	SCPI.SENSE(Ch).CORRection.COLlect.CKIT.ORDer.THRU(Cpt_m,Cpt_n) on page 389
	ECAL	Executes 1-port calibration.	SCPI.SENSE(Ch).CORRection.COLlect.ECAL.SOLT1 on page 408
		Executes 2-port calibration.	SCPI.SENSE(Ch).CORRection.COLlect.ECAL.SOLT2 on page 409
		Executes 3-port calibration.	SCPI.SENSE(Ch).CORRection.COLlect.ECAL.SOLT3 on page 410
Executes 4-port calibration.		SCPI.SENSE(Ch).CORRection.COLlect.ECAL.SOLT4 on page 411	
Executes response calibration (Thru).		SCPI.SENSE(Ch).CORRection.COLlect.ECAL.THRU on page 412	

COM Object Reference  
List by Function

Table 7-1 E5070B/E5071B COM objects by function

Function	Item to be set/executed		COM Object	
Calibration (Continued)	ECAL (Continued)	Turns On/Off the Isolation measurement.	SCPI.SENSE(Ch).CORREction.COLlect.ECAL.ISOLation.STA Te on page 406	
		Selects the characterization (factory/user 1-5).	SCPI.SENSE(Ch).CORREction.COLlect.ECAL.UCHar on page 413	
		Executes the confidence check of the applied calibration coefficients.	SCPI.SENSE(Ch).CORREction.COLlect.ECAL.UCHar on page 413	
		Reads the connected port.	SCPI.SENSE.CORREction.COLlect.ECAL.PATH(Cpt) on page 407	
	Port extension	On/Off	SCPI.SENSE(Ch).CORREction.EXTension.STAte on page 423	
		Correction value	SCPI.SENSE(Ch).CORREction.EXTension.PORT(Pt).TIME on page 422	
	Velocity factor		SCPI.SENSE(Ch).CORREction.RVELocity.COAX on page 426	
Power calibration	On/Off		SCPI.SOURce(Ch).POWer.PORT(Pt).CORREction.STAte on page 472	
	Power calibration data	Measurement	SCPI.SOURce(Ch).POWer.PORT(Pt).CORREction. COLlect.ACQUIRE on page 463	
		Number of power measurements at one measurement point	SCPI.SOURce(Ch).POWer.PORT(Pt).CORREction. COLlect.AVERage.COUNT on page 465	
		Reading out/writing	SCPI.SOURce(Ch).POWer.PORT(Pt).CORREction.DATA on page 471	
	Power sensor calibration factor settings	Reference calibration factor	Channel A	SCPI.SOURce.POWer.PORT.CORREction.COLlect. ASENsor.RCFactor on page 464
			Channel B	SCPI.SOURce.POWer.PORT.CORREction.COLlect. BSENsor.RCFactor on page 466
		Calibration factor table	Channel A	SCPI.SOURce.POWer.PORT.CORREction.COLlect. TABLE.ASENsor.DATA on page 467
			Channel B	SCPI.SOURce.POWer.PORT.CORREction.COLlect. TABLE.BSENsor.DATA on page 468
	Loss compensation	ON/OFF		SCPI.SOURce(Ch).POWer.PORT(Pt).CORREction. COLlect.TABLE.LOSS.STAte on page 470
		Settings the Loss compensation table		SCPI.SOURce(Ch).POWer.PORT(Pt).CORREction. COLlect.TABLE.LOSS.DATA on page 469
	Settings the power meter GPIB address			SCPI.SYSTem.COMMunicate.GPIB.PMETer.ADDRes on page 504
Measurement	Aborts the sweep.		SCPI.ABORt on page 181	
	Trigger system (Trigger mode)	Single trigger (Single)	SCPI.INITiate(Ch).IMMediate on page 353	
		Turns on/off continuous mode. (Continuous/Hold)	SCPI.INITiate(Ch).CONTInuous on page 352	
	Triggers when trigger source is BUS.		SCPI.IEEE4882.TRG on page 351	
	Triggers at any settings for trigger source.		SCPI.TRIGger.SEQuence.IMMediate on page 514	
	Triggers at any settings for trigger source.		SCPI.TRIGger.SEQuence.SINGle on page 515	
	Selects trigger source.		SCPI.TRIGger.SEQuence.SOURce on page 516	

**Table 7-1 E5070B/E5071B COM objects by function**

Function	Item to be set/executed		COM Object		
Reads/Writes the data	Data transfer format	Format	SCPI.FORMat.DATA on page 343		
		Byte order	SCPI.FORMat.BORDer on page 342		
	Reads/Writes the formatted trace data.		SCPI.CALCulate(Ch).SELEcted.DATA.FDATA on page 230		
	Reads/Writes the formatted memory data.		SCPI.CALCulate(Ch).SELEcted.DATA.FMEMory on page 231		
	Reads/Writes the corrected trace data.		SCPI.CALCulate(Ch).SELEcted.DATA.SDATA on page 232		
	Reads/Writes the corrected memory data.		SCPI.CALCulate(Ch).SELEcted.DATA.SMEMory on page 233		
	Reads the stimulus (frequency) data.		SCPI.SENSE(Ch).FREQuency.DATA on page 431		
	Reads/Writes the power calibration data.		SCPI.SOURce(Ch).POWer.PORT(Pt).CORRection.DATA on page 471		
Limit test	On/Off		SCPI.CALCulate(Ch).SELEcted.LIMit.STATe on page 260		
	Turns on/off the display of limit line.		SCPI.CALCulate(Ch).SELEcted.LIMit.DISPlay.STATe on page 256		
	Turns on/off the “Fail” display on the LCD screen.		SCPI.DISPlay.FSIGn on page 321		
	Edits limit line table.		SCPI.CALCulate(Ch).SELEcted.LIMit.DATA on page 254		
	Reads test result.	Test results for each trace		SCPI.CALCulate(Ch).SELEcted.LIMit.FAIL on page 257	
		Frequency value at measurement points failed		SCPI.CALCulate(Ch).SELEcted.LIMit.REPort.DATA on page 258	
		Number of measurement points failed		SCPI.CALCulate(Ch).SELEcted.LIMit.REPort.POINts on page 259	
Marker	Selects active marker.		SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).ACTivate on page 261		
	Turns on/off the marker.		SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).STATe on page 281		
	Turns on/off marker coupling function.		SCPI.CALCulate(Ch).SELEcted.MARKer.COUPle on page 265		
	Movement mode (Continuous/Discrete)		SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).DISCrete on page 266		
	Turns on/off reference marker mode.		SCPI.CALCulate(Ch).SELEcted.MARKer.REFerence. STATe on page 279		
	Reads marker value.	Response value		SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).Y on page 283	
		Stimulus value		SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).X on page 282	
	Sets marker stimulus value.				
	Marker search	Executes search		SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).FUNction.EXECute on page 271	
		Search type		SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).FUNction. TYPE on page 277	
		Search range	On/Off of the range coupling between traces		SCPI.CALCulate(Ch).SELEcted.MARKer.FUNction.DOMain.COUPle on page 267
			Partial Search	On/Off	SCPI.CALCulate(Ch).SELEcted.MARKer.FUNction.DOMain.STATe on page 269
				Start	SCPI.CALCulate(Ch).SELEcted.MARKer.FUNction.DOMain.STARt on page 268
Stop		SCPI.CALCulate(Ch).SELEcted.MARKer.FUNction.DOMain.STOP on page 270			

COM Object Reference  
List by Function

**Table 7-1 E5070B/E5071B COM objects by function**

Function	Item to be set/executed			COM Object	
Marker (Continued)	Marker search (Continued)	Peak definition	Lower limit of peak excursion value	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon.PEXCursion on page 272	
			Polarity	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon.PPOLarity on page 273	
		Target definition	Target value	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon.TARGET on page 274	
			Polarity	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon.TTRansition on page 276	
		Turns on/off tracking function.			SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon.TRACKing on page 275
	Bandwidth search	Turns on/off the results display.		SCPI.CALCulate(Ch).SElected.MARKer.BWIDth.STATe on page 263	
		Bandwidth definition value		SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth.THREshold on page 264	
		Reads the result.		SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth.DATa on page 262	
	Sets the start/stop/center/scale reference/electrical delay value using a marker				SCPI.CALCulate(Ch).SElected.MARKer(Mk).SET on page 280
	Statistical analysis for the trace	Turns on/off the result display.		SCPI.CALCulate(Ch).SElected.MSTATistics.STATe on page 286	
		Reads the result.		SCPI.CALCulate(Ch).SElected.MSTATistics.DATa on page 285	
	Analysis	Executes analysis			SCPI.CALCulate(Ch).SElected.FUNctIon.EXECute on page 247
Analysis type			SCPI.CALCulate(Ch).SElected.FUNctIon.TYPE on page 253		
Range		On/Off of the range coupling between traces			SCPI.CALCulate(Ch).SElected.FUNctIon.DOMain.COUPle on page 243
		Partial range	On/Off		SCPI.CALCulate(Ch).SElected.FUNctIon.DOMain.STATe on page 245
			Start		SCPI.CALCulate(Ch).SElected.FUNctIon.DOMain.START on page 244
			Stop		SCPI.CALCulate(Ch).SElected.FUNctIon.DOMain.STOP on page 246
Peak definition		Lower limit of peak excursion value		SCPI.CALCulate(Ch).SElected.FUNctIon.PEXCursion on page 248	
		Polarity		SCPI.CALCulate(Ch).SElected.FUNctIon.PPOLarity on page 250	
Target definition		Target value		SCPI.CALCulate(Ch).SElected.FUNctIon.TARGET on page 251	
		Polarity		SCPI.CALCulate(Ch).SElected.FUNctIon.TTRansition on page 252	
Reads analysis result		Data for analysis		SCPI.CALCulate(Ch).SElected.FUNctIon.DATa on page 242	
		Number of data for analysis		SCPI.CALCulate(Ch).SElected.FUNctIon.POINts on page 249	

**Table 7-1 E5070B/E5071B COM objects by function**

Function	Item to be set/executed		COM Object	
Fixture simulator	Turns on/off fixture simulator function.		SCPI.CALCulate(Ch).FSIMulator.STATe on page 222	
	Topology	Balanced device type	SCPI.CALCulate(Ch).FSIMulator.BALun.DEVice on page 185	
		Port assignment	Unbalance-Balance	SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology.SBALanced.PPORTs on page 201
			Balance-Balance	SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology.BBALanced.PPORTs on page 199
			Unbalance-Unbalance-Balance	SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology.SSBALanced.PPORTs on page 202
	On/Off of the property display		SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology.PROPERty.STATe on page 200	
	Balance/Unbalance conversion function	On/Off		SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).STATe on page 198
		Measurement parameter	Unbalance-Balance	SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).SBALanced.DEFIne on page 196
			Balance-Balance	SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).BBALanced.DEFIne on page 195
			Unbalance-Unbalance-Balance	SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).SSBALanced.DEFIne on page 197
	Matching circuit embedding function	On/Off		SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.STATe on page 219
		Circuit type		SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).TYPE on page 217
		Circuit constant	C	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).PARAmeters.C on page 213
			G	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).PARAmeters.G on page 214
			L	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).PARAmeters.L on page 215
			R	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).PARAmeters.R on page 216
		User file		SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).USER.FILeName on page 218
Port impedance conversion function	On/Off		SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONVersion.STATe on page 221	
	Z0	SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONVersion.PORT(Pt).Z0.R on page 220		

COM Object Reference  
List by Function

**Table 7-1 E5070B/E5071B COM objects by function**

Function	Item to be set/executed		COM Object		
Fixture simulator (Continued)	Network de-embedding function	On/Off	SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. STATE on page 212		
		Type	SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).TYPE on page 210		
		User file	SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).USER.FILename on page 211		
	4-port network embedding/ de-embedding function	On/Off		SCPI.CALCulate(Ch).FSIMulator.EMBed.STATE on page 205	
		Topology	Type	SCPI.CALCulate(Ch).FSIMulator.EMBed.TYPE on page 209	
			Port assignm-ent	A	SCPI.CALCulate(Ch).FSIMulator.EMBed.TOPology.A. PORTs on page 206
				B	SCPI.CALCulate(Ch).FSIMulator.EMBed.TOPology.B. PORTs on page 207
		C		SCPI.CALCulate(Ch).FSIMulator.EMBed.TOPology.C. PORTs on page 208	
		Network	Type	SCPI.CALCulate(Ch).FSIMulator.EMBed.NETWork(Nwk). TYPE on page 204	
	File		SCPI.CALCulate(Ch).FSIMulator.EMBed.NETWork(Nwk). FILename on page 203		
	Differential matching circuit embedding function	On/Off		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. STATE on page 192	
		Circuit type		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE on page 190	
		Circuit constant	C	SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.C on page 186	
G			SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.G on page 187		
L			SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.L on page 188		
R			SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.R on page 189		
User file			SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).USER.FILename on page 191		
Differential port impedance conversion function	On/Off		SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion. STATE on page 194		
	Z0		SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion. BPORT(Bpt).Z0.R on page 193		
Common port impedance conversion function	On/Off		SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion. STATE on page 184		
	Z0		SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion. BPORT(Bpt).Z0.R on page 182		



**Table 7-1 E5070B/E5071B COM objects by function**

Function	Item to be set/executed		COM Object	
Time domain	Transform	On/Off	SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.STATe on page 295	
		Transform type	SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.TYPE on page 299	
		Stimulus type	SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.STIMulus on page 297	
		Changes the frequency range to match with the low-pass type	SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.LPFRequency on page 292	
		Window setup	$\beta$	SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.KBESsel on page 291
			Impulse width	SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.IMPulse.WIDTh on page 290
			Rise time of step signal	SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.STEP.RTIMe on page 296
		Display range after time domain transformation	Start	SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.STARt on page 294
			Stop	SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.STOP on page 298
			Center	SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.CENTer on page 289
	Span		SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.SPAN on page 293	
	Gating	On/Off	SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME.STATe on page 238	
		Gate type	SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME.TYPE on page 240	
		Gate shape	SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME.SHAPe on page 235	
		Display range after time domain transformation	Start	SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME.STARt on page 237
			Stop	SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME.STOP on page 239
Center			SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME.CENTer on page 234	
Span			SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME.SPAN on page 236	
Parameter conversion	On/Off	SCPI.CALCulate(Ch).SELEcted.CONVersion.STATe on page 227		
	Selects the conversion parameter.	SCPI.CALCulate(Ch).SELEcted.CONVersion.FUNcTION on page 226		
Handler I/O control	Outputs data using port A.		SCPI.CONTRol.HANDler.A.DATA on page 300	
	Outputs data using port B.		SCPI.CONTRol.HANDler.B.DATA on page 301	
	Port C	Inputs/Outputs data.	SCPI.CONTRol.HANDler.C.DATA on page 302	
		Selects input/output mode.	SCPI.CONTRol.HANDler.C.MODE on page 303	
	Port D	Inputs/Outputs data.	SCPI.CONTRol.HANDler.D.DATA on page 304	
		Selects input/output mode.	SCPI.CONTRol.HANDler.D.MODE on page 305	
	Inputs/outputs data using port E (port C + port D)		SCPI.CONTRol.HANDler.E.DATA on page 306	
	Outputs data using port F (port A + port B)		SCPI.CONTRol.HANDler.F.DATA on page 309	
	Sets/Reads OUTPUT1 and OUTPUT2		SCPI.CONTRol.HANDler.OUTPUT(Num).DATA on page 310	
	Turns on/off INDEX signal.		SCPI.CONTRol.HANDler.EXTension.INDEX.STATe on page 307	
Turns on/off READY FOR TRIGGER signal.		SCPI.CONTRol.HANDler.EXTension.RTRigger.STATe on page 308		

COM Object Reference  
List by Function

**Table 7-1 E5070B/E5071B 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 438	
	On/Off of the E5091A property display		SCPI.SENSE.MULTIplexer(Id).DISPlay.STATE on page 437	
	Reads number of port.		SCPI.SENSE.MULTIplexer(Id).COUNT on page 436	
	Assigns the port.	Port 1	SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT1 on page 440	
		Port 2	SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT2 on page 441	
		Port 3	SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT3 on page 442	
Port 4		SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT4 on page 443		
Sets control lines.		SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.OUTPUT.DATA on page 439		
File operation	Save	Instrument Setting	Entire state (file)	SCPI.MMEMORY.STORE.STATE on page 374
			State for each channel (register)	SCPI.MMEMORY.STORE.CHANnel.STATE on page 367
			Selects contents	SCPI.MMEMORY.STORE.STYPE on page 375
			Selects target channels/traces	SCPI.MMEMORY.STORE.SALL on page 372
		Formatted trace data		SCPI.MMEMORY.STORE.FDATA on page 368
		Display image on the LCD screen		SCPI.MMEMORY.STORE.IMAGE on page 369
		Segment sweep table		SCPI.MMEMORY.STORE.SEGMent on page 373
		Power sensor calibration factor table	Channel A	SCPI.MMEMORY.STORE.ASCFactor on page 365
			Channel B	SCPI.MMEMORY.STORE.BSCFactor on page 366
		Loss compensation table		SCPI.MMEMORY.STORE.PLOSS(Pt) on page 371
	Limit line table		SCPI.MMEMORY.STORE.LIMit on page 370	
	Recall	Instrument setting	Entire state (file)	SCPI.MMEMORY.LOAD.STATE on page 363
			State for each channel (register)	SCPI.MMEMORY.LOAD.CHANnel.STATE on page 359
		Power sensor calibration factor table	Channel A	SCPI.MMEMORY.LOAD.ASCFactor on page 357
			Channel B	SCPI.MMEMORY.LOAD.BSCFactor on page 358
		Loss compensation table		SCPI.MMEMORY.LOAD.PLOSS(Pt) on page 361
		Segment sweep table		SCPI.MMEMORY.LOAD.SEGMent on page 362
		Limit line table		SCPI.MMEMORY.LOAD.LIMit on page 360
	Clears registers.		SCPI.MMEMORY.STORE.CHANnel.CLEar on page 367	
	Creates directory (folder).		SCPI.MMEMORY.MDIRectory on page 364	
	Copies file.		SCPI.MMEMORY.COPY on page 355	
	Deletes file or directory.		SCPI.MMEMORY.DELEte on page 356	
	Reads list of files in the directory.		SCPI.MMEMORY.CATalog(Dir) on page 354	

**Table 7-1 E5070B/E5071B COM objects by function**

Function	Item to be set/executed	COM Object	
Status report system	Clears register.	SCPI.IEEE4882.CLS on page 346	
	Reads status byte register.	SCPI.IEEE4882.STB on page 351	
	Sets service request enable register.	SCPI.IEEE4882.SRE on page 350	
	Standard event status register	Reads register value.	SCPI.IEEE4882.ESR on page 347
		Sets enable register value.	SCPI.IEEE4882.ESE on page 346
		Sets OPC bit on operation termination.	SCPI.IEEE4882.OPC on page 348
	Operation status register	Reset	SCPI.STATus.PRESet on page 480
		Reads conditional register value.	SCPI.STATus.OPERation.CONDITION on page 478
		Sets enable register value.	SCPI.STATus.OPERation.ENABLE on page 478
		Reads event register value.	SCPI.STATus.OPERation.EVENT on page 479
		Sets positive transition filter value.	SCPI.STATus.OPERation.PTRansition on page 480
		Sets negative transition filter value.	SCPI.STATus.OPERation.NTRansition on page 479
	Questionable status register	Reset	SCPI.STATus.PRESet on page 480
		Reads conditional register value.	SCPI.STATus.QUESTionable.CONDITION on page 481
		Sets enable register value.	SCPI.STATus.QUESTionable.ENABLE on page 481
		Reads event register value.	SCPI.STATus.QUESTionable.EVENT on page 482
		Sets positive transition filter value.	SCPI.STATus.QUESTionable.PTRansition on page 500
		Sets negative transition filter value.	SCPI.STATus.QUESTionable.NTRansition on page 499
	Questionable limit status register	Reset	SCPI.STATus.PRESet on page 480
		Reads conditional register value.	SCPI.STATus.QUESTionable.LIMit.CONDITION on page 492
		Sets enable register value.	SCPI.STATus.QUESTionable.LIMit.ENABLE on page 496
		Reads event register value.	SCPI.STATus.QUESTionable.LIMit.EVENT on page 496
		Sets positive transition filter value.	SCPI.STATus.QUESTionable.LIMit.PTRansition on page 498
		Sets negative transition filter value.	SCPI.STATus.QUESTionable.LIMit.NTRansition on page 497
	Questionable limit extra status register	Reset	SCPI.STATus.PRESet on page 480
		Reads conditional register value.	SCPI.STATus.QUESTionable.LIMit.ELIMit.CONDITION on page 492
		Sets enable register value.	SCPI.STATus.QUESTionable.LIMit.ELIMit.ENABLE on page 493
Reads event register value.		SCPI.STATus.QUESTionable.LIMit.ELIMit.EVENT on page 493	
Sets positive transition filter value.		SCPI.STATus.QUESTionable.LIMit.ELIMit.PTRansition on page 495	
Sets negative transition filter value.		SCPI.STATus.QUESTionable.LIMit.ELIMit.NTRansition on page 494	

COM Object Reference  
List by Function

Table 7-1 E5070B/E5071B COM objects by function

Function	Item to be set/executed		COM Object
Status report system (Continued)	Questionable limit channel{1-16} status register	Reset	SCPI.STATus.PRESet on page 480
		Reads conditional register value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). CONDition on page 482
		Sets enable register value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).ENABle on page 488
		Reads event register value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).EVENT on page 489
		Sets positive transition filter value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). PTRansition on page 491
		Sets negative transition filter value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). NTRansition on page 490
	Questionable limit channel{1-16} extra status register	Reset	SCPI.STATus.PRESet on page 480
		Reads conditional register value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). ECHannel.CONDition on page 483
		Sets enable register value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). ECHannel.ENABle on page 484
		Reads event register value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). ECHannel.EVENT on page 485
		Sets positive transition filter value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). ECHannel.PTRansition on page 487
		Sets negative transition filter value.	SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). ECHannel.NTRansition on page 486
VBA Macro	User menu function	Preset	UserMenu.PRESet on page 177
		Label name	UserMenu.Item(Key_id).Caption on page 175
		Softkey enabled/disabled	UserMenu.Item(Key_id).Enabled on page 176
		Event processing	UserMenu_OnPress(ByVal Key_id As Long) on page 177
		Show the softkey	UserMenu.Show on page 178
	Reads VBA application name.	NAME on page 172	
	Reads VBA version.	VBAVersion on page 179	
	Control through SCPI commands	Parse on page 173	
	Waits for clicking <b>[Macro Setup] - Continue</b> button.	Prompt on page 174	
	Waits for returning 1 at RQS/MSS bit (status register).	WaitOnSRQ on page 180	
Print	Outputs print.		SCPI.HCOPy.IMMEdiate on page 345
	Aborts printing.		SCPI.HCOPy.ABORT on page 344
	Selects print mode.		SCPI.HCOPy.IMAGe on page 344
Operations	Disables front panel/keyboard operations.		SCPI.SYSTem.KLOCK.KBD on page 508
	Disables mouse/touch screen operations.		SCPI.SYSTem.KLOCK.MOUSe on page 509
Beeper	For operation completion	On/Off	SCPI.SYSTem.BEEPer.COMPLete.STATe on page 502
		Makes beep sound.	SCPI.SYSTem.BEEPer.COMPLete.IMMEdiate on page 502
	For warning/limit test result	On/Off	SCPI.SYSTem.BEEPer.WARNing.STATe on page 503
		Makes beep sound.	SCPI.SYSTem.BEEPer.WARNing.IMMEdiate on page 503
Internal clock	Date		SCPI.SYSTem.DATE on page 506
	Time		SCPI.SYSTem.TIME on page 513

**Table 7-1 E5070B/E5071B COM objects by function**

Function	Item to be set/executed	COM Object
Others	Shutdown	SCPI.SYSTem.POFF on page 509
	Reads the upper limits of the number of channels.	SCPI.SERVice.CHANnel.COUNT on page 455
	Reads the upper limits of the number of traces.	SCPI.SERVice.CHANnel.TRACe.COUNT on page 456
	Reads the number of test ports.	SCPI.SERVice.PORT.COUNT on page 457
	Reads product information.	SCPI.IEEE4882.IDN on page 347
	Reads options installed.	SCPI.IEEE4882.OPT on page 349
	Waits for object execution.	SCPI.IEEE4882.WAI on page 351
	Returns 1 when completing object execution.	SCPI.IEEE4882.OPC on page 348
	Reads error message occurred.	SCPI.SYSTem.ERRor on page 507
	Confirms whether external reference signal is inputted or not.	SCPI.SENSE(Ch).ROSCillator.SOURce on page 444
	Turns on/off the spurious avoid mode.	SCPI.SENSE(Ch).SWEp.ASPurious on page 448
	Turns on/off the system correction.	SCPI.SYSTem.CORRection.STATe on page 505
	Confirms whether warm-up is enough or not.	SCPI.SYSTem.TEMPerature.STATe on page 512
	Turns on/off the high temperature mode.	SCPI.SYSTem.TEMPerature.HIGH on page 511
	Confirms whether service mode or not.	SCPI.SYSTem.SERVice on page 510
	Sets the power meter GPIB address.	SCPI.SYSTem.COMMunicate.GPIB.PMETer.ADDRes on page 504

## 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 227		
		Function	SCPI.CALCulate(Ch).SELEcted.CONVersion.FUNcTION on page 226		
	Fixture Simulator	BalUn		SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr). STATe on page 198	
		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 184	
		Port n (bal)		SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion. BPORT(Bpt).Z0.R on page 182	
	De-Embedding	De- Embedding		SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. STATe on page 212	
		Select Port	SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).TYPE on page 210		
		Select Type	SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).USER.FILename on page 211		
	De-Embedding S4P	De-Embedding S4P		SCPI.CALCulate(Ch).FSIMulator.EMBEd.STATe on page 205	
		Topology	Ports	SCPI.CALCulate(Ch).FSIMulator.EMBEd.TOPology.A. PORTs on page 206 SCPI.CALCulate(Ch).FSIMulator.EMBEd.TOPology.B. PORTs on page 207 SCPI.CALCulate(Ch).FSIMulator.EMBEd.TOPology.C. PORTs on page 208	
			Select Topology	SCPI.CALCulate(Ch).FSIMulator.EMBEd.TYPE on page 209	
			Type (nwk1/2)	SCPI.CALCulate(Ch).FSIMulator.EMBEd.NETWork(Nwk). TYPE on page 204	
		User File (nwk1/2)	SCPI.CALCulate(Ch).FSIMulator.EMBEd.NETWork(Nwk). FILename on page 203		
	Diff Matching	C		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.C on page 186	
		Diff Matching		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. STATe on page 192	
		G		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.G on page 187	
		L		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.L on page 188	
		R		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAmeters.R on page 189	
		Select Bal Port	SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE on page 190		
Select Circuit		SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).USER.FILename on page 191			

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

Front panel key (Operation)			Corresponding COM object	
[Analysis] (Continued)	Fixture Simulator (Continued)	Diff ZConversion	SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion. STATE on page 194	
			Port n (bal)	SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion. BPORT(Bpt).Z0.R on page 193
		Measurement		SCPI.CALCulate(Ch).PARAmeter(Tr).DEFine on page 224 SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).SBALanced.DEFine on page 196 SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).BBALanced.DEFine on page 195 SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).SSBalanced.DEFine on page 197
		Fixture Simulator		SCPI.CALCulate(Ch).FSIMulator.STATE on page 222
		Port Matching	C	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.C on page 213
			G	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.G on page 214
			L	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.L on page 215
			Port Matching	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 219
			R	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.R on page 216
			Select Port	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).TYPE on page 217
			Select Circuit	
			User File	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).USER.FILename on page 218
		Port ZConversion	Port ZConversion	SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONversion. STATE on page 221
			Port n Z0	SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONversion. PORT(Pt).Z0.R on page 220
		Topology	Device	SCPI.CALCulate(Ch).FSIMulator.BALun.DEVice on page 185
			Port n (se) Port n (bal)	SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology. SSBalanced.PPORTs on page 202 SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology. SBALanced.PPORTs on page 201 SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology. BBALanced.PPORTs on page 199
			Property	SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology. PROPerty.STATE on page 200
		Gating	Center	SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME. CENTer on page 234
			Gating	SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME. STATE on page 238
Shape	SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME. SHAPe on page 235			
Span	SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME. SPAN on page 236			
Start	SCPI.CALCulate(Ch).SELEcted.FILTer.GATE.TIME. START on page 237			

7. COM Object Reference

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

Front panel key (Operation)			Corresponding COM object	
[Analysis] (Continued)	Gating (Continued)	Stop	SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STOP on page 239	
		Type	SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. TYPE on page 240	
	Limit Test	Edit Limit Line	Add / Delete / Clear Limit Table	SCPI.CALCulate(Ch).SElected.LIMit.DATA on page 254
			Export to CSV File	SCPI.MMEMory.STORE.LIMit on page 370
			Import from CSV File	SCPI.MMEMory.LOAD.LIMit on page 360
		Fail Sign	SCPI.DISPlay.FSIGn on page 321	
		Limit Line	SCPI.CALCulate(Ch).SElected.LIMit.DISPlay.STATe on page 256	
	Limit Test	SCPI.CALCulate(Ch).SElected.LIMit.STATe on page 260		
	Transform	Center	SCPI.CALCulate(Ch).SElected.TRANSform.TIME. CENTer on page 289	
		Set Freq Low Pass	SCPI.CALCulate(Ch).SElected.TRANSform.TIME. LPFRequency on page 292	
		Span	SCPI.CALCulate(Ch).SElected.TRANSform.TIME.SPAN on page 293	
		Start	SCPI.CALCulate(Ch).SElected.TRANSform.TIME.START on page 294	
		Stop	SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STOP on page 298	
		Transform	SCPI.CALCulate(Ch).SElected.TRANSform.TIME.TYPE on page 299 SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STATe on page 295	
		Type	SCPI.CALCulate(Ch).SElected.TRANSform.TIME. STIMulus on page 297	
		Window	Impulse Width	SCPI.CALCulate(Ch).SElected.TRANSform.TIME. IMPulse.WIDTH on page 290
			Kaiser Beta	SCPI.CALCulate(Ch).SElected.TRANSform.TIME. KBESsel on page 291
Maximum				
Minimum				
Normal				
Step Rise	SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STEP.RTIME on page 296			
[Avg]	Averaging		SCPI.SENSE(Ch).AVERAge.STATe on page 378	
	Averaging Restart		SCPI.SENSE(Ch).AVERAge.CLEAr on page 377	
	Avg Factor		SCPI.SENSE(Ch).AVERAge.COUNT on page 377	
	Smo Aperture		SCPI.CALCulate(Ch).SElected.SMOothing.APERture on page 287	
	Smoothing		SCPI.CALCulate(Ch).SElected.SMOothing.STATe on page 288	
	IF Bandwidth		SCPI.SENSE(Ch).BANDwidth.RESolution on page 379 SCPI.SENSE(Ch).BWIDTH.RESolution on page 380	
[Cal]	Cal Kit			SCPI.SENSE(Ch).CORRection.COLLect.CKIT.SELect on page 390
	Calibrate	1-Port Cal	Done	SCPI.SENSE(Ch).CORRection.COLLect.SAVE on page 420
			Load	SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE.LOAD on page 382
			Open	SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE.OPEN on page 383
			Select Port	SCPI.SENSE(Ch).CORRection.COLLect.METHod. SOLT1 on page 415
			Short	SCPI.SENSE(Ch).CORRection.COLLect.ACQUIRE. SHORt on page 383



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

Front panel key (Operation)			Corresponding COM object		
[Cal] (Continued)	Calibrate (Continued)	2-Port Cal 3-Port Cal 4-Port Cal	Done	SCPI.SENSE(Ch).CORRection.COLlect.SAVE on page 420	
			Isolation (Optional)	SCPI.SENSE(Ch).CORRection.COLlect.ACQUIRE. ISOLation on page 381	
			Reflection	Port n Load	SCPI.SENSE(Ch).CORRection.COLlect.ACQUIRE.LOAD on page 382
				Port n Open	SCPI.SENSE(Ch).CORRection.COLlect.ACQUIRE.OPEN on page 383
				Port n Short	SCPI.SENSE(Ch).CORRection.COLlect.ACQUIRE. SHORT on page 383
			Select Ports	(2-Port Cal)	SCPI.SENSE(Ch).CORRection.COLlect.METHod. SOLT2 on page 416
				(3-Port Cal)	SCPI.SENSE(Ch).CORRection.COLlect.METHod. SOLT3 on page 417
				(4-Port Cal)	SCPI.SENSE(Ch).CORRection.COLlect.METHod. SOLT4 on page 418
			Transmission	SCPI.SENSE(Ch).CORRection.COLlect.ACQUIRE.THURU on page 384	
			Response (Open)	Done	SCPI.SENSE(Ch).CORRection.COLlect.SAVE on page 420
		Load (Optional)		SCPI.SENSE(Ch).CORRection.COLlect.ACQUIRE.LOAD on page 382	
		Open		SCPI.SENSE(Ch).CORRection.COLlect.ACQUIRE.OPEN on page 383	
		Select Port		SCPI.SENSE(Ch).CORRection.COLlect.METHod. RESPonse.OPEN on page 414	
		Response (Short)	Done	SCPI.SENSE(Ch).CORRection.COLlect.SAVE on page 420	
			Load (Optional)	SCPI.SENSE(Ch).CORRection.COLlect.ACQUIRE.LOAD on page 382	
			Select Port	SCPI.SENSE(Ch).CORRection.COLlect.METHod. RESPonse.SHORT on page 414	
			Short	SCPI.SENSE(Ch).CORRection.COLlect.ACQUIRE. SHORT on page 383	
		Response (Thru)	Done	SCPI.SENSE(Ch).CORRection.COLlect.SAVE on page 420	
			Isolation (Optional)	SCPI.SENSE(Ch).CORRection.COLlect.ACQUIRE. ISOLation on page 381	
			Select Ports	SCPI.SENSE(Ch).CORRection.COLlect.METHod. RESPonse.THURU on page 415	
			Thru	SCPI.SENSE(Ch).CORRection.COLlect.ACQUIRE.THURU on page 384	
		Correction			SCPI.SENSE(Ch).CORRection.STATE on page 427
		ECal	1-Port Cal	SCPI.SENSE(Ch).CORRection.COLlect.ECAL.SOLT1 on page 408	
			2-Port Cal	SCPI.SENSE(Ch).CORRection.COLlect.ECAL.SOLT2 on page 409	
			3-Port Cal	SCPI.SENSE(Ch).CORRection.COLlect.ECAL.SOLT3 on page 410	
			4-Port Cal	SCPI.SENSE(Ch).CORRection.COLlect.ECAL.SOLT4 on page 411	
			Characterization	SCPI.SENSE(Ch).CORRection.COLlect.ECAL.UCHar on page 413	
			Characterization Info	N/A	
			Confidence Check	SCPI.SENSE(Ch).CORRection.COLlect.ECAL.CCHeck. ACQUIRE on page 405	
			Isolation	SCPI.SENSE(Ch).CORRection.COLlect.ECAL.ISOLation.STATE on page 406	
			Thru Cal	SCPI.SENSE(Ch).CORRection.COLlect.ECAL.THURU on page 412	

7. COM Object Reference

**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 391
				C0	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).C0 on page 392
				C1	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).C1 on page 393
				C2	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).C2 on page 394
				C3	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).C3 on page 395
				L0	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).L0 on page 397
				L1	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).L1 on page 398
				L2	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).L2 on page 399
				L3	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).L3 on page 400
				Label	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).LABel on page 401
				Offset Delay	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).DELay on page 396
				Offset Loss	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).LOSS on page 402
				Offset Z0	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).Z0 on page 404
				STD Type	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.STAN(Std).TYPE on page 403
		Label Kit		SCPI.SENSE(Ch).CORRection.COLLect.CKIT.LABel on page 385	
		Specify CLSs	Load	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.ORDER. LOAD(Cpt) on page 386	
			Open	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.ORDER. OPEN(Cpt) on page 387	
			Short	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.ORDER. SHORT(Cpt) on page 388	
			Thru	SCPI.SENSE(Ch).CORRection.COLLect.CKIT.ORDER. THRU(Cpt_m,Cpt_n) on page 389	
		Port Extensions	Extension Port 1	SCPI.SENSE(Ch).CORRection.EXTension.PORT(Pt).TIME on page 422	
	Extension Port 2				
	Extension Port 3				
	Extension Port 4				
	Extensions		SCPI.SENSE(Ch).CORRection.EXTension.STATe on page 423		

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

Front panel key (Operation)		Corresponding COM object		
[Cal] (Continued)	Power Calibration	Abort	SCPI.ABORT on page 181	
		Correction	SCPI.SOURce(Ch).POWER.PORT(Pt).CORRection.STATE on page 472	
		Loss Compen	Add / Delete / Clear Loss Table	SCPI.SOURce(Ch).POWER.PORT(Pt).CORRection.COLLECT.TABLE.LOSS.DATA on page 469
			Compensation	SCPI.SOURce(Ch).POWER.PORT(Pt).CORRection.COLLECT.TABLE.LOSS.STATE on page 470
			Export to CSV File	SCPI.MMEMory.STORE.PLOSSs(Pt) on page 371
			Import from CSV File	SCPI.MMEMory.LOAD.PLOSSs(Pt) on page 361
		Num of Readings	SCPI.SOURce(Ch).POWER.PORT(Pt).CORRection.COLLECT.AVERAge.COUNT on page 465	
		Select Port	N/A	
		Sensor A Settings	Add / Delete / Clear Factor Table	SCPI.SOURce.POWER.PORT.CORRection.COLLECT.TABLE.ASENSor.DATA on page 467
			Export to CSV File	SCPI.MMEMory.STORE.ASCFactor on page 365
			Import from CSV File	SCPI.MMEMory.LOAD.ASCFactor on page 357
			Ref Cal Factor	SCPI.SOURce.POWER.PORT.CORRection.COLLECT.ASENSor.RCFactor on page 464
		Sensor B Settings	Add / Delete / Clear Factor Table	SCPI.SOURce.POWER.PORT.CORRection.COLLECT.TABLE.BSENSor.DATA on page 468
			Export to CSV File	SCPI.MMEMory.STORE.BSCFactor on page 366
			Import from CSV File	SCPI.MMEMory.LOAD.BSCFactor on page 358
	Ref Cal Factor		SCPI.SOURce.POWER.PORT.CORRection.COLLECT.BSENSor.RCFactor on page 466	
	Take Cal Sweep	SCPI.SOURce(Ch).POWER.PORT(Pt).CORRection.COLLECT.ACQuire on page 463		
	Use Sensor	N/A		
	Property	SCPI.SENSE(Ch).CORRection.PROPERty on page 425		
	Velocity Factor	SCPI.SENSE(Ch).CORRection.RVELocity.COAX on page 426		
[Center]	SCPI.SENSE(Ch).FREQUency.CENTer on page 429 SCPI.SOURce(Ch).POWER.CENTer on page 459			
[Channel Prev]	SCPI.DISPlay.WINDow(Ch).ACTivate on page 329			
[Channel Max]	SCPI.DISPlay.MAXimize on page 323			
[Channel Next]	SCPI.DISPlay.WINDow(Ch).ACTivate on page 329			
[Display]	Allocate Channels	SCPI.DISPlay.SPLit on page 325		
	Allocate Traces	SCPI.DISPlay.WINDow(Ch).SPLit on page 332		
	Data - > Mem	SCPI.CALCulate(Ch).SElected.MATH.MEMorize on page 285		
	Data Math	SCPI.CALCulate(Ch).SElected.MATH.FUNcTION on page 284		
	Display	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).STATE on page 336 SCPI.DISPlay.WINDow(Ch).TRACe(Tr).MEMory. STATE on page 335		
	Edit Title Label	SCPI.DISPlay.WINDow(Ch).TITLe.DATA on page 333		
	Frequency	SCPI.DISPlay.ANNotation.FREQUency.STATE on page 311		
	Graticule Label	SCPI.DISPlay.WINDow(Ch).LABel on page 330		
	Invert Color	SCPI.DISPlay.IMAGe on page 322		
	Num of Traces	SCPI.CALCulate(Ch).PARAmeter.COUNT on page 223		
	Title Label	SCPI.DISPlay.WINDow(Ch).TITLe.STATE on page 334		
	Update	SCPI.DISPlay.ENABLE on page 320		

7. COM Object Reference

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

Front panel key (Operation)		Corresponding COM object	
[Format]		SCPI.CALCulate(Ch).SElected.FORMat on page 241	
[Macro Break]		N/A	
[Macro Run]		N/A	
[Macro Setup]	Clear Echo	SCPI.DISPlay.ECHO.CLEar on page 319	
	Close Editor	N/A	
	Continue	N/A	
	Echo Window	SCPI.DISPlay.TABLE.STATe on page 327 SCPI.DISPlay.TABLE.TYPE on page 328	
	Load & Run	N/A	
	Load Project	N/A	
	New Project	N/A	
	Preset User Menu	UserMenu.PRESet on page 177	
	Save Project	N/A	
	Select Macro	N/A	
	Stop	N/A	
	User Menu	UserMenu.Press(Key_id) on page 178	
VBA Editor	N/A		
[Marker]	Clear Marker Menu	SCPI.CALCulate(Ch).SElected.MARKer(Mk).STATe on page 281	
	Marker 1 to Marker 4	SCPI.CALCulate(Ch).SElected.MARKer(Mk).STATe on page 281 SCPI.CALCulate(Ch).SElected.MARKer(Mk).ACTivate on page 261 SCPI.CALCulate(Ch).SElected.MARKer(Mk).X on page 282	
	Marker -> Ref Marker	N/A	
	More Markers	Marker 5 to Marker 9	SCPI.CALCulate(Ch).SElected.MARKer(Mk).STATe on page 281 SCPI.CALCulate(Ch).SElected.MARKer(Mk).ACTivate on page 261 SCPI.CALCulate(Ch).SElected.MARKer(Mk).X on page 282
	Ref Marker	SCPI.CALCulate(Ch).SElected.MARKer(Mk).STATe on page 281 SCPI.CALCulate(Ch).SElected.MARKer(Mk).ACTivate on page 261 SCPI.CALCulate(Ch).SElected.MARKer(Mk).X on page 282 SCPI.CALCulate(Ch).SElected.MARKer.REFerence. STATe on page 279	
	Ref Marker Mode	SCPI.CALCulate(Ch).SElected.MARKer.REFerence. STATe on page 279	
[Marker Func]	Couple	SCPI.CALCulate(Ch).SElected.MARKer.COUPle on page 265	
	Discrete	SCPI.CALCulate(Ch).SElected.MARKer(Mk).DISCrete on page 266	
	Marker Table	SCPI.DISPlay.TABLE.STATe on page 327 SCPI.DISPlay.TABLE.TYPE on page 328	
	Marker -> Center	SCPI.CALCulate(Ch).SElected.MARKer(Mk).SET on page 280	
	Marker -> Delay		
	Marker -> Reference		
	Marker -> Start		
	Marker -> Stop		
Statistics	SCPI.CALCulate(Ch).SElected.MSTATistics.STATe on page 286 SCPI.CALCulate(Ch).SElected.MSTATistics.DATA on page 285		

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

Front panel key (Operation)		Corresponding COM object	
[Marker Search]	Bandwidth	SCPI.CALCulate(Ch).SElected.MARKer.BWIDth.STATe on page 263 SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth. DATA on page 262	
	Bandwidth Value	SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth. THReshold on page 264	
	Max	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. TYPE on page 277	
	Min	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. EXECute on page 271	
	Peak	Peak Excursion	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. PEXCursion on page 272
		Peak Polarity	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. PPOLarity on page 273
		Search Left	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. TYPE on page 277
		Search Peak	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. EXECute on page 271
		Search Right	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. EXECute on page 271
	Search Range	Couple	SCPI.CALCulate(Ch).SElected.MARKer.FUNctIon. DOMain.COUPLE on page 267
		Search Range	SCPI.CALCulate(Ch).SElected.MARKer.FUNctIon. DOMain.STATe on page 269
		Start	SCPI.CALCulate(Ch).SElected.MARKer.FUNctIon. DOMain.START on page 268
		Stop	SCPI.CALCulate(Ch).SElected.MARKer.FUNctIon. DOMain.STOP on page 270
	Target	Search Left	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. TYPE on page 277
		Search Right	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. EXECute on page 271
		Search Target	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. EXECute on page 271
		Target Transition	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. TTRansition on page 276
Target Value		SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. TARGeT on page 274	
Tracking	SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNctIon. TRACKing on page 275		
[Meas]		SCPI.CALCulate(Ch).PARAmeter(Tr).DEFine on page 224 SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).SBALanced.DEFine on page 196 SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).BBALanced.DEFine on page 195 SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).SSBALanced.DEFine on page 197	
[Preset]	OK	SCPI.SYSTem.PRESet on page 510	

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]	Channel/Trace	SCPI.MMEMemory.STORE.SALL on page 372	
	Explorer	N/A	
	Recall Channel	SCPI.MMEMemory.LOAD.CHANnel.STATe on page 359	
	Recall State	SCPI.MMEMemory.LOAD.STATe on page 363	
	Save Channel	Clear States	SCPI.MMEMemory.STORE.CHANnel.CLEar on page 367
		State A - State D	SCPI.MMEMemory.STORE.CHANnel.STATe on page 367
	Save State	SCPI.MMEMemory.STORE.STATe on page 374	
	Save Trace Data	SCPI.MMEMemory.STORE.FDATA on page 368	
Save Type	SCPI.MMEMemory.STORE.STYPE on page 375		
[Scale]	Auto Scale	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.AUTO on page 336	
	Auto Scale All	N/A	
	Divisions	SCPI.DISPlay.WINDow(Ch).Y.SCALe.DIVisions on page 341	
	Electrical Delay	SCPI.CALCulate(Ch).SELEcted.CORREction.EDELay. TIME on page 228	
	Marker -> Reference	SCPI.CALCulate(Ch).SELEcted.MARKer(Mk).SET on page 280	
	Phase Offset	SCPI.CALCulate(Ch).SELEcted.CORREction.OFFSet. PHASe on page 229	
	Reference Position	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. RPOSition on page 339	
	Reference Value	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVel on page 338	
	Scale/Div	SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. PDIVision on page 337	
[Softkey On/Off]	SCPI.DISPlay.SKEY.STATe on page 324		
[Span]	SCPI.SENSE(Ch).FREQuency.SPAN on page 433 SCPI.SOURce(Ch).POWER.SPAN on page 475		
[Start]	SCPI.SENSE(Ch).FREQuency.STARt on page 434 SCPI.SOURce(Ch).POWER.STARt on page 476		
[Stop]	SCPI.SENSE(Ch).FREQuency.STOP on page 435 SCPI.SOURce(Ch).POWER.STOP on page 477		

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

Front panel key (Operation)		Corresponding COM object	
[Sweep Setup]	Edit Segment Table		SCPI.SENSE(Ch).SEGMENT.DATA on page 445
	Edit Segment Table	Export to CSV File	SCPI.MMEMORY.STORE.SEGMENT on page 373
		Import from CSV File	SCPI.MMEMORY.LOAD.SEGMENT on page 362
	Points		SCPI.SENSE(Ch).SWEep.POINTs on page 451
	Power	CW Freq	SCPI.SENSE(Ch).FREQUENCY.CW on page 430
			SCPI.SENSE(Ch).FREQUENCY.FIXed on page 432
		Port Couple	SCPI.SOURCE(Ch).POWER.PORT.COUPLE on page 473
		Port Power	SCPI.SOURCE(Ch).POWER.PORT(Pt).LEVEL.IMMEDIATE. AMPLitude on page 474
		Power	SCPI.SOURCE(Ch).POWER.LEVEL.IMMEDIATE. AMPLitude on page 460
		Power Ranges	SCPI.SOURCE(Ch).POWER.ATTenuation.DATA on page 458
		RF Out	SCPI.OUTPUT.STATE on page 376
		Slope [ON/OFF]	SCPI.SOURCE(Ch).POWER.LEVEL.SLOPE.STATE on page 462
	Slope [xx dB/GHz]	SCPI.SOURCE(Ch).POWER.LEVEL.SLOPE.DATA on page 461	
	Segment Display		SCPI.DISPLAY.WINDOW(Ch).X.SPACing on page 340
	Sweep Delay		SCPI.SENSE(Ch).SWEep.DELay on page 449
	Sweep Mode		SCPI.SENSE(Ch).SWEep.GENERation on page 450
Sweep Time		SCPI.SENSE(Ch).SWEep.TIME.DATA on page 453 SCPI.SENSE(Ch).SWEep.TIME.AUTO on page 452	
Sweep Type		SCPI.SENSE(Ch).SWEep.TYPE on page 454	
[System]	Abort Printing		SCPI.HCOPY.ABORT on page 344
	Backlight		SCPI.SYSTEM.BACKlight on page 501
	Dump Screen Image		SCPI.MMEMORY.STORE.IMAGE on page 369
	E5091A Setup	Control Lines	SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.OUTPUT.DATA on page 439
		E5091A Control	SCPI.SENSE.MULTIplexer(Id).STATE on page 438
		E5091A Property	SCPI.SENSE.MULTIplexer(Id).DISPLAY.STATE on page 437
		Port 1	SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT1 on page 440
		Port 2	SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT2 on page 441
		Port 3	SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT3 on page 442
		Port 4	SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT4 on page 443
	Select ID		N/A
	Firmware Revision		SCPI.IEEE4882.IDN on page 347
Invert Image		SCPI.HCOPY.IMAGE on page 344	

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

Front panel key (Operation)			Corresponding COM object	
[System] (Continued)	Misc Setup	Beeper	Beep Complete	SCPI.SYSTem.BEEPer.COMPlete.STATe on page 502
			Beep Warning	SCPI.SYSTem.BEEPer.WARNing.STATe on page 503
			Test Beep Complete	SCPI.SYSTem.BEEPer.COMPlete.IMMEdiate on page 502
			Test Beep Warning	SCPI.SYSTem.BEEPer.WARNing.IMMEdiate on page 503
		Channel/Trace Setup		N/A
		Clock Setup	Set Date and Time	SCPI.SYSTem.DATE on page 506 SCPI.SYSTem.TIME on page 513
			Show Clock	SCPI.DISPlay.CLOCK on page 312
		Color Setup		SCPI.DISPlay.COLor(Dnum).TRACe(Tr).DATA on page 317 SCPI.DISPlay.COLor(Dnum).TRACe(Tr).MEMory on page 318 SCPI.DISPlay.COLor(Dnum).GRATicule(Gnum) on page 314 SCPI.DISPlay.COLor(Dnum).LIMit(Lnum) on page 315 SCPI.DISPlay.COLor(Dnum).BACK on page 313 SCPI.DISPlay.COLor(Dnum).RESet on page 316
		Control Panel...		N/A
		GPIB Setup	Power Meter Address	SCPI.SYSTem.COMMunicate.GPIB.PMETer.ADDRes on page 504
	System Controller Configuration		N/A	
	Talker/Listener Address		N/A	
	Key Lock	Front Panel & Keyboard Lock	SCPI.SYSTem.KLOCK.KBD on page 508	
		Touch Screen & Mouse Lock	SCPI.SYSTem.KLOCK.MOUSe on page 509	
	Network Setup		N/A	
	Print		SCPI.HCOPy.IMMEdiate on page 345	
	Printer Setup		N/A	
	Service Menu	Avoid Spurious	SCPI.SENSE(Ch).SWEep.ASPurious on page 448	
		High Temperature	SCPI.SYSTem.TEMPerature.HIGH on page 511	
		System Correction	SCPI.SYSTem.CORRection.STATe on page 505	
[Trace Prev]			SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225	
[Trace Max]			SCPI.DISPlay.WINDow(Ch).MAXimize on page 331	
[Trace Next]			SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225	
[Trigger]	Continuous		SCPI.INITiate(Ch).CONTInuous on page 352	
	Continuous Disp Channels		N/A	
	Hold		SCPI.ABORt on page 181 SCPI.INITiate(Ch).CONTInuous on page 352	
	Hold All Channels		N/A	
	Restart		SCPI.ABORt on page 181	
	Single		SCPI.ABORt on page 181 SCPI.INITiate(Ch).CONTInuous on page 352 SCPI.INITiate(Ch).IMMEdiate on page 353	
	Trigger Source		SCPI.TRIGger.SEQuence.SOURce on page 516	
	Trigger		SCPI.TRIGger.SEQuence.IMMEdiate on page 514	



## COM Object Tree

Table 7-3 shows the COM object tree of the E5070B/E5071B.

**Table 7-3 E5070B/E5071B 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>Key_id</i> )		
.Caption	Property(Data Type:String)	
.Enabled	Property(Data Type:Boolean)	
_OnPress(ByVal <i>Key_id</i> As Long)	Event	
.PRESet	Method	[No read]
.Press( <i>Key_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 E5070B/E5071B COM object tree

Object	Object type	Note
SCPI		
.CALCulate( <i>Ch</i> )		
.FSIMulator		
.BALun		
.TOPology		
.BBALanced		
.PPORTs	Property(Data Type:Variant)	
.PROPerTy		
.STATe	Property(Data Type:Boolean)	
.SBALanced		
.PPORTs	Property(Data Type:Variant)	
.SSBalanced		
.PPORTs	Property(Data Type:Variant)	
.EMBed		
.NETWork( <i>Nwk</i> )		
.FILename	Property(Data Type:String)	
.TYPE	Property(Data Type:String)	
.STATe	Property(Data Type:Boolean)	
.TOPology		
.A		
.PORTs	Property(Data Type:Variant)	
.B		
.PORTs	Property(Data Type:Variant)	
.C		
.PORTs	Property(Data Type:Variant)	
.TYPE	Property(Data Type:String)	
.SENDEd		
.DEEMbed		
.PORT( <i>Pr</i> )		
.TYPE	Property(Data Type:String)	
.USER		
.FILename	Property(Data Type:String)	
.STATe	Property(Data Type:Boolean)	
.PMCircuit		
.PORT( <i>Pr</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>Pr</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]

**Table 7-3 E5070B/E5071B COM object tree**

Object	Object type	Note
SCPI		
.CALCulate( <i>Ch</i> )		
.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)	
.SMEMory	Property(Data Type:Variant)	
.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		
.COUPle	Property(Data Type:Boolean)	
.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)	

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Table 7-3 E5070B/E5071B COM object tree

Object	Object type	Note
SCPI		
.CALCulate( <i>Ch</i> )		
.SELected		
.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]
.DOMain		
.COUPle	Property(Data Type:Boolean)	
.STARt	Property(Data Type:Double)	
.STATe	Property(Data Type:Boolean)	
.STOP	Property(Data Type:Double)	
.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)	
.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)	

**Table 7-3 E5070B/E5071B COM object tree**

	Object	Object type	Note
SCPI			
	.CONTRol		
	.HANDler		
	.A	.DATA Property(Data Type:Long)	[No read]
	.B	.DATA Property(Data Type:Long)	[No read]
	.C	.DATA .MODE Property(Data Type:Long) Property(Data Type:String)	
	.D	.DATA .MODE Property(Data Type:Long) 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(Num)		
	.DATA	Property(Data Type:Long)	
	.DISPlay		
	.ANNotation		
	.FREQuency		
	.STATE	Property(Data Type:Boolean)	
	.CCLear	Method	[No read]
	.CLOCK	Property(Data Type:Boolean)	
	.COLor(Dnum)		
	.BACK	Property(Data Type:Variant)	
	.GRATicule(Gnum)	Property(Data Type:Variant)	
	.LIMit(Lnum)	Property(Data Type:Variant)	
	.RESet	Method	[No read]
	.TRACe(Tr)		
	.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]

**Table 7-3 E5070B/E5071B COM object tree**

Object	Object type	Note
SCPI		
.DISPlay		
.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)	
.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]

**Table 7-3 E5070B/E5071B COM object tree**

Object	Object type	Note
SCPI		
.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		
.ASCFactor	Property(Data Type:String)	[No read]
.BSCFactor	Property(Data Type:String)	[No read]
.CAHNnel		
.STATe	Property(Data Type:String)	[No read]
.LIMit	Property(Data Type:String)	[No read]
.PLOs	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		
.ASCFactor	Property(Data Type:String)	[No read]
.BSCFactor	Property(Data Type:String)	[No read]
.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]
.PLOs	Property(Data Type:String)	[No read]
.SALL	Property(Data Type:Boolean)	
.SEGMent	Property(Data Type:String)	[No read]
.STATe	Property(Data Type:String)	[No read]
.STYPe	Property(Data Type:String)	
.OUTPUT		
.STATe	Property(Data Type:Boolean)	
.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)	
.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]

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Table 7-3 E5070B/E5071B COM object tree

Object	Object type	Note
SCPI		
.SENSE( <i>Ch</i> )		
.CORRection		
.COLLection		
.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		
.CCHeck		
.ACQuire	Method	[No read]
.ISOLation		
.STATe	Property(Data Type:Boolean)	
.PATH( <i>Cpt</i> )	Property(Data Type:Long)	
.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]
.UCHar	Property(Data Type:String)	
.METHod		
.RESPOse		
.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]



**Table 7-3 E5070B/E5071B 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)	
.CW	Property(Data Type:Double)	
.DATA	Property(Data Type:Variant)	[Read only]
.FIXed	Property(Data Type:Double)	
.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)	

7. COM Object Reference

Table 7-3 E5070B/E5071B COM object tree

Object	Object type	Note
SCPI		
.SERVICE		
.CHANnel( <i>Ch</i> )		
.ACTive	Property(Data Type:Long)	[Read only]
.COUNt	Property(Data Type:Long)	[Read only]
.TRACe		
.ACTive	Property(Data Type:Long)	[Read only]
.COUNt	Property(Data Type:Long)	[Read only]
.PORT		
.COUNt	Property(Data Type:Long)	[Read only]
.SOURce( <i>Ch</i> )		
.POWER		
.ATTenuation		
.DATA	Property(Data Type:Long)	
.CENTer	Property(Data Type:Double)	
.LEVel		
.IMMediate		
.AMPLitude	Property(Data Type:Double)	
.SLOPe		
.DATA	Property(Data Type:Double)	
.STATe	Property(Data Type:Boolean)	
.PORT( <i>Pr</i> )		
.CORRection		
.COLLection		
.ACQuire	Property(Data Type:String)	[No read]
.ASENSor		
.RCFactor	Property(Data Type:Double)	
.AVERAge		
.COUNt	Property(Data Type:Long)	
.BSENSor		
.RCFactor	Property(Data Type:Double)	
.TABLe		
.ASENSor		
.DATA	Property(Data Type:Variant)	
.BSENSor		
.DATA	Property(Data Type:Variant)	
.LOSS		
.DATA	Property(Data Type:Variant)	
.STATe	Property(Data Type:Boolean)	
.DATA	Property(Data Type:Variant)	
.STATe	Property(Data Type:Boolean)	
.COUPle	Property(Data Type:Boolean)	
.LEVel		
.IMMediate		
.AMPLitude	Property(Data Type:Double)	
.SPAN	Property(Data Type:Double)	
.START	Property(Data Type:Double)	
.STOP	Property(Data Type:Double)	

**Table 7-3 E5070B/E5071B 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]
.ECHANnel		
.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)	
.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]
.ELIMit		
.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)	
.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)	

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**Table 7-3 E5070B/E5071B COM object tree**

Object	Object type	Note
SCPI		
.SYSTEM		
.BACKlight	Property(Data Type:Boolean)	
.BEEPPer		
.COMPLete		
.IMMEdiate	Method	[No read]
.STATe	Property(Data Type:Boolean)	
.WARNing		
.IMMEdiate	Method	[No read]
.STATe	Property(Data Type:Boolean)	
.COMMunicate		
.GPIB		
.PMETer		
.ADDRess	Property(Data Type:Long)	
.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)	

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## 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 E5070B/E5071B COM object. The E5070B/E5071B provides properties and methods as the types of COM objects. In the E5070B/E5071B COM objects, COM objects to set (send)/read (return) the state of the E5070B/E5071B 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 E5070B/E5071B VBA to the E5070B/E5071B. 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 E5070B/E5071B.

*variable*=object (property): to read the stat of the E5070B/E5071B.

"Object (method)": to make the E5070B/E5071B 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 E5070B/E5071B are indicated with “Read only” and ones used only to set the state of the E5070B/E5071B “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 E5070B/E5071B 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/alphanumeric 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 E5070B/E5071B 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 object.

**[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 E5070B/E5071B COM object model. They consist of 7 objects dedicated to the E5070B/E5071B COM interface and SCPI objects corresponding to SCPI commands. This section describes the objects dedicated to the E5070B/E5071B COM interface.

### ECHO

Object type	Method						
Syntax	ECHO <i>V1,V2,...,V10</i> ECHO <i>SCPI object</i>						
Description	Provides display in the echo window. (No read)  There is the following difference from the display with the SCPI.DISPLAY.ECHO.DATA object. <ul style="list-style-type: none"> <li>• Up to 10 data items can be displayed.</li> <li>• Data is displayed as the declared data type without a cast.</li> </ul> <table border="1" style="margin-top: 10px;"> <tr> <td></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	<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  ECHO SCPI.SYSTem.ERRor</pre>						
Related objects	SCPI.DISPLAY.ECHO.DATA on page 319						
Equivalent key	No equivalent key is available on the front panel.						

COM Object Reference  
**NAME**

**NAME**

Object type Property

Syntax *App* = NAME

Description Reads out the application name of VBA. “E5070B” or “E5071B” 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 E5070B/E5071B. For information on the SCPI commands, see Chapter “SCPI Command Reference” in the *E5070B/E5071B Programmer’s Guide*.

The **Parse** object is a little slower in the execution speed than the COM object which has the same function as the SCPI command 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

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

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

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

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

Equivalent key

No equivalent key is available on the front panel.

**Prompt****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 <b>[Macro Setup] - Continue</b> 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 E5070B/E5071B Measurement Screen” on page 50. If you need to abort the program, see “Stopping with the Dialog Box Appeared” on page 51.

## 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(*Key\_id*).Caption

**Object type** Property

**Syntax** UserMenu.Item(*Key\_id*).Caption = *Lbl*  
*Lbl* = UserMenu.Item(*Key\_id*).Caption

**Description** Sets the label name of the user menu function softkeys 1 to 10 (*Key\_id*).

**Variable**

**Table 7-5**

### Variable (*Key\_id*)

	<i>Key_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.

**Examples**

```
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(Key\_id).Enabled**

Object type	Property
Syntax	UserMenu.Item( <i>Key_id</i> ).Enabled = <i>Status</i> <i>Status</i> = UserMenu.Item( <i>Key_id</i> ).Enabled
Description	Makes the user menu function softkeys 1 to 10 ( <i>Key_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. •True or -1                    Makes the softkey enabled. •False or 0                    Makes the softkey enabled.
Preset value	True or -1

For information on the variable (*Key\_id*), see Table 7-5, “Variable (Key\_id),” on page 175.

**Examples**

```
Dim KeyEna As Boolean
UserMenu.Item(10).Enabled = False
KeyEna = UserMenu.Item(10).Enabled
```

**Related objects**      UserMenu.Press(*Key\_id*) on page 178

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

## **UserMenu\_OnPress(ByVal Key\_id As Long)**

Object type	Event
Description	Executes the processing when one of the user menu function softkeys 1 to 10 ( <i>Key_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 76.
Variable	For information on the variable ( <i>Key_id</i> ), see Table 7-5, “Variable (Key_id),” on page 175.
Examples	<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)
Examples	UserMenu.PRESet
Related objects	UserMenu.Item(Key_id).Caption on page 175 UserMenu.Item(Key_id).Enabled on page 176
Equivalent key	<b>[Macro Setup] - Preset User Menu</b>

## **UserMenu.Press(*Key\_id*)**

Object type	Method
Syntax	UserMenu.Press( <i>Key_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>Key_id</i> ), see Table 7-5, “Variable (Key_id),” on page 175.
Examples	UserMenu.Press(1)
Related objects	UserMenu.Item(Key_id).Enabled on page 176
Equivalent key	<b>[Macro Setup] - User Menu - Button 1  Button 2  Button 3  Button 4  Button 5  Button 6   Button 7   Button 8   Button 9   Button 10</b>

## **UserMenu.Show**

Object type	Method
Syntax	UserMenu.Show
Description	Displays the user menu function softkeys in the softkey area. (No read)
Examples	UserMenu.Show
Equivalent key	<b>[Macro Setup] - User Menu</b>

## VBAVersion

Object type	Property
Syntax	<i>Vers</i> = VBAVersion
Description	Reads out the version information of VBA installed in the E5070B/E5071B. (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>E5070B/E5071B 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"> <li>• True or -1                    1 has been received within the specified time.</li> <li>• False or 0                    1 has not been received within the specified time due to timeout or abort.</li> </ul>

	<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 E5070B/E5071B.

### 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>E5070B/E5071B Programmer’s Guide</i>. (No read)</p>
Examples	SCPI.ABORT
Related objects	SCPI.INITiate(Ch).IMMEDIATE on page 353 SCPI.INITiate(Ch).CONTinuous on page 352
Equivalent key	<b>[Trigger] - Restart</b>

## 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 16 ( <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 16
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 185.

	<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	$\Omega$ (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.

**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 184

**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( <i>Ch</i> ).FSIMulator.BALun.CZConversion.STATE = <i>Status</i> <i>Status</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.CZConversion.STATE
Description	For all the balance ports of channels 1 to 16 ( <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"> <li>• True or -1                      Turns ON the common port impedance conversion function.</li> <li>• False or 0                      Turns OFF the common 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 182.

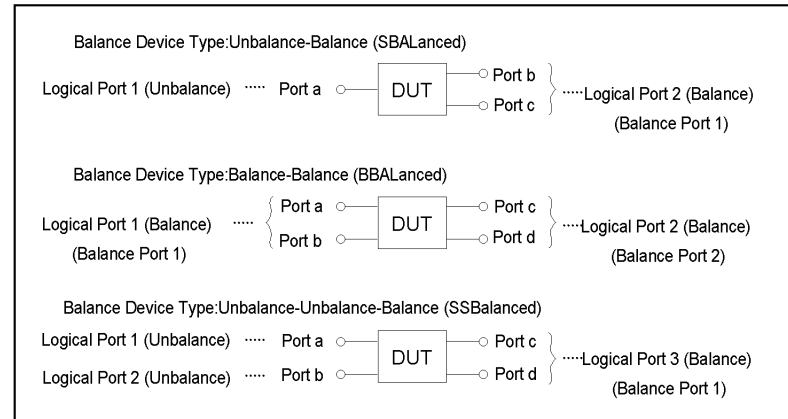
Examples	<pre>Dim ComZcon As Boolean SCPI.CALCulate(1).FSIMulator.BALun.CZConversion.STATE = True ComZcon = SCPI.CALCulate(1).FSIMulator.BALun.CZConversion.STATE</pre>
Related objects	SCPI.CALCulate(Ch).FSIMulator.BALun.CZConversion. BPORT(Bpt).Z0.R on page 182
Equivalent key	<b>[Analysis] - Fixture Simulator - Cmn ZConversion - Cmn ZConversion</b>

## 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 16 ( <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"> <li>•"SBALanced"            Specifies the unbalance-balance (3 ports).</li> <li>•"BBALanced"           Specifies the balance-balance (4 ports).</li> <li>•"SSBALanced"          Specifies the unbalance-unbalance-balance (4 ports).</li> </ul>
Preset value	"SBALanced"

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

**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 199
- SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology. SBALanced.PPORTs on page 201
- SCPI.CALCulate(Ch).FSIMulator.BALun.TOPology. SSBALanced.PPORTs on page 202

**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 182 and Table 7-7, “Variable (Bpt),” on page 182, respectively.

**Examples**

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

**Related objects**

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.G on page 187

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.L on page 188

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.R on page 189

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).TYPE on page 190

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. STATE on page 192

**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 182 and Table 7-7, “Variable (Bpt),” on page 182, 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 186
  - SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.L on page 188
  - SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.R on page 189
  - SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE on page 190
  - SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. STATE on page 192
- 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 182 and Table 7-7, “Variable (Bpt),” on page 182, 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 186

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.G on page 187

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).PARAMeters.R on page 189

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. BPORT(*Bpt*).TYPE on page 190

SCPI.CALCulate(*Ch*).FSIMulator.BALun.DMCircuit. STATE on page 192

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 182 and Table 7-7, “Variable (Bpt),” on page 182, 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 186
  - SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.G on page 187
  - SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.L on page 188
  - SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE on page 190
  - SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. STATE on page 192
- Equivalent key** **[Analysis] - Fixture Simulator - Diff Matching - R**

7. COM Object Reference

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

Object type	Property
Syntax	SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit.BPORT(Bpt).TYPE = <i>Param</i> <i>Param</i> = SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit.BPORT(Bpt).TYPE
Description	For balance ports 1 and 2 ( <i>Bpt</i> ) of channels 1 to 16 ( <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>E5070B/E5071B 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. <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*1.</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 182 and Table 7-7, “Variable (Bpt),” on page 182, 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 186

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.G on page 187

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.L on page 188

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.R on page 189

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).USER.FILEname on page 191

SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. STATE on page 192

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

**Description** For balance ports 1 and 2 (*Bpt*) of channels 1 to 16 (*Ch*), specifies the file in which the information on the user-defined differential matching circuit 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 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.

**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 182 and Table 7-7, "Variable (Bpt)," on page 182, respectively.

**Examples**

```
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"
```

**Related objects** SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE on page 190  
 SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. STATE on page 192

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

**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 16 (*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. <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 182.

**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 186
- SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.G on page 187
- SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.L on page 188
- SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).PARAMeters.R on page 189
- SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).USER.FILEname on page 191
- SCPI.CALCulate(Ch).FSIMulator.BALun.DMCircuit. BPORT(Bpt).TYPE on page 190
- SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr). STATE on page 198
- SCPI.CALCulate(Ch).FSIMulator.STATE on page 222

**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> <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 16 ( <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 182 and Table 7-7, “Variable (Bpt),” on page 182, respectively.

Examples	Dim DZ0 As Double SCPI.CALCulate(1).FSIMulator.BALun.DZConversion.BPORT(1).Z0.R = 200 DZ0 = SCPI.CALCulate(1).FSIMulator.BALun.DZConversion.BPORT(1).Z0.R
Related objects	SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion.STATE on page 194
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 = *Status*  
*Status* = SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion.STATE

Description For all the balance ports of channels 1 to 16 (*Ch*), 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. <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 182.

Examples

```
Dim DifZcon As Boolean
SCPI.CALCulate(1).FSIMulator.BALun.DZConversion.STATE = True
DifZcon = SCPI.CALCulate(1).FSIMulator.BALun.DZConversion.STATE
```

Related objects SCPI.CALCulate(Ch).FSIMulator.BALun.DZConversion. BPORT(Bpt).Z0.R on page 193

Equivalent key **[Analysis] - Fixture Simulator - Diff ZConversion - Diff ZConversion**

## 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> <i>Param</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.PARAmeter( <i>Tr</i> ).BBALanced.DEFIne
Description	For traces 1 to 16 ( <i>Tr</i> ) of channels 1 to 16 ( <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. <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/Scc21).</li> </ul>
Preset value	"SDD11"

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, "Variable (Ch)," on page 182 and Table 7-10, "Variable (Tr)," on page 225, 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 185

### Equivalent key

**[Analysis] - Fixture Simulator**[Meas] - Sdd11|Sdd21|Sdd12|Sdd22|Scd11|Scd21|Scd12|Scd22|Sdc11|Sdc21|Sdc12|Sdc22|Scc11|Scc21|Scc12|Scc22|Imbalance1|Imbalance2|Sdd21|Scc21

**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> <i>Param</i> = SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).SBALanced.DEFine
Description	For traces 1 to 16 ( <i>Tr</i> ) of channels 1 to 16 ( <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. <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> <li>•"CMRR2"               Specifies CMRR2 (Ssd12/Ssc12).</li> </ul>
Preset value	"SSS11"

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, "Variable (Ch)," on page 182 and Table 7-10, "Variable (Tr)," on page 225, 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 185

## Equivalent key

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



## 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> <i>Param</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.PARAmeter( <i>Tr</i> ).SSBalanced.DEFine
Description	For traces 1 to 16 ( <i>Tr</i> ) of channels 1 to 16 ( <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. <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 182 and Table 7-10, "Variable (Tr)," on page 225, 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 185

### 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 = <i>Status</i> <i>Status</i> = SCPI.CALCulate(Ch).FSIMulator.BALun.PARAmeter(Tr).STATE
Description	For traces 1 and 9 ( <i>Tr</i> ) of channels 1 to 16 ( <i>Ch</i> ), 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. <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 182 and Table 7-10, “Variable (Tr),” on page 225, respectively.

Examples	<pre>Dim BalMode As Boolean SCPI.CALCulate(1).FSIMulator.BALun.PARAmeter(1).STATE = True BalMode = SCPI.CALCulate(1).FSIMulator.BALun.PARAmeter(1).STATE</pre>
Related objects	SCPI.CALCulate(Ch).FSIMulator.STATE on page 222
Equivalent key	<b>[Analysis] - Fixture Simulator - BalUn</b>

## SCPI.CALCulate(*Ch*).FSIMulator.BALun.TOPology.BBALanced.PPORTs

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.TOPology.BBALanced.PPORTs = <i>Ports</i> <i>Ports</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.TOPology.BBALanced.PPORTs
Description	For channels 1 to 16 ( <i>Ch</i> ), 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( <i>Ch</i> ).FSIMulator.BALun.DEVICE object.

### Variable

	<i>Ports</i>
Description	Indicates 4-element array data (port number).  <ul style="list-style-type: none"> <li>• <i>Ports</i>(0)                      Port number assigned to port a in Figure 7-2 on page 185.</li> <li>• <i>Ports</i>(1)                      Port number assigned to port b in Figure 7-2 on page 185.</li> <li>• <i>Ports</i>(2)                      Port number assigned to port c in Figure 7-2 on page 185.</li> <li>• <i>Ports</i>(3)                      Port number assigned to port d in Figure 7-2 on page 185.</li> </ul> The index of the array starts from 0.
Data type	Variant type (Variant)
Range	1 to 4
Preset value	<i>Ports</i> (0):1 / <i>Ports</i> (1):2 / <i>Ports</i> (2):3 / <i>Ports</i> (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 182.

### Examples

```
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
```

```
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 185

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.PROPerTy.STATe

Object type Property

Syntax SCPI.CALCulate(*Ch*).FSIMulator.BALun.TOPology.PROPerTy.STATe = *Status*  
*Status* = SCPI.CALCulate(*Ch*).FSIMulator.BALun.TOPology.PROPerTy.STATe

Description For channels 1 to 16 (*Ch*), turns on/off the property display for the topology setting when using the balance-unbalance conversion.

Variable

	<i>Status</i>
Description	On/off of the property display of the topology setting
Data type	Boolean type (Boolean)
Range	Select from the following. <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 (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

Examples

```
Dim TopProp As Boolean
SCPI.CALCulate(1).FSIMulator.BALun.TOPology.PROPerTy.STATe = True
TopProp = SCPI.CALCulate(1).FSIMulator.BALun.TOPology.PROPerTy.STATe
```

Equivalent key

**[Analysis] - Fixture Simulator - Topology - Property**

## SCPI.CALCulate(*Ch*).FSIMulator.BALun.TOPology.SBALanced.PPORts

<b>Object type</b>	Property
<b>Syntax</b>	SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.TOPology.SBALanced.PPORts = <i>Ports</i> <i>Ports</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.TOPology.SBALanced.PPORts
<b>Description</b>	For channels 1 to 16 ( <i>Ch</i> ), 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"> <li>• <i>Ports</i>(0)                      Port number assigned to port a in Figure 7-2 on page 185.</li> <li>• <i>Ports</i>(1)                      Port number assigned to port b in Figure 7-2 on page 185.</li> <li>• <i>Ports</i>(2)                      Port number assigned to port c in Figure 7-2 on page 185.</li> </ul> The index of the array starts from 0.
Data type	Variant type (Variant)
Range	1 to 4
Preset value	<i>Ports</i> (0):1 / <i>Ports</i> (1):2 / <i>Ports</i> (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 182.

**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 185

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

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

## SCPI.CALCulate(*Ch*).FSIMulator.BALun.TOPology.SSBalanced.PPORTs

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.TOPology.SSBalanced.PPORTs = <i>Ports</i> <i>Ports</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.TOPology.SSBalanced.PPORTs
Description	For channels 1 to 16 ( <i>Ch</i> ), assigns each port when the balance device type is "unbalance-unbalance-balance."  To set the balance device type to "unbalance-unbalance-balance," specify SSB with the SCPI.CALCulate( <i>Ch</i> ).FSIMulator.BALun.DEVICE object.

### Variable

	<i>Ports</i>
Description	Indicates 4-element array data (port number).  <ul style="list-style-type: none"> <li>• <i>Ports(0)</i>                      Port number assigned to port a in Figure 7-2 on page 185.</li> <li>• <i>Ports(1)</i>                      Port number assigned to port b in Figure 7-2 on page 185.</li> <li>• <i>Ports(2)</i>                      Port number assigned to port c in Figure 7-2 on page 185.</li> <li>• <i>Ports(3)</i>                      Port number assigned to port d in Figure 7-2 on page 185.</li> </ul> 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, 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 182.

### Examples

```
Dim SsbPort As Variant
SCPI.CALCulate(1).FSIMulator.BALun.DEVICE = "ssb"
SCPI.CALCulate(1).FSIMulator.BALun.TOPology.SSBalanced.PPORTs = Array(1, 4, 2, 3)
SsbPort = SCPI.CALCulate(1).FSIMulator.BALun.TOPology.SSBalanced.PPORTs
```

Related objects      SCPI.CALCulate(*Ch*).FSIMulator.BALun.DEVICE on page 185

Equivalent key      **[Analysis] - Fixture Simulator - Topology - Port1(se)**  
**[Analysis] - Fixture Simulator - Topology - Port2(se)**  
**[Analysis] - Fixture Simulator - Topology - Port3(bal)**

### NOTE

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

## SCPI.CALCulate(*Ch*).FSIMulator.EMBed.NETWork(*Nwk*). FILEname

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).FSIMulator.EMBed.NETWork( <i>Nwk</i> ).FILEname = <i>File</i> <i>File</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.EMBed.NETWork( <i>Nwk</i> ).FILEname
Description	<p>For channels 1 to 16 (<i>Ch</i>), specifies a file in which the information of networks 1 to 2 (<i>Nwk</i>) you want to embed/de-embed using the 4-port network embedding/de-embedding feature is saved (4-port touchstone file with the ".s4p" 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>For information on network numbers, refer to Figure 7-3 on page 209.</p>

**NOTE** This function is available with the firmware version 3.50 or greater.

Variable

**Table 7-8**

**Variable (*Nwk*)**

	<b><i>Nwk</i></b>
Description	Number of network
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.

	<b><i>File</i></b>
Description	4-port touchstone file name (extension: .s4p) for the 4-port network embedding/de-embedding feature
Data type	Character string type (String)
Range	254 characters or less
Preset value	""
Note	When the processing type is set to NONE, even if the specified file does not exist, no error occurs when you execute this object. However, when you set the processing type to embedding/de-embedding with the SCPI.CALCulate( <i>Ch</i> ).FSIMulator.EMBed.NETWork( <i>Nwk</i> ). TYPE object, an error occurs.

For information on the variable (*Ch*), refer to Table 7-6, "Variable (Ch)," on page 182.

Examples

```
Dim Emb As String
SCPI.CALCulate(1).FSIMulator.EMBed.NETWork(1).FILEname = "network.s4p"
Emb = SCPI.CALCulate(1).FSIMulator.EMBed.NETWork(1).FILEname
```

Related objects

SCPI.CALCulate(*Ch*).FSIMulator.EMBed.NETWork(*Nwk*). TYPE on page 204  
 SCPI.CALCulate(*Ch*).FSIMulator.EMBed.STAtE on page 205

Equivalent key

[Analysis] - Fixture Simulator - De-Embedding S4P - Topology - User File (nwk1) User File (nwk2)

**SCPI.CALCulate(Ch).FSIMulator.EMBed.NETWork(Nwk).TYPE**

Object type	Property
Syntax	SCPI.CALCulate(Ch).FSIMulator.EMBed.NETWork(Nwk).TYPE = <i>File</i> <i>File</i> = SCPI.CALCulate(Ch).FSIMulator.EMBed.NETWork(Nwk).TYPE
Description	For the 4-port network embedding/de-embedding feature for channels 1 to 16 ( <i>Ch</i> ), selects the processing type for networks 1 and 2 ( <i>Nwk</i> ).

---

**NOTE** This function is available with the firmware version 3.50 or greater.

## Variable

	<i>Param</i>
Description	Processing type
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> <li>•"NONE"                      Specifies no-processing.</li> <li>•"EMBed"                    Specifies embedding.</li> <li>•"DEEMbed"                Specifies de-embedding.</li> </ul>
Preset value	"NONE"
Note	Before selecting embedding/de-embedding, use the SCPI.CALCulate(Ch).FSIMulator.EMBed.NETWork(Nwk).FILENAME object to specify the 4-port touchstone file in which the information on the network is saved. If you do not specify the appropriate file and you select embedding/de-embedding, a runtime error occurs and NONE is automatically selected.

For information on the variable (*Ch*) and the variable (*Nwk*), refer to Table 7-6, "Variable (Ch)," on page 182 and Table 7-8, "Variable (Nwk)," on page 203, respectively.

Examples	<pre>Dim EmbType As String SCPI.CALCulate(1).FSIMulator.EMBed.NETWork(1).FILENAME = "network.s4p" SCPI.CALCulate(1).FSIMulator.EMBed.NETWork(1).TYPE = "deem" EmbType = SCPI.CALCulate(1).FSIMulator.EMBed.NETWork(1).TYPE</pre>
Related objects	SCPI.CALCulate(Ch).FSIMulator.EMBed.NETWork(Nwk).FILENAME on page 203 SCPI.CALCulate(Ch).FSIMulator.EMBed.STATE on page 205
Equivalent key	<b>[Analysis] - Fixture Simulator - De-Embedding S4P - Topology - Type (nwk1) Type (nwk2) - None Embed De-Embed</b>



## SCPI.CALCulate(*Ch*).FSIMulator.EMBed.STATe

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).FSIMulator.EMBed.STATe = <i>Status</i> <i>Status</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.EMBed.STATe
Description	For channels 1 to 16 ( <i>Ch</i> ), turns ON/OFF the 4-port network embedding/de-embedding feature when the fixture simulator feature is ON.

**NOTE** This function is available with the firmware version 3.50 or greater.

### Variable

	<i>Status</i>
Description	Turns ON/OFF the 4-port network embedding/de-embedding feature.
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> <li>• True or -1                      Turns ON the 4-port network embedding/de-embedding feature.</li> <li>• False or 0                      Turns OFF the 4-port network embedding/de-embedding feature.</li> </ul>
Preset value	False or 0

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

**Examples**

```
Dim Emb As Boolean
SCPI.CALCulate(1).FSIMulator.EMBed.STATe = True
Emb = SCPI.CALCulate(1).FSIMulator.EMBed.STATe
```

**Related objects**

SCPI.CALCulate(Ch).FSIMulator.EMBed.NETWork(Nwk).FILENAME on page 203  
 SCPI.CALCulate(Ch).FSIMulator.EMBed.NETWork(Nwk).TYPE on page 204  
 SCPI.CALCulate(Ch).FSIMulator.STATe on page 222

**Equivalent key**     **[Analysis] - Fixture Simulator - De-Embedding S4P - De-Embedding S4P**

## SCPI.CALCulate(*Ch*).FSIMulator.EMBed.TOPology.A. PORTs

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).FSIMulator.EMBed.TOPology.A.PORTs = <i>Ports</i> <i>Ports</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.EMBed.TOPology.A.PORTs
Description	For the 4-port network embedding/de-embedding feature for channels 1 to 16 ( <i>Ch</i> ), specifies test port assignment when the connection type (Topology) is set to A.  For information on the connection type (Topology), refer to Figure 7-3 on page 209.

---

**NOTE** This function is available with the firmware version 3.50 or greater.

---

### Variable

	<i>Ports</i>
Description	Indicates 2-element array data (port numbers). <ul style="list-style-type: none"> <li>• <i>Ports(0)</i>                      Port number assigned to port a in Figure 7-3.</li> <li>• <i>Ports(1)</i>                      Port number assigned to port b in Figure 7-3.</li> </ul> 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
Resolution	1
Note	If the specified variable is out of the allowable setting range, an error occurs when executed. If you specify an identical port number to multiple ports, a runtime error occurs.

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

**Examples**

```
Dim EnbPort As Variant
SCPI.CALCulate(1).FSIMulator.ENBed.TYPE = "a"
SCPI.CALCulate(1).FSIMulator.ENBed.TOPology.A.PORTs = Array(2,1)
EnbPort = SCPI.CALCulate(1).FSIMulator.ENBed.TOPology.A.PORTs
```

**Related objects** SCPI.CALCulate(Ch).FSIMulator.EMBed.TYPE on page 209

**Equivalent key** **[Analysis] - Fixture Simulator - De-Embedding S4P - Topology - Ports - 1-2|1-3|1-4|2-1|2-3|2-4|3-1|3-2|3-4|4-1|4-2|4-3**

## SCPI.CALCulate(*Ch*).FSIMulator.EMBed.TOPology.B. PORTs

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).FSIMulator.EMBed.TOPology.B.PORTs = <i>Ports</i> <i>Ports</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.EMBed.TOPology.B.PORTs
Description	For the 4-port network embedding/de-embedding feature for channels 1 to 16 ( <i>Ch</i> ), specifies test port assignment when the connection type (Topology) is set to B.  For information on the connection type (Topology), refer to Figure 7-3 on page 209.

**NOTE** This function is available with the firmware version 3.50 or greater.

### Variable

	<i>Ports</i>
Description	Indicates 3-element array data (port numbers). <ul style="list-style-type: none"> <li>• <i>Ports(0)</i>                      Port number assigned to port a in Figure 7-3.</li> <li>• <i>Ports(1)</i>                      Port number assigned to port b in Figure 7-3.</li> <li>• <i>Ports(2)</i>                      Port number assigned to port c in Figure 7-3.</li> </ul> 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 setting range, an error occurs when executed. If you specify an identical port number to multiple ports, a runtime error occurs.

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

### Examples

```
Dim EnbPort As Variant
SCPI.CALCulate(1).FSIMulator.ENBed.TYPE = "b"
SCPI.CALCulate(1).FSIMulator.ENBed.TOPology.B.PORTs = Array(1,3,2)
EnbPort = SCPI.CALCulate(1).FSIMulator.ENBed.TOPology.B.PORTs
```

### Related objects

SCPI.CALCulate(Ch).FSIMulator.EMBed.TYPE on page 209

### Equivalent key

**[Analysis] - Fixture Simulator - De-Embedding S4P - Topology - Ports -**  
**1-2-3|1-2-4|1-3-2|1-3-4|1-4-2|1-4-3|2-1-3|2-1-4|2-3-1|2-3-4|2-4-1|2-4-3|**  
**3-1-2|3-1-4|3-2-1|3-2-4|3-4-1|3-4-2|4-1-2|4-1-3|4-2-1|4-2-3|4-3-1|4-3-2**

## SCPI.CALCulate(*Ch*).FSIMulator.EMBed.TOPology.C. PORTs

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).FSIMulator.EMBed.TOPology.C.PORTs = <i>Ports</i> <i>Ports</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.EMBed.TOPology.C.PORTs
Description	For the 4-port network embedding/de-embedding feature for channels 1 to 16 ( <i>Ch</i> ), specifies test port assignment when the connection type (Topology) is set to C.  For information on the connection type (Topology), refer to Figure 7-3 on page 209.

---

**NOTE** This function is available with the firmware version 3.50 or greater.

### Variable

	<i>Ports</i>
Description	Indicates 4-element array data (port numbers).  <ul style="list-style-type: none"> <li>• <i>Ports(0)</i> Port number assigned to port a in Figure 7-3.</li> <li>• <i>Ports(1)</i> Port number assigned to port b in Figure 7-3.</li> <li>• <i>Ports(2)</i> Port number assigned to port c in Figure 7-3.</li> <li>• <i>Ports(3)</i> Port number assigned to port d in Figure 7-3.</li> </ul> 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 setting range, an error occurs when executed. If you specify an identical port number to multiple ports, a runtime error occurs.

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

**Examples**

```
Dim EnbPort As Variant
SCPI.CALCulate(1).FSIMulator.ENBed.TYPE = "c"
SCPI.CALCulate(1).FSIMulator.ENBed.TOPology.C.PORTs = Array(1,4,2,3)
EnbPort = SCPI.CALCulate(1).FSIMulator.ENBed.TOPology.C.PORTs
```

**Related objects** SCPI.CALCulate(Ch).FSIMulator.EMBed.TYPE on page 209

**Equivalent key** **[Analysis] - Fixture Simulator - De-Embedding S4P - Topology - Ports -**  
**1-2-3-4|1-2-4-3|1-3-2-4|1-3-4-2|1-4-2-3|1-4-3-2|2-1-3-4|2-1-4-3|2-3-1-4|2-3-4-1|**  
**2-4-1-3|2-4-3-1|3-1-2-4|3-1-4-2|3-2-1-4|3-2-4-1|3-4-1-2|3-4-2-1|4-1-2-3|4-1-3-2|**  
**4-2-1-3|4-2-3-1|4-3-1-2|4-3-2-1**

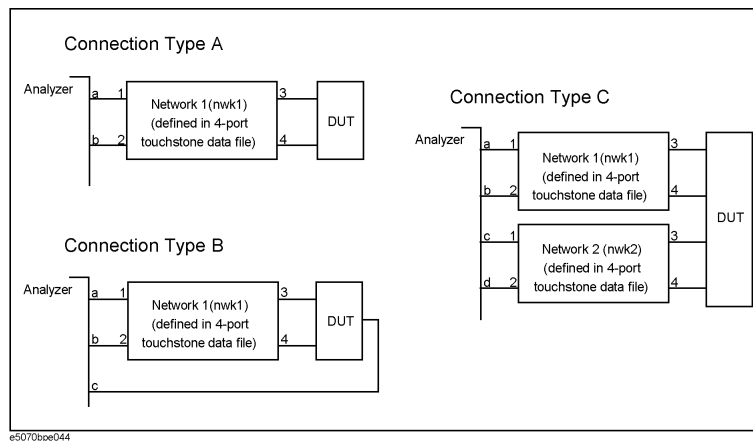
## SCPI.CALCulate(Ch).FSIMulator.EMBed.TYPE

Object type	Property
Syntax	SCPI.CALCulate(Ch).FSIMulator.EMBed.TYPE = <i>File</i> <i>File</i> = SCPI.CALCulate(Ch).FSIMulator.EMBed.TYPE
Description	For the 4-port network embedding/de-embedding feature for channels 1 to 16 ( <i>Ch</i> ), selects a connection type (Topology).

**NOTE** This function is available with the firmware version 3.50 or greater.

**Figure 7-3**

**Connection type**



**Variable**

	<i>Param</i>
Description	Connection type (refer to Figure 7-3)
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> <li>•"A"                      Specifies connection type A.</li> <li>•"B"                      Specifies connection type B.</li> <li>•"C"                      Specifies connection type C.</li> </ul>
Preset value	"A"

(For information on *Ch*, refer to Table 7-6, “Variable (Ch),” on page 182.

**Examples**

```
Dim EmbType As String
SCPI.CALCulate(1).FSIMulator.EMBed.TYPE = "b"
EmbType = SCPI.CALCulate(1).FSIMulator.EMBed.TYPE
```

**Related objects**

- SCPI.CALCulate(Ch).FSIMulator.EMBed.TOPology.A. PORTs on page 206
- SCPI.CALCulate(Ch).FSIMulator.EMBed.TOPology.B. PORTs on page 207
- SCPI.CALCulate(Ch).FSIMulator.EMBed.TOPology.C. PORTs on page 208

**Equivalent key**

[Analysis] - Fixture Simulator - De-Embedding S4P - Topology - Select Topology - A|B|C

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

Object type	Property
Syntax	SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed.PORT(Pt).TYPE = <i>Param</i> <i>Param</i> = SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed.PORT(Pt).TYPE
Description	For ports 1 and 4 ( <i>Pt</i> ) of channels 1 to 16 ( <i>Ch</i> ), selects the type of the network de-embedding.

Variable

Table 7-9

**Variable (*Pt*)**

	<b><i>Pt</i></b>
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.

	<b><i>Param</i></b>
Description	Type of the network de-embedding
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> <li>•"NONE"                      Specifies no network de-embedding.</li> <li>•"USER"                      Specifies the user-defined network de-embedding *1.</li> </ul>
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 182.

**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 211

SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. STATE on page 212

**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 16 (*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 182 and Table 7-9, "Variable (Pt)," on page 210, 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 210  
 SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.DEEMbed. STATE on page 212

**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"> <li>•True or -1                      Turns ON the network de-embedding function.</li> <li>•False or 0                      Turns OFF the network de-embedding function.</li> </ul>
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

**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 211  
SCPI.CALCulate(Ch).FSIMulator.SENDEd.DEEMbed. PORT(Pt).TYPE on page 210  
SCPI.CALCulate(Ch).FSIMulator.STATe on page 222

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



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

**Object type** Property

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

**Description** For ports 1 and 4 (*Pt*) of channels 1 to 16 (*Ch*), 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 182 and Table 7-9, “Variable (Pt),” on page 210, 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 217

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.G on page 214

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.L on page 215

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.R on page 216

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 219

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

7. COM Object Reference

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

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).FSIMulator.SENDEd.PMCircuit.PORT( <i>Pt</i> ).PARAmeters.G = <i>Value</i> <i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.SENDEd.PMCircuit.PORT( <i>Pt</i> ).PARAmeters.G
Description	For ports 1 and 4 ( <i>Pt</i> ) of channels 1 to 16 ( <i>Ch</i> ), sets the G value of the matching circuit specified with the SCPI.CALCulate( <i>Ch</i> ).FSIMulator.SENDEd.PMCircuit.PORT( <i>Pt</i> ).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 182 and Table 7-9, “Variable (Pt),” on page 210, 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 217  
 SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.PMCircuit. PORT(*Pt*).PARAmeters.C on page 213  
 SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.PMCircuit. PORT(*Pt*).PARAmeters.L on page 215  
 SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.PMCircuit. PORT(*Pt*).PARAmeters.R on page 216  
 SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.PMCircuit. STATE on page 219

## Equivalent key

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

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

Object type	Property
Syntax	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).PARAmeters.L = <i>Value</i> <i>Value</i> = SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).PARAmeters.L
Description	For ports 1 and 4 ( <i>Pt</i> ) of channels 1 to 16 ( <i>Ch</i> ), sets the L value of the matching circuit specified with the SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).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 182 and Table 7-9, “Variable (Pt),” on page 210, 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 217  
SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.C on page 213

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.G on page 214

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.R on page 216

SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 219

## 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 16 (*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 182 and Table 7-9, “Variable (Pt),” on page 210, 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 217  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.C on page 213  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.G on page 214  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAmeters.L on page 215  
 SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 219

**Equivalent key**

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

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

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).FSIMulator.SENDEd.PMCircuit.PORT( <i>Pt</i> ).TYPE = <i>Param</i> <i>Param</i> = SCPI.CALCulate( <i>Ch</i> ).FSIMulator.SENDEd.PMCircuit.PORT( <i>Pt</i> ).TYPE
Description	For ports 1 and 4 ( <i>Pt</i> ) of channels 1 to 16 ( <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>E5070B/E5071B 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. <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 182 and Table 7-9, “Variable (Pt),” on page 210, respectively.

Examples	<pre>Dim CirType As String SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).TYPE = "slpc" CirType = SCPI.CALCulate(1).FSIMulator.SENDEd.PMCircuit.PORT(1).TYPE</pre>
Related objects	<p>SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.C on page 213</p> <p>SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.G on page 214</p> <p>SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.L on page 215</p> <p>SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.R on page 216</p> <p>SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).USER.FILEname on page 218</p> <p>SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 219</p>
Equivalent key	<b>[Analysis] - Fixture Simulator - Port Matching - Select Circuit</b>

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

Object type	Property
Syntax	SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).USER.FILename = <i>File</i> <i>File</i> = SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit.PORT(Pt).USER.FILename
Description	<p>For ports 1 and 4 (<i>Pt</i>) of channels 1 to 16 (<i>Ch</i>), specifies the file in which the information on the user-defined matching circuit is saved (2-port touchstone file).</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 matching circuit to the user-defined circuit with the SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).TYPE object, an error occurs.</p>

## 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 182 and Table 7-9, "Variable (Pt)," on page 210, respectively.

Examples	<pre>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"</pre>
Related objects	<p>SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).TYPE on page 217</p> <p>SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. STATE on page 219</p>
Equivalent key	<b>[Analysis] - Fixture Simulator - Port Matching - User File</b>

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

- Object type** Property
- Syntax** SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.PMCircuit.STATE = *Status*  
*Status* = SCPI.CALCulate(*Ch*).FSIMulator.SENDEd.PMCircuit.STATE
- Description** For all the ports of channel 1 to 9 (*Ch*), 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. <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 182.

- 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 217
  - SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.C on page 213
  - SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.G on page 214
  - SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.L on page 215
  - SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).PARAMeters.R on page 216
  - SCPI.CALCulate(Ch).FSIMulator.SENDEd.PMCircuit. PORT(Pt).USER.FILEname on page 218
  - SCPI.CALCulate(Ch).FSIMulator.STATE on page 222
- 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(Ch).FSIMulator.SENDEd.ZCONversion.PORT(Pt).Z0.R = <i>Value</i><br><i>Value</i> = SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONversion.PORT(Pt).Z0.R |
| Description | For ports 1 and 4 ( <i>Pt</i> ) of channels 1 to 16 ( <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 182 and Table 7-9, “Variable (Pt),” on page 210, 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 221                                                                                              |
| 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( <i>Ch</i> ).FSIMulator.SENDEd.ZCONversion.STATE = <i>Status</i><br><i>Status</i> = SCPI.CALCulate( <i>Ch</i> ).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 182.

|                 |                                                                                                                                                          |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Zcon As Boolean SCPI.CALCulate(1).FSIMulator.SENDEd.ZCONversion.STATE = True Zcon = SCPI.CALCulate(1).FSIMulator.SENDEd.ZCONversion.STATE</pre> |
| Related objects | SCPI.CALCulate(Ch).FSIMulator.SENDEd.ZCONversion. PORT(Pt).Z0.R on page 220<br>SCPI.CALCulate(Ch).FSIMulator.STATE on page 222                           |
| 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 = <i>Status</i><br><i>Status</i> = SCPI.CALCulate(Ch).FSIMulator.STATe |
| Description | Turns ON/OFF the fixture simulator function of channels 1 to 16 ( <i>Ch</i> ).                             |
| 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>•True or -1                      Turns ON the fixture simulator function.<br>•False or 0                      Turns OFF the fixture simulator function. |
| Preset value | False or 0                                                                                                                                                                            |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

|          |                                                                                                                        |
|----------|------------------------------------------------------------------------------------------------------------------------|
| Examples | <pre>Dim FxtSim As Boolean SCPI.CALCulate(1).FSIMulator.STATe = True FxtSim = SCPI.CALCulate(1).FSIMulator.STATe</pre> |
|----------|------------------------------------------------------------------------------------------------------------------------|

|                |                                                           |
|----------------|-----------------------------------------------------------|
| Equivalent key | <b>[Analysis] - Fixture Simulator - Fixture Simulator</b> |
|----------------|-----------------------------------------------------------|

## 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 16 ( <i>Ch</i> ).                                                             |
| Variable    |                                                                                                                          |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Number of traces                                                                                                                                                                                             |
| Data type    | Long integer type (Long)                                                                                                                                                                                     |
| Range        | Varies depending on the upper limit setting for the channel/trace number.                                                                                                                                    |
| 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 182.

**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 16 ( <i>Ch</i> ), sets the measurement parameter of traces 1 to 16 ( <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 182 and Table 7-10, “Variable (Tr),” on page 225, 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 16 (*Tr*) of channels 1 to 16 (*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 7-10**

### Variable (*Tr*)

|              | <i>Tr</i>                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------|
| Description  | Trace number                                                                                  |
| Data type    | Long integer type (Long)                                                                      |
| Range        | 1 to 16                                                                                       |
| 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 182.

**Examples** SCPI.CALCulate(2).PARAmeter(2).SElect

**Related objects** SCPI.DISPlay.WINDow(Ch).ACTivate on page 329

**Equivalent key** **[Trace Prev] / [Trace Next]**

## SCPI.CALCulate(*Ch*).SElected.CONVersion.FUNcTion

|             |                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                           |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.CONVersion.FUNcTion = <i>Param</i><br><i>Param</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.CONVersion.FUNcTion |
| Description | For the active trace of channels 1 to 16 ( <i>Ch</i> ), 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. <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 182.

|                 |                                                                                                                                                                                  |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Func As String SCPI.CALCulate(1).PARAmeter(1).SElect SCPI.CALCulate(1).SElected.CONVersion.FUNcTion = "ztr" Func = SCPI.CALCulate(1).SElected.CONVersion.FUNcTion</pre> |
| Related objects | SCPI.CALCulate( <i>Ch</i> ).SElected.CONVersion.STATe on page 227<br>SCPI.CALCulate( <i>Ch</i> ).PARAmeter( <i>Tr</i> ).SElect on page 225                                       |
| Equivalent key  | <b>[Analysis] - Conversion - Z:Reflection Z:Transmission Y:Reflection Y:Transmission 1/S</b>                                                                                     |

## 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 16 ( <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 182.

|                 |                                                                                                                                                                            |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 | SCPI.CALCulate(Ch).SElected.CONVersion.FUNcTION on page 226<br>SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225                                                         |
| Equivalent key  | <b>[Analysis] - Conversion - Conversion</b>                                                                                                                                |

**SCPI.CALCulate(Ch).SElected.CORRection.EDElay.TIME**

|             |                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                               |
| Syntax      | SCPI.CALCulate(Ch).SElected.CORRection.EDElay.TIME = <i>Value</i><br><i>Value</i> = SCPI.CALCulate(Ch).SElected.CORRection.EDElay.TIME |
| Description | Sets the electrical delay time of the active trace of channels 1 to 16 ( <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 182.

|                 |                                                                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>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</pre> |
| Related objects | SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225                                                                                                                                  |
| Equivalent key  | <b>[Scale] - Electrical Delay</b>                                                                                                                                                    |



## SCPI.CALCulate(*Ch*).SElected.CORRection.OFFSet.PHASE

- Object type** Property
- Syntax** SCPI.CALCulate(*Ch*).SElected.CORRection.OFFSet.PHASE = *Value*  
*Value* = SCPI.CALCulate(*Ch*).SElected.CORRection.OFFSet.PHASE
- Description** Sets the phase offset of the active trace of channels 1 to 16 (*Ch*).
- 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 182.

- Examples**
- ```
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
```
- Related objects** SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225
- Equivalent key** **[Scale] - Phase Offset**

## SCPI.CALCulate(Ch).SElected.DATA.FDATA

Object type	Property
Syntax	SCPI.CALCulate(Ch).SElected.DATA.FDATA = <i>Data</i> <i>Data</i> = SCPI.CALCulate(Ch).SElected.DATA.FDATA
Description	For the active trace of channels 1 to 16 ( <i>Ch</i> ), 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 <i>E5070B/E5071B Programmer’s Guide</i> .

---

**NOTE** If valid data is not calculated because of the invalid measurement, “1.#QNB” is read out.

### 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.  <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 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 182.

**Examples**

```
Dim FmtData As Variant
SCPI.SENSE(1).SWEp.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 225
- SCPI.SENSE(Ch).SWEp.POINTs on page 451
- SCPI.CALCulate(Ch).SElected.FORMAT on page 241
- SCPI.CALCulate(Ch).SElected.DATA.FMEMORY on page 231
- SCPI.CALCulate(Ch).SElected.DATA.SDATA on page 232

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

## SCPI.CALCulate(*Ch*).SElected.DATA.FMEMory

Object type	Property
Syntax	<p>SCPI.CALCulate(<i>Ch</i>).SElected.DATA.FMEMory = <i>Data</i></p> <p><i>Data</i> = SCPI.CALCulate(<i>Ch</i>).SElected.DATA.FMEMory</p>
Description	<p>For the active trace of channels 1 to 16 (<i>Ch</i>), sets/reads out the formatted memory array. The array data element varies in the data format (specified with the SCPI.CALCulate(<i>Ch</i>).SElected.FORMat object). For more information on the formatted memory array, see Section “Internal Data Processing” in the <i>E5070B/E5071B Programmer’s Guide</i>.</p>

---

**NOTE** If valid data is not calculated because of the invalid measurement, “1.#QNB” is read out.

### Variable

	<i>Data</i>
Description	<p>Indicates the array data (formatted 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)                      Data (primary value) at the n-th measurement point.</li> <li>• <i>Data</i>(<i>n</i>×2-1)                      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 182.

### Examples

```
Dim FmtMem As Variant
SCPI.SENSE(1).SWEep.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 225
- SCPI.SENSE(*Ch*).SWEep.POINTs on page 451
- SCPI.CALCulate(*Ch*).SElected.FORMat on page 241
- SCPI.CALCulate(*Ch*).SElected.DATA.FDATA on page 230
- SCPI.CALCulate(*Ch*).SElected.DATA.SMEMory on page 233

### Equivalent key

No equivalent key is available on the front panel.

## SCPI.CALCulate(*Ch*).SElected.DATA.SDATA

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).SElected.DATA.SDATA = <i>Data</i> <i>Data</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.DATA.SDATA
Description	For the active trace of channels 1 to 16 ( <i>Ch</i> ), sets/reads out the corrected data array. For more information on the corrected data array, see Section “Internal Data Processing” in the <i>E5070B/E5071B Programmer’s Guide</i> .

---

**NOTE** If valid data is not calculated because of the invalid measurement, “1.#QNB” is read out.

### Variable

	<i>Data</i>
Description	Indicates the array data (corrected data array) of NOP (number of measurement points)×2. Where n is an integer between 1 and NOP. <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> 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 corrected 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 182.

**Examples**

```
Dim CorData As Variant
SCPI.SENSE(1).SWEp.POINTs = 201
CorData = SCPI.CALCulate(1).SElected.DATA.SDATA
SCPI.SENSE(2).SWEp.POINTs = 201
SCPI.CALCulate(2).SElected.DATA.SDATA = CorData
```

**Related objects**

- SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225
- SCPI.SENSE(Ch).SWEp.POINTs on page 451
- SCPI.CALCulate(Ch).SElected.DATA.SMEMory on page 233
- SCPI.CALCulate(Ch).SElected.DATA.FDATA on page 230

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

## SCPI.CALCulate(*Ch*).SElected.DATA.SMEMory

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).SElected.DATA.SMEMory = <i>Data</i> <i>Data</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.DATA.SMEMory
Description	For the active trace of channels 1 to 16 ( <i>Ch</i> ), sets/reads out the corrected memory array. For more information on the corrected memory array, see Section “Internal Data Processing” in the <i>E5070B/E5071B Programmer’s Guide</i> .

---

**NOTE** If valid data is not calculated because of the invalid measurement, “1.#QNB” is read out.

---

### Variable

	<i>Data</i>
Description	Indicates the array data (corrected memory array) of NOP (number of measurement points)×2. Where n is an integer between 1 and NOP.  <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)
Note	If there is no array data of NOP (number of measurement point)×2 when setting a corrected 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 182.

**Examples**

```
Dim CorMem As Variant
SCPI.SENSE(1).SWEep.POINTs = 201
CorMem = SCPI.CALCulate(1).SElected.DATA.SMEMory
SCPI.SENSE(2).SWEep.POINTs = 201
SCPI.CALCulate(1).SElected.DATA.SMEMory = CorMem
```

**Related objects**

- SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225
- SCPI.SENSE(Ch).SWEep.POINTs on page 451
- SCPI.CALCulate(Ch).SElected.DATA.SDATA on page 232
- SCPI.CALCulate(Ch).SElected.DATA.FMEMory on page 231

**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 = <i>Value</i> <i>Value</i> = SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.CENTer
Description	For the active trace of channels 1 to 16 ( <i>Ch</i> ), 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 182.

## 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 236  
 SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STATE on page 238  
 SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225

## 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 16 ( <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"> <li>•"MAXimum"            Specifies the maximum shape.</li> <li>•"WIDE"                Specifies the wide shape.</li> <li>•"NORMal"             Specifies the normal shape.</li> <li>•"MINimum"            Specifies the minimum shape.</li> </ul>
Preset value	"NORMal"

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 182.

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(Ch).SElected.FILTer.GATE.TIME. TYPE on page 240</p> <p>SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STATE on page 238</p> <p>SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225</p>
Equivalent key	<b>[Analysis] - Gating - Shape - Maximum Wide Normal Minimum</b>

**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 16 (*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 182.

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 234

SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.STATe on page 238

SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225

Equivalent key

**[Analysis] - Gating - Span**



## SCPI.CALCulate(*Ch*).SElected.FILTer.GATE.TIME. START

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).SElected.FILTer.GATE.TIME.START = <i>Value</i> <i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.FILTer.GATE.TIME.START
Description	For the active trace of channels 1 to 16 ( <i>Ch</i> ), 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 182.

Examples	<pre>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</pre>
Related objects	<p>SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STOP on page 239</p> <p>SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STATE on page 238</p> <p>SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225</p>
Equivalent key	<b>[Analysis] - Gating - Start</b>

**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 16 (*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 object 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 object is ignored.

When the sweep type is the power sweep, you cannot turn on the gating function. If you execute this object trying to turn on the gating function during the power sweep, an error occurs and the object is ignored.

## Variable

	<i>Status</i>
Description	ON/OFF of the gating function
Data type	Boolean type (Boolean)
Range	Select from the following. <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 182.

## 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 225

SCPI.SENSE(Ch).SWEep.TYPE on page 454

SCPI.SENSE(Ch).SWEep.POINTs on page 451

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 16 (*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 182.

- 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 237
  - SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STAtE on page 238
  - SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225
- Equivalent key** **[Analysis] - Gating - Stop**

7. COM Object Reference

**SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.  
TYPE**

|             |                                                                                                                                         |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                |
| Syntax      | SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.TYPE = <i>Param</i><br><i>Param</i> = SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME.TYPE    |
| Description | For the active trace of channels 1 to 16 ( <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.<br><ul style="list-style-type: none"> <li>•"BPASs"                      Specifies the band-pass type.</li> <li>•"NOTCh"                      Specifies the notch type.</li> </ul> |
| Preset value | "BPASs"                                                                                                                                                                                                      |

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 182.

|                 |                                                                                                                                                                                                          |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 235</p> <p>SCPI.CALCulate(Ch).SElected.FILTer.GATE.TIME. STATE on page 238</p> <p>SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225</p> |
| Equivalent key  | <b>[Analysis] - Gating - Type</b>                                                                                                                                                                        |

## SCPI.CALCulate(*Ch*).SElected.FORMat

|             |                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                 |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.FORMat = <i>Param</i><br><i>Param</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.FORMat |
| Description | Selects the data format of the active trace of channels 1 to 16 ( <i>Ch</i> ).                                           |
| Variable    |                                                                                                                          |

|              | <i>Param</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Data format                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"MLOGarithmic" Specifies the log magnitude format.</li> <li>•"PHASe" Specifies the phase format.</li> <li>•"GDELay" Specifies the group delay format.</li> <li>•"SLINear" Specifies the Smith chart format (Lin/Phase).</li> <li>•"SLOGarithmic" Specifies the Smith chart format (Log/Phase).</li> <li>•"SCOMplex" Specifies the Smith chart format (Re/Im).</li> <li>•"SMITH" Specifies the Smith chart format (R+jX).</li> <li>•"SADMittance" Specifies the Smith chart format (G+jB).</li> <li>•"PLINear" Specifies the polar format (Lin/Phase).</li> <li>•"PLOGarithmic" Specifies the polar format (Log/Phase).</li> <li>•"POLar" Specifies the polar format (Re/Im).</li> <li>•"MLINear" Specifies the linear magnitude format.</li> <li>•"SWR" Specifies the SWR format.</li> <li>•"REAL" Specifies the real format.</li> <li>•"IMAGinary" Specifies the imaginary format.</li> <li>•"UPHase" Specifies the expanded phase format.</li> <li>•"PPHase" Specifies the positive phase format.</li> </ul> |
| Preset value | "MLOGarithmic"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 182.

|                 |                                                                                                                                                                                                                                                   |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Fmt As String SCPI.CALCulate(1).PARAMeter(1).SElect SCPI.CALCulate(1).SElected.FORMat = "smit" Fmt = SCPI.CALCulate(1).SElected.FORMat</pre>                                                                                             |
| Related objects | SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225                                                                                                                                                                                               |
| Equivalent key  | <p><b>[Format] - Log Mag Phase Group Delay Lin Mag SWR Real Imaginary Expand Phase Positive Phase</b></p> <p><b>[Format] - Smith - Lin/Phase Log/Phase Real/Imag R+jX G+jB</b></p> <p><b>[Format] - Polor - Lin/Phase Log/Phase Real/Imag</b></p> |

## 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 16 ( <i>Ch</i> ), reads out the analysis result of the SCPI.CALCulate( <i>Ch</i> ).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(<i>Ch</i>).SElected.FUNCtion.POINTs object. Where n is an integer between 1 and N.</p> <ul style="list-style-type: none"> <li>• <i>Data</i>(<i>n</i>×2-2)      Response value or analysis result of the searched n-th measurement point.</li> <li>• <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.</li> </ul> <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 182.

**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 225
- SCPI.CALCulate(*Ch*).SElected.FUNCtion.TYPE on page 253
- SCPI.CALCulate(*Ch*).SElected.FUNCtion.EXECute on page 247
- SCPI.CALCulate(*Ch*).SElected.FUNCtion.POINTs on page 249

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

**SCPI.CALCulate(*Ch*).SElected.FUNcTion.DOMain.COUPle**

Object type Property

Syntax SCPI.CALCulate(*Ch*).SElected.FUNcTion.DOMain.COUPle = *Status*  
*Status* = SCPI.CALCulate(*Ch*).SElected.FUNcTion.DOMain.COUPle

Description For channels 1 to 16 (*Ch*), specifies whether to set the coupling of the analysis range of the SCPI.CALCulate(*Ch*).SElected.FUNcTion.EXECute object for all traces.

Variable

|              |                                                                                                                                                                                                                                                                 |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <i>Status</i>                                                                                                                                                                                                                                                   |
| Description  | On/off of the trace coupling of the analysis range.                                                                                                                                                                                                             |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                                          |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>• True or -1                      Specifies the analysis range with the trace coupling.</li> <li>• False or 0                      Specifies the analysis range for each trace.</li> </ul> |
| Preset value | True or -1                                                                                                                                                                                                                                                      |

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

Examples

```
Dim TrCpl As Boolean
SCPI.CALCulate(1).SElected.FUNcTion.DOMain.COUPle = False
TrCpl = SCPI.CALCulate(1).SElected.FUNcTion.DOMain.COUPle
```

Related objects SCPI.CALCulate(*Ch*).SElected.FUNcTion.EXECute on page 247

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><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.FUNcTion.DOMain.START                                                                               |
| Description | For channels 1 to 16 ( <i>Ch</i> ), sets the start value of the analysis range of the SCPI.CALCulate( <i>Ch</i> ).SElected.FUNcTion.EXECute object.<br><br>When the trace coupling is off, the active trace is the target to be set. |
| 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), dBm or s (second)                 |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                                                                                                                                                                                                                                            |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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(<i>Ch</i>).SElected.FUNcTion.DOMain.STOP on page 246</p> <p>SCPI.CALCulate(<i>Ch</i>).SElected.FUNcTion.DOMain.STATe on page 245</p> <p>SCPI.CALCulate(<i>Ch</i>).SElected.FUNcTion.DOMain.COUPle on page 243</p> <p>SCPI.CALCulate(<i>Ch</i>).SElected.FUNcTion.EXECute on page 247</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 16 (*Ch*), sets whether to use an arbitrary range when executing the analysis with the SCPI.CALCulate(Ch).SElected.FUNction.EXECute object.  
 When the trace coupling is off, the active trace is the target to be set.

**Variable**

|              | <i>Status</i>                                                                                                                                                                                                                              |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Selection of the analysis range                                                                                                                                                                                                            |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                     |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>• True or -1                      Specifies an arbitrary range <sup>*1</sup>.</li> <li>• False or 0                      Specifies the entire sweep range.</li> </ul> |
| 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 182.

**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 244  
 SCPI.CALCulate(Ch).SElected.FUNction.DOMain.STOP on page 246  
 SCPI.CALCulate(Ch).SElected.FUNction.DOMain.COUPLE on page 243  
 SCPI.CALCulate(Ch).SElected.FUNction.EXECute on page 247

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

**SCPI.CALCulate(*Ch*).SElected.FUNcTion.DOMain.STOP**

|             |                                                                                                                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                                        |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.FUNcTion.DOMain.STOP = <i>Value</i><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.FUNcTion.DOMain.STOP                                                                            |
| Description | For channels 1 to 16 ( <i>Ch</i> ), sets the stop value of the analysis range of the SCPI.CALCulate( <i>Ch</i> ).SElected.FUNcTion.EXECute object.<br>When the trace coupling is off, the active trace is the target to be set. |

## 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), dBm or s (second)                 |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

## 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 244  
 SCPI.CALCulate(*Ch*).SElected.FUNcTion.DOMain.STATe on page 245  
 SCPI.CALCulate(*Ch*).SElected.FUNcTion.DOMain.COUPle on page 243  
 SCPI.CALCulate(*Ch*).SElected.FUNcTion.EXECute on page 247

## 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 16 ( <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 182.                                                                                   |
| 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 225<br>SCPI.CALCulate(Ch).SElected.FUNcTion.TYPE on page 253<br>SCPI.CALCulate(Ch).SElected.FUNcTion.DOMain.STATE on page 245 |
| 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 16 (*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 *E5070B/E5071B 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"> <li>• Log magnitude (MLOG) : dB (decibel)</li> <li>• Phase (PHAS), Expanded phase (UPH) or Positive phase (PPH) : ° (degree)</li> <li>• Group delay (GDEL) : s (second)</li> <li>• Others : No unit</li> </ul> |
| 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 182.

**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 225  
SCPI.CALCulate(*Ch*).SElected.FUNction.TYPE on page 253  
SCPI.CALCulate(*Ch*).SElected.FUNction.PPOLarity on page 250  
SCPI.CALCulate(*Ch*).SElected.FUNction.EXECute on page 247

**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 16 (*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 182.

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 225  
 SCPI.CALCulate(Ch).SElected.FUNcTion.EXECute on page 247  
 SCPI.CALCulate(Ch).SElected.FUNcTion.DATA on page 242

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 16 (*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.<br><ul style="list-style-type: none"> <li>•"POSitive"                Specifies the positive peak.</li> <li>•"NEGative"               Specifies the negative peak.</li> <li>•"BOTH"                    Specifies both the positive peak and the negative peak.</li> </ul> |
| Preset value | "POSitive"                                                                                                                                                                                                                                                                                          |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

**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 225
- SCPI.CALCulate(*Ch*).SElected.FUNction.TYPE on page 253
- SCPI.CALCulate(*Ch*).SElected.FUNction.PEXCursion on page 248
- SCPI.CALCulate(*Ch*).SElected.FUNction.EXECute on page 247

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

## SCPI.CALCulate(*Ch*).SElected.FUNcTion.TARGet

|             |                                                                                                                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                  |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.FUNcTion.TARGet = <i>Value</i><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.FUNcTion.TARGet                                                |
| Description | For the active trace of channels 1 to 16 ( <i>Ch</i> ), selects the target value when performing the target search with the SCPI.CALCulate( <i>Ch</i> ).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"> <li>• Log magnitude (MLOG) : dB (decibel)</li> <li>• Phase (PHAS), Expanded phase (UPH) or Positive phase (PPH) : ° (degree)</li> <li>• Group delay (GDEL) : s (second)</li> <li>• Others : No unit</li> </ul> |
| 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 182.

**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 225
- SCPI.CALCulate(*Ch*).SElected.FUNcTion.TYPE on page 253
- SCPI.CALCulate(*Ch*).SElected.FUNcTion.TTRansition on page 252
- SCPI.CALCulate(*Ch*).SElected.FUNcTion.EXECute on page 247

**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 16 (*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 *E5070B/E5071B User’s Guide*.

**Variable**

|              | <i>Param</i>                                                                                                                                                                                                                                                                                                                                       |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Transition type for search                                                                                                                                                                                                                                                                                                                         |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                                     |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"POSitive"                      Specifies the positive transition.</li> <li>•"NEGative"                      Specifies the negative transition.</li> <li>•"BOTH"                              Specifies both the positive transition and the negative transition.</li> </ul> |
| Preset value | "BOTH"                                                                                                                                                                                                                                                                                                                                             |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

**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 225  
SCPI.CALCulate(*Ch*).SElected.FUNcTion.TYPE on page 253  
SCPI.CALCulate(*Ch*).SElected.FUNcTion.TARGET on page 251  
SCPI.CALCulate(*Ch*).SElected.FUNcTion.EXECute on page 247

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



## SCPI.CALCulate(*Ch*).SElected.FUNCTION.TYPE

**Object type** Property

**Syntax** SCPI.CALCulate(*Ch*).SElected.FUNCTION.TYPE = *Param*  
*Param* = SCPI.CALCulate(*Ch*).SElected.FUNCTION.TYPE

**Description** For the active trace of channels 1 to 16 (*Ch*), 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"> <li>•"PTPeak" Specifies the analysis of the difference between the maximum value and the minimum value (Peak to Peak).</li> <li>•"STDEV" Specifies the analysis of the standard deviation.</li> <li>•"MEAN" Specifies the analysis of the mean value.</li> <li>•"MAXimum" Specifies the search for the maximum value.</li> <li>•"MINimum" Specifies the search for the minimum value.</li> <li>•"PEAK" Specifies the search for the peak *1.</li> <li>•"APEak" Specifies the search for all peaks *1.</li> <li>•"ATARget" Specifies the search for all targets *2.</li> </ul> |
| 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 182.

**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 225

SCPI.CALCulate(Ch).SElected.FUNCTION.PEXCursion on page 248

SCPI.CALCulate(Ch).SElected.FUNCTION.PPOLarity on page 250

SCPI.CALCulate(Ch).SElected.FUNCTION.TARGET on page 251

SCPI.CALCulate(Ch).SElected.FUNCTION.TTRansition on page 252

SCPI.CALCulate(Ch).SElected.FUNCTION.EXECute on page 247

**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><br><i>Data</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.LIMit.DATA |
| Description | For the active trace of channels 1 to 16 ( <i>Ch</i> ), sets the limit table for the limit test.                               |
| Variable    |                                                                                                                                |

|             | <b><i>Data</i></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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"> <li>• <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).</li> <li>• <i>Data</i>(<i>n</i>×5-4)                  The type of the n-th line. Specify an integer 0 to 2 as follows.<br/> 0: OFF<br/> 1: Upper limit line<br/> 2: Lower limit line</li> <li>• <i>Data</i>(<i>n</i>×5-3)                  The value on the horizontal axis (frequency/power/time) of the start point of the n-th line.</li> <li>• <i>Data</i>(<i>n</i>×5-2)                  The value on the horizontal axis (frequency/power/time) of the end point of the n-th line.</li> <li>• <i>Data</i>(<i>n</i>×5-1)                  The value on the vertical axis of the start point of the n-th line.</li> <li>• <i>Data</i>(<i>n</i>×5)                      The value on the vertical axis of the end point of the n-th line.</li> </ul> <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 182.

### Examples

```
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
```

```
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 225
  - [SCPI.CALCulate\(Ch\).SElected.LIMit.STATe](#) on page 260
  - [SCPI.CALCulate\(Ch\).SElected.LIMit.DISPlay.STATe](#) on page 256
- Equivalent key
- [Analysis] - Limit Test - Edit Limit Line**

## SCPI.CALCulate(*Ch*).SElected.LIMit.DISPlay.STATe

|             |                                                                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                             |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.LIMit.DISPlay.STATe = <i>Status</i><br><i>Status</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.LIMit.DISPlay.STATe |
| Description | For the active trace of channels 1 to 16 ( <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.<br><ul style="list-style-type: none"> <li>• True or -1                      Turns ON the limit line display.</li> <li>• False or 0                      Turns OFF the limit line display.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                      |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

**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 225  
SCPI.CALCulate(Ch).SElected.LIMit.STATe on page 260

**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 16 ( <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.<br><ul style="list-style-type: none"> <li>•True or -1                   The limit test result is FAIL.</li> <li>•False or 0                   The limit test result is PASS.</li> </ul> |
| 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 182.

|                 |                                                                                                                                                                     |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 225</p> <p>SCPI.CALCulate(Ch).SElected.LIMit.STATe on page 260</p>                                               |
| Equivalent key  | No equivalent key is available on the front panel.                                                                                                                  |

## SCPI.CALCulate(*Ch*).SElected.LIMit.REPort.DATA

|             |                                                                                                                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                     |
| Syntax      | <i>Data</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.LIMit.REPort.DATA                                                                                                                         |
| Description | For the active trace of channels 1 to 16 ( <i>Ch</i> ), reads out the stimulus values (frequency, power level or time) at all the measurement points that failed the limit test. (Read only) |
| Variable    |                                                                                                                                                                                              |

|             | <i>Data</i>                                                                                                                               |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Description | Indicates the array data 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 182.

**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 225
- SCPI.CALCulate(Ch).SElected.LIMit.REPort.POINts on page 259
- SCPI.CALCulate(Ch).SElected.LIMit.STATe on page 260

**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 16 (*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 182.

**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 225  
 SCPI.CALCulate(*Ch*).SElected.LIMit.STATe on page 260

**Equivalent key**

No equivalent key is available on the front panel.

## SCPI.CALCulate(*Ch*).SElected.LIMit.STATe

|             |                                                                                                                                      |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                             |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.LIMit.STATe = <i>Status</i><br><i>Status</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.LIMit.STATe |
| Description | For the active trace of channels 1 to 16 ( <i>Ch</i> ), 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.<br><ul style="list-style-type: none"> <li>• True or -1                      Turns ON the limit test function.</li> <li>• False or 0                      Turns OFF the limit test function.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                        |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

**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 225  
SCPI.CALCulate(Ch).SElected.LIMit.DISPlay.STATe on page 256  
SCPI.DISPlay.FSIGN on page 321

**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 16 ( <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 7-11**

### Variable (*Mk*)

|              | <i>Mk</i>                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------|
| Description  | Marker number                                                                                 |
| Data type    | Long integer type (Long)                                                                      |
| Range        | 1 to 10<br>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 182.

**Examples**  
 SCPI.CALCulate(1).PARAMeter(1).SElect  
 SCPI.CALCulate(1).SElected.MARKer(1).ACTivate

**Related objects**  
 SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225  
 SCPI.DISPlay.WINDow(Ch).ACTivate on page 329

**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 16 (*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 | Indicates 4-element array data (bandwidth search result). <ul style="list-style-type: none"> <li>• <i>Data</i>(0)                      The bandwidth.</li> <li>• <i>Data</i>(1)                      Center point frequency of the 2 cutoff frequency points.</li> <li>• <i>Data</i>(2)                      The Q value.</li> <li>• <i>Data</i>(3)                      Insertion loss</li> </ul> <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 182 and Table 7-11, “Variable (Mk),” on page 261, 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 225

SCPI.CALCulate(Ch).SElected.MARKer.BWIDth.STATe on page 263

SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth. THReshold on page 264

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 16 (*Ch*), turns ON/OFF the bandwidth search result display.

**Variable**

|              |                                                                                                                                                                                                                                                         |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <b><i>Status</i></b>                                                                                                                                                                                                                                    |
| Description  | ON/OFF of the bandwidth search result 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 bandwidth search result display.</li> <li>•False or 0                      Turns OFF the bandwidth search result display.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                                              |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

**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 225  
SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth. DATA on page 262  
SCPI.CALCulate(Ch).SElected.MARKer(Mk).BWIDth. THReshold on page 264

**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 = *Value*  
*Value* = SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).BWIDth.THReshold

Description For the active trace of channels 1 to 16 (*Ch*), sets the bandwidth definition value (the value to define the pass-band of the filter) of marker 1 to 9 (*Mk*) and reference marker (*Mk*: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"> <li>• Log magnitude (MLOG): dB (decibel)</li> <li>• Phase (PHAS), Expanded phase (UPH) or Positive phase (PPH): ° (degree)</li> <li>• Group delay (GDEL): s (second)</li> <li>• Others: No unit</li> </ul> |
| 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 182 and Table 7-11, “Variable (Mk),” on page 261, respectively.

Examples

```
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
```

Related objects SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225

SCPI.CALCulate(Ch).SElected.MARKer.BWIDth.STATE on page 263

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><br><i>Status</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer.COUPle |
| Description | For channels 1 to 16 ( <i>Ch</i> ), turns ON/OFF the marker coupling between traces.                                                     |
| Variable    |                                                                                                                                          |

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

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

**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(*Mk*).DISCrete

**Object type** Property

**Syntax** SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).DISCrete = *Status*  
*Status* = SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).DISCrete

**Description** For the active trace of channels 1 to 16 (*Ch*), turns ON/OFF the discrete mode (mode in which the marker moves only at the measurement points) with marker 1 to 9 (*Mk*) and reference marker (*Mk*:10).

**Variable**

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

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

**Examples**

```
Dim MkrDsc As Boolean
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.MARKer(1).DISCrete = True
MkrDsc = SCPI.CALCulate(1).SElected.MARKer(1).DISCrete
```

**Related objects** SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225

**Equivalent key** **[Marker Fctn] - Discrete**

## SCPI.CALCulate(*Ch*).SElected.MARKer.FUNction. DOMain.COUPle

|             |                                                                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                 |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer.FUNction.DOMain.COUPle = <i>Status</i><br><i>Status</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer.FUNction.DOMain.COUPle |
| Description | For channels 1 to 16 ( <i>Ch</i> ), specifies whether to set the coupling of the marker search range for all traces.                                                     |
| Variable    |                                                                                                                                                                          |

|              | <i>Status</i>                                                                                                                                                                                                                                               |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | On/off of the trace coupling of the marker search range.                                                                                                                                                                                                    |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                                      |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>• True or -1                      Specifies the search range with the trace coupling.</li> <li>• False or 0                      Specifies the search range for each trace.</li> </ul> |
| Preset value | True or -1                                                                                                                                                                                                                                                  |

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                                                                                                   |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim TrCpl As Boolean SCPI.CALCulate(1).SElected.MARKer.FUNction.DOMain.COUPle = False TrCpl = SCPI.CALCulate(1).SElected.MARKer.FUNction.DOMain.COUPle</pre> |
| Related objects | SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. EXECute on page 271                                                                                              |
| Equivalent key  | <b>[Marker Search] - Search Range - Couple</b>                                                                                                                    |

**SCPI.CALCulate(*Ch*).SElected.MARKer.FUNction.  
DOMain.START**

|             |                                                                                                                                                                      |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                             |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer.FUNction.DOMain.START = <i>Value</i><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer.FUNction.DOMain.START |
| Description | For channels 1 to 16 ( <i>Ch</i> ), sets the start value of the marker search range.<br>When the trace coupling is off, the active trace is the target to be set.    |

## Variable

|              | <i>Value</i>                                  |
|--------------|-----------------------------------------------|
| Description  | The start value of the search range           |
| Data type    | Double precision floating point type (Double) |
| Preset value | 0                                             |
| Unit         | Hz (hertz), dBm or s (second)                 |

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                                                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim SchStar As Double SCPI.CALCulate(1).SElected.MARKer.FUNction.DOMain.START = 1.7E9 SchStar = SCPI.CALCulate(1).SElected.MARKer.FUNction.DOMain.START</pre>                                                                   |
| Related objects | <p>SCPI.CALCulate(Ch).SElected.MARKer.FUNction. DOMain.STOP on page 270</p> <p>SCPI.CALCulate(Ch).SElected.MARKer.FUNction. DOMain.STATe on page 269</p> <p>SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. EXECute on page 271</p> |
| Equivalent key  | <b>[Marker Search] - Search Range - Start</b>                                                                                                                                                                                        |



## SCPI.CALCulate(*Ch*).SElected.MARKer.FUNction. DOMain.STATe

**Object type** Property

**Syntax** SCPI.CALCulate(*Ch*).SElected.MARKer.FUNction.DOMain.STATe = *Status*  
*Status* = SCPI.CALCulate(*Ch*).SElected.MARKer.FUNction.DOMain.STATe

**Description** For channels 1 to 16 (*Ch*), sets whether to use an arbitrary range when executing the marker search.  
 When the trace coupling is off, the active trace is the target to be set.

**Variable**

|              |                                                                                                                                                                                                                                           |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <i>Status</i>                                                                                                                                                                                                                             |
| Description  | Selects the search range.                                                                                                                                                                                                                 |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                    |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>• True or -1                      Specifies an arbitrary range*<sup>1</sup>.</li> <li>• False or 0                      Specifies the entire sweep range.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                                |

\*1. Specify with the SCPI.CALCulate(Ch).SElected.MARKer.FUNction. DOMain.START object and the SCPI.CALCulate(Ch).SElected.MARKer.FUNction. DOMain.STOP object.

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

**Examples**

```
Dim SchRnge As Boolean
SCPI.CALCulate(1).SElected.MARKer.FUNction.DOMain.START = 1.5E9
SCPI.CALCulate(1).SElected.MARKer.FUNction.DOMain.STOP = 1.8E9
SCPI.CALCulate(1).SElected.MARKer.FUNction.DOMain.STATe = True
SchRnge = SCPI.CALCulate(1).SElected.MARKer.FUNction.DOMain.STATe
```

**Related objects** SCPI.CALCulate(Ch).SElected.MARKer.FUNction. DOMain.START on page 268  
 SCPI.CALCulate(Ch).SElected.MARKer.FUNction. DOMain.STOP on page 270  
 SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. EXECute on page 271

**Equivalent key** **[Marker Search] - Search Range - Search Range [ON/OFF]**

**SCPI.CALCulate(*Ch*).SElected.MARKer.FUNction.  
DOMain.STOP**

|             |                                                                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                           |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer.FUNction.DOMain.STOP = <i>Value</i><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer.FUNction.DOMain.STOP |
| Description | For channels 1 to 16 ( <i>Ch</i> ), sets the stop value of the marker search range.<br>When the trace coupling is off, the active trace is the target to be set.   |

## Variable

|              | <i>Value</i>                                  |
|--------------|-----------------------------------------------|
| Description  | Stop value of the search range                |
| Data type    | Double precision floating point type (Double) |
| Preset value | 0                                             |
| Unit         | Hz (hertz), dBm or s (second)                 |

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                                                                                                                                                                       |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim SchStop As Double SCPI.CALCulate(1).SElected.MARKer.FUNction.DOMain.STOP = 1.8E9 SchStop = SCPI.CALCulate(1).SElected.MARKer.FUNction.DOMain.STOP</pre>                                                                      |
| Related objects | <p>SCPI.CALCulate(Ch).SElected.MARKer.FUNction. DOMain.STARt on page 268</p> <p>SCPI.CALCulate(Ch).SElected.MARKer.FUNction. DOMain.STATe on page 269</p> <p>SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. EXECute on page 271</p> |
| Equivalent key  | <b>[Marker Search] - Search Range - Stop</b>                                                                                                                                                                                          |

## **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 16 (<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 182 and Table 7-11, “Variable (Mk),” on page 261, 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 225</p> <p>SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNcTion. TYPE on page 277</p> <p>SCPI.CALCulate(Ch).SElected.MARKer.FUNcTion. DOMain.STATE on page 269</p>                                                           |
| Equivalent key  | <p><b>[Marker Search] - Max Min</b></p> <p><b>[Marker Search] - Peak - Search Peak Search Left Search Right</b></p> <p><b>[Marker Search] - Target - Search Target Search Left Search Right</b></p>                                                                        |

---

**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(Mk).FUNction.PEXCursion**

Object type Property

Syntax SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction.PEXCursion = *Value*  
*Value* = SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction.PEXCursion

Description For the active trace of channels 1 to 16 (*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 marker 1 to 9 (*Mk*) and reference marker (*Mk*:10). For information on the peak excursion value, see Section “Searching for the Peak” in the *E5070B/E5071B 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"> <li>• Log magnitude (MLOG): dB (decibel)</li> <li>• Phase (PHAS), Expanded phase (UPH) or Positive phase (PPH): ° (degree)</li> <li>• Group delay (GDEL): s (second)</li> <li>• Others: No unit</li> </ul> |
| 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 182 and Table 7-11, “Variable (Mk),” on page 261, 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 225  
SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TYPE on page 277  
SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. PPOLarity on page 273

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><br><i>Param</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer( <i>Mk</i> ).FUNction.PPOLarity |
| Description | For the active trace of channels 1 to 16 ( <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.<br><ul style="list-style-type: none"> <li>•"POSitive"                      Specifies the positive peak.</li> <li>•"NEGative"                      Specifies the negative peak.</li> <li>•"BOTH"                              Specifies both the positive peak and the negative peak.</li> </ul> |
| Preset value | "POSitive"                                                                                                                                                                                                                                                                                                                 |

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, "Variable (Ch)," on page 182 and Table 7-11, "Variable (Mk)," on page 261, 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 225</p> <p>SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TYPE on page 277</p> <p>SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. PEXCursion on page 272</p>                                                    |
| Equivalent key  | <b>[Marker Search] - Peak - Peak Polarity</b>                                                                                                                                                                                                                         |

**SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).FUNction.TARGet**

|             |                                                                                                                                                                                    |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                           |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer( <i>Mk</i> ).FUNction.TARGet = <i>Value</i><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer( <i>Mk</i> ).FUNction.TARGet |
| Description | For the active trace of channels 1 to 16 ( <i>Ch</i> ), sets the target value to be searched with marker 1 to 9 ( <i>Mk</i> ) and reference marker ( <i>Mk</i> :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"> <li>Log magnitude (MLOG): dB (decibel)</li> <li>Phase (PHAS), Expanded phase (UPH) or Positive phase (PPH): ° (degree)</li> <li>Group delay (GDEL): s (second)</li> <li>Others: No unit</li> </ul> |
| 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 182 and Table 7-11, “Variable (Mk),” on page 261, 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 225  
 SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction.TYPE on page 277  
 SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction.TTRansition on page 276

## 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><br><i>Status</i> = SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction.TRACking                                                       |
| Description | For the active trace of channels 1 to 16 ( <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.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns ON the search tracking.</li> <li>•False or 0                      Turns OFF the search tracking.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                              |

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, “Variable (Ch),” on page 182 and Table 7-11, “Variable (Mk),” on page 261, 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 225</p> <p>SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TYPE on page 277</p> <p>SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. EXECute on page 271</p>                                                      |
| Equivalent key  | <b>[Marker Search] - Tracking</b>                                                                                                                                                                                                                                    |

## SCPI.CALCulate(*Ch*).SElected.MARKer(*Mk*).FUNction. TTRansition

|             |                                                                                                                                                                                                                                                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                                                                                                                                            |
| Syntax      | SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer( <i>Mk</i> ).FUNction.TTRansition = <i>Param</i><br><i>Param</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer( <i>Mk</i> ).FUNction.TTRansition                                                                                                                        |
| Description | For marker 1 to 9 ( <i>Mk</i> ) and reference marker ( <i>Mk</i> :10) of the active trace of channels 1 to 16 ( <i>Ch</i> ), selects the transition type of the target search. For more information on the transition type, see Section “Searching for the Target Value” in the <i>E5070B/E5071B User’s Guide</i> . |

### Variable

|              | <i>Param</i>                                                                                                                                                                                                                                                                                                                                       |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Transition type for search                                                                                                                                                                                                                                                                                                                         |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                                     |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"POSitive"                      Specifies the positive transition.</li> <li>•"NEGative"                      Specifies the negative transition.</li> <li>•"BOTH"                              Specifies both the positive transition and the negative transition.</li> </ul> |
| Preset value | "BOTH"                                                                                                                                                                                                                                                                                                                                             |

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, “Variable (Ch),” on page 182 and Table 7-11, “Variable (Mk),” on page 261, 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 225

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TYPE on page 277

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TARGet on page 274

**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><br><i>Param</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer( <i>Mk</i> ).FUNction.TYPE |
| Description | For the active trace of channels 1 to 16 ( <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.<br><ul style="list-style-type: none"> <li>•"MAXimum"      Sets the search type to the maximum value.</li> <li>•"MINimum"      Sets the search type to the minimum value.</li> <li>•"PEAK"          Sets the search type to the peak search <sup>*1</sup>.</li> <li>•"LPEak"         Sets the search type to the peak search <sup>*1</sup> to the left from the marker position.</li> <li>•"RPEak"         Sets the search type to the peak search <sup>*1</sup> to the right from the marker position.</li> <li>•"TARGet"         Sets the search type to the target search <sup>*2</sup>.</li> <li>•"LTARget"       Sets the search type to the target search <sup>*2</sup> to the left from the marker position.</li> <li>•"RTARget"       Sets the search type to the target search <sup>*2</sup> to the right from the marker position.</li> </ul> |
| 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 182 and Table 7-11, "Variable (Mk)," on page 261, 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 225

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. PEXCursion on page 272

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. PPOLarity on page 273

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TARGet on page 274

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. TTRansition on page 276

SCPI.CALCulate(Ch).SElected.MARKer(Mk).FUNction. EXECute on page 271

**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><br><i>Status</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer.REFerence.STATE |
| Description | For the active trace of channels 1 to 16 ( <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.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns ON the reference marker mode.</li> <li>•False or 0                      Turns OFF the reference marker mode.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                          |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

**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 225

**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 16 ( <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"> <li>•"STARt"                Sets the sweep start value to the stimulus value at the marker position.</li> <li>•"STOP"                Sets the sweep stop value to the stimulus value at the marker position.</li> <li>•"CENTer"              Sets the sweep center value to the stimulus value at the marker position.</li> <li>•"RLEVel"              Sets the reference line value to the response value at the marker position.</li> <li>•"DELay"               Sets the electrical delay time value to the value of the group delay at the marker position (a value smoothed with the aperture of 20%).</li> </ul> |

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, "Variable (Ch)," on page 182 and Table 7-11, "Variable (Mk)," on page 261, 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 225  
 SCPI.CALCulate(Ch).SElected.MARKer.REFERence.STATE on page 279

**Equivalent key**

**[Marker Fctn] - Marker -> Start|Marker -> Stop|Marker -> Center|Marker -> Reference | Marker -> Delay**

## 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 16 (*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.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns ON the display of the marker.</li> <li>•False or 0                      Turns OFF the display of the marker.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                          |

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, “Variable (Ch),” on page 182 and Table 7-11, “Variable (Mk),” on page 261, 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 225

**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><br><i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.MARKer( <i>Mk</i> ).X |
| Description | For the active trace of channels 1 to 16 ( <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), dBm or 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. |

\*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.

For information on the variable (*Ch*) and the variable (*Mk*), see Table 7-6, "Variable (Ch)," on page 182 and Table 7-11, "Variable (Mk)," on page 261, 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 225  
 SCPI.CALCulate(Ch).SElected.MARKer.REFerence. STATE on page 279  
 SCPI.CALCulate(Ch).SElected.MARKer(Mk).Y on page 283

### 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 16 (*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).<br><ul style="list-style-type: none"> <li>• <i>Data</i>(0) Response value (primary value) at the marker position.</li> <li>• <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.</li> </ul> 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 182 and Table 7-11, "Variable (Mk)," on page 261, 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 225
  - SCPI.CALCulate(Ch).SElected.MARKer.REFERENCE.STATE on page 279
  - SCPI.CALCulate(Ch).SElected.MARKer(Mk).X on page 282

- 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 16 (*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. <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 182.

**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 225

**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 16 ( <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 182.
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 225
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 16 ( <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 182.

<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 225</p> <p>SCPI.CALCulate(Ch).SElected.MSTatistics.STATe on page 286</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 16 (*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. <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 182.

**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 225  
SCPI.CALCulate(Ch).SElected.MSTatistics.DATA on page 285

**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> <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 16 ( <i>Ch</i> ).
Variable	

	<i>Value</i>
Description	Smoothing aperture
Data type	Double precision floating point type (Double)
Range	0.05 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 182.

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 225</p> <p>SCPI.CALCulate(Ch).SElected.SMOothing.STATe on page 288</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> <i>Status</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.SMOothing.STATe
Description	For the active trace of channels 1 to 16 ( <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. <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 182.

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 225</p> <p>SCPI.CALCulate(Ch).SElected.SMOothing.APERTure on page 287</p>
Equivalent key	<b>[Avg] - Smoothing</b>

## SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME. **CENTer**

- Object type** Property
- Syntax** SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.CENTer = *Value*  
*Value* = SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.CENTer
- Description** For the active trace of channels 1 to 16 (*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 182.

- Examples**
- ```
Dim Cent As Double
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.TRANSform.TIME.CENTer = 1E-8
Cent = SCPI.CALCulate(1).SElected.TRANSform.TIME.CENTer
```
- Related objects**
- SCPI.CALCulate(Ch).SElected.TRANSform.TIME.SPAN on page 293
  - SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STATe on page 295
  - SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225
- Equivalent key** **[Analysis] - Transform - Center**

7. COM Object Reference

**SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.IMPulse.WIDTH**

|             |                                                                                                                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                     |
| Syntax      | SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.IMPulse.WIDTH = <i>Value</i><br><i>Value</i> = SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.IMPulse.WIDTH                                           |
| Description | For the active trace of channels 1 to 16 ( <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 182.

## Examples

```
Dim ImpWid As Double
SCPI.CALCulate(1).PARAMeter(1).SELEct
SCPI.CALCulate(1).SELEcted.TRANSform.TIME.IMPulse.WIDTH = 1E-10
ImpWid = SCPI.CALCulate(1).SELEcted.TRANSform.TIME.IMPulse.WIDTH
```

## Related objects

SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.KBESsel on page 291  
 SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.STEP.RTIME on page 296  
 SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.STATe on page 295  
 SCPI.CALCulate(Ch).PARAMeter(Tr).SELEct on page 225

## Equivalent key

**[Analysis] - Transform - Center**

## SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.KBESsel

- Object type** Property
- Syntax** SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.KBESsel = *Value*  
*Value* = SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.KBESsel
- Description** For the active trace of channels 1 to 16 (*Ch*), sets the shape of the Kayser Bessel window using  $\beta$  used for the transformation function of the time domain function.
- Variable**

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | The value of $\beta$                                                                                                                                                                                         |
| 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 182.

- Examples**
- ```
Dim Beta As Double
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.TRANSform.TIME.KBESsel = 3
Beta = SCPI.CALCulate(1).SElected.TRANSform.TIME.KBESsel
```
- Related objects**
- SCPI.CALCulate(Ch).SElected.TRANSform.TIME.IMPulse.WIDTH on page 290
  - SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STEP.RTIME on page 296
  - SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STATE on page 295
  - SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225
- Equivalent key** **[Analysis] - Transform - Center**

## SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.LPFRequency

Object type	Method
Syntax	SCPI.CALCulate( <i>Ch</i> ).SElected.TRANSform.TIME.LPFRequency = <i>Value</i>
Description	For the active trace of channels 1 to 16 ( <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 182.
Examples	SCPI.CALCulate(1).PARAmeter(1).SElect SCPI.CALCulate(1).SElected.TRANSform.TIME.LPFRequency
Related objects	SCPI.CALCulate(Ch).SElected.TRANSform.TIME.TYPE on page 299 SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STATE on page 295 SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225
Equivalent key	<b>[Analysis] - Transform - Set Freq Low pass</b>



## SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.SPAN

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).SElected.TRANSform.TIME.SPAN = <i>Value</i> <i>Value</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.TRANSform.TIME.SPAN
Description	For the active trace of channels 1 to 16 ( <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 182.

Examples	<pre>Dim Span As Double SCPI.CALCulate(1).PARAMeter(1).SElect SCPI.CALCulate(1).SElected.TRANSform.TIME.SPAN = 1E-8 Cent = SCPI.CALCulate(1).SElected.TRANSform.TIME.SPAN</pre>
Related objects	<p>SCPI.CALCulate(Ch).SElected.TRANSform.TIME.CENTER on page 289</p> <p>SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STATE on page 295</p> <p>SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225</p>
Equivalent key	<b>[Analysis] - Transform - Center</b>

**SCPI.CALCulate(Ch).SElected.TRANSform.TIME.START**

Object type

Property

Syntax

SCPI.CALCulate(Ch).SElected.TRANSform.TIME.START = *Value**Value* = SCPI.CALCulate(Ch).SElected.TRANSform.TIME.START

Description

For the active trace of channels 1 to 16 (*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 182.

Examples

```
Dim Star As Double
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.TRANSform.TIME.START = 0
Star = SCPI.CALCulate(1).SElected.TRANSform.TIME.START
```

Related objects

SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STOP on page 298

SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STATE on page 295

SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225

Equivalent key

**[Analysis] - Transform - Start**

**SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.STATe**

Object type Property

Syntax SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.STATe = *Status*  
*Status* = SCPI.CALCulate(Ch).SELEcted.TRANSform.TIME.STATe

Description For the active trace of channels 1 to 16 (*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 object 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 object is ignored.

When the sweep type is the power sweep, you cannot turn on the transformation function. If you execute this object trying to turn on the transformation function during the power sweep, an error occurs and the object is ignored.

Variable

	<i>Status</i>
Description	ON/OFF of the gating function
Data type	Boolean type (Boolean)
Range	Select from the following. <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 182.

Examples

```
Dim Trans As Boolean
SCPI.CALCulate(1).PARAMeter(1).SELEct
SCPI.CALCulate(1).SELEcted.TRANSform.TIME.STATe = True
Trans = SCPI.CALCulate(1).SELEcted.TRANSform.TIME.STATe
```

Related objects

SCPI.CALCulate(Ch).PARAMeter(Tr).SELEct on page 225

SCPI.SENSE(Ch).SWEep.TYPE on page 454

SCPI.SENSE(Ch).SWEep.POINTs on page 451

Equivalent key

**[Analysis] - Transform - Transform**

**SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.STEP.RTime**

Object type Property

Syntax SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.STEP.RTime = *Value*  
*Value* = SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.STEP.RTime

Description For the active trace of channels 1 to 16 (*Ch*), 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 182.

Examples

```
Dim RTime As Double
SCPI.CALCulate(1).PARAmeter(1).SElect
SCPI.CALCulate(1).SElected.TRANSform.TIME.STEP.RTime = 1E-10
RTime = SCPI.CALCulate(1).SElected.TRANSform.TIME.STEP.RTime
```

Related objects

SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.IMPulse.WIDTh on page 290  
 SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.KBESsel on page 291  
 SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.STATe on page 295  
 SCPI.CALCulate(*Ch*).PARAmeter(*Tr*).SElect on page 225

Equivalent key

**[Analysis] - Transform - Center**

## SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME. STIMulus

Object type	Property
Syntax	SCPI.CALCulate( <i>Ch</i> ).SElected.TRANSform.TIME.STIMulus = <i>Param</i>  <i>Param</i> = SCPI.CALCulate( <i>Ch</i> ).SElected.TRANSform.TIME.STIMulus
Description	For the active trace of channels 1 to 16 ( <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"> <li>•"IMPulse"                      Specifies the impulse*1.</li> <li>•"STEP"                              Specifies the step*2.</li> </ul>
Preset value	"IMPulse"

\*1. You need to select the transformation type (band-pass or low-pass) with the SCPI.CALCulate(Ch).SElected.TRANSform.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 182.

**Examples**

```
Dim StimType As String
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.TRANSform.TIME.STIMulus = "step"
StimType = SCPI.CALCulate(1).SElected.TRANSform.TIME.STIMulus
```

**Related objects**

SCPI.CALCulate(Ch).SElected.TRANSform.TIME.TYPE on page 299  
 SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STATE on page 295  
 SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225

**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.TIME.STOP**

Object type

Property

Syntax

SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STOP = *Value**Value* = SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STOP

Description

For the active trace of channels 1 to 16 (*Ch*), 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 182.

Examples

```
Dim Span As Double
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.TRANSform.TIME.STOP = 2E-8
Cent = SCPI.CALCulate(1).SElected.TRANSform.TIME.STOP
```

Related objects

SCPI.CALCulate(Ch).SElected.TRANSform.TIME.START on page 294

SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STATE on page 295

SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225

Equivalent key

**[Analysis] - Transform - Stop**

## SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.TYPE

**Object type** Property

**Syntax** SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.TYPE = *Param*  
*Param* = SCPI.CALCulate(*Ch*).SElected.TRANSform.TIME.TYPE

**Description** For the active trace of channels 1 to 16 (*Ch*), 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"> <li>•"BPASs"                      Specifies the band-pass *1.</li> <li>•"LPASs"                      Specifies the low-pass *2.</li> </ul>
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.TIME. STIMulus object.

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 182.

**Examples**

```
Dim Typ As String
SCPI.CALCulate(1).PARAMeter(1).SElect
SCPI.CALCulate(1).SElected.TRANSform.TIME.SHApe = "lpas"
Typ = SCPI.CALCulate(1).SElected.TRANSform.TIME.SHApe
```

**Related objects** SCPI.CALCulate(Ch).SElected.TRANSform.TIME. STIMulus on page 297  
SCPI.CALCulate(Ch).SElected.TRANSform.TIME.STATE on page 295  
SCPI.CALCulate(Ch).PARAMeter(Tr).SElect on page 225

**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 *E5070B/E5071B 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 *E5070B/E5071B 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>E5070B/E5071B 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

```
SCPI.CONTRol.HANDler.C.MODE = "outp"  

SCPI.CONTRol.HANDler.C.DATA = 8
```

```
Dim HdlCinp As Long  

SCPI.CONTRol.HANDler.C.MODE = "inp"  

HdlCinp = SCPI.CONTRol.HANDler.C.DATA
```

Related objects    SCPI.CONTRol.HANDler.C.MODE on page 303

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 *E5070B/E5071B 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 302

**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 = <i>Value</i> (for output port) <i>Value</i> = SCPI.CONTrol.HANDler.D.DATA (for input port)
Description	<p>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).</p> <p>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).</p> <p>Port information is outputted as 4-bit binary data using D0 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>E5070B/E5071B 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

```
SCPI.CONTrol.HANDler.D.MODE = "outp"  
SCPI.CONTrol.HANDler.D.DATA = 8
```

```
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 305

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 *E5070B/E5071B 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 304

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>E5070B/E5071B 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

```
SCPI.CONTrol.HANDler.C.MODE = "outp"  
SCPI.CONTrol.HANDler.D.MODE = "outp"  
SCPI.CONTrol.HANDler.E.DATA = 128
```

```
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 303 SCPI.CONTrol.HANDler.D.MODE on page 305 SCPI.CONTrol.HANDler.C.DATA on page 302 SCPI.CONTrol.HANDler.D.DATA on page 304
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 *E5070B/E5071B 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"> <li>•True or -1                      Turns ON the INDEX signal output.</li> <li>•False or 0                      Turns OFF the INDEX signal output.</li> </ul>
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 308

**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>E5070B/E5071B 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"> <li>• True or -1                      Turns ON the READY FOR TRIGGER signal output.</li> <li>• False or 0                      Turns OFF the READY FOR TRIGGER signal output.</li> </ul>
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 307

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 = <i>Value</i>
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)

---

<b>NOTE</b>	<p>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).</p> <p>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).</p>
-------------	--

---

For more information on the handler I/O, see Chapter “Communication with External Instruments Using Handler I/O Port” in the *E5070B/E5071B 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 300 SCPI.CONTRol.HANDler.B.DATA on page 301
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>E5070B/E5071B 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"> <li>•1                      Specifies LOW.</li> <li>•0                      Specifies HIGH.</li> </ul>

**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	

	<b><i>Status</i></b>
Description	ON/OFF of the frequency display
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> <li>•True or -1                      Turns ON the frequency display.</li> <li>•False or 0                      Turns OFF the frequency display.</li> </ul>
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 = <i>Status</i> <i>Status</i> = 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 7-12**

### 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"> <li>• <i>Data</i>(0)                      Sets amount of red.</li> <li>• <i>Data</i>(1)                      Sets amount of green.</li> <li>• <i>Data</i>(2)                      Sets amount of blue.</li> </ul> The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> <li>• <i>Data</i>(0)                      0 to 5</li> <li>• <i>Data</i>(1)                      0 to 5</li> <li>• <i>Data</i>(2)                      0 to 5</li> </ul>
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 316

**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"> <li>• <i>Data</i>(0)                Sets amount of red.</li> <li>• <i>Data</i>(1)                Sets amount of green.</li> <li>• <i>Data</i>(2)                Sets amount of blue.</li> </ul> The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> <li>• <i>Data</i>(0)                0 to 5</li> <li>• <i>Data</i>(1)                0 to 5</li> <li>• <i>Data</i>(2)                0 to 5</li> </ul>
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 7-12, “Variable(Dnum),” on page 313.

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 316

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 (*Lnum*: 1) and the color of the limit line (*Lnum*: 2) for normal display (*Dnum*: 1) and inverted display (*Dnum*: 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"> <li>• <i>Data</i>(0) Sets amount of red.</li> <li>• <i>Data</i>(1) Sets amount of green.</li> <li>• <i>Data</i>(2) Sets amount of blue.</li> </ul> The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> <li>• <i>Data</i>(0) 0 to 5</li> <li>• <i>Data</i>(1) 0 to 5</li> <li>• <i>Data</i>(2) 0 to 5</li> </ul>
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 7-12, “Variable(Dnum),” on page 313.

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 316

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 7-12, “Variable( <i>Dnum</i> ),” on page 313.
Examples	<code>SCPI.DISPlay.COLOr(1).RESet</code>
Related objects	SCPI.DISPlay.COLOr( <i>Dnum</i> ).BACK on page 313 SCPI.DISPlay.COLOr( <i>Dnum</i> ).GRATicule( <i>Gnum</i> ) on page 314 SCPI.DISPlay.COLOr( <i>Dnum</i> ).LIMit( <i>Lnum</i> ) on page 315 SCPI.DISPlay.COLOr( <i>Dnum</i> ).TRACe( <i>Tr</i> ).DATA on page 317 SCPI.DISPlay.COLOr( <i>Dnum</i> ).TRACe( <i>Tr</i> ).MEMory on page 318
Equivalent key	<b>[System] - Misc Setup - Color Setup - Normal Invert - Reset Color - OK</b>



## 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 16 ( <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"> <li>• <i>Data</i>(0)                      Sets amount of red.</li> <li>• <i>Data</i>(1)                      Sets amount of green.</li> <li>• <i>Data</i>(2)                      Sets amount of blue.</li> </ul> The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> <li>• <i>Data</i>(0)                      0 to 5</li> <li>• <i>Data</i>(1)                      0 to 5</li> <li>• <i>Data</i>(2)                      0 to 5</li> </ul>
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 7-12, “Variable(Dnum),” on page 313 and Table 7-10, “Variable (Tr),” on page 225, respectively.

Examples	<pre>Dim TrColor As Variant SCPI.DISPlay.COLor(1).TRACe(1).DATA = Array(1,2,3) TrColor = SCPI.DISPlay.COLor(1).TRACe(1).DATA</pre>
Related objects	SCPI.DISPlay.COLor(Dnum).RESet on page 316
Equivalent key	<b>[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</b>

## 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 16 ( <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"> <li>• <i>Data</i>(0)                 Sets amount of red.</li> <li>• <i>Data</i>(1)                 Sets amount of green.</li> <li>• <i>Data</i>(2)                 Sets amount of blue.</li> </ul> The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> <li>• <i>Data</i>(0)                 0 to 5</li> <li>• <i>Data</i>(1)                 0 to 5</li> <li>• <i>Data</i>(2)                 0 to 5</li> </ul>
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 7-12, “Variable(Dnum),” on page 313 and Table 7-10, “Variable (Tr),” on page 225, 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 316

**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 171 SCPI.DISPlay.ECHO.DATA on page 319
Equivalent key	<b>[Macro Setup] - Clear Echo</b>

## 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"> <li>• Displays a single character string.</li> </ul>

### 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 171 SCPI.DISPlay.TABLE.TYPE on page 328 SCPI.DISPlay.TABLE.STATe on page 327 SCPI.DISPlay.ECHO.CLEAr on page 319
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 E5070B/E5071B measurement screen.
Variable	

	<i>Status</i>
Description	ON/OFF of the display update of the E5070B/E5071B 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"> <li>• True or -1                      Turns ON the “Fail” display.</li> <li>• False or 0                      Turns OFF the “Fail” display.</li> </ul>
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 260

Equivalent key

**[Analysis] - Limit Test - Fail Sign**

## SCPI.DISPlay.IMAGe

Object type	Property
Syntax	SCPI.DISPlay.IMAGe = <i>Param</i> <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. <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 329

Equivalent key      **[Channel Max]**

## SCPI.DISPlay.SKEY.STATe

Object type	Property
Syntax	SCPI.DISPlay.SKEY.STATe = <i>Status</i> <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. •True or -1                      Turns ON the softkey menu bar display. •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> <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. <ul style="list-style-type: none"> <li>•"D1" See Figure 7-4 on page 326.</li> <li>•"D12" See Figure 7-4.</li> <li>•"D1_2" See Figure 7-4.</li> <li>•"D112" See Figure 7-4.</li> <li>•"D1_1_2" See Figure 7-4.</li> <li>•"D123" See Figure 7-4.</li> <li>•"D1_2_3" See Figure 7-4.</li> <li>•"D12_33" See Figure 7-4.</li> <li>•"D11_23" See Figure 7-4.</li> <li>•"D13_23" See Figure 7-4.</li> <li>•"D12_13" See Figure 7-4.</li> <li>•"D1234" See Figure 7-4.</li> <li>•"D1_2_3_4" See Figure 7-4.</li> <li>•"D12_34" See Figure 7-4.</li> <li>•"D123_456" See Figure 7-4.</li> <li>•"D12_34_56" See Figure 7-4.</li> <li>•"D1234_5678" See Figure 7-4.</li> <li>•"D12_34_56_78" See Figure 7-4.</li> <li>•"D123_456_789" See Figure 7-4.</li> <li>•"D123__ABC" See Figure 7-4.</li> <li>•"D1234__9ABC" See Figure 7-4.</li> <li>•"D1234__CDEF" See Figure 7-4.</li> </ul>
Preset value	"D1"

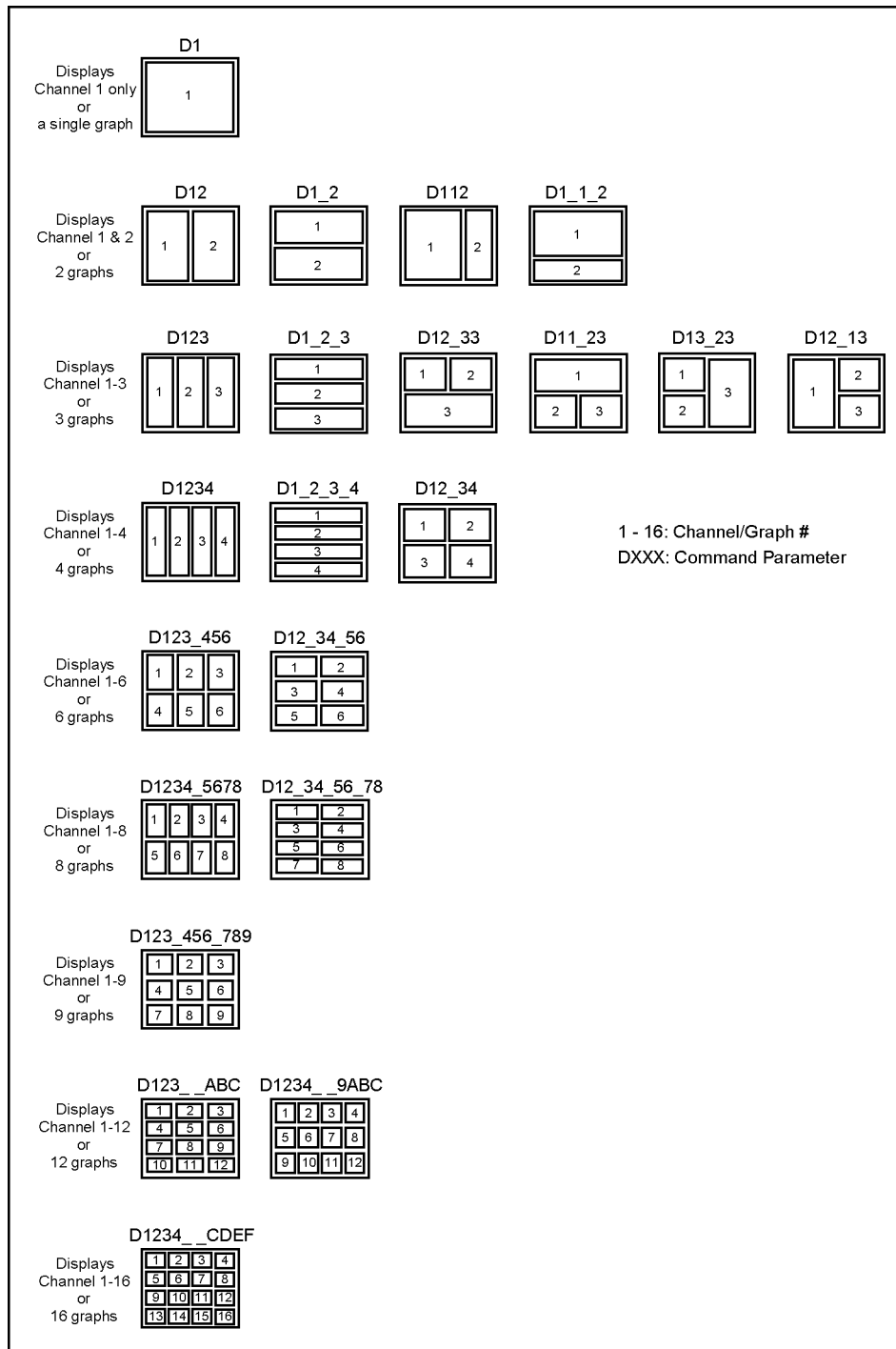
**Examples**

```
Dim ChanAloc As String
SCPI.DISPlay.SPLit = "d12_34"
ChanAloc = SCPI.DISPlay.SPLit
```

Related objects SCPI.DISPlay.WINDOW(Ch).SPLit on page 332

Equivalent key **[Display] - Allocate Channels**

Figure 7-4 **Channel/graph window layouts**



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## SCPI.DISPlay.TABLe.STATe

Object type	Property
Syntax	SCPI.DISPlay.TABLe.STATe = <i>Status</i> <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. <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 328

**Equivalent key**

- [Sweep Setup] - Edit Segment Table**
- [Marker Fctn] - Marker Table**
- [Analysis] - Limit Test - Edit Limit Line**
- [Macro Setup] - Echo Window**
- [Cal] - Power Calibration - Loss Compen**
- [Cal] - Power Calibration - Sensor A Settings | Sensor B Settings**

---

**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> <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. <ul style="list-style-type: none"> <li>•"MARKer"                 Specifies the marker table window.</li> <li>•"LIMit"                 Specifies the limit test table window.</li> <li>•"SEGment"               Specifies the segment table window.</li> <li>•"ECHO"                 Specifies the echo window.</li> <li>•"PLOSs"                 Specifies the loss compensation table window.</li> <li>•"SCFactor"              Specifies the power sensor's calibration factor table window.</li> </ul>
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 327

**Equivalent key**

- [Sweep Setup] - Edit Segment Table**
- [Marker Fctn] - Marker Table**
- [Analysis] - Limit Test - Edit Limit Line**
- [Macro Setup] - Echo Window**
- [Cal] - Power Calibration - Loss Compen**
- [Cal] - Power Calibration - Sensor A Settings | Sensor B Settings**

---

**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)
Examples	SCPI.DISPlay.ENABLE = False SCPI.DISPlay.UPDate.IMMediate
Related objects	SCPI.DISPlay.ENABLE on page 320
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	Specifies channels 1 to 16 ( <i>Ch</i> ) to the active channel.  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)
Variable	For information on the variable ( <i>Ch</i> ), see Table 7-6, “Variable (Ch),” on page 182.
Examples	SCPI.DISPlay.SPLit = "d1_2" SCPI.DISPlay.WINDow(2).ACTivate
Related objects	SCPI.CALCulate(Ch).PARAmeter(Tr).SELEct on page 225
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 16 (*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. •True or -1                      Turns ON the graticule label display. •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 182.

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 16 (*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. <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 182.

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 225  
 SCPI.DISPlay.MAXimize on page 323

Equivalent key **[Trace Max]**

## SCPI.DISPlay.WINDow(*Ch*).SPLit

Object type	Property
Syntax	SCPI.DISPlay.WINDow( <i>Ch</i> ).SPLit = <i>Param</i> <i>Param</i> = SCPI.DISPlay.WINDow( <i>Ch</i> ).SPLit
Description	Sets the graph layout of channels 1 to 16 ( <i>Ch</i> ).
Variable	

	<i>Param</i>
Description	Graph layout
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> <li>•"D1"                    See Figure 7-4 on page 326.</li> <li>•"D12"                   See Figure 7-4.</li> <li>•"D1_2"                   See Figure 7-4.</li> <li>•"D112"                   See Figure 7-4.</li> <li>•"D1_1_2"                See Figure 7-4.</li> <li>•"D123"                   See Figure 7-4.</li> <li>•"D1_2_3"                See Figure 7-4.</li> <li>•"D12_33"                See Figure 7-4.</li> <li>•"D11_23"                See Figure 7-4.</li> <li>•"D13_23"                See Figure 7-4.</li> <li>•"D12_13"                See Figure 7-4.</li> <li>•"D1234"                 See Figure 7-4.</li> <li>•"D1_2_3_4"             See Figure 7-4.</li> <li>•"D12_34"                See Figure 7-4.</li> <li>•"D123_456"             See Figure 7-4.</li> <li>•"D12_34_56"            See Figure 7-4.</li> <li>•"D1234_5678"           See Figure 7-4.</li> <li>•"D12_34_56_78"        See Figure 7-4.</li> <li>•"D123_456_789"        See Figure 7-4.</li> <li>•"D123_ABC"             See Figure 7-4.</li> <li>•"D1234_9ABC"           See Figure 7-4.</li> <li>•"D1234_CDEF"           See Figure 7-4.</li> </ul>
Preset value	"D1"

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 182.

**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 325

**Equivalent key**      **[Display] - Allocate Traces**



## SCPI.DISPlay.WINDow(Ch).TITLe.DATA

Object type	Property
Syntax	SCPI.DISPlay.WINDow( <i>Ch</i> ).TITLe.DATA = <i>Lbl</i> <i>Lbl</i> = SCPI.DISPlay.WINDow( <i>Ch</i> ).TITLe.DATA
Description	Sets the title label displayed in the title area of channels 1 to 16 ( <i>Ch</i> ).
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 182.

Examples	<pre>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</pre>
Related objects	SCPI.DISPlay.WINDow(Ch).TITLe.STATe on page 334
Equivalent key	<b>[Display] - Edit Title Label</b>

## **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 16 ( <i>Ch</i> ).
Variable	

	<b><i>Status</i></b>
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 182.

**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 333

**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 16 ( <i>Tr</i> ) of channels 1 to 16 ( <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"> <li>•True or -1                      Turns ON the memory trace display.</li> <li>•False or 0                      Turns OFF the memory trace display.</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 182 and Table 7-10, “Variable (Tr),” on page 225, respectively.

Examples	Dim DispMem As Boolean SCPI.DISPlay.WINDOW(1).TRACe(2).MEMory.STATe = True DispMem = SCPI.DISPlay.WINDOW(1).TRACe(2).MEMory.STATe
Related objects	SCPI.CALCulate(Ch).SElected.MATH.MEMorize on page 285 SCPI.DISPlay.WINDOW(Ch).TRACe(Tr).STATe on page 336
Equivalent key	<b>[Display] - Display - Mem</b> (when the data trace display is OFF) <b>[Display] - Display - Data &amp; Mem</b> (when the data trace display is ON)

## SCPI.DISPlay.WINDow(Ch).TRACe(Tr).STATe

**Object type** Property  
**Syntax** SCPI.DISPlay.WINDow(*Ch*).TRACe(*Tr*).STATe = *Status*  
*Status* = SCPI.DISPlay.WINDow(*Ch*).TRACe(*Tr*).STATe  
**Description** For traces 1 to 16 (*Tr*) of channels 1 to 16 (*Ch*), 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"> <li>•True or -1 Turns ON the data trace display.</li> <li>•False or 0 Turns OFF the data trace display.</li> </ul>
Preset value	True or -1

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, “Variable (Ch),” on page 182 and Table 7-10, “Variable (Tr),” on page 225, respectively.

**Examples**  

```
Dim DispTrac As Boolean
SCPI.DISPlay.WINDow(1).TRACe(2).STATe = False
DispTrac = SCPI.DISPlay.WINDow(1).TRACe(2).STATe
```

**Related objects** SCPI.DISPlay.WINDow(Ch).TRACe(Tr).MEMory. STATe on page 335

**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(*Ch*).TRACe(*Tr*).Y.SCALe.AUTO  
**Description** For traces 1 to 16 (*Tr*) of channels 1 to 16 (*Ch*), 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 (*Ch*) and the variable (*Tr*), see Table 7-6, “Variable (Ch),” on page 182 and Table 7-10, “Variable (Tr),” on page 225, respectively.  
**Examples** SCPI.DISPlay.WINDow(1).TRACe(2).Y.SCALe.AUTO  
**Related objects** SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. PDIVision on page 337  
SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVel on page 338  
**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 16 (*Tr*) of channels 1 to 16 (*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"> <li>• Log magnitude: 10</li> <li>• Phase, Expanded phase or Positive phase: 90</li> <li>• Group delay: 1E-8</li> <li>• Smith chart or Polar or SWR: 1</li> <li>• Linear magnitude: 0.1</li> <li>• Real or Imaginary: 0.2</li> </ul>
Unit	Varies depending on the data format. <ul style="list-style-type: none"> <li>• Log magnitude: dB (decibel)</li> <li>• Phase, Expanded phase or Positive phase: ° (degree)</li> <li>• Group delay: s (second)</li> <li>• Others: No unit</li> </ul>
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 182 and Table 7-10, “Variable (Tr),” on page 225, 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 241  
 SCPI.DISPlay.WINDow(Ch).Y.SCALe.DIVisions on page 341  
 SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVel on page 338  
 SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RPOsition on page 339

**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 16 ( <i>Tr</i> ) of channels 1 to 16 ( <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"> <li>• Log magnitude (MLOG): dB (decibel)</li> <li>• Phase (PHAS), Expanded phase (UPH) or Positive phase (PPH): ° (degree)</li> <li>• Group delay (GDEL): s (second)</li> <li>• Others: No unit</li> </ul>
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 182 and Table 7-10, “Variable (Tr),” on page 225, 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 241
- SCPI.DISPlay.WINDow(Ch).Y.SCALe.DIVisions on page 341
- SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. PDIVision on page 337
- SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. RPOSITION on page 339

**Equivalent key**     **[Scale] - Reference Value**

## **SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RPOsition**

Object type	Property
Syntax	SCPI.DISPlay.WINDow( <i>Ch</i> ).TRACe( <i>Tr</i> ).Y.SCALe.RPOsition = <i>Value</i> <i>Value</i> = SCPI.DISPlay.WINDow( <i>Ch</i> ).TRACe( <i>Tr</i> ).Y.SCALe.RPOsition
Description	For traces 1 to 16 ( <i>Tr</i> ) of channels 1 to 16 ( <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 182 and Table 7-10, “Variable (Tr),” on page 225, 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 241</p> <p>SCPI.DISPlay.WINDow(Ch).Y.SCALe.DIVisions on page 341</p> <p>SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.PDIVision on page 337</p> <p>SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVel on page 338</p>
Equivalent key	<b>[Scale] - Reference Position</b>

## 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 16 ( <i>Ch</i> ) for segment sweep.
Variable	

	<b><i>Param</i></b>
Description	Horizontal axis display type of the graph for segment sweep
Data type	Character string type (String)
Range	Select from the following.  •"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 182.

Examples	<pre>Dim DispSegm As String SCPI.SENSE(1).SWEep.TYPE = "segm" SCPI.DISPlay.WINDow(1).X.SPACing = "obas" DispSegm = SCPI.DISPlay.WINDow(1).X.SPACing</pre>
----------	---

Related objects	SCPI.SENSE(Ch).SWEep.TYPE on page 454
-----------------	---------------------------------------

Equivalent key	<b>[Sweep Setup] - Segment Display</b>
----------------	--



## 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 16 ( <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 182.

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	<p>SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. PDIVision on page 337</p> <p>SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe.RLEVel on page 338</p> <p>SCPI.DISPlay.WINDow(Ch).TRACe(Tr).Y.SCALe. RPOStion on page 339</p>
Equivalent key	<b>[Scale] - Divisions</b>

## 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 E5070B/E5071B using COM objects in the E5070B/E5071B 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 343

**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"> <li>• :CALC{1-16}:DATA:FDAT</li> <li>• :CALC{1-16}:DATA:FMEM</li> <li>• :CALC{1-16}:DATA:SDAT?</li> <li>• :CALC{1-16}:DATA:SMEM?</li> <li>• :CALC{1-16}:FUNC:DATA?</li> <li>• :CALC{1-16}:LIM:DATA</li> <li>• :CALC{1-16}:LIM:REP?</li> <li>• :SENS{1-16}:FREQ:DATA?</li> <li>• :SENS{1-16}:SEGM:DATA</li> <li>• :SOUR:POW:PORT:CORR:COLL:TABL:ASEN:DATA</li> <li>• :SOUR:POW:PORT:CORR:COLL:TABL:BSEN:DATA</li> <li>• :SOUR{1-16}:POW:PORT{1-4}:CORR:COLL:TABL:LOSS:DATA</li> <li>• :SOUR{1-16}:POW:PORT{1-4}:CORR:DATA</li> </ul>

---

**NOTE** ASCII transfer format must be specified when controlling the E5070B/E5071B using SCPI commands with the **Parse** object in the E5070B/E5071B 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"> <li>• "ASCIi"                      Specifies the ASCII transfer format.</li> <li>• "REAL"                        Specifies the IEEE 64-bit floating point binary transfer format.</li> <li>• "REAL32"                      Specifies the IEEE 32-bit floating point binary transfer format.</li> </ul>
Preset value	"NORMal"

**Examples**

```
Dim Fmt As String
SCPI.FORMat.DATA = "asc"
Fmt = SCPI.FORMat.DATA
```

**Related objects** SCPI.FORMat.BORDER on page 342  
Parse on page 173

**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 345
Equivalent key	<b>[System] - Abort Printing</b>

## 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 345
Equivalent key	<b>[System] - Invert Image</b>

## 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 E5070B/E5071B. (No read)
<b>NOTE</b>	When printing the E5070B/E5071B measurement screen, execute the VBA program with the Visual Basic editor closed. For the method, see “Running a Program from the E5070B/E5071B Measurement Screen” on page 50.
Examples	<code>SCPI.HCOPy.IMMediate</code>
Related objects	SCPI.HCOPy.ABORT on page 344 SCPI.HCOPy.IMAGe on page 344
Equivalent key	<b>[System] - Print</b> 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 <b>[Capture] ([System])</b> 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"><li>• Error Queue</li><li>• Status Byte Register</li><li>• Standard Event Status Register</li><li>• Operation Status Event Register</li><li>• Questionable Status Event Register</li><li>• Questionable Limit Status Event Register</li><li>• Questionable Limit Extra Status Event Register</li><li>• Questionable Limit Channel Status Event Register</li><li>• Questionable Limit Channel Extra Status Event Register</li></ul>
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.
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	Dim Stat As Long SCPI.IEEE4882.ESE = 16 Stat = SCPI.IEEE4882.ESE
Related objects	SCPI.IEEE4882.SRE on page 350
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. (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 E5070B/E5071B. (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: E5070B).</li> <li>• {string 3}                   Serial number (example: JP1KI00101).</li> <li>• {string 4}                   Firmware version number (example: 03.00).</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 = *Dummy*  
(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 *E5070B/E5071B 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 = 1

Case (2) :  
Dim Dmy As Long  
Dmy = SCPI.IEEE4882.OPC

Related objects SCPI.SENSE(Ch).CORREction.COLLECT.ACQUIRE.ISOLation on page 381  
SCPI.SENSE(Ch).CORREction.COLLECT.ACQUIRE.LOAD on page 382  
SCPI.SENSE(Ch).CORREction.COLLECT.ACQUIRE.OPEN on page 383  
SCPI.SENSE(Ch).CORREction.COLLECT.ACQUIRE.SHORT on page 383  
SCPI.SENSE(Ch).CORREction.COLLECT.ACQUIRE.THROUGH on page 384  
SCPI.TRIGGER.SEQUENCE.SINGLE on page 515

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 E5070B/E5071B. (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	<p>Presets the setting state of the E5070B/E5071B. 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>E5070B/E5071B User’s Guide</i>. (No read)</p> <ul style="list-style-type: none"> <li>The continuous initiation mode (see the SCPI.INITiate(Ch).CONTinuous object) of channel 1 is set to OFF.</li> </ul>

**Examples**

```
SCPI.IEEE4882.RST
```

**Related objects**

SCPI.SYSTem.PRESet on page 510  
 SCPI.INITiate(Ch).CONTinuous on page 352

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

## SCPI.IEEE4882.SRE

Object type	Property
Syntax	SCPI.IEEE4882.SRE = <i>Value</i> <i>Value</i> = SCPI.IEEE4882.SRE
Description	Sets the value of the Service Request Enable Register.
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 346
- SCPI.STATus.OPERation.ENABLE on page 478
- SCPI.STATus.QUESTionable.ENABLE on page 481

**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. (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 E5070B/E5071B waiting for trigger. For information on the waiting for trigger state, see Section “Trigger System” in the *E5070B/E5071B Programmer’s Guide*. (No read)
- Examples**  

```
SCPI.TRIGger.SEQUence.SOURce = "bus"
SCPI.IEEE4882.TRG
```
- Related objects** SCPI.TRIGger.SEQUence.SOURce on page 516
- 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 16 (*Ch*) in the trigger system.  
 For more information on the trigger system, see Section “Trigger System” in the *E5070B/E5071B 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"> <li>• True or -1                      Turns ON the continuous initiation mode.</li> <li>• False or 0                      Turns OFF the continuous initiation mode.</li> </ul>
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 182.

**Examples**

```
Dim ContMode As Boolean
SCPI.INITiate(2).CONTInuous = True
ContMode = SCPI.INITiate(2).CONTInuous
```

**Related objects** SCPI.INITiate(Ch).IMMEDIATE on page 353

**Equivalent key** **[Trigger] - Continuous** (continuous initiation mode ON)  
**[Trigger] - Hold** (continuous initiation mode 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 16 (<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>E5070B/E5071B Programmer’s Guide</i>. (No read)</p>
Variable	For information on the variable ( <i>Ch</i> ), see Table 7-6, “Variable (Ch),” on page 182.
Examples	<pre>SCPI.INITiate(1).CONTinuous = False SCPI.INITiate(1).IMMEDIATE</pre>
Related objects	SCPI.INITiate(Ch).CONTinuous on page 352
Equivalent key	<b>[Trigger] - Single</b>

## SCPI.MMEMory.CATalog(*Dir*)

Object type	Property
Syntax	<i>Cont</i> = SCPI.MMEMory.CATalog( <i>Dir</i> )
Description	<p>Reads out the following information on the built-in storage device of the E5070B/E5071B.</p> <ul style="list-style-type: none"> <li>• Space in use</li> <li>• Available space</li> <li>• Name and size of all files (including directories) in the specified directory.</li> </ul>

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	<p>Directory information ("{A},{B},{Name 1},{Size 1},{Name 2},{Size 2},...,{Name N},{Size N}")</p> <p>Where N is the number of all files in the specified directory and n is an integer between 1 and N.</p> <ul style="list-style-type: none"> <li>• {A}                      Space in use of the built-in storage device (byte)*1.</li> <li>• {B}                      Available space of the built-in storage device (byte)*1.</li> <li>• {Name n}                Name of the n-th file (directory).</li> <li>• {Size n}                Size (byte) of the n-th file (directory). Always 0 for directories.</li> </ul>
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

	<b><i>File</i></b>
Description	Indicates 2 file names (copy source and copy destination). <ul style="list-style-type: none"> <li>• <i>File(0)</i> Copy source file name</li> <li>• <i>File(1)</i> Copy destination file name</li> </ul> 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 `SCPI.MMEMory.COPY = Array("test/state01.sta", "a:test01.sta")`

```
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 SCPI.MMEMory.DElete = "a:\"

SCPI.MMEMory.DElete = "test/state01.sta"

Equivalent key **[Save/Recall] - Save State - File Dialog...**



## SCPI.MMEMory.LOAD.ASCFactor

Object type Property

Syntax SCPI.MMEMory.LOAD.ASCFactor = *File*

Description Recalls the file (file with the ".csv" extension saved with the SCPI.MMEMory.STORE.ASCFactor object) you want to specify as the table for the reference calibration coefficient and the calibration coefficient table for power sensor A. Specify the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use directory names and file name, separate them with "\", " \" (back slash), or "/" (slash). (No read)

Variable

	<i>File</i>
Description	A file name (extension ".csv") of the reference calibration coefficient and the calibration coefficient table for power sensor A.
Data type	Character string type (String)
Range	254 characters or less
Note	If the specified file does not exist, a runtime error occurs.

Examples SCPI.MMEMory.LOAD.ASCFactor = "a:\sensor01.csv"

SCPI.MMEMory.LOAD.ASCFactor = "test/sensor01.csv"

Related objects SCPI.MMEMory.STORE.ASCFactor on page 365

Equivalent key **[Cal] - Power Calibration - Sensor A Settings - Import from CSV File**

## SCPI.MMEMory.LOAD.BSCFactor

Object type Property

Syntax SCPI.MMEMory.LOAD.BSCFactor = *File*

Description Recalls the file (file with the ".csv" extension saved with the SCPI.MMEMory.STORe.BSCFactor object) you want to specify as the table for the reference calibration coefficient and the calibration coefficient table for power sensor B.

Specify the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use directory names and file name, separate them with "\", "\" (back slash), or "/" (slash). (No read

Variable

	<i>File</i>
Description	A file name (extension ".csv") of the reference calibration coefficient and the calibration coefficient table for power sensor B.
Data type	Character string type (String)
Range	254 characters or less
Note	If the specified file does not exist, a runtime error occurs.

Examples SCPI.MMEMory.LOAD.BSCFactor = "a:\sensor01.csv"

SCPI.MMEMory.LOAD.BSCFactor = "test/sensor01.csv"

Related objects SCPI.MMEMory.STORe.BSCFactor on page 366

Equivalent key **[Cal] - Power Calibration - Sensor B Settings - Import from CSV File**

## SCPI.MMEMemory.LOAD.CHANnel.STATe

- Object type** Property
- Syntax** SCPI.MMEMemory.LOAD.CHANnel.STATe = *Register*
- Description** Recalls the instrument state for an individual channel (saved with the SCPI.MMEMemory.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"> <li>•"A"                      Specifies register A.</li> <li>•"B"                      Specifies register B.</li> <li>•"C"                      Specifies register C.</li> <li>•"D"                      Specifies register D.</li> </ul>
Note	If no instrument state has been saved in the specified register, an error occurs and the object is ignored.

- Examples** SCPI.MMEMemory.LOAD.CHANnel.STATe = "a"
- Related objects** SCPI.MMEMemory.STORE.CHANnel.STATe on page 367  
 SCPI.DISPlay.WINDow(Ch).ACTivate on page 329
- 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

```
SCPI.DISPlay.WINDow(1).ACTivate  
SCPI.CALCulate(1).PARAmeter(1).SElect  
SCPI.MMEMory.LOAD.LIMit = "a:\limit01.csv"
```

```
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 329  
SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225  
SCPI.MMEMory.STORE.LIMit on page 370

### Equivalent key

**[Analysis] - Limit Test - Edit Limit Line - Import from CSV File**

## SCPI.MMEMemory.LOAD.PLOSs(*Pt*)

Object type Property

Syntax SCPI.MMEMemory.LOAD.PLOSs(*Pt*) = *File*

Description For ports 1 to 4 (*Pt*), as the loss compensation table for the active channel, recalls the specified loss compensation table file (a file with the ".csv" extension saved with the SCPI.MMEMemory.STORE.PLOSs(*Pt*) 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 the loss compensation table (extension ".csv")
Data type	Character string type (String)
Range	254 characters or less
Note	If the specified file does not exist, a runtime error occurs.

For information on the variable (*Pt*), refer to Table 7-9, "Variable (*Pt*)," on page 210.

Examples

```
SCPI.DISPlay.WINDow(1).ACTivate
SCPI.MMEMemory.LOAD.PLOSs(1) = "a:\loss01.csv"
```

```
SCPI.DISPlay.WINDow(1).ACTivate
SCPI.MMEMemory.LOAD.PLOSs(1) = "test/loss01.csv"
```

Related objects

SCPI.DISPlay.WINDow(*Ch*).ACTivate on page 329  
 SCPI.MMEMemory.STORE.PLOSs(*Pt*) on page 371

Equivalent key

**[Cal] - Power Calibration - Loss Compen - 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**
- ```
SCPI.DISPlay.WINDow(1).ACTivate  
SCPI.MMEMory.LOAD.SEGMent = "a:\segm01.csv"
```
- ```
SCPI.DISPlay.WINDow(1).ACTivate  
SCPI.MMEMory.LOAD.SEGMent = "test/segm01.csv"
```
- Related objects** SCPI.DISPlay.WINDow(Ch).ACTivate on page 329  
SCPI.MMEMory.STORE.SEGMent on page 373
- 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**

```
SCPI.MMEMory.LOAD.STATe = "a:\state01.sta"
```

```
SCPI.MMEMory.LOAD.STATe = "test/state01.sta"
```

**Related objects** SCPI.MMEMory.STORE.STATe on page 374

**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 SCPI.MMEMory.MDIRectory = "a:\test"

SCPI.MMEMory.MDIRectory = "test"

Equivalent key **[Save/Recall] - Save State - File Dialog...**



## SCPI.MMEMory.STORe.ASCFactor

**Object type** Property

**Syntax** SCPI.MMEMory.STORe.ASCFactor = *File*

**Description** Saves the reference calibration coefficient and the calibration coefficient table for power sensor A into a CSV file (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	A file name (extension ".csv") to save the reference calibration coefficient and the calibration coefficient table for power sensor A.
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**

```
SCPI.MMEMory.STORe.ASCFactor = "a:\sensor01.csv"
```

```
SCPI.MMEMory.STORe.ASCFactor = "test/sensor01.csv"
```

**Related objects** SCPI.MMEMory.LOAD.ASCFactor on page 357

**Equivalent key** **[Cal] - Power Calibration - Sensor A Settings - Export to CSV File**

## SCPI.MMEMory.STORe.BSCFactor

Object type	Property
Syntax	SCPI.MMEMory.STORe.BSCFactor = <i>File</i>
Description	<p>Saves the reference calibration coefficient and the calibration coefficient table for power sensor B into a CSV file (extension ".csv").</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	A file name (extension ".csv") to save the reference calibration coefficient and the calibration coefficient table for power sensor B.
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

```
SCPI.MMEMory.STORe.BSCFactor = "a:\sensor01.csv"
```

```
SCPI.MMEMory.STORe.BSCFactor = "test/sensor01.csv"
```

### Related objects

SCPI.MMEMory.LOAD.BSCFactor on page 358

### Equivalent key

**[Cal] - Power Calibration - Sensor B Settings - Export to CSV File**

## 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	<code>SCPI.MMEMory.STORe.CHANnel.CLEAr</code>
Related objects	SCPI.MMEMory.STORe.CHANnel.STATe on page 367
Equivalent key	<b>[Save/Recall] - Save Channel - Clear States - OK</b>

## 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"> <li>•"A"                      Specifies register A.</li> <li>•"B"                      Specifies register B.</li> <li>•"C"                      Specifies register C.</li> <li>•"D"                      Specifies register D.</li> </ul>
Note	If an instrument state has been saved already in the specified register, its contents are overwritten.

Examples	<code>SCPI.MMEMory.STORe.CHANnel.STATe = "a"</code>
Related objects	SCPI.MMEMory.LOAD.CHANnel.STATe on page 359 SCPI.DISPlay.WINDow(Ch).ACTivate on page 329
Equivalent key	<b>[Save/Recall] - Save Channel - A B C D</b>

## SCPI.MMEMory.STORe.FDATa

Object type	Property
Syntax	SCPI.MMEMory.STORe.FDATa = <i>File</i>
Description	<p>For the active trace of the active channel, saves the formatted data array into a file in the CSV format (extension ".csv").</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 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

```
SCPI.DISPlay.WINDow(1).ACTivate  
SCPI.CALCulate(1).PARAmeter(1).SElect  
SCPI.MMEMory.STORe.FDATa = "a:\trace01.csv"
```

```
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 329 SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225
Equivalent key	<b>[Save/Recall] - Save Trace Data</b>

## SCPI.MMEMory.STORe.IMAGe

- Object type** Property
- Syntax** SCPI.MMEMory.STORe.IMAGe = *File*
- Description** 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 E5070B/E5071B measurement screen, execute the VBA program with the Visual Basic editor closed. For more information, see “Running a Program from the E5070B/E5071B Measurement Screen” on page 50.
- 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 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**
- ```
SCPI.MMEMory.STORe.IMAGe = "a:\image01.bmp"
```
- ```
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 = <i>File</i>
Description	<p>Saves the limit table of the active trace of the active channel into a file in the CSV format (extension ".csv").</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 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

```
SCPI.DISPlay.WINDow(1).ACTivate  
SCPI.CALCulate(1).PARAmeter(1).SElect  
SCPI.MMEMory.STORe.LIMit = "a:\limit01.csv"
```

```
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 329 SCPI.CALCulate(Ch).PARAmeter(Tr).SElect on page 225 SCPI.MMEMory.LOAD.LIMit on page 360
Equivalent key	<b>[Analysis] - Limit Test - Edit Limit Line - Export to CSV File</b>

## SCPI.MMEMory.STORe.PLOSs(Pt)

**Object type** Property

**Syntax** SCPI.MMEMory.STORe.PLOSs(*Pt*) = *File*

**Description** For ports 1 to 4 (*Pt*), saves the loss compensation 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	A file name to save the loss compensation 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.

For information on the variable (*Pt*), refer to Table 7-9, "Variable (Pt)," on page 210.

**Examples**

```
SCPI.DISPlay.WINDow(1).ACTivate
SCPI.MMEMory.STORe.PLOSs(1) = "a:\loss01.csv"

SCPI.DISPlay.WINDow(1).ACTivate
SCPI.MMEMory.STORe.PLOSs(1) = "test/loss01.csv"
```

**Related objects**

SCPI.DISPlay.WINDow(Ch).ACTivate on page 329  
 SCPI.MMEMory.LOAD.PLOSs(Pt) on page 361

**Equivalent key**

**[Cal] - Power Calibration - Loss Compen - Export to CSV File**

## SCPI.MMEMory.STORe.SALL

Object type

Property

Syntax

SCPI.MMEMory.STORe.SALL = *Status*

*Status* = SCPI.MMEMory.STORe.SALL

Description

Selects whether to save the setting of all channels/traces or that of the displayed channels/traces only as the instrument state to be saved.

Variable

	<b><i>Status</i></b>
Description	Selecting content to be saved as the instrument state setting.
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"><li>• True or -1                      Specifies the setting of all channels/traces as the target to be saved.</li><li>• False or 0                      Specifies the setting of displayed channels/traces only as the target to be saved.</li></ul>
Preset value	False or 0

Examples

```
Dim Obj As Boolean
SCPI.MMEMory.STORe.SALL = True
Obj = SCPI.MMEMory.STORe.SALL
```

Related objects

SCPI.MMEMory.STORe.STATe on page 374

Equivalent key

**[Save/Recall] - Channel/Trace**



## 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**

```
SCPI.DISPlay.WINDow(1).ACTivate
SCPI.MMEMory.STORe.SEGMent = "a:\segm01.csv"
```

```
SCPI.DISPlay.WINDow(1).ACTivate
SCPI.MMEMory.STORe.SEGMent = "test/segm01.csv"
```

**Related objects**

SCPI.DISPlay.WINDow(Ch).ACTivate on page 329  
 SCPI.MMEMory.LOAD.SEGMent on page 362

**Equivalent key**

**[Sweep Setup] - Edit Segment Table - Export to CSV File**

## SCPI.MMEMory.STORe.STATe

**Object type** Property

**Syntax** SCPI.MMEMory.STORe.STATe = *File*

**Description** Saves the instrument state (contents to be saved specified with the SCPI.MMEMory.STORe.STYPE object) into a file (file with the .sta extension).

Specify the file name with the extension. If you want to specify a file on the floppy disk drive, you need to add "A:" at the beginning of the file name. When you use directory names and file name, separate them with "\" (back slash), or "/" (slash). (No read)

---

**NOTE** The instrument setting file saved with the "autorec.sta" file name is automatically recalled when turning on the E5070B/E5071B.

---

**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**

```
Dim StaType As String
SCPI.MMEMory.STORe.STYPE = "cdst"
SCPI.MMEMory.STORe.STATe = "a:\state01.sta"

Dim StaType As String
SCPI.MMEMory.STORe.STYPE = "cdst"
SCPI.MMEMory.STORe.STATe = "test/state01.sta"
```

**Related objects** SCPI.MMEMory.STORe.STYPE on page 375  
 SCPI.MMEMory.LOAD.STATe on page 363

**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"> <li>•"STATE"                    Specifies the save of the measurement conditions *1 only.</li> <li>•"CStAtE"                   Specifies the save of the measurement conditions*1 and the calibration state.</li> <li>•"DStAtE"                   Specifies the save of the measurement conditions *1 and the formatted data array.</li> <li>•"CDStAtE"                 Specifies the save of the measurement conditions *1, the calibration state, and the formatted data array.</li> </ul>
Preset value	"CStAtE"

\*1. For information on the measurement conditions to be saved, see Appendix "List of Default Values" in the *E5070B/E5071B User's Guide or Programmer's Guide*.

Examples	<pre>Dim StaType As String SCPI.MMEMory.STORe.STYPE = "cdst" StaType = SCPI.MMEMory.STORe.STYPE</pre>
Related objects	SCPI.MMEMory.STORe.STATe on page 374
Equivalent key	<b>[Save/Recall] - Save Type - State Only State &amp; Cal State &amp; Trace All</b>

## SCPI.OUTPUT.STATE

Object type	Property
Syntax	SCPI.OUTPUT.STATE = <i>Status</i> <i>Status</i> = SCPI.OUTPUT.STATE
Description	Turns on/off of the stimulus signal output. You cannot perform measurement until you turn on the stimulus signal output.

### Variable

	<b><i>Status</i></b>
Description	On/off of the stimulus signal output
Data type	Boolean type (Boolean)
Range	Select from the following. •True or -1                      Turns on the stimulus signal. •False or 0                      Turns off the stimulus signal.
Preset value	True or -1

Examples	Dim Outp As Boolean SCPI.OUTPUT.STATE = True Outp = SCPI.OUTPUT.STATE
----------	---

Equivalent key	<b>[Sweep Setup] - Power - RF Out</b>
----------------	---------------------------------------

## 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 16 ( <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 182.
Examples	SCPI.SENSE(1).AVERAge.CLEAr
Related objects	SCPI.SENSE(Ch).AVERAge.COUNT on page 377 SCPI.SENSE(Ch).AVERAge.STATE on page 378
Equivalent key	<b>[Avg] - Averaging Restart</b>

## 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 16 ( <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 182.

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 378 SCPI.SENSE(Ch).AVERAge.CLEAr on page 377
Equivalent key	<b>[Avg] - Avg Factor</b>

## 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 16 ( <i>Ch</i> ).
Variable	

	<b><i>Status</i></b>
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 182.

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 377 SCPI.SENSE( <i>Ch</i> ).AVERAge.CLEAr on page 377
-----------------	--

Equivalent key	<b>[Avg] - Averaging</b>
----------------	--------------------------

## SCPI.SENSE(Ch).BANDwidth.RESolution

**Object type** Property

**Syntax** SCPI.SENSE(*Ch*).BANDwidth.RESolution = *Value*  
*Value* = SCPI.SENSE(*Ch*).BANDwidth.RESolution

**Description** Sets the IF bandwidth of channels 1 to 16 (*Ch*).  
 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 182.

**Examples**

```
Dim IfBw As Double
SCPI.SENSE(1).BANDwidth.RESolution = 1.5E3
IfBw = SCPI.SENSE(1).BANDwidth.RESolution
```

**Related objects** SCPI.SENSE(Ch).BWIDth.RESolution on page 380

**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 16 ( <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 182.

**Examples**

```
Dim IfBw As Double
SCPI.SENSE(1).BWIDth.RESolution = 1.5E3
IfBw = SCPI.SENSE(1).BWIDth.RESolution
```

**Related objects** SCPI.SENSE(*Ch*).BANDwidth.RESolution on page 379

**Equivalent key** **[Avg] - IF Bandwidth**



## SCPI.SENSE(*Ch*).CORRection.COLLect.ACQuire.ISOLation

Object type	Property
Syntax	SCPI.SENSE( <i>Ch</i> ).CORRection.COLLect.ACQuire.ISOLation = <i>Ports</i>
Description	For channels 1 to 16 ( <i>Ch</i> ), measures the calibration data of the isolation from the specified stimulus port to the specified response port. (No read)
Variable	

**Table 7-13**

### Variable (*Ports*)

	<i>Ports</i>
Description	Indicates 2-element array data (port number). <ul style="list-style-type: none"> <li>• <i>Ports(0)</i>                      Specifies the response port number.</li> <li>• <i>Ports(1)</i>                      Specifies the stimulus port number.</li> </ul> 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 182.

### Examples

```
Dim Dmy As Long
SCPI.SENSE(1).CORRection.COLLect.ACQuire.ISOLation = Array(1,2)
Dmy = SCPI.IEEE4882.OPC
```

```
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 348

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 16 ( <i>Ch</i> ), measures the calibration data of the load standard for the specified port. (No read)
Variable	

**Table 7-14****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 182.

**Examples**

```
Dim Dmy As Long
SCPI.SENSE(1).CORRection.COLLect.ACQuire.LOAD = 1
Dmy = SCPI.IEEE4882.OPC
```

Related objects SCPI.IEEE4882.OPC on page 348

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 16 ( <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 182 and Table 7-14, “Variable (Port),” on page 382, 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 348
Equivalent key	<p><b>[Cal] - Calibrate - Response (Open) 1-Port Cal - Open</b></p> <p><b>[Cal] - Calibrate - n-Port Cal - Reflection - Port m Open</b></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 16 ( <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 182 and Table 7-14, “Variable (Port),” on page 382, 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 348
Equivalent key	<p><b>[Cal] - Calibrate - Response (Short) 1-Port Cal - Short</b></p> <p><b>[Cal] - Calibrate - n-Port Cal - Reflection - Port m Short</b></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 16 ( <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 182 and Table 7-13, “Variable (Ports),” on page 381, respectively.
Examples	<pre>Dim Dmy As Long SCPI.SENSE(1).CORRection.COLLect.ACQuire.THRU = Array(2,1) Dmy = SCPI.IEEE4882.OPC  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 348
Equivalent key	<b>[Cal] - Calibrate - Response (Thru) - Thru</b> <b>[Cal] - Calibrate - n-Port Cal - Transmission - Port m-n Thru</b>

## 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 16 ( <i>Ch</i> ).
Variable	

	<b><i>Lbl</i></b>
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"> <li>• 1: "85033E"</li> <li>• 2: "85033D"</li> <li>• 3: "85052D"</li> <li>• 4: "85032F"</li> <li>• 5: "85032B"</li> <li>• 6: "85036B/E"</li> <li>• 7 to 10: "User"</li> </ul>

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 390
Equivalent key	<b>[Cal] - Modify Cal Kit - Label Kit</b>

**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 16 ( <i>Ch</i> ), selects the standard used for the load measurement of the specified port ( <i>Cpt</i> ).

Variable

**Table 7-15** 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 182.

**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 390

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 16 (*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 182 and Table 7-15, “Variable (Cpt),” on page 386, 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 390

**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 16 ( <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 182 and Table 7-15, “Variable (Cpt),” on page 386, respectively.

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<b>NOTE</b>	Since the variable ( <i>Cpt</i> ) has no preset value, you cannot omit it. If you omit the variable ( <i>Cpt</i> ), an error occurs when executed.
-------------	--

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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 390
Equivalent key	<b>[Cal] - Modify Cal Kit - Specify CLSs - Short - Port 1 Port 2 Port 3 Port 4</b>



**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) = Value Value = SCPI.SENSE(Ch).CORRection.COLLect.CKIT.ORDer.THRU(Cpt_m,Cpt_n)
Description	For the calibration kit selected for channels 1 to 16 (Ch), selects the standard used for the thru measurement between the specified 2 ports (Cpt_m and Cpt_n).

## 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 182.

## 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 390

## 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 16 ( <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 182.
Examples	SCPI.SENSE(1).CORRection.COLLect.CKIT.RESet
Related objects	SCPI.SENSE( <i>Ch</i> ).CORRection.COLLect.CKIT.SELect on page 390
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 16 ( <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 182.

Examples	Dim CalKit As Long SCPI.SENSE(1).CORRection.COLLect.CKIT.SELect = 3 CalKit = SCPI.SENSE(1).CORRection.COLLect.CKIT.SELect
Equivalent key	<b>[Cal] - Cal Kit</b>

## SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).ARBITrary

**Object type** Property

**Syntax** SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).ARBITrary = *Value*  
*Value* = SCPI.SENSE(*Ch*).CORRection.COLLEct.CKIT.STAN(*Std*).ARBITrary

**Description** For the calibration kit selected for channels 1 to 16 (*Ch*), sets the value of the arbitrary impedance of the standards 1 to 21 (*Std*).

**Variable**

**Table 7-16**

### 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	$\Omega$ (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 182.

**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 390

**Equivalent key**

**[Cal] - Modify Cal Kit - Define STDs - no. name<sup>\*1</sup> - 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 16 ( <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 182 and Table 7-16, “Variable (Std),” on page 391, 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 390
Equivalent key	<b>[Cal] - Modify Cal Kit - Define STDs - no. name<sup>*1</sup> - C0</b>

\*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 16 ( <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 182 and Table 7-16, “Variable (Std),” on page 391, 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 390
Equivalent key	<b>[Cal] - Modify Cal Kit - Define STDs - no. name<sup>*1</sup> - C1</b>

\*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 16 ( <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 <sup>2</sup> (1E-36 farad /hertz <sup>2</sup> )
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 182 and Table 7-16, “Variable (Std),” on page 391, 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 390

Equivalent key **[Cal] - Modify Cal Kit - Define STDs - no. name<sup>\*1</sup> - 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 16 (*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 <sup>3</sup> (1E-45 farad / hertz <sup>3</sup> )
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 182 and Table 7-16, “Variable (Std),” on page 391, 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 390

**Equivalent key** **[Cal] - Modify Cal Kit - Define STDs - no. name<sup>\*1</sup> - 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 16 ( <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 182 and Table 7-16, “Variable (Std),” on page 391, 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 390
Equivalent key	<b>[Cal] - Modify Cal Kit - Define STDs - no. name<sup>*1</sup> - Offset Delay</b>

\*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 16 ( <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 182 and Table 7-16, “Variable (Std),” on page 391, 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( <i>Ch</i> ).CORRection.COLLect.CKIT.SELect on page 390
Equivalent key	<b>[Cal] - Modify Cal Kit - Define STDs - no. name<sup>*1</sup> - L0</b>

<sup>\*1</sup>.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 16 ( <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 182 and Table 7-16, “Variable (Std),” on page 391, 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( <i>Ch</i> ).CORRection.COLLEct.CKIT.SELect on page 390
Equivalent key	<b>[Cal] - Modify Cal Kit - Define STDs - no. name<sup>*1</sup> - L1</b>

\*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 16 ( <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 <sup>2</sup> (1E-33 henry / hertz <sup>2</sup> )
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 182 and Table 7-16, “Variable (Std),” on page 391, 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 390
Equivalent key	<b>[Cal] - Modify Cal Kit - Define STDs - no. name<sup>*1</sup> - L2</b>

\*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 16 ( <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 <sup>3</sup> (1E-42 henry / hertz <sup>3</sup> )
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 182 and Table 7-16, “Variable (Std),” on page 391, 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 390

Equivalent key **[Cal] - Modify Cal Kit - Define STDs - no. name<sup>\*1</sup> - 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 16 (*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 182 and Table 7-16, “Variable (Std),” on page 391, 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 390

**Equivalent key** **[Cal] - Modify Cal Kit - Define STDs - no. name<sup>\*1</sup> - Label**

<sup>\*1</sup>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 16 ( <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	$\Omega/s$ (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 182 and Table 7-16, “Variable (Std),” on page 391, 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 390
Equivalent key	<b>[Cal] - Modify Cal Kit - Define STDs - no. name<sup>*1</sup> - Offset Loss</b>

\*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 16 ( <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"> <li>•"OPEN"                      Specifies open.</li> <li>•"SHORT"                    Specifies short.</li> <li>•"LOAD"                     Specifies load.</li> <li>•"THRU"                     Specifies thru.</li> <li>•"ARBI"                     Specifies arbitrary impedance.</li> <li>•"NONE"                     Specifies DUT of which theoretical value is 0.</li> </ul>
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 182 and Table 7-16, "Variable (Std)," on page 391, 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 390
Equivalent key	<b>[Cal] - Modify Cal Kit - Define STDs - no. name<sup>*1</sup> - STD Type</b>

\*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 16 ( <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	$\Omega$ (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 182 and Table 7-16, “Variable (Std),” on page 391, 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 390
Equivalent key	<b>[Cal] - Modify Cal Kit - Define STDs - no. name<sup>*1</sup> - Offset Z0</b>

\*1. no: standard number (1 to 21), name: standard name (variable)



## SCPI.SENSE(*Ch*).CORRection.COLLEct.ECAL.CCHeck.ACQuire

Type of object	Method
Syntax	SCPI.SENSE( <i>Ch</i> ).CORRection.COLLEct.ECAL.CCHeck.ACQuire
Description	<p>Using ECal (Electronic Calibration), executes the confidence check of the calibration coefficients for channels 1 to 16 (<i>Ch</i>) (sets the data measured with the analyzer and the data stored in ECal so that they can be compared).</p> <p>If you execute this object when the ECal module is not connected or when ports are not connected each other appropriately, a runtime error occurs. (No read)</p>
<b>NOTE</b>	This function is available with the firmware version 3.50 or greater.
Variable	For information on the variable ( <i>Ch</i> ), refer to Table 7-6, “Variable (Ch),” on page 182.
Example of use	SCPI.SENSE(1).CORRection.COLLEct.ECAL.CCHeck.ACQuire
Equivalent key	<b>[Cal] - ECal - Confidence Check</b>

**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 16 ( <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"> <li>•True or -1                      Turns ON the isolation measurement.</li> <li>•False or 0                      Turns OFF the isolation measurement.</li> </ul>
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

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(Ch).CORRection.COLLect.ECAL.SOLT1 on page 408</p> <p>SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT2 on page 409</p> <p>SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT3 on page 410</p> <p>SCPI.SENSE(Ch).CORRection.COLLect.ECAL.SOLT4 on page 411</p>
Equivalent key	<b>[Cal] - ECal - Isolation</b>

## 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 E5070B/E5071B. (Read only)
Variable	

	<i>Ept</i>
Description	Port of ECal module.
Data type	Long integer type (Long)
Range	<p>One of the following is read out.</p> <ul style="list-style-type: none"> <li>• 0                    Nothing is connected.</li> <li>• 1                    Port A is connected.</li> <li>• 2                    Port B is connected.</li> <li>• 3                    Port C is connected.</li> <li>• 4                    Port D is connected.</li> </ul>

For information on the variable (*Cpt*), see Table 7-15, “Variable (*Cpt*),” on page 386.

**Examples**

```
Dim ECalPort As Long
ECalPort = SCPI.SENSE.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(*Ch*).CORRection.COLLect.ECAL.SOLT1 = *Eport*

**Description** Executes full 1-port calibration of the specified port of channels 1 to 16 (*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>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 182.

**Examples** SCPI.SENSE(1).CORRection.COLLect.ECAL.SOLT1 = 1

**Equivalent key** **[Cal] - ECal - 1-Port Cal - 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 16 (*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"> <li>• <i>EPorts(0)</i></li> <li>• <i>EPorts(1)</i></li> </ul> 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 182.

**Examples**

```
SCPI.SENSE(1).CORRection.COLLEct.ECAL.SOLT2 = Array(1,2)

Dim EcalPort(1) As Variant
EcalPort(0) = 1
EcalPort(1) = 2
SCPI.SENSE(1).CORRection.COLLEct.ECAL.SOLT2 = EcalPort
```

**Equivalent key** **[Cal] - ECal - 2-Port Cal - Port 1-2|Port 1-3|Port 1-4|Port 2-3|Port 2-4|Port 3-4**

## SCPI.SENSE(*Ch*).CORRection.COLLect.ECAL.SOLT3

Object type	Property
Syntax	SCPI.SENSE( <i>Ch</i> ).CORRection.COLLect.ECAL.SOLT3 = <i>Eports</i>
Description	<p>Executes full 3-port calibration between the specified 3 ports of channels 1 to 16 (<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

	<b><i>Eports</i></b>
Description	<p>Indicates 3-element array data (port number).</p> <ul style="list-style-type: none"> <li>• <i>EPorts(0)</i></li> <li><i>EPorts(1)</i></li> <li><i>EPorts(2)</i></li> </ul> <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	<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 3 port numbers to be specified is arbitrary.</p>

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

Examples

```
SCPI.SENSE(1).CORRection.COLLect.ECAL.SOLT3 = Array(1,2,3)

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 - 3-Port Cal - 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(*Ch*).CORRection.COLLect.ECAL.SOLT4 = *Eports*

**Description**           Executes full 4-port calibration for channels 1 to 16 (*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**

	<b><i>Eports</i></b>
Description	Indicates 4-element array data (port number). <ul style="list-style-type: none"> <li>• <i>EPorts(0)</i></li> <li>  <i>EPorts(1)</i></li> <li>  <i>EPorts(2)</i></li> <li>  <i>EPorts(3)</i></li> </ul> <p style="margin-left: 100px;">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	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 4 port numbers to be specified is arbitrary.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

**Examples**                SCPI.SENSE(1).CORRection.COLLect.ECAL.SOLT4 = Array(1, 2, 3, 4)

```
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 - 4-Port Cal**

## SCPI.SENSE(*Ch*).CORRection.COLLect.ECAL.THURU

Object type	Property
Syntax	SCPI.SENSE( <i>Ch</i> ).CORRection.COLLect.ECAL.THURU = <i>Eports</i>
Description	<p>Executes response calibration (thru) between the specified 2 ports of channels 1 to 16 (<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

	<b><i>Eports</i></b>
Description	<p>Indicates 2-element array data (port number).</p> <ul style="list-style-type: none"> <li>• <i>Ports(0)</i>                      Specifies the response port number.</li> <li>• <i>Ports(1)</i>                      Specifies the stimulus port number.</li> </ul> <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. 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.</p>

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

Examples

```
SCPI.SENSE(1).CORRection.COLLect.ECAL.THURU = Array(1,2)

Dim EcalPort(1) As Variant
EcalPort(0) = 1
EcalPort(1) = 2
SCPI.SENSE(1).CORRection.COLLect.ECAL.THURU = EcalPort
```

Equivalent key

**[Cal] - ECal - Thru Cal - 2-1 (S21)|3-1 (S31)|4-1 (S41)|1-2 (S12)|3-2 (S32)| 4-2 (S42)| 1-3 (S13)|2-3 (S23)|4-3 (S43)|1-4 (S14)|2-4 (S24)|3-4 (S34)**



## SCPI.SENSE(*Ch*).CORRection.COLLect.ECAL.UCHar

**Object type** Property

**Syntax** SCPI.SENSE(*Ch*).CORRection.COLLect.ECAL.UCHar = *Param*

**Description** For channels 1 to 16 (*Ch*), selects the ECal characteristic used when executing the user-defined ECal.

The user-defined ECal is a type of ECal that is executed using the characteristic that has been acquired by the user and stored in the memory for ECal. For more information, refer to *User's Guide*.

When the ECal module is not connected or the characteristic is not stored at the specified location number, executing this object will cause a runtime error.

---

**NOTE** This function is available with the firmware version 3.50 or greater.

---

**Variable**

	<i>Param</i>
Description	Characteristic used when executing ECal (user characterization)
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> <li>•"CHAR0" Uses the factory-default characteristic. (Normal ECal)</li> <li>•"CHAR1" Uses the characteristic stored at location number 1 in the ECal's flash memory.</li> <li>•"CHAR2" Uses the characteristic stored at location number 2 in the ECal's flash memory.</li> <li>•"CHAR3" Uses the characteristic stored at location number 3 in the ECal's flash memory.</li> <li>•"CHAR4" Uses the characteristic stored at location number 4 in the ECal's flash memory.</li> <li>•"CHAR5" Uses the characteristic stored at location number 5 in the ECal's flash memory.</li> </ul>
Preset value	"CHAR0"

For information on the variable (*Ch*), refer to Table 7-6, "Variable (Ch)," on page 182.

**Examples**

```
Dim UserChar As String
SCPI.SENSE(1).CORRection.COLLect.ECAL.UCHar = "CHAR2"
UserChar = SCPI.SENSE(1).CORRection.COLLect.ECAL.UCHar
```

**Equivalent key** **[Cal] - ECal - Characterization - Factory|User1|User2|User3|User4|User5**

**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 16 ( <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 182 and Table 7-14, “Variable (Port),” on page 382, respectively.
Examples	SCPI.SENSE(1).CORRection.COLLect.METHod.RESPonse.OPEN = 1
Related objects	SCPI.SENSE(Ch).CORRection.COLLect.METHod.TYPE on page 419
Equivalent key	<b>[Cal] - Calibrate - Response (Open) - Select Port</b>

**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 16 ( <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 182 and Table 7-14, “Variable (Port),” on page 382, respectively.
Examples	SCPI.SENSE(1).CORRection.COLLect.METHod.RESPonse.SHORT = 1
Related objects	SCPI.SENSE(Ch).CORRection.COLLect.METHod.TYPE on page 419
Equivalent key	<b>[Cal] - Calibrate - Response (Short) - Select Port</b>

## **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 16 ( <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 182 and Table 7-13, “Variable ( <i>Ports</i> ),” on page 381, respectively.
Examples	<pre>SCPI.SENSE(1).CORREction.COLLECT.METHOD.RESPonse.THRU = Array(2,1)</pre> <pre>Dim ThruPort(1) As Variant ThruPort(0) = 2 ThruPort(1) = 1 SCPI.SENSE(1).CORREction.COLLECT.METHOD.RESPonse.THRU = ThruPort</pre>
Related objects	SCPI.SENSE( <i>Ch</i> ).CORREction.COLLECT.METHOD.TYPE on page 419
Equivalent key	<b>[Cal] - Calibrate - Response (Thru) - Select Ports</b>

## **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 16 ( <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 182 and Table 7-14, “Variable ( <i>Port</i> ),” on page 382, respectively.
Examples	<pre>SCPI.SENSE(1).CORREction.COLLECT.METHOD.SOLT1 = 1</pre>
Related objects	SCPI.SENSE( <i>Ch</i> ).CORREction.COLLECT.METHOD.TYPE on page 419
Equivalent key	<b>[Cal] - Calibrate - 1-Port Cal - Select Port</b>

**SCPI.SENSE(*Ch*).CORRection.COLLect.METHod. SOLT2**

Object type           Property

Syntax                SCPI.SENSE(*Ch*).CORRection.COLLect.METHod.SOLT2 = *Ports*

Description          For channels 1 to 16 (*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"> <li>• <i>Ports(0)</i>                   Specifies a port for full 2-port calibration.</li> <li>• <i>Ports(1)</i>                   Specifies the other port for full 2-port calibration.</li> </ul> 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 182.

Examples              SCPI.SENSE(1).CORRection.COLLect.METHod.SOLT2 = Array(1,2)

```
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 419

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 16 ( <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"> <li>• <i>Ports(0)</i> Specifies a port for full 3-port calibration.</li> <li>• <i>Ports(1)</i> Specifies a port for full 3-port calibration.</li> <li>• <i>Ports(2)</i> Specifies a port for full 3-port calibration.</li> </ul> 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 182.

**Examples** SCPI.SENSE(1).CORRection.COLLect.METHod.SOLT3 = Array(1, 2, 3)

```
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 419

**Equivalent key** **[Cal] - Calibrate - 3-Port Cal - Select Ports**

**SCPI.SENSE(*Ch*).CORRection.COLLect.METHod. SOLT4**

Object type           Property  
 Syntax               SCPI.SENSE(*Ch*).CORRection.COLLect.METHod.SOLT4 = *Ports*  
 Description         For channels 1 to 16 (*Ch*), sets the calibration type to the full 4-port calibration. (No read)  
 Variable

	<b><i>Ports</i></b>
Description	Indicates 4-element array data (port number). <ul style="list-style-type: none"> <li>• <i>Ports(0)</i>               Specifies a port for full 4-port calibration.</li> <li>• <i>Ports(1)</i>               Specifies a port for full 4-port calibration.</li> <li>• <i>Ports(2)</i>               Specifies a port for full 4-port calibration.</li> <li>• <i>Ports(3)</i>               Specifies a port for full 4-port calibration.</li> </ul> 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 4 port numbers to be specified is arbitrary.

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

Examples               SCPI.SENSE(1).CORRection.COLLect.METHod.SOLT4 = Array(1,2,3,4)

```
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 419

Equivalent key       **[Cal] - Calibrate - 4-Port Cal**

## SCPI.SENSE(*Ch*).CORRection.COLLect.METHod.TYPE

**Object type**            Property

**Syntax**                *Param* = SCPI.SENSE(*Ch*).CORRection.COLLect.METHod.TYPE

**Description**           Reads out the selected calibration type of channels 1 to 16 (*Ch*). (Read only)

---

**NOTE**                    This object is used to check the selected calibration type for calculating the calibration coefficients. To check the applied calibration type (error correction on), use the SCPI.SENSE(Ch).CORRection.TYPE(Tr) object.

---

**Variable**

	<i>Param</i>
Description	Calibration type
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> <li>•"NONE"                    The calibration type is set to nothing.</li> <li>•"RESPO"                   The calibration type is the response calibration (open).</li> <li>•"RESPS"                   The calibration type is the response calibration (short).</li> <li>•"RESPT"                   The calibration type is the response calibration (thru).</li> <li>•"SOLT1"                    The calibration type is the full 1-port calibration.</li> <li>•"SOLT2"                    The calibration type is the full 2-port calibration.</li> <li>•"SOLT3"                    The calibration type is the full 3-port calibration.</li> <li>•"SOLT4"                    The calibration type is the full 4-port calibration.</li> </ul>

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 182.

**Examples**                `Dim CalType As String`  
                                 `CalType = SCPI.SENSE(1).CORRection.COLLect.METHod.TYPE`

**Related objects**        SCPI.SENSE(Ch).CORRection.COLLect.SAVE on page 420  
                                 SCPI.SENSE(Ch).CORRection.TYPE(Tr) on page 428

**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 coefficients depending on the calibration type selection.</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 selection.</p> <p>If you execute this object before all necessary calibration data for calculating the calibration coefficients 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 182.
Examples	<pre>Dim Dmy As Long SCPI.SENSE(1).CORRection.COLLect.METHod.RESPonse.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.METHod. RESPonse.OPEN on page 414</p> <p>SCPI.SENSE(Ch).CORRection.COLLect.METHod. RESPonse.SHORt on page 414</p> <p>SCPI.SENSE(Ch).CORRection.COLLect.METHod. RESPonse.THru on page 415</p> <p>SCPI.SENSE(Ch).CORRection.COLLect.METHod. SOLT1 on page 415</p> <p>SCPI.SENSE(Ch).CORRection.COLLect.METHod. SOLT2 on page 416</p> <p>SCPI.SENSE(Ch).CORRection.COLLect.METHod. SOLT3 on page 417</p> <p>SCPI.SENSE(Ch).CORRection.COLLect.METHod. SOLT4 on page 418</p>
Equivalent key	<b>[Cal] - Calibrate - Response n-Port Cal - Done</b>



## SCPI.SENSE(*Ch*).CORRection.COLLEct.SIMPLified.SAVE

Object type	Method
Syntax	SCPI.SENSE( <i>Ch</i> ).CORRection.COLLEct.SIMPLified.SAVE
Description	<p>When the full 3/4 port calibration is selected as the calibration type, calculates the calibration coefficients for the simple full 3 port calibration or the simple full 4 port calibration from the measured calibration data.</p> <p>If the response calibration or the full 1/2 port calibration is selected as the calibration type, this object provides the same function as the SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.SAVE object.</p> <p>After the calibration coefficients are calculated, the measured data and the calibration type setting are cleared.</p> <p>If you execute this object before all the necessary calibration data for calculating the calibration coefficients for the simple full 3 port calibration or the simple full 4 port calibration is measured, a runtime error occurs. (No read)</p>
<b>NOTE</b>	This function is available with the firmware version 3.50 or greater.
Variable	For information on the variable ( <i>Ch</i> ), refer to Table 7-6, “Variable (Ch),” on page 182.
Examples	<pre>SCPI.SENSE(1).CORRection.COLLEct.METHod.SOLT3 = Array(1,2,3) SCPI.SENSE(1).CORRection.COLLEct.SIMPLified.SAVE</pre>
Related objects	<p>SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.METHod. SOLT3 on page 417</p> <p>SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.METHod. SOLT4 on page 418</p> <p>SCPI.SENSE(<i>Ch</i>).CORRection.COLLEct.SAVE on page 420</p>
Equivalent key	No equivalent key is available on the front panel.

**SCPI.SENSE(*Ch*).CORRection.EXTEnsion.PORT(*Pt*).TIME**

Object type

Property

Syntax

SCPI.SENSE(*Ch*).CORRection.EXTEnsion.PORT(*Pt*).TIME = *Value**Value* = SCPI.SENSE(*Ch*).CORRection.EXTEnsion.PORT(*Pt*).TIME

Description

For channels 1 to 16 (*Ch*), sets the delay time for the port extension of ports 1 and 4 (*Pt*).

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 182 and Table 7-9, “Variable (Pt),” on page 210, respectively.

Examples

```
Dim PortExt As Double
SCPI.SENSE(1).CORRection.EXTEnsion.PORT(1).TIME = 1E-3
PortExt = SCPI.SENSE(1).CORRection.EXTEnsion.PORT(1).TIME
```

Related objects

SCPI.SENSE(Ch).CORRection.EXTEnsion.STATe on page 423

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 16 ( <i>Ch</i> ), turns ON/OFF the port extension.
Variable	

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

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

**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 422

**Equivalent key**      **[Cal] - Port Extensions - Extensions**

**SCPI.SENSE.CORRection.IMPedance.INPut.MAGNitude**

Object type	Property
Syntax	SCPI.SENSE.CORRection.IMPedance.INPut.MAGNitude = <i>Value</i> <i>Value</i> = SCPI.SENSE.CORRection.IMPedance.INPut.MAGNitude
Description	Sets the system characteristic impedance (Z0) value.

---

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

## Variable

	<i>Value</i>
Description	System Z0 value
Data type	Double precision floating point type (Double)
Range	1E-3 to 1000
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.

**Examples**

```
Dim SysZ0 As Double
SCPI.SENSE.CORRection.IMPedance.INPut.MAGNitude = 75
SysZ0 = SCPI.SENSE.CORRection.IMPedance.INPut.MAGNitude
```

**Equivalent key**     **[Cal] - Set Z0**

## SCPI.SENSE(*Ch*).CORRection.PROPerTy

Object type Property

Syntax SCPI.SENSE(*Ch*).CORRection.PROPerTy = *Status*  
*Status* = SCPI.SENSE(*Ch*).CORRection.PROPerTy

Description For the active trace of channels 1 to 16 (*Ch*), 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"> <li>• True or -1                      Turns ON the display of the calibration property.</li> <li>• False or 0                      Turns OFF the display of the calibration property.</li> </ul>
Preset value	False or 0

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

Examples  

```
Dim CalProp As Boolean
SCPI.SENSE(1).CORRection.PROPerTy = True
CalProp = SCPI.SENSE(1).CORRection.PROPerTy
```

Equivalent key **[Cal] - Property**

## 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 16 ( <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 182.

Examples	<pre>Dim Vel As Double SCPI.SENSE(1).CORRection.RVELocity.COAX = 0.5 Vel = SCPI.SENSE(1).CORRection.RVELocity.COAX</pre>
----------	--

Equivalent key	<b>[Cal] - Velocity Factor</b>
----------------	--------------------------------

## SCPI.SENSE(*Ch*).CORRection.STATe

- Object type      Property
- Syntax            SCPI.SENSE(*Ch*).CORRection.STATe = *Status*  
*Status* = SCPI.SENSE(*Ch*).CORRection.STATe
- Description      For the active trace of channels 1 to 16 (*Ch*), 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"> <li>•True or -1                      Turns ON the error correction.</li> <li>•False or 0                      Turns OFF the error correction.</li> </ul>
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

*Data* = SCPI.SENSE(*Ch*).CORREction.TYPE(*Tr*)

Description

For traces 1 to 16 (*Tr*) of channels 1 to 16 (*Ch*), reads out the information (calibration type, port numbers) of the applied calibration coefficients for the actual error correction. (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"> <li>• <i>Data</i>(0)                      The calibration type applied. For detail, refer to the Range section.</li> <li>• <i>Data</i>(1)                      The port number to which the calibration is applied (0 when the calibration type is NONE).</li> <li>• <i>Data</i>(2)                      The port number to which the calibration is applied (0 when the calibration type is not SOLT2, SOLT3, or SOLT4).</li> <li>• <i>Data</i>(3)                      The port number to which the calibration is applied (0 when the calibration type is not SOLT3 or SOLT4).</li> <li>• <i>Data</i>(4)                      The port number to which the calibration is applied (0 when the calibration type is not SOLT4).</li> </ul> <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"> <li>• "NONE"                      Nothing is applied.</li> <li>• "RESPO"                      The response calibration (open) is applied.</li> <li>• "RESPS"                      The response calibration (short) is applied.</li> <li>• "RESPT"                      The response calibration (thru) is applied.</li> <li>• "SOLT1"                      The full 1-port calibration is applied.</li> <li>• "SOLT2"                      The full 2-port calibration is applied.</li> <li>• "SOLT3"                      The full 3-port calibration is applied.</li> <li>• "SOLT4"                      The full 4-port calibration is applied.</li> </ul>
Data type	Variant type (Variant)

For information on the variable (*Ch*) and the variable (*Tr*), see Table 7-6, "Variable (Ch)," on page 182 and Table 7-10, "Variable (Tr)," on page 225, respectively.

Examples

```
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 16 (*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 or 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 182.

**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 433

**Equivalent key** **[Center]**

## **SCPI.SENSE(*Ch*).FREQUENCY.CW**

Object type	Property
Syntax	SCPI.SENSE( <i>Ch</i> ).FREQUENCY.CW = <i>Value</i> <i>Value</i> = SCPI.SENSE( <i>Ch</i> ).FREQUENCY.CW
Description	Sets the fixed frequency (CW frequency) for the power sweep for channels 1 to 16 ( <i>Ch</i> ). This object provides the same function as the SCPI.SENSE( <i>Ch</i> ).FREQUENCY.FIXED object.

### Variable

	<i>Value</i>
Description	Fixed frequency
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*), refer to Table 7-6, “Variable (Ch),” on page 182.

**Examples**

```
Dim CwFreq As Double
SCPI.SENSE(1).FREQUENCY.CW = 1E9
CwFreq = SCPI.SENSE(1).FREQUENCY.CW
```

**Related objects**

SCPI.SENSE(*Ch*).FREQUENCY.FIXED on page 432  
SCPI.SENSE(*Ch*).SWEep.TYPE on page 454

**Equivalent key**     **[Sweep Setup] - Power - CW Freq**

## SCPI.SENSE(*Ch*).FREQUENCY.DATA

Object type	Property
Syntax	<i>Data</i> = SCPI.SENSE( <i>Ch</i> ).FREQUENCY.DATA
Description	Reads out the frequencies at all measurement points of channels 1 to 16 ( <i>Ch</i> ). (Read only)
Variable	

	<i>Data</i>
Description	Indicates the array data (frequency) of NOP (number of measurement points). Where n is an integer between 1 and NOP. <ul style="list-style-type: none"> <li>• <i>Data</i>(<i>n-1</i>)                      Frequency at the n-th measurement point</li> </ul> The index of the array starts from 0.
Data type	Variant type (Variant)

For information on the variable (*Ch*), see Table 7-6, “Variable (*Ch*),” on page 182.

**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 451

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

## SCPI.SENSE(*Ch*).FREQUENCY.FIXed

Object type	Property
Syntax	SCPI.SENSE( <i>Ch</i> ).FREQUENCY.FIXed = <i>Value</i> <i>Value</i> = SCPI.SENSE( <i>Ch</i> ).FREQUENCY.FIXed
Description	Sets the fixed frequency (CW frequency) for the power sweep for channels 1 to 16 ( <i>Ch</i> ). This object provides the same function as the SCPI.SENSE( <i>Ch</i> ).FREQUENCY.CW object.

### Variable

	<i>Value</i>
Description	Fixed frequency
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*), refer to Table 7-6, “Variable (Ch),” on page 182.

Examples	<pre>Dim CwFreq As Double SCPI.SENSE(1).FREQUENCY.FIXed = 1E9 CwFreq = SCPI.SENSE(1).FREQUENCY.FIXed</pre>
Related objects	SCPI.SENSE( <i>Ch</i> ).FREQUENCY.CW on page 430 SCPI.SENSE( <i>Ch</i> ).SWEep.TYPE on page 454
Equivalent key	<b>[Sweep Setup] - Power - CW Freq</b>

## SCPI.SENSE(*Ch*).FREQUENCY.SPAN

Object type	Property
Syntax	SCPI.SENSE( <i>Ch</i> ).FREQUENCY.SPAN = <i>Value</i> <i>Value</i> = SCPI.SENSE( <i>Ch</i> ).FREQUENCY.SPAN
Description	Sets the span value of the sweep range of channels 1 to 16 ( <i>Ch</i> ).
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 182.

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 429
Equivalent key	<b>[Span]</b>

## 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 16 ( <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 182.

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 435
Equivalent key	<b>[Start]</b>

## 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 16 (*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 182.

- 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 434
- 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 7-17**

### 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> <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. <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 7-17, “Variable(Id),” on page 436.

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 440</p> <p>SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT2 on page 441</p> <p>SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT3 on page 442</p> <p>SCPI.SENSE(Ch).MULTIplexer(Id).TSET9.PORT4 on page 443</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> <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. <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 7-17, “Variable(*Id*),” on page 436.

Examples	Dim Cont As Boolean SCPI.SENSE.MULTIplexer(1).DISPlay.STATe = True Cont = SCPI.SENSE.MULTIplexer(1).DISPlay.STATe
Related objects	SCPI.SENSE(Ch).MULTIplexer( <i>Id</i> ).TSET9.PORT1 on page 440 SCPI.SENSE(Ch).MULTIplexer( <i>Id</i> ).TSET9.PORT2 on page 441 SCPI.SENSE(Ch).MULTIplexer( <i>Id</i> ).TSET9.PORT3 on page 442 SCPI.SENSE(Ch).MULTIplexer( <i>Id</i> ).TSET9.PORT4 on page 443 SCPI.SENSE(Ch).MULTIplexer( <i>Id</i> ).TSET9.OUTPUT.DATA on page 439
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 16 (*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 182 and Table 7-17, “Variable(Id),” on page 436, 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 438
- 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 16 ( <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 182 and Table 7-17, "Variable(Id)," on page 436, 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(*Id*).STATE on page 438
- SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.PORT2 on page 441
- SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.PORT3 on page 442
- SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.PORT4 on page 443

**Equivalent key**     **[System] - E5091A Setup - Port1 - A|T1**

## 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 16 (*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 182 and Table 7-17, “Variable(Id),” on page 436, 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 438  
 SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT1 on page 440  
 SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT3 on page 442  
 SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT4 on page 443
- 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 16 ( <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 182 and Table 7-17, "Variable(Id)," on page 436, 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 438  
SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.PORT1 on page 440  
SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.PORT2 on page 441  
SCPI.SENSE(*Ch*).MULTiplexer(*Id*).TSET9.PORT4 on page 443

**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 16 ( <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 182 and Table 7-17, "Variable(Id)," on page 436, 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 | <p>SCPI.SENSE.MULTiplexer(Id).STATE on page 438</p> <p>SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT1 on page 440</p> <p>SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT2 on page 441</p> <p>SCPI.SENSE(Ch).MULTiplexer(Id).TSET9.PORT3 on page 442</p> |
| 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 182.

|          |                                                                     |
|----------|---------------------------------------------------------------------|
| 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 16 ( <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 182.

**Examples**

```
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
```

```
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 454

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 16 (*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 182.

- Examples**  

```
Dim SegmPoin As Long
SegmPoin = SCPI.SENSE(1).SEGMENT.SWEep.POINTs
```
- Related objects** SCPI.SENSE(Ch).SEGMENT.DATA on page 445
- 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 16 (*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 182.

- Examples**  

```
Dim SegmTime As Double
SegmTime = SCPI.SENSE(1).SEGMENT.SWEep.TIME.DATA
```
- Related objects** SCPI.SENSE(Ch).SEGMENT.DATA on page 445
- Equivalent key** No equivalent key is available on the front panel.

## SCPI.SENSE(*Ch*).SWEep.ASPurious

Object type      Property

Syntax            SCPI.SENSE(*Ch*).SWEep.ASPurious = *Status*  
*Status* = SCPI.SENSE(*Ch*).SWEep.ASPurious

Description      Turns ON/OFF the spurious avoidance mode of channels 1 to 16 (*Ch*).

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 182.

Examples            

```
Dim ASpurious As Boolean
SCPI.SENSE(1).SWEep.ASPurious = False
ASpurious = SCPI.SENSE(1).SWEep.ASPurious
```

Equivalent key      **[System] - Service Menu - Avoid Spurious**

## 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 16 (*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 182.

- 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(*Ch*).SWEep.GENERation = *Param*  
*Param* = SCPI.SENSE(*Ch*).SWEep.GENERation

Description      Selects the sweep mode of channels 1 to 16 (*Ch*).

When the sweep type is the power sweep (POW specified with the SCPI.SENSE(*Ch*).SWEep.TYPE object), when the power calibration is on (ON specified with the SCPI.SOURCE(*Ch*).POWER.PORT(*Pt*).CORRection.STATe object), or the power slope value is other than 0 and the power slope function is on (ON specified with the SCPI.SOURCE(*Ch*).POWER.LEVel.SLOPe.STATe object), if you execute this object to try to set the sweep mode to the swept mode or the fast swept mode, an error occurs and the sweep mode is automatically set to the step mode or the fast step mode, respectively.

### Variable

	<i>Param</i>
Description	Sweep mode
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> <li>•"STEPped"                Sets the sweep mode to the stepped mode.</li> <li>•"ANALog"                Sets the sweep mode to the swept mode.</li> <li>•"FSTepped"              Sets the sweep mode to the fast stepped mode.</li> <li>•"FANalog"                Sets the sweep mode to the fast swept mode.</li> </ul>
Preset value	"STEPped"

For information on the variable (*Ch*), see Table 7-6, "Variable (*Ch*)," on page 182.

Examples

```
Dim SwptMode As String
SCPI.SENSE(1).SWEep.GENERation = "anal"
SwptMode = SCPI.SENSE(1).SWEep.GENERation
```

Related objects    SCPI.SENSE(*Ch*).SWEep.TYPE on page 454  
SCPI.SOURCE(*Ch*).POWER.PORT(*Pt*).CORRection.STATe on page 472  
SCPI.SOURCE(*Ch*).POWER.LEVel.SLOPe.STATe on page 462

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 16 (*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 182.

- 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(*Ch*).SWEep.TIME.AUTO = *Status*  
*Status* = SCPI.SENSE(*Ch*).SWEep.TIME.AUTO

Description Sets whether to automatically set the sweep time of channels 1 to 16 (*Ch*).

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 182.

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 453

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 16 ( <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 182.

**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 452

**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 16 ( <i>Ch</i> ).                                                 |
| Variable    |                                                                                                        |

|              |                                                                                                                                                                                                                                                                                                                                                                                |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <b><i>Param</i></b>                                                                                                                                                                                                                                                                                                                                                            |
| Description  | Sweep type                                                                                                                                                                                                                                                                                                                                                                     |
| Data type    | Character string type (String)                                                                                                                                                                                                                                                                                                                                                 |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•"LINear"                 Sets the sweep type to the linear sweep.</li> <li>•"LOGarithmic"         Sets the sweep type to the log sweep. *1</li> <li>•"SEGment"             Sets the sweep type to the segment sweep.</li> <li>•"POWer"                Sets the sweep type to the power sweep.</li> </ul> |
| Preset value | "LINear"                                                                                                                                                                                                                                                                                                                                                                       |

\*1. If you execute this object to try to specify the log sweep when the frequency span condition necessary for the log sweep is not satisfied (the stop frequency is about 4 times or more the start frequency), an error occurs and the object is ignored.

For information on the variable (*Ch*), see Table 7-6, "Variable (Ch)," on page 182.

**Examples**

```
Dim SweType As String
SCPI.SENSE(1).SWEep.TYPE = "segm"
SweType = SCPI.SENSE(1).SWEep.TYPE
```

**Equivalent key**     **[Sweep Setup] - Sweep Type - Lin Freq|Log Freq|Segment**

## SCPI.SERVICE.CHANNEL.ACTIVE

Object type      Property

Syntax            *Value* = SCPI.SERVICE.CHANNEL.ACTIVE

Description      Reads out the active channel number. (Read only)

Variable

|             | <i>Value</i>             |
|-------------|--------------------------|
| Description | Active channel number    |
| Data type   | Long integer type (Long) |

Examples            `Dim ActChan As Long`  
                         `ActChan = SCPI.SERVICE.CHANNEL.ACTIVE`

Related objects    SCPI.DISPLAY.WINDOW(Ch).ACTIVATE on page 329

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

## SCPI.SERVICE.CHANNEL.COUNT

Object type      Property

Syntax            *Value* = SCPI.SERVICE.CHANNEL.COUNT

Description      Reads out the upper limit of the number of channels of the E5070B/E5071B. (Read only)

Variable

|             | <i>Value</i>                           |
|-------------|----------------------------------------|
| Description | Upper limit of the number of channels. |
| Data type   | Long integer type (Long)               |

Examples            `Dim MaxChan As Long`  
                         `MaxChan = SCPI.SERVICE.CHANNEL.COUNT`

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

## **SCPI.SERVICE.CHANNEL(*Ch*).TRACE.ACTIVE**

|             |                                                                                  |
|-------------|----------------------------------------------------------------------------------|
| Object type | Property                                                                         |
| Syntax      | <i>Value</i> = SCPI.SERVICE.CHANNEL( <i>Ch</i> ).TRACE.ACTIVE                    |
| Description | Reads out the active trace number of channels 1 to 16 ( <i>Ch</i> ). (Read only) |
| Variable    |                                                                                  |

|             | <i>Value</i>             |
|-------------|--------------------------|
| Description | Active trace number      |
| Data type   | Long integer type (Long) |

|                 |                                                                               |
|-----------------|-------------------------------------------------------------------------------|
| Examples        | <pre>Dim ActTrac As Long ActTrac = SCPI.SERVICE.CHANNEL(1).TRACE.ACTIVE</pre> |
| Related objects | SCPI.CALCULATE(Ch).PARAMETER(Tr).SELECT on page 225                           |
| Equivalent key  | No equivalent key is available on the front panel.                            |

## **SCPI.SERVICE.CHANNEL.TRACE.COUNT**

|             |                                                                            |
|-------------|----------------------------------------------------------------------------|
| Object type | Property                                                                   |
| Syntax      | <i>Value</i> = SCPI.SERVICE.CHANNEL.TRACE.COUNT                            |
| Description | Reads out the upper limit of the number of traces per channel. (Read only) |
| Variable    |                                                                            |

|             | <i>Value</i>                         |
|-------------|--------------------------------------|
| Description | Upper limit of the number of traces. |
| Data type   | Long integer type (Long)             |

|                |                                                                           |
|----------------|---------------------------------------------------------------------------|
| Examples       | <pre>Dim MaxTrac As Long MaxTrac = SCPI.SERVICE.CHANNEL.TRACE.COUNT</pre> |
| Equivalent key | No equivalent key is available on the front panel.                        |

## SCPI.SERVICE.PORT.COUNT

|             |                                                                 |
|-------------|-----------------------------------------------------------------|
| Object type | Property                                                        |
| Syntax      | <i>Value</i> = SCPI.SERVICE.PORT.COUNT                          |
| Description | Reads out the number of ports of the E5070B/E5071B. (Read only) |
| Variable    |                                                                 |

|             | <i>Value</i>             |
|-------------|--------------------------|
| Description | Number of ports          |
| Data type   | Long integer type (Long) |

**Examples**  
`Dim MaxPort As Long`  
`MaxPort = SCPI.SERVICE.PORT.COUNT`

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

## SCPI.SOURce(*Ch*).POWER.ATTenuation.DATA

|             |                                                                                                                                         |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                |
| Syntax      | SCPI.SOURce( <i>Ch</i> ).POWER.ATTenuation.DATA = <i>Value</i><br><i>Value</i> = SCPI.SOURce( <i>Ch</i> ).POWER.ATTenuation.DATA        |
| Description | Selects the attenuator used for channels 1 to 16 ( <i>Ch</i> ). 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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------|----------------|---|----------------|---|----------------|----|----------------|----|----------------|----|----------------|----|----------------|----|----------------|----|
| Description    | <table> <thead> <tr> <th>Power ranges</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>-20 to +12[dB]</td> <td>0</td> </tr> <tr> <td>-25 to +7 [dB]</td> <td>5</td> </tr> <tr> <td>-30 to +2 [dB]</td> <td>10</td> </tr> <tr> <td>-35 to -3 [dB]</td> <td>15</td> </tr> <tr> <td>-40 to -8 [dB]</td> <td>20</td> </tr> <tr> <td>-45 to -13[dB]</td> <td>25</td> </tr> <tr> <td>-50 to -18[dB]</td> <td>30</td> </tr> <tr> <td>-55 to -23[dB]</td> <td>35</td> </tr> </tbody> </table> | Power ranges | Setting | -20 to +12[dB] | 0 | -25 to +7 [dB] | 5 | -30 to +2 [dB] | 10 | -35 to -3 [dB] | 15 | -40 to -8 [dB] | 20 | -45 to -13[dB] | 25 | -50 to -18[dB] | 30 | -55 to -23[dB] | 35 |
| Power ranges   | Setting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
| -20 to +12[dB] | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
| -25 to +7 [dB] | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
| -30 to +2 [dB] | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
| -35 to -3 [dB] | 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
| -40 to -8 [dB] | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
| -45 to -13[dB] | 25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
| -50 to -18[dB] | 30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
| -55 to -23[dB] | 35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
| Data type      | Long integer type (Long)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
| Range          | 0 to 35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
| Preset value   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
| Unit           | dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |         |                |   |                |   |                |    |                |    |                |    |                |    |                |    |                |    |
| Resolution     | 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 182.

**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 460

**Equivalent key** **[Sweep Setup] - Power - Power Ranges**

## SCPI.SOURce(Ch).POWer.CENTer

|             |                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                         |
| Syntax      | SCPI.SOURce(Ch).POWer.CENTer = <i>Value</i><br><i>Value</i> = SCPI.SOURce(Ch).POWer.CENTer       |
| Description | Sets the center value of the sweep range for the power sweep for channels 1 to 16 ( <i>Ch</i> ). |
| Variable    |                                                                                                  |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Center value                                                                                                                                                                                                 |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | Varies depending on the power range.                                                                                                                                                                         |
| Preset value | -7.5                                                                                                                                                                                                         |
| Unit         | dBm                                                                                                                                                                                                          |
| Resolution   | 0.05 or 0.025                                                                                                                                                                                                |
| 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*), refer to Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                                                                                      |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Pcntr As Double SCPI.SOURce(1).POWer.CENTer = 0 Pcntr = SCPI.SOURce(1).POWer.CENTer</pre>                                                   |
| Related objects | <p>SCPI.SENSE(Ch).SWEep.TYPE on page 454</p> <p>SCPI.SOURce(Ch).POWer.ATTenuation.DATA on page 458</p> <p>SCPI.SOURce(Ch).POWer.SPAN on page 475</p> |
| Equivalent key  | <b>[Center]</b>                                                                                                                                      |

## 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 16 ( <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 182.

|                 |                                                                                                                                              |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 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(Ch).POWer.ATTenuation.DATA on page 458                                                                                           |
| Equivalent key  | <b>[Sweep Setup] - Power</b>                                                                                                                 |



## SCPI.SOURce(Ch).POWer.LEVel.SLOPe.DATA

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                       |
| Syntax      | SCPI.SOURce(Ch).POWer.LEVel.SLOPe.DATA = <i>Value</i><br><i>Value</i> = SCPI.SOURce(Ch).POWer.LEVel.SLOPe.DATA |
| Description | Sets the correction value of the power slope feature of channels 1 to 16 ( <i>Ch</i> ).                        |
| Variable    |                                                                                                                |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Correction value of the power slope feature                                                                                                                                                                  |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | -2 to 2                                                                                                                                                                                                      |
| Preset value | 0                                                                                                                                                                                                            |
| Unit         | dB/GHz                                                                                                                                                                                                       |
| Resolution   | 0.01                                                                                                                                                                                                         |
| 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*), refer to Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                                                         |
|-----------------|-------------------------------------------------------------------------------------------------------------------------|
| Examples        | Dim SlopLev As Double<br>SCPI.SOURce(1).POWer.LEVel.SLOPe.DATA = 0.1<br>SlopLev = SCPI.SOURce(1).POWer.LEVel.SLOPe.DATA |
| Related objects | SCPI.SOURce(Ch).POWer.LEVel.SLOPe.STATe on page 462                                                                     |
| Equivalent key  | <b>[Sweep Setup] - Power - Slop [xxx dB/GHz]</b>                                                                        |

## SCPI.SOURce(*Ch*).POWER.LEVel.SLOPe.STATe

**Object type** Property

**Syntax** SCPI.SOURce(*Ch*).POWER.LEVel.SLOPe.STATe = *Status*  
*Status* = SCPI.SOURce(*Ch*).POWER.LEVel.SLOPe.STATe

**Description** Turns on/off the power slope feature for channels 1 to 16 (*Ch*). This function is a function to correct the attenuation of simple power level proportional to the frequency (attenuation due to cables and so on).

**Variable**

|              |                                                                                                                                                                                                                               |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <b><i>Status</i></b>                                                                                                                                                                                                          |
| Description  | On/off of the power slope feature                                                                                                                                                                                             |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                        |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•True or -1                      Turns on the power slop feature.</li> <li>•False or 0                      Turns off the power slop feature.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                    |

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

**Examples**

```
Dim Slop As Boolean
SCPI.SOURce(1).POWER.LEVel.SLOPe.STATe = True
Slop = SCPI.SOURce(1).POWER.LEVel.SLOPe.STATe
```

**Related objects** SCPI.SOURce(Ch).POWER.LEVel.SLOPe.DATA on page 461  
SCPI.SENSE(Ch).SWEep.GENERation on page 450

**Equivalent key** **[Sweep Setup] - Power - Slop [ON/OFF]**

## **SCPI.SOURce(*Ch*).POWer.PORT(*Pt*).CORRection. COLLeCt.ACQuire**

**Object type** Property

**Syntax** SCPI.SOURce(*Ch*).POWer.PORT(*Pt*).CORRection.COLLeCt.ACQuire = *Param*

**Description** For ports 1 to 4 (*Pt*) of channels 1 to 16 (*Ch*), measure the power calibration data using the specified power sensor. When the measurement is complete successfully, the power level error correction is automatically turned on.

If the power meter is not connected correctly, an error occurs and the object is ignored. (No read)

**Variable**

|             |                                                                                                                                                                                                              |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | <i>Param</i>                                                                                                                                                                                                 |
| Description | Selection of the power sensor                                                                                                                                                                                |
| Data type   | Character string type (String)                                                                                                                                                                               |
| Range       | Select from the following.<br><ul style="list-style-type: none"> <li>•"ASENsor"                      Specifies power sensor A.</li> <li>•"BSEnSor"                      Specifies power sensor B.</li> </ul> |

For information on the variable (*Ch*) and the variable (*Pt*), refer to Table 7-6, "Variable (Ch)," on page 182 and Table 7-9, "Variable (Pt)," on page 210, respectively.

**Examples**

```
Dim Dmy As Long
SCPI.SOURce(1).POWer.PORT(1).CORRection.COLLeCt.ACQuire = "asen"
Dmy = SCPI.IEEE4882.OPC
```

**Related objects** SCPI.IEEE4882.OPC on page 348

**Equivalent key** **[Cal] - Power Calibration - Take Cal Sweep**

**SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.ASENSor.RCFactor**

|             |                                                                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                               |
| Syntax      | SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.ASENSor.RCFactor = <i>Value</i><br><i>Value</i> = SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.ASENSor.RCFactor |
| Description | Sets the reference calibration coefficient (the calibration coefficient at 50 MHz) for power sensor A.                                                 |

## Variable

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Reference calibration coefficient                                                                                                                                                                            |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | 1 to 150                                                                                                                                                                                                     |
| Preset value | 100                                                                                                                                                                                                          |
| Unit         | % (percent)                                                                                                                                                                                                  |
| Resolution   | 0.01                                                                                                                                                                                                         |
| 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 CalRef As Double
SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.ASENSor.RCFactor = 99.5
CalRef = SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.ASENSor.RCFactor
```

Related objects SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.BSENSor.RCFactor on page 466

Equivalent key **[Cal] - Power Calibration - Sensor A Settings - Ref Cal Factor**

## SCPI.SOURce(*Ch*).POWer.PORT(*Pt*).CORRection. COLLEct.AVERAge.COUNT

|             |                                                                                                                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                                             |
| Syntax      | SCPI.SOURce( <i>Ch</i> ).POWer.PORT( <i>Pt</i> ).CORRection.COLLEct.AVERAge.COUNT = <i>Value</i><br><i>Value</i> = SCPI.SOURce( <i>Ch</i> ).POWer.PORT( <i>Pt</i> ).CORRection.COLLEct.AVERAge.COUNT |
| Description | For ports 1 to 4 ( <i>Pt</i> ) of channels 1 to 16 ( <i>Ch</i> ), sets the number of power calibration data measurements per measurement point (averaging factor).                                   |
| Variable    |                                                                                                                                                                                                      |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Averaging factor                                                                                                                                                                                             |
| Data type    | Long integer type (Long)                                                                                                                                                                                     |
| Range        | 1 to 100                                                                                                                                                                                                     |
| 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*) and the variable (*Pt*), refer to Table 7-6, “Variable (Ch),” on page 182 and Table 7-9, “Variable (Pt),” on page 210, respectively.

|                 |                                                                                                                                                                      |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | Dim AvgCnt As Long<br>SCPI.SOURce(1).POWer.PORT(1).CORRection.COLLEct.AVERAge.COUNT = 6<br>AvgCnt =<br>SCPI.SOURce(1).POWer.PORT(1).CORRection.COLLEct.AVERAge.COUNT |
| Related objects | SCPI.SOURce(Ch).POWer.PORT(Pt).CORRection. COLLEct.ACQuire on page 463                                                                                               |
| Equivalent key  | <b>[Cal] - Power Calibration - Num of Readings</b>                                                                                                                   |

## SCPI.SOURCE.POWER.PORT.CORREction.COLlect. BSENSOR.RCFactor

|             |                                                                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                               |
| Syntax      | SCPI.SOURCE.POWER.PORT.CORREction.COLlect.BSENSOR.RCFactor = <i>Value</i><br><i>Value</i> = SCPI.SOURCE.POWER.PORT.CORREction.COLlect.BSENSOR.RCFactor |
| Description | Sets the reference calibration coefficient (the calibration coefficient at 50 MHz) for power sensor B.                                                 |

### Variable

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Reference calibration coefficient                                                                                                                                                                            |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | 1 to 150                                                                                                                                                                                                     |
| Preset value | 100                                                                                                                                                                                                          |
| Unit         | % (percent)                                                                                                                                                                                                  |
| Resolution   | 0.01                                                                                                                                                                                                         |
| 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 CalRef As Double
SCPI.SOURCE.POWER.PORT.CORREction.COLlect.BSENSOR.RCFactor = 99
CalRef = SCPI.SOURCE.POWER.PORT.CORREction.COLlect.BSENSOR.RCFactor
```

Related objects SCPI.SOURCE.POWER.PORT.CORREction.COLlect. ASENSOR.RCFactor on page 464

Equivalent key **[Cal] - Power Calibration - Sensor B Settings - Ref Cal Factor**

## SCPI.SOURce.POWer.PORT.CORRection.COLlect.TABLe.ASENSor.DATA

|             |                                                                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                 |
| Syntax      | SCPI.SOURce.POWer.PORT.CORRection.COLlect.TABLe.ASENSor.DATA = <i>Data</i><br><i>Data</i> = SCPI.SOURce.POWer.PORT.CORRection.COLlect.TABLe.ASENSor.DATA |
| Description | Sets the calibration coefficient table for power sensor A.                                                                                               |
| Variable    |                                                                                                                                                          |

|             | <i>Data</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | <p>Indicates the array data (for the calibration coefficient table) of 1 + Num (number of set data items)×2. Where n is an integer between 1 and Num.</p> <ul style="list-style-type: none"> <li>• <i>Data</i>(0)                      The number of data items you want to set. Specify an integer between 0 to 100. When you set the number of data items to 0 (to clear the calibration coefficient table), you specify only <i>Data</i>(0) as the Data variable.</li> <li>• <i>Data</i>(n¥2-1)                      The frequency of the n-th data item (1 kHz to 500 GHz).</li> <li>• <i>Data</i>(n¥2)                      The calibration coefficient of the n-th data item (1% to 150%).</li> </ul> <p>The index of the array starts from 0.</p> |
| Data type   | Variant type (Variant)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Note        | If the array data does not contain 1+Num (number of set data items)×2 when setting a calibration coefficient table, a runtime error occurs. For <i>Data</i> (n¥2-1) and <i>Data</i> (n¥2) 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.                                                                                                                                                                                                                                                                                                                                   |

### Examples

```
Dim CalFac As Variant
SCPI.SOURce.POWer.PORT.CORRection.COLlect.TABLe.ASENSor.DATA = Array(2,1e7,99.8,
1e9,98.7)
CalFac = SCPI.SOURce.POWer.PORT.CORRection.COLlect.TABLe.ASENSor.DATA
'''Clear Cal Factor Table
SCPI.SOURce.POWer.PORT.CORRection.COLlect.TABLe.ASENSor.DATA = Array(0)
```

```
Dim CalFac(4) As Variant
Dim Ref As Variant
CalFac(0) = 2
CalFac(1) = 1e7
CalFac(2) = 99.8
CalFac(3) = 1e9
CalFac(4) = 98.7
SCPI.SOURce.POWer.PORT.CORRection.COLlect.TABLe.ASENSor.DATA = CalFac
Ref = SCPI.SOURce.POWer.PORT.CORRection.COLlect.TABLe.ASENSor.DATA
'''Clear Cal Factor Table
Dim CalFac(0) As Variant
CalFac(0) = 0
SCPI.SOURce.POWer.PORT.CORRection.COLlect.TABLe.ASENSor.DATA = CalFac
```

|                 |                                                                                              |
|-----------------|----------------------------------------------------------------------------------------------|
| Related objects | SCPI.SOURce.POWer.PORT.CORRection.COLlect.TABLe.BSENSor.DATA on page 468                     |
| Equivalent key  | <b>[Cal] - Power Calibration - Sensor A Settings - Delete   Add   Clear Cal Factor Table</b> |

## SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.TABLE.BSENSOR.DATA

|             |                                                                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                 |
| Syntax      | SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.TABLE.BSENSOR.DATA = <i>Data</i><br><i>Data</i> = SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.TABLE.BSENSOR.DATA |
| Description | Sets the calibration coefficient table for power sensor B.                                                                                               |
| Variable    |                                                                                                                                                          |

|             | <i>Data</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | <p>Indicates the array data (for the calibration coefficient table) of <math>1 + \text{Num}</math> (number of set data items)<math>\times 2</math>. Where n is an integer between 1 and Num.</p> <ul style="list-style-type: none"> <li>• <i>Data</i>(0)                      The number of data items you want to set. Specify an integer between 0 to 100. When you set the number of data items to 0 (to clear the calibration coefficient table), you specify only <i>Data</i>(0) as the Data variable.</li> <li>• <i>Data</i>(n<math>\neq</math>2-1)                The frequency of the n-th data item (1 kHz to 500 GHz).</li> <li>• <i>Data</i>(n<math>\neq</math>2)                    The calibration coefficient of the n-th data item (1% to 150%).</li> </ul> <p>The index of the array starts from 0.</p> |
| Data type   | Variant type (Variant)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Note        | If the array data does not contain $1 + \text{Num}$ (number of set data items) $\times 2$ when setting a calibration coefficient table, a runtime error occurs. For <i>Data</i> (n $\neq$ 2-1) and <i>Data</i> (n $\neq$ 2) 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.                                                                                                                                                                                                                                                                                                                                                                |

### Examples

```
Dim CalFac As Variant
SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.TABLE.BSENSOR.DATA = Array(2,1e7,99.8,
1e9,98.7)
CalFac = SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.TABLE.BSENSOR.DATA
'''Clear Cal Factor Table
SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.TABLE.BSENSOR.DATA = Array(0)
```

```
Dim CalFac(4) As Variant
Dim Ref As Variant
CalFac(0) = 2
CalFac(1) = 1e7
CalFac(2) = 99.8
CalFac(3) = 1e9
CalFac(4) = 98.7
SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.TABLE.BSENSOR.DATA = CalFac
Ref = SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.TABLE.BSENSOR.DATA
'''Clear Cal Factor Table
Dim CalFac(0) As Variant
CalFac(0) = 0
SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.TABLE.BSENSOR.DATA = CalFac
```

|                 |                                                                                              |
|-----------------|----------------------------------------------------------------------------------------------|
| Related objects | SCPI.SOURCE.POWER.PORT.CORREction.COLLECT.TABLE.ASENSOR.DATA on page 467                     |
| Equivalent key  | <b>[Cal] - Power Calibration - Sensor B Settings - Delete   Add   Clear Cal Factor Table</b> |



## SCPI.SOURce(Ch).POWer.PORT(Pt).CORRection. COLLect.TABLE.LOSS.DATA

**Object type** Property

**Syntax** SCPI.SOURce(Ch).POWer.PORT(Pt).CORRection.COLLect.TABLE.LOSS.DATA = *Data*  
*Data* = SCPI.SOURce(Ch).POWer.PORT(Pt).CORRection.COLLect.TABLE.LOSS.DATA

**Description** For ports 1 to 4 (*Pt*) of channels 1 to 16 (*Ch*), sets the loss compensation table.

**Variable**

|                    | <b><i>Data</i></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b> | Indicates the array data (for the loss compensation table) of 1 + Num (number of set data items)×2. Where n is an integer between 1 and Num.<br><br><ul style="list-style-type: none"> <li>• <i>Data(0)</i> The number of data items you want to set. Specify an integer between 0 to 100. When you set the number of data items to 0 (to clear the loss compensation table), you specify only <i>Data(0)</i> as the Data variable.</li> <li>• <i>Data(n¥2-1)</i> The frequency of the n-th data item (1 kHz to 500 GHz).</li> <li>• <i>Data(n¥2)</i> The loss of the n-th data item (-100 dB to 100 dB).</li> </ul> The index of the array starts from 0. |
| <b>Data type</b>   | Variant type (Variant)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Note</b>        | If the array data does not contain 1+Num (number of set data items)×2 when setting a loss compensation table, a runtime error occurs. For <i>Data(n¥2-1)</i> and <i>Data(n¥2)</i> 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*) and the variable (*Pt*), refer to Table 7-6, “Variable (Ch),” on page 182 and Table 7-9, “Variable (Pt),” on page 210, respectively.

**Examples**

```
Dim Loss As Variant
SCPI.SOURce(1).POWer.PORT(1).CORRection.COLLect.TABLE.LOSS.DATA = Array(2,1e8,0.5,1e9,0.8)
Loss = SCPI.SOURce(1).POWer.PORT(1).CORRection.COLLect.TABLE.LOSS.DATA
'''Clear Loss Table
SCPI.SOURce(1).POWer.PORT(1).CORRection.COLLect.TABLE.LOSS.DATA = Array(0)

Dim Loss(4) As Variant
Dim Ref As Variant
Loss(0) = 2
Loss(1) = 1e8
Loss(2) = 0.5
Loss(3) = 1e9
Loss(4) = 0.8
SCPI.SOURce(1).POWer.PORT(1).CORRection.COLLect.TABLE.LOSS.DATA = Loss
Ref = SCPI.SOURce(1).POWer.PORT(1).CORRection.COLLect.TABLE.LOSS.DATA
'''Clear Loss Table
Dim Loss(0) As Variant
Loss(0) = 0
SCPI.SOURce(1).POWer.PORT(1).CORRection.COLLect.TABLE.LOSS.DATA = Loss
```

**Related objects** SCPI.SOURce(Ch).POWer.PORT(Pt).CORRection.  
COLLect.TABLE.LOSS.STATe on page 470

**Equivalent key** **[Cal] - Power Calibration - Loss Compens - Delete | Add | Clear Loss Table**

**SCPI.SOURce(Ch).POWER.PORT(Pt).CORRection.  
COLLect.TABLe.LOSS.STATe**

Object type           Property

Syntax                SCPI.SOURce(Ch).POWER.PORT(Pt).CORRection.COLLect.TABLe.LOSS.STATe = *Status*  
*Status* = SCPI.SOURce(Ch).POWER.PORT(Pt).CORRection.COLLect.TABLe.LOSS.STATe

Description         For ports 1 to 4 (*Pt*) of channels 1 to 16 (*Ch*), turns on/off the loss compensation.

Variable

|              |                                                                                                                                                                                                                       |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <i>Status</i>                                                                                                                                                                                                         |
| Description  | On/off of loss compensation                                                                                                                                                                                           |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>•True or -1                   Turns on the loss compensation.</li> <li>•False or 0                   Turns off the loss compensation.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                            |

For information on the variable (*Ch*) and the variable (*Pt*), refer to Table 7-6, “Variable (Ch),” on page 182 and Table 7-9, “Variable (Pt),” on page 210, respectively.

Examples             Dim LComp As Boolean  
SCPI.SOURce(1).POWER.PORT(1).CORRection.COLLect.TABLe.LOSS.STATe = True  
LComp = SCPI.SOURce(1).POWER.PORT(1).CORRection.COLLect.TABLe.LOSS.STATe

Equivalent key       **[Cal] - Power Calibration - Loss Compen - Compensation**

## SCPI.SOURce(Ch).POWer.PORT(Pt).CORRection.DATA

|             |                                                                                                                              |
|-------------|------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                     |
| Syntax      | SCPI.SOURce(Ch).POWer.PORT(Pt).CORRection.DATA = <i>Data</i><br><i>Data</i> = SCPI.SOURce(Ch).POWer.PORT(Pt).CORRection.DATA |
| Description | For ports 1 to 4 ( <i>Pt</i> ) of channels 1 to 16 ( <i>Ch</i> ), sets/reads out the power calibration data array.           |
| Variable    |                                                                                                                              |

|             | <b><i>Data</i></b>                                                                                                                                                                                                                                                                                |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | Indicates the array data (power calibration data array) of NOP (number of points). Where n is an integer between 1 and NOP.<br><ul style="list-style-type: none"> <li>• <i>Data(n-1)</i>                      Data at the n-th measurement point</li> </ul> The index of the array starts from 0. |
| Data type   | Variant type (Variant)                                                                                                                                                                                                                                                                            |
| Note        | If the array data does not contain NOP (number of measurement point))2 when setting a power calibration data array, a runtime error occurs.                                                                                                                                                       |

For information on the variable (*Ch*) and the variable (*Pt*), refer to Table 7-6, “Variable (Ch),” on page 182 and Table 7-9, “Variable (Pt),” on page 210, respectively.

|                 |                                                                                                                                                                                                                                                                                    |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim FreqData As Variant SCPI.SENSE(1).SWEep.POINTs = 201 FreqData = SCPI.SENSE(1).FREQuency.DATA  Dim CorData As Variant SCPI.SENSE(1).SWEep.POINTs = 201 CorData = SCPI.SOURce(1).POWer.PORT(1).CORRection.DATA SCPI.SOURce(1).POWer.PORT(2).CORRection.DATA = CorData</pre> |
| Related objects | <p>SCPI.SOURce(Ch).POWer.PORT(Pt).CORRection.STATe on page 472</p> <p>SCPI.SENSE(Ch).SWEep.POINTs on page 451</p>                                                                                                                                                                  |
| Equivalent key  | No equivalent key is available on the front panel.                                                                                                                                                                                                                                 |

**SCPI.SOURCE(*Ch*).POWER.PORT(*Pt*).CORREction.STATe**

Object type

Property

Syntax

SCPI.SOURCE(*Ch*).POWER.PORT(*Pt*).CORREction.STATe = *Status**Status* = SCPI.SOURCE(*Ch*).POWER.PORT(*Pt*).CORREction.STATe

Description

For ports 1 to 4 (*Pt*) of channels 1 to 16 (*Ch*), turns on/off the power level error correction.

Variable

|              | <i>Status</i>                                                                                                                                                                                                                                       |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Turning on/off the power level error correction                                                                                                                                                                                                     |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                              |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>• True or -1                      Turns on the power level error correction.</li> <li>• False or 0                      Turns off the power level error correction.</li> </ul> |
| Preset value | False or 0                                                                                                                                                                                                                                          |

For information on the variable (*Ch*) and the variable (*Pt*), refer to Table 7-6, “Variable (Ch),” on page 182 and Table 7-9, “Variable (Pt),” on page 210, respectively.

Examples

```
Dim PowCorr As Boolean
SCPI.SOURCE(1).POWER.PORT(1).CORREction.STATe = True
PowCorr = SCPI.SOURCE(1).POWER.PORT(1).CORREction.STATe
```

Equivalent key

**[Cal] - Power Calibration - Correction**

## SCPI.SOURce(Ch).POWer.PORT.COUPle

**Object type** Property

**Syntax** SCPI.SOURce(Ch).POWer.PORT.COUPle = *Status*  
*Status* = SCPI.SOURce(Ch).POWer.PORT.COUPle

**Description** Sets whether to output the same power level for each port of channels 1 to 16 (*Ch*). When the power slope feature is on, the same power level is always outputted to all ports regardless of this setting because different power levels cannot be outputted for each port.

**Variable**

|              | <i>Status</i>                                                                                                                                                                                                                                                      |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Turning on/off the coupling between ports for the power level output                                                                                                                                                                                               |
| Data type    | Boolean type (Boolean)                                                                                                                                                                                                                                             |
| Range        | Select from the following.<br><ul style="list-style-type: none"> <li>• True or -1                      Outputs the same power level to individual ports.</li> <li>• False or 0                      Outputs different power levels to individual ports.</li> </ul> |
| Preset value | True or -1                                                                                                                                                                                                                                                         |

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

**Examples**

```
Dim OutCpl As Boolean
SCPI.SOURce(1).POWer.PORT.COUPle = False
OutCpl = SCPI.SOURce(1).POWer.PORT.COUPle
```

**Related objects** SCPI.SOURce(Ch).POWer.PORT(Pt).LEVel.IMMediate. AMPLitude on page 474

**Equivalent key** **[Sweep Setup] - Power - Port Couple**

**SCPI.SOURCE(*Ch*).POWER.PORT(*Pt*).LEVEL.IMMEDIATE.AMPLITUDE**

|             |                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                               |
| Syntax      | SCPI.SOURCE( <i>Ch</i> ).POWER.PORT( <i>Pt</i> ).LEVEL.IMMEDIATE.AMPLITUDE = <i>Value</i><br><i>Value</i> = SCPI.SOURCE( <i>Ch</i> ).POWER.PORT( <i>Pt</i> ).LEVEL.IMMEDIATE.AMPLITUDE |
| Description | For ports 1 to 4 ( <i>Pt</i> ) of channels 1 to 16 ( <i>Ch</i> ), sets the power level.                                                                                                |
| Variable    |                                                                                                                                                                                        |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Power level at the specified port.                                                                                                                                                                           |
| 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*) and the variable (*Pt*), refer to Table 7-6, “Variable (Ch),” on page 182 and Table 7-9, “Variable (Pt),” on page 210, respectively.

|                 |                                                                                                                                                                                                         |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim PowLev As Double SCPI.SOURCE(1).POWER.PORT.COUPLE = False SCPI.SOURCE(1).POWER.PORT(1).LEVEL.IMMEDIATE.AMPLITUDE = -12.5 PowLev = SCPI.SOURCE(1).POWER.PORT(1).LEVEL.IMMEDIATE.AMPLITUDE</pre> |
| Related objects | <p>SCPI.SOURCE(Ch).POWER.PORT.COUPLE on page 473</p> <p>SCPI.SOURCE(Ch).POWER.ATTENUATION.DATA on page 458</p>                                                                                          |
| Equivalent key  | <b>[Sweep Setup] - Power - Port Power - Port 1 Power   Port 2 Power   Port 3 Power   Port 4 Power</b>                                                                                                   |

## SCPI.SOURce(Ch).POWer.SPAN

|             |                                                                                                |
|-------------|------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                       |
| Syntax      | SCPI.SOURce(Ch).POWer.SPAN = <i>Value</i><br><i>Value</i> = SCPI.SOURce(Ch).POWer.SPAN         |
| Description | Sets the span value of the sweep range for the power sweep for channels 1 to 16 ( <i>Ch</i> ). |
| Variable    |                                                                                                |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Span value                                                                                                                                                                                                   |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | Varies depending on the power range.                                                                                                                                                                         |
| Preset value | 15                                                                                                                                                                                                           |
| 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*), refer to Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                                                                                        |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Pspan As Double SCPI.SOURce(1).POWer.SPAN = 10 Pspan = SCPI.SOURce(1).POWer.SPAN</pre>                                                        |
| Related objects | <p>SCPI.SENSE(Ch).SWEep.TYPE on page 454</p> <p>SCPI.SOURce(Ch).POWer.ATTenuation.DATA on page 458</p> <p>SCPI.SOURce(Ch).POWer.CENTer on page 459</p> |
| Equivalent key  | <b>[Span]</b>                                                                                                                                          |

## SCPI.SOURce(Ch).POWer.STARt

|             |                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                        |
| Syntax      | SCPI.SOURce(Ch).POWer.STARt = <i>Value</i><br><i>Value</i> = SCPI.SOURce(Ch).POWer.STARt        |
| Description | Sets the start value of the sweep range for the power sweep for channels 1 to 16 ( <i>Ch</i> ). |
| Variable    |                                                                                                 |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Start value                                                                                                                                                                                                  |
| Data type    | Double precision floating point type (Double)                                                                                                                                                                |
| Range        | Varies depending on the power range.                                                                                                                                                                         |
| Preset value | -15                                                                                                                                                                                                          |
| 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*), refer to Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                                                                       |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Pstart As Double SCPI.SOURce(1).POWer.STARt = -10 Pstart = SCPI.SOURce(1).POWer.STARt</pre>                                  |
| Related objects | SCPI.SENSE(Ch).SWEep.TYPE on page 454<br>SCPI.SOURce(Ch).POWer.ATTenuation.DATA on page 458<br>SCPI.SOURce(Ch).POWer.STOP on page 477 |
| Equivalent key  | <b>[Start]</b>                                                                                                                        |



## SCPI.SOURce(Ch).POWer.STOP

|             |                                                                                                |
|-------------|------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                       |
| Syntax      | SCPI.SOURce(Ch).POWer.STOP = <i>Value</i><br><i>Value</i> = SCPI.SOURce(Ch).POWer.STOP         |
| Description | Sets the stop value of the sweep range for the power sweep for channels 1 to 16 ( <i>Ch</i> ). |
| Variable    |                                                                                                |

|              | <i>Value</i>                                                                                                                                                                                                 |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Stop value                                                                                                                                                                                                   |
| 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*), refer to Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                                                                                       |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Pstop As Double SCPI.SOURce(1).POWer.STOP = 10 Pstop = SCPI.SOURce(1).POWer.STOP</pre>                                                       |
| Related objects | <p>SCPI.SENSE(Ch).SWEep.TYPE on page 454</p> <p>SCPI.SOURce(Ch).POWer.ATTenuation.DATA on page 458</p> <p>SCPI.SOURce(Ch).POWer.START on page 476</p> |
| Equivalent key  | <b>[Stop]</b>                                                                                                                                         |

## SCPI.STATus.OPERation.CONDITION

|             |                                                                             |
|-------------|-----------------------------------------------------------------------------|
| Object type | Property                                                                    |
| Syntax      | <i>Value</i> = SCPI.STATus.OPERation.CONDITION                              |
| Description | Reads out the value of the Operation Status Condition Register. (Read only) |
| Variable    |                                                                             |

|             | <i>Value</i>                                     |
|-------------|--------------------------------------------------|
| Description | Value of the Operation Status Condition Register |
| Data type   | Long integer type (Long)                         |

|                 |                                                                                                |
|-----------------|------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Stat As Long Stat = SCPI.STATus.OPERation.CONDITION</pre>                             |
| Related objects | SCPI.STATus.OPERation.NTRansition on page 479<br>SCPI.STATus.OPERation.PTRansition on page 480 |
| Equivalent key  | No equivalent key is available on the front panel.                                             |

## SCPI.STATus.OPERation.ENABLE

|             |                                                                                            |
|-------------|--------------------------------------------------------------------------------------------|
| Object type | Property                                                                                   |
| Syntax      | SCPI.STATus.OPERation.ENABLE = <i>Value</i><br><i>Value</i> = SCPI.STATus.OPERation.ENABLE |
| Description | Sets the value of the Operation Status Enable Register.                                    |
| 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        | <pre>Dim Stat As Long SCPI.STATus.OPERation.ENABLE = 16 Stat = SCPI.STATus.OPERation.ENABLE</pre> |
| Related objects | SCPI.IEEE4882.SRE on page 350                                                                     |
| 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. (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 346  
 SCPI.STATus.OPERation.NTRansition on page 479  
 SCPI.STATus.OPERation.PTRansition on page 480

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

## SCPI.STATus.OPERation.NTRansition

Object type Property  
 Syntax SCPI.STATus.OPERation.NTRansition = *Value*  
*Value* = SCPI.STATus.OPERation.NTRansition  
 Description Sets the value of negative transition filter of the Operation Status Register.

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 to 13 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 479  
 SCPI.STATus.OPERation.PTRansition on page 480

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

## SCPI.STATus.OPERation.PTRansition

|             |                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                             |
| Syntax      | SCPI.STATus.OPERation.PTRansition = <i>Value</i><br><i>Value</i> = SCPI.STATus.OPERation.PTRansition |
| Description | Sets the value of positive transition filter of the Operation Status Register.                       |
| 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 to 13 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 479  
 SCPI.STATus.OPERation.NTRansition on page 479

**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, Questionable Limit Extra Status Register, Questionable Limit Chnel{1-16} Status Register, and Questionable Limit Chnel{1-16} Extra 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. (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 499  
 SCPI.STATus.QUEStionable.PTRansition on page 500

**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.

**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 350

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

## SCPI.STATus.QUEStionable.EVENT

|             |                                                                            |
|-------------|----------------------------------------------------------------------------|
| Object type | Property                                                                   |
| Syntax      | <i>Value</i> = SCPI.STATus.QUEStionable.EVENT                              |
| Description | Reads out the value of the Questionable Status Event Register. (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 346  
SCPI.STATus.QUEStionable.NTRansition on page 499  
SCPI.STATus.QUEStionable.PTRansition on page 500

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

## SCPI.STATus.QUEStionable.LIMit.CHANnel(*Ch*). CONDition

|             |                                                                                                                                |
|-------------|--------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                       |
| Syntax      | <i>Value</i> = SCPI.STATus.QUEStionable.LIMit.CHANnel( <i>Ch</i> ).CONDition                                                   |
| Description | Reads out the value of the Questionable Limit Channel Status Condition Register of channels 1 to 16 ( <i>Ch</i> ). (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 182.

**Examples**  

```
Dim Stat As Long  
Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).CONDition
```

**Related objects**  
SCPI.STATus.QUEStionable.LIMit.CHANnel(*Ch*). NTRansition on page 490  
SCPI.STATus.QUEStionable.LIMit.CHANnel(*Ch*). PTRansition on page 491

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

## SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). ECHannel.CONDITION

|             |                                                                                                                                      |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                             |
| Syntax      | <i>Value</i> = SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).CONDITION                                                                  |
| Description | Reads out the value of the Questionable Limit Channel Extra Status Condition Register of channels 1 to 16 ( <i>Ch</i> ). (Read only) |
| Variable    |                                                                                                                                      |

|             | <i>Value</i>                                                            |
|-------------|-------------------------------------------------------------------------|
| Description | Value of the Questionable Limit Channel Extra Status Condition Register |
| Data type   | Long integer type (Long)                                                |

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                                                                                                         |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Stat As Long Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).ECHannel.CONDITION</pre>                                                                         |
| Related objects | <p>SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). ECHannel.NTRansition on page 486</p> <p>SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). ECHannel.PTRansition on page 487</p> |
| Equivalent key  | No equivalent key is available on the front panel.                                                                                                                      |

**SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).  
ECHannel.ENABLE**

|             |                                                                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                               |
| Syntax      | SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).ECHannel.ENABLE = <i>Value</i><br><i>Value</i> = SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).ECHannel.ENABLE |
| Description | Sets the value of the Questionable Limit Channel Extra Status Enable Register of channels 1 to 16 ( <i>Ch</i> ).                                       |

## Variable

|              | <i>Value</i>                                                                  |
|--------------|-------------------------------------------------------------------------------|
| Description  | Value of the Questionable Limit Channel Extra Status Enable Register          |
| Data type    | Long integer type (Long)                                                      |
| Range        | 0 to 65535                                                                    |
| Preset value | Varies depending on the upper limit setting of the number of channels/traces. |
| Note         | Bits 0 and 3 to 15 cannot be set to 1.                                        |

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

## Examples

```
Dim Stat As Long
SCPI.STATus.QUEStionable.LIMit.CHANnel(1).ECHannel.ENABLE = 6
Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).ECHannel.ENABLE
```

Related objects SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).ENABLE on page 488

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



## SCPI.STATus.QUEStionable.LIMit.CHANnel(*Ch*). ECHannel.EVENT

|             |                                                                                                                                  |
|-------------|----------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                         |
| Syntax      | <i>Value</i> = SCPI.STATus.QUEStionable.LIMit.CHANnel( <i>Ch</i> ).ECHannel.EVENT                                                |
| Description | Reads out the value of the Questionable Limit Channel Extra Status Event Register of channels 1 to 16 ( <i>Ch</i> ). (Read only) |
| Variable    |                                                                                                                                  |

|             | <i>Value</i>                                                        |
|-------------|---------------------------------------------------------------------|
| Description | Value of the Questionable Limit Channel Extra Status Event Register |
| Data type   | Long integer type (Long)                                            |

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                             |
|-----------------|---------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Stat As Long Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).ECHannel.EVENT</pre> |
| Related objects | SCPI.IEEE4882.CLS on page 346                                                               |
| Equivalent key  | No equivalent key is available on the front panel.                                          |

**SCPI.STATUS.QUESTIONABLE.LIMIT.CHANNEL(Ch).  
ECHANNEL.NTRANSITION**

|             |                                                                                                                                                                                    |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                                           |
| Syntax      | SCPI.STATUS.QUESTIONABLE.LIMIT.CHANNEL( <i>Ch</i> ).ECHANNEL.NTRANSITION = <i>Value</i><br><i>Value</i> = SCPI.STATUS.QUESTIONABLE.LIMIT.CHANNEL( <i>Ch</i> ).ECHANNEL.NTRANSITION |
| Description | Sets the value of the negative transition filter of the Questionable Limit Channel Extra Status Register of channels 1 to 16 ( <i>Ch</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         | Bits 0 and 3 to 15 cannot be set to 1.  |

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                                                                                                 |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | Dim Stat As Long<br>SCPI.STATUS.QUESTIONABLE.LIMIT.CHANNEL(1).ECHANNEL.NTRANSITION = 6<br>Stat = SCPI.STATUS.QUESTIONABLE.LIMIT.CHANNEL(1).ECHANNEL.NTRANSITION |
| Related objects | SCPI.STATUS.QUESTIONABLE.LIMIT.CHANNEL(Ch). ECHANNEL.EVENT on page 485<br>SCPI.STATUS.QUESTIONABLE.LIMIT.CHANNEL(Ch). ECHANNEL.PTRANSITION on page 487          |
| Equivalent key  | No equivalent key is available on the front panel.                                                                                                              |

## **SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). ECHannel.PTRansition**

|             |                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                                                         |
| Syntax      | SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).ECHannel.PTRansition = <i>Value</i><br><i>Value</i> = SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).ECHannel.PTRansition |
| Description | Sets the value of the positive transition filter of the Questionable Limit Channel Extra Status Register of channels 1 to 16 ( <i>Ch</i> ).                      |
| Variable    |                                                                                                                                                                  |

|              | <i>Value</i>                                                                  |
|--------------|-------------------------------------------------------------------------------|
| Description  | Value of the positive transition filter                                       |
| Data type    | Long integer type (Long)                                                      |
| Range        | 0 to 65535                                                                    |
| Preset value | Varies depending on the upper limit setting of the number of channels/traces. |
| Note         | Bits 0 and 3 to 15 cannot be set to 1.                                        |

For information on the variable (*Ch*), refer to Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                                                                                                 |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | Dim Stat As Long<br>SCPI.STATus.QUEStionable.LIMit.CHANnel(1).ECHannel.PTRansition = 6<br>Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).ECHannel.PTRansition |
| Related objects | SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). ECHannel.EVENT on page 485<br>SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). ECHannel.NTRansition on page 486          |
| 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 = *Value**Value* = SCPI.STATus.QUEStionable.LIMit.CHANnel(*Ch*).ENABLE

Description

Sets the value of the Questionable Limit Channel Status Enable Register of channels 1 to 16 (*Ch*).

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 | Varies depending on the upper limit setting for the channel/trace number. |
| Note         | The bit 15 can not be set to 1.                                           |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

Examples

```
Dim Stat As Long
SCPI.STATus.QUEStionable.LIMit.CHANnel(1).ENABLE = 16
Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).ENABLE
```

Related objects

SCPI.STATus.QUEStionable.LIMit.ENABLE on page 496

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 16 (*Ch*). (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 182.

- Examples**               Dim Stat As Long  
                               Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).EVENT
- Related objects**       SCPI.IEEE4882.CLS on page 346
- 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 16 ( <i>Ch</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 15 can not be set to 1.         |

For information on the variable (*Ch*), see Table 7-6, “Variable (*Ch*),” on page 182.

|                 |                                                                                                                                                              |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Stat As Long SCPI.STATus.QUEStionable.LIMit.CHANnel(1).NTRansition = 16 Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).NTRansition</pre>          |
| Related objects | <p>SCPI.STATus.QUEStionable.LIMit.CHANnel(<i>Ch</i>).EVENT on page 489</p> <p>SCPI.STATus.QUEStionable.LIMit.CHANnel(<i>Ch</i>). PTRansition on page 491</p> |
| 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 = <i>Value</i><br><i>Value</i> = 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 16 ( <i>Ch</i> ).          |
| Variable    |                                                                                                                                                |

|              | <i>Value</i>                                                              |
|--------------|---------------------------------------------------------------------------|
| Description  | Value of the positive transition filter                                   |
| Data type    | Long integer type (Long)                                                  |
| Range        | 0 to 65535                                                                |
| Preset value | Varies depending on the upper limit setting for the channel/trace number. |
| Note         | The bit 15 can not be set to 1.                                           |

For information on the variable (*Ch*), see Table 7-6, “Variable (Ch),” on page 182.

|                 |                                                                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Stat As Long SCPI.STATus.QUEStionable.LIMit.CHANnel(1).PTRansition = 0 Stat = SCPI.STATus.QUEStionable.LIMit.CHANnel(1).PTRansition</pre> |
| Related objects | SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch).EVENT on page 489<br>SCPI.STATus.QUEStionable.LIMit.CHANnel(Ch). NTRansition on page 490                |
| Equivalent key  | No equivalent key is available on the front panel.                                                                                                 |

## **SCPI.STATUS.QUESTIONABLE.LIMIT.CONDITION**

|             |                                                                                      |
|-------------|--------------------------------------------------------------------------------------|
| Object type | Property                                                                             |
| Syntax      | <i>Value</i> = SCPI.STATUS.QUESTIONABLE.LIMIT.CONDITION                              |
| Description | Reads out the value of the Questionable Limit Status Condition Register. (Read only) |
| Variable    |                                                                                      |

|             | <i>Value</i>                                              |
|-------------|-----------------------------------------------------------|
| Description | Value of the Questionable Limit Status Condition Register |
| Data type   | Long integer type (Long)                                  |

|                 |                                                                                                                  |
|-----------------|------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Stat As Long Stat = SCPI.STATUS.QUESTIONABLE.LIMIT.CONDITION</pre>                                      |
| Related objects | SCPI.STATUS.QUESTIONABLE.LIMIT.NTRANSITION on page 497<br>SCPI.STATUS.QUESTIONABLE.LIMIT.PTRANSITION on page 498 |
| Equivalent key  | No equivalent key is available on the front panel.                                                               |

## **SCPI.STATUS.QUESTIONABLE.LIMIT.ELIMIT.CONDITION**

|             |                                                                                            |
|-------------|--------------------------------------------------------------------------------------------|
| Object type | Property                                                                                   |
| Syntax      | <i>Value</i> = SCPI.STATUS.QUESTIONABLE.LIMIT.ELIMIT.CONDITION                             |
| Description | Reads out the value of the Questionable Limit Extra Status Condition Register. (Read only) |
| Variable    |                                                                                            |

|             | <i>Value</i>                                                    |
|-------------|-----------------------------------------------------------------|
| Description | Value of the Questionable Limit Extra Status Condition Register |
| Data type   | Long integer type (Long)                                        |

|                 |                                                                                                                                |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Stat As Long Stat = SCPI.STATUS.QUESTIONABLE.LIMIT.ELIMIT.CONDITION</pre>                                             |
| Related objects | SCPI.STATUS.QUESTIONABLE.LIMIT.ELIMIT.NTRANSITION on page 494<br>SCPI.STATUS.QUESTIONABLE.LIMIT.ELIMIT.PTRANSITION on page 495 |
| Equivalent key  | No equivalent key is available on the front panel.                                                                             |



## SCPI.STATus.QUEStionable.LIMit.ELIMit.ENABLE

- Object type** Property
- Syntax** SCPI.STATus.QUEStionable.LIMit.ELIMit.ENABLE = *Value*  
*Value* = SCPI.STATus.QUEStionable.LIMit.ELIMit.ENABLE
- Description** Sets the value of the Questionable Limit Extra Status Enable Register.

**Variable**

|              | <i>Value</i>                                                                  |
|--------------|-------------------------------------------------------------------------------|
| Description  | Value of the Questionable Limit Extra Status Enable Register                  |
| Data type    | Long integer type (Long)                                                      |
| Range        | 0 to 65535                                                                    |
| Preset value | Varies depending on the upper limit setting of the number of channels/traces. |
| Note         | Bits 0 and 3 to 15 cannot be set to 1.                                        |

- Examples**
- ```
Dim Stat As Long
SCPI.STATus.QUEStionable.LIMit.ELIMit.ENABLE = 6
Stat = SCPI.STATus.QUEStionable.LIMit.ELIMit.ENABLE
```

- Related objects** SCPI.STATus.QUEStionable.LIMit.ENABLE on page 496

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

## SCPI.STATus.QUEStionable.LIMit.ELIMit.EVENT

- Object type** Property
- Syntax** *Value* = SCPI.STATus.QUEStionable.LIMit.ELIMit.EVENT
- Description** Reads out the value of the Questionable Limit Extra Status Event Register. (Read only)

**Variable**

	<i>Value</i>
Description	Value of the Questionable Limit Extra Status Event Register
Data type	Long integer type (Long)

- Examples**
- ```
Dim Stat As Long
Stat = SCPI.STATus.QUEStionable.LIMit.ELIMit.EVENT
```

- Related objects** SCPI.IEEE4882.CLS on page 346

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

## SCPI.STATus.QUEStionable.LIMit.ELIMit.NTRansition

|             |                                                                                                                                      |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                             |
| Syntax      | SCPI.STATus.QUEStionable.LIMit.ELIMit.NTRansition = <i>Value</i><br><i>Value</i> = SCPI.STATus.QUEStionable.LIMit.ELIMit.NTRansition |
| Description | Sets the value of the negative transition filter of the Questionable Limit Extra Status Register.                                    |

### 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         | Bits 0 and 3 to 15 cannot be set to 1.  |

**Examples**

```
Dim Stat As Long
SCPI.STATus.QUEStionable.LIMit.ELIMit.NTRansition = 6
Stat = SCPI.STATus.QUEStionable.LIMit.ELIMit.NTRansition
```

**Related objects**

SCPI.STATus.QUEStionable.LIMit.ELIMit.EVENT on page 493  
SCPI.STATus.QUEStionable.LIMit.ELIMit.PTRansition on page 495

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

## SCPI.STATus.QUEStionable.LIMit.ELIMit.PTRansition

|             |                                                                                                                                      |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Object type | Property                                                                                                                             |
| Syntax      | SCPI.STATus.QUEStionable.LIMit.ELIMit.PTRansition = <i>Value</i><br><i>Value</i> = SCPI.STATus.QUEStionable.LIMit.ELIMit.PTRansition |
| Description | Sets the value of the positive transition filter of the Questionable Limit Extra Status Register.                                    |

### Variable

|              | <i>Value</i>                                                                  |
|--------------|-------------------------------------------------------------------------------|
| Description  | Value of the positive transition filter                                       |
| Data type    | Long integer type (Long)                                                      |
| Range        | 0 to 65535                                                                    |
| Preset value | Varies depending on the upper limit setting of the number of channels/traces. |
| Note         | Bits 0 and 3 to 15 cannot be set to 1.                                        |

|                 |                                                                                                                                            |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Examples        | <pre>Dim Stat As Long SCPI.STATus.QUEStionable.LIMit.ELIMit.PTRansition = 6 Stat = SCPI.STATus.QUEStionable.LIMit.ELIMit.PTRansition</pre> |
| Related objects | SCPI.STATus.QUEStionable.LIMit.ELIMit.EVENTt on page 493<br>SCPI.STATus.QUEStionable.LIMit.ELIMit.NTRansition on page 494                  |
| 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 = <i>Value</i><br><i>Value</i> = SCPI.STATus.QUEStionable.LIMit.ENABLE |
| Description | Sets the value of the Questionable Limit Status Enable Register.                                             |
| 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 | Varies depending on the upper limit setting for the channel/trace number. |
| Note         | The bit 15 can not be set to 1.                                           |

|          |                                                                                                                     |
|----------|---------------------------------------------------------------------------------------------------------------------|
| Examples | <pre>Dim Stat As Long SCPI.STATus.QUEStionable.LIMit.ENABLE = 16 Stat = SCPI.STATus.QUEStionable.LIMit.ENABLE</pre> |
|----------|---------------------------------------------------------------------------------------------------------------------|

Related objects SCPI.STATus.QUEStionable.ENABLE on page 481

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

## **SCPI.STATus.QUEStionable.LIMit.EVENT**

|             |                                                                                  |
|-------------|----------------------------------------------------------------------------------|
| Object type | Property                                                                         |
| Syntax      | <i>Value</i> = SCPI.STATus.QUEStionable.LIMit.EVENT                              |
| Description | Reads out the value of the Questionable Limit Status Event Register. (Read only) |
| Variable    |                                                                                  |

|             | <i>Value</i>                                          |
|-------------|-------------------------------------------------------|
| Description | Value of the Questionable Limit Status Event Register |
| Data type   | Long integer type (Long)                              |

|          |                                                                         |
|----------|-------------------------------------------------------------------------|
| Examples | <pre>Dim Stat As Long Stat = SCPI.STATus.QUEStionable.LIMit.EVENT</pre> |
|----------|-------------------------------------------------------------------------|

Related objects SCPI.IEEE4882.CLS on page 346

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.
- 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 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 496  
SCPI.STATus.QUEStionable.LIMit.PTRansition on page 498
- 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 = <i>Value</i> <i>Value</i> = SCPI.STATus.QUEStionable.LIMit.PTRansition
Description	Sets the value of positive transition filter of the Questionable Limit Status Register.
Variable	

	<i>Value</i>
Description	Value of the positive transition filter
Data type	Long integer type (Long)
Range	0 to 65535
Preset value	Varies depending on the upper limit setting for the channel/trace number.
Note	The bit 15 can not be set to 1.

Examples	<pre>Dim Stat As Long SCPI.STATus.QUEStionable.LIMit.PTRansition = 6 Stat = SCPI.STATus.QUEStionable.LIMit.PTRansition</pre>
Related objects	SCPI.STATus.QUEStionable.LIMit.EVENT on page 496 SCPI.STATus.QUEStionable.LIMit.NTRansition on page 497
Equivalent key	No equivalent key is available on the front panel.

## SCPI.STATus.QUEStionable.NTRansition

Object type	Property
Syntax	SCPI.STATus.QUEStionable.NTRansition = <i>Value</i> <i>Value</i> = SCPI.STATus.QUEStionable.NTRansition
Description	Sets the value of negative transition filter of the Questionable Status Register.
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	<pre>Dim Stat As Long SCPI.STATus.QUEStionable.NTRansition = 6 Stat = SCPI.STATus.QUEStionable.NTRansition</pre>
Related objects	<p>SCPI.STATus.QUEStionable.EVENT on page 482</p> <p>SCPI.STATus.QUEStionable.PTRansition on page 500</p>
Equivalent key	No equivalent key is available on the front panel.

## SCPI.STATus.QUEStionable.PTRansition

Object type	Property
Syntax	SCPI.STATus.QUEStionable.PTRansition = <i>Value</i> <i>Value</i> = SCPI.STATus.QUEStionable.PTRansition
Description	Sets the value of positive transition filter of the Questionable Status Register.
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	<pre>Dim Stat As Long SCPI.STATus.QUEStionable.PTRansition = 6 Stat = SCPI.STATus.QUEStionable.PTRansition</pre>
Related objects	SCPI.STATus.QUEStionable.EVENT on page 482 SCPI.STATus.QUEStionable.NTRansition on page 499
Equivalent key	No equivalent key is available on the front panel.



## SCPI.SYSTem.BACKlight

- Object type** Property
- Syntax** SCPI.SYSTem.BACKlight = *Status*  
*Status* = 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"> <li>•True or -1                      Turns ON the backlight.</li> <li>•False or 0                      Turns OFF the backlight.</li> </ul>
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	<code>SCPI.SYSTem.BEEPer.COMPLete.IMMEdiate</code>
Related objects	SCPI.SYSTem.BEEPer.COMPLete.STATe on page 502 SCPI.SYSTem.BEEPer.WARNIng.IMMEdiate on page 503
Equivalent key	<b>[System] - Misc Setup - Beeper - Test Beep Complete</b>

## 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. <ul style="list-style-type: none"> <li>•True or -1                      Turns ON the beeper for the notification of the completion of the operation.</li> <li>•False or 0                      Turns OFF the beeper for the notification of the completion of the operation.</li> </ul>
Preset value	True or -1

Examples	<pre>Dim BeepComp As Boolean SCPI.SYSTem.BEEPer.COMPLete.STATe = False BeepComp = SCPI.SYSTem.BEEPer.COMPLete.STATe</pre>
Related objects	SCPI.SYSTem.BEEPer.COMPLete.IMMEdiate on page 502 SCPI.SYSTem.BEEPer.WARNIng.STATe on page 503
Equivalent key	<b>[System] - Misc Setup - Beeper - Beep Complete</b>

## 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	<code>SCPI.SYSTem.BEEPer.WARning.IMMediate</code>
Related objects	SCPI.SYSTem.BEEPer.WARning.STATe on page 503 SCPI.SYSTem.BEEPer.COMPLete.IMMediate on page 502
Equivalent key	<b>[System] - Misc Setup - Beeper - Test Beep Warning</b>

## SCPI.SYSTem.BEEPer.WARning.STATe

Object type	Property
Syntax	SCPI.SYSTem.BEEPer.WARning.STATe = <i>Status</i> <i>Status</i> = 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"> <li>• True or -1                      Turns ON the beeper for the notification of warning/limit test result.</li> <li>• False or 0                      Turns OFF the beeper for the notification of warning/limit test result.</li> </ul>
Preset value	True or -1

Examples	<code>Dim BeepWarn As Boolean</code> <code>SCPI.SYSTem.BEEPer.WARning.STATe = False</code> <code>BeepWarn = SCPI.SYSTem.BEEPer.WARning.STATe</code>
Related objects	SCPI.SYSTem.BEEPer.WARning.IMMediate on page 503 SCPI.SYSTem.BEEPer.COMPLete.STATe on page 502
Equivalent key	<b>[System] - Misc Setup - Beeper - Beep Warning</b>

## **SCPI.SYSem.COMMunicate.GPIB.PMEter.ADDress**

Object type	Property
Syntax	SCPI.SYSem.COMMunicate.GPIB.PMEter.ADDress = <i>Value</i> <i>Value</i> = SCPI.COMMunicate.GPIB.PMEter.ADDress
Description	Sets/reads out the GPIB address of the power meter in use.
Variable	

	<i>Value</i>
Description	GPIB address of the power meter
Data type	Long integer type (Long)
Range	0 to 30
Preset value	13
Note	If the specified parameter is out of the allowable setting range, a runtime error occurs.

Examples	<pre>Dim Paddr As Long SCPI.SYSem.COMMunicate.GPIB.PMEter.ADDress = 15 Paddr = SCPI.SYSem.COMMunicate.GPIB.PMEter.ADDress</pre>
----------	---

Equivalent key	<b>[System] - Misc Setup - GPIB Setup - Power Meter Address</b>
----------------	---

## SCPI.SYSTem.CORRection.STATe

Object type      Property

Syntax            SCPI.SYSTem.CORRection.STATe = *Status*  
*Status* = SCPI.SYSTem.CORRection.STATe

Description      Turns ON/OFF the system correction.

Variable

	<b><i>Status</i></b>
Description	ON/OFF of the system correction
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> <li>•True or -1                      Turns ON the system correction.</li> <li>•False or 0                      Turns OFF the system correction.</li> </ul>
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 E5070B/E5071B.
Variable	

	<b><i>Data</i></b>
Description	Indicates 3-element array data (date of the built-in clock). <ul style="list-style-type: none"> <li>• <i>Data</i>(0)                 Sets year.</li> <li>• <i>Data</i>(1)                 Sets month.</li> <li>• <i>Data</i>(2)                 Sets day.</li> </ul> The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> <li>• <i>Data</i>(0)                 1980 to 2099</li> <li>• <i>Data</i>(1)                 1 to 12</li> <li>• <i>Data</i>(2)                 1 to 31</li> </ul>
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 Day As Variant
SCPI.SYSTem.DATE = Array(2001,12,24)
Day = SCPI.SYSTem.DATE

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 513  
                           SCPI.DISPlay.CLOCK on page 312

**Equivalent key**     **[System] - Misc Setup - Clock Setup - Set Date and Time**

## SCPI.SYSTem.ERRor

**Object type** Property

**Syntax** *Err* = SCPI.SYSTem.ERRor

**Description** Reads out the oldest error of the errors stored in the error queue of the E5070B/E5071B. The read-out error is deleted from the error queue. The size of the error queue is 100. Executing the 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 E5070B/E5071B from the external controller.

---

**Variable**

	<i>Err</i>
Description	Indicates 2-element array data (for error). <ul style="list-style-type: none"> <li>• <i>Err(0)</i> Error number</li> <li>• <i>Err(1)</i> Error message</li> </ul> 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 346

**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. •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 509

**Equivalent key**      **[System] - Misc Setup - Front Panel & Keyboard Lock**



## SCPI.SYSTem.KLOCK.MOUSe

- Object type Property
- Syntax SCPI.SYSTem.KLOCK.MOUSe = *Status*  
*Status* = SCPI.SYSTem.KLOCK.MOUSe
- Description Sets whether to lock the operation of the mouse and touch screen.
- Variable

	<b><i>Status</i></b>
Description	ON/OFF of lock
Data type	Boolean type (Boolean)
Range	Select from the following. <ul style="list-style-type: none"> <li>•True or -1                      Specifies lock.</li> <li>•False or 0                      Specifies unlock.</li> </ul>
Preset value	False or 0

- Examples 

```
Dim MTLock As Boolean
SCPI.SYSTem.KLOCK.MOUSe = True
MTLock = SCPI.SYSTem.KLOCK.MOUSe
```
- Related objects SCPI.SYSTem.KLOCK.KBD on page 508
- Equivalent key **[System] - Key Lock - Mouse Lock**

## SCPI.SYSTem.POFF

- Object type Method
- Syntax SCPI.SYSTem.POFF
- Description Turns OFF the E5070B/E5071B. (No read)
- Examples SCPI.SYSTem.POFF
- Equivalent key Standby switch

## SCPI.SYSTem.PRESet

Object type	Method
Syntax	SCPI.SYSTem.PRESet
Description	<p>Presets the setting state of the E5070B/E5071B. 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>E5070B/E5071B User’s Guide</i>. (No read)</p> <ul style="list-style-type: none"><li>• The continuous startup mode (see the SCPI.INITiate(Ch).CONTinuous object) of channel 1 is set to ON.</li></ul>
Examples	<code>SCPI.SYSTem.PRESet</code>
Related objects	SCPI.IEEE4882.RST on page 349
Equivalent key	<b>[Preset] - OK</b>

## 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	Select from the following. <ul style="list-style-type: none"><li>• True or -1                      In the service mode.</li><li>• False or 0                      Not in the service mode.</li></ul>

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.SYSTem.TEMPerature.HIGH

Object type      Property

Syntax            SCPI.SYSTem.TEMPerature.HIGH = *Status*  
*Status* = SCPI.SYSTem.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. <ul style="list-style-type: none"> <li>•True or -1                      Turns ON the high temperature mode.</li> <li>•False or 0                      Turns OFF the high temperature mode.</li> </ul>
Preset value	False or 0

Examples

```
Dim TempMode As Boolean
SCPI.SYSTem.TEMPerature.HIGH = True
TempMode = SCPI.SYSTem.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 E5070B/E5071B. (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. •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.SYSTem.TIME

Object type	Property
Syntax	SCPI.SYSTem.TIME = <i>Data</i> <i>Data</i> = SCPI.SYSTem.TIME
Description	Sets the time of the clock built in the E5070B/E5071B.
Variable	

	<b><i>Data</i></b>
Description	Indicates 3-element array data (time of the built-in clock). <ul style="list-style-type: none"> <li>• <i>Data(0)</i>                      Sets hour (24-hour basis)</li> <li>• <i>Data(1)</i>                      Sets minute.</li> <li>• <i>Data(2)</i>                      Sets second.</li> </ul> The index of the array starts from 0.
Data type	Variant type (Variant)
Range	<ul style="list-style-type: none"> <li>• <i>Data(0)</i>                      0 to 23</li> <li>• <i>Data(1)</i>                      0 to 59</li> <li>• <i>Data(2)</i>                      0 to 59</li> </ul>
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 Time As Variant
SCPI.SYSTem.TIME = Array(21,30,0)
Time = SCPI.SYSTem.TIME
```

```
Dim Time(2) As Variant
Dim Ref As Variant
Time(0) = 21
Time(1) = 30
Time(2) = 0
SCPI.SYSTem.TIME = Time
Ref = SCPI.SYSTem.TIME
```

Related objects	SCPI.SYSTem.DATE on page 506 SCPI.DISPlay.CLOCK on page 312
Equivalent key	<b>[System] - Misc Setup - Clock Setup - Set Date and Time</b>

## 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"><li>• The execution of the object finishes at the time of a trigger.</li></ul> <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>E5070B/E5071B 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 514
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"><li>• 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.</li></ul> <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>E5070B/E5071B 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 514 SCPI.IEEE4882.OPC on page 348
Equivalent key	No equivalent key is available on the front panel.

## SCPI.TRIGger.SEQuence.SOURce

Object type	Property
Syntax	SCPI.TRIGger.SEQuence.SOURce = <i>Param</i> <i>Param</i> = SCPI.TRIGger.SEQuence.SOURce
Description	<p>Selects the trigger source from the following 4 types.</p> <p>Internal trigger      Uses the internal trigger to generate continuous triggers automatically.</p> <p>External trigger      Generates a trigger when the trigger signal is inputted externally via the Ext Trig connector or the handler interface.</p> <p>Manual trigger        Generates a trigger when the key operation of <b>[Trigger] - Trigger</b> is executed from the front panel.</p> <p>Bus trigger            Generates a trigger when the SCPI.IEEE4882.TRG object is executed.</p> <p>When you change the trigger source during sweep, the sweep is aborted.</p>

### Variable

	<i>Param</i>
Description	Trigger source
Data type	Character string type (String)
Range	Select from the following. <ul style="list-style-type: none"> <li>•"INTernal"            Specifies internal trigger.</li> <li>•"EXTernal"            Specifies external trigger.</li> <li>•"MANual"             Specifies manual trigger.</li> <li>•"BUS"                 Specifies bus trigger.</li> </ul>
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**



---

**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 E5070B/E5071B 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.

<b>STEP 1. Condition setting before using the ripple analysis library</b>
<input type="checkbox"/> Specifying the analysis range
<input type="checkbox"/> Setting the peak definition
<b>STEP 2. Using the ripple analysis library</b>

### 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 244
- **SCPI.CALCulate(Ch).SElected.FUNcTion.DOMain.STOP** on page 246
- **SCPI.CALCulate(Ch).SElected.FUNcTion.DOMain.STATe** on page 245
- **SCPI.CALCulate(Ch).SElected.FUNcTion.DOMain.COUPle** on page 243

#### 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 248
- **SCPI.CALCulate(Ch).SElected.FUNcTion.PPOLarity** on page 250

## 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 E5070B/E5071B ripple analysis library, refer to **Procedure Reference** on page 523.

List of ripple analysis library
<ul style="list-style-type: none"> <li>Returns the maximum value of the difference between a positive peak and a negative peak. <b>MaxPeakToPeak(Chan)</b> on page 531</li> </ul>
<ul style="list-style-type: none"> <li>Returns the maximum value of the difference between a positive peak and its right adjacent negative peak. <b>MaxRightGap(Chan)</b> on page 532</li> </ul>
<ul style="list-style-type: none"> <li>Returns the maximum value of the difference between a positive peak and its left adjacent negative peak. <b>MaxLeftGap(Chan)</b> on page 530</li> </ul>
<ul style="list-style-type: none"> <li>Returns the maximum value of the difference between a positive peak and its adjacent negative peak. <b>MaxGap(Chan)</b> on page 529</li> </ul>
<ul style="list-style-type: none"> <li>Returns the maximum value of the vertical distance between a line segment connecting 2 adjacent positive peaks and the negative peak between them. <b>MaxEnvelopeGap(Chan)</b> on page 528</li> </ul>
<ul style="list-style-type: none"> <li>Returns the mean value of the differences between a negative peak and its right and left adjacent positive peaks. <b>GapMean(Chan)</b> on page 527</li> </ul>
<ul style="list-style-type: none"> <li>Returns the maximum value of the total of the differences between a negative peak and its right and left adjacent positive peaks. <b>MaxRippleValue(Chan)</b> on page 534</li> </ul>
<ul style="list-style-type: none"> <li>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. <b>MaxRipplePoint(Chan,Stim)</b> on page 533</li> </ul>
<ul style="list-style-type: none"> <li>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. <b>Pole(Chan,D,LeftStim,LeftValue,RightStim,RightValue)</b> on page 535</li> </ul>
<ul style="list-style-type: none"> <li>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. <b>FirstRightGap(Chan)</b> on page 525</li> </ul>

List of ripple analysis library	
<ul style="list-style-type: none"> <li>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.</li> </ul> <p><b>FirstLeftGap(Chan)</b> on page 523</p>	
<ul style="list-style-type: none"> <li>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.</li> </ul> <p><b>FirstRightInterval(Chan)</b> on page 526</p>	
<ul style="list-style-type: none"> <li>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.</li> </ul> <p><b>FirstLeftInterval(Chan)</b> on page 524</p>	

## 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) in the ripple analysis library to the Val variable.

## Procedure Reference

This section describes the procedures in the ripple analysis library provided by the E5070B/E5071B in alphabetical order.

### FirstLeftGap(*Chan*)

**Syntax**

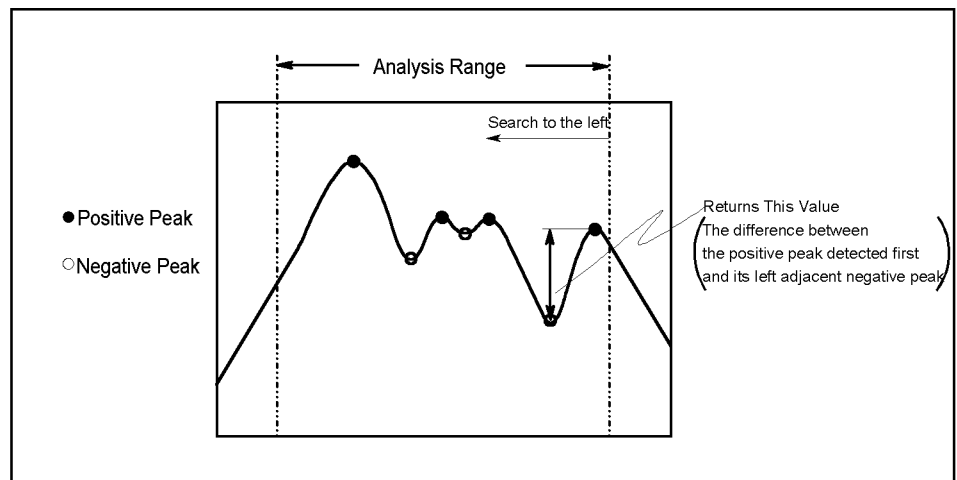
*Value* = FirstLeftGap(*Chan*)

**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
```

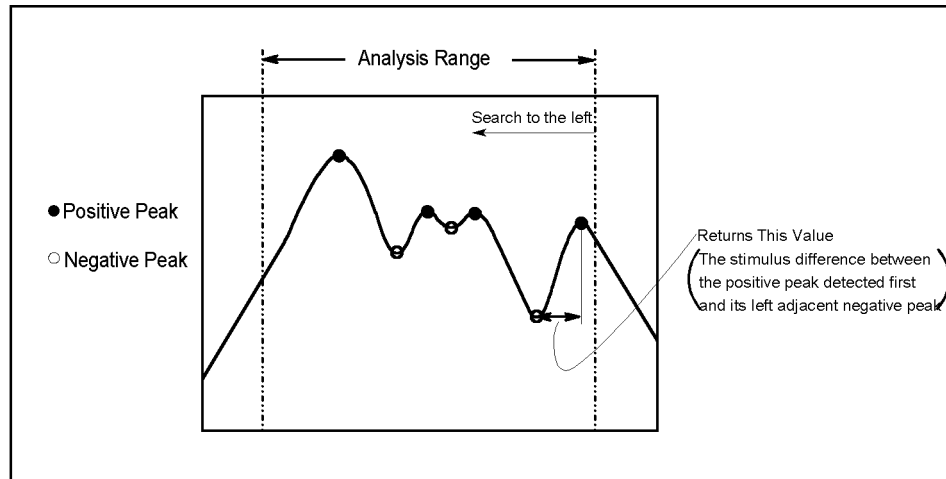
### FirstLeftInterval(*Chan*)

**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**



**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
```

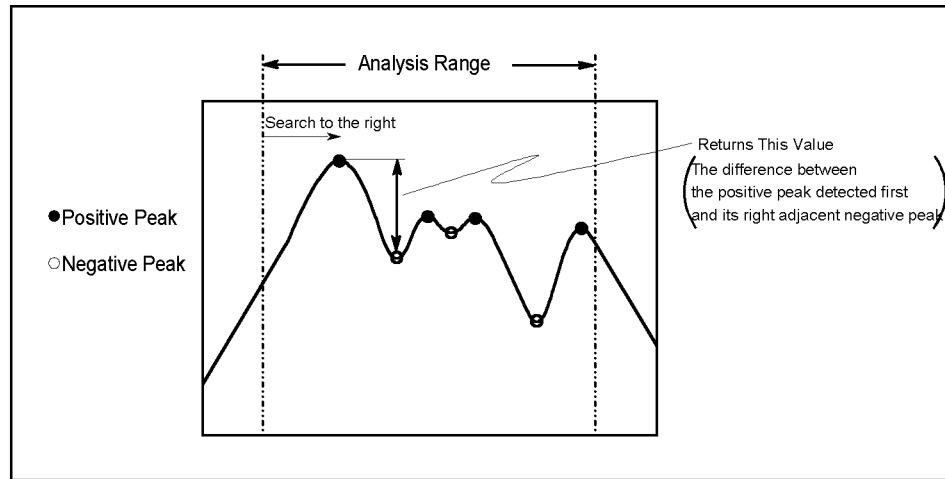
### FirstRightGap(*Chan*)

**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



e5070ave034

**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**

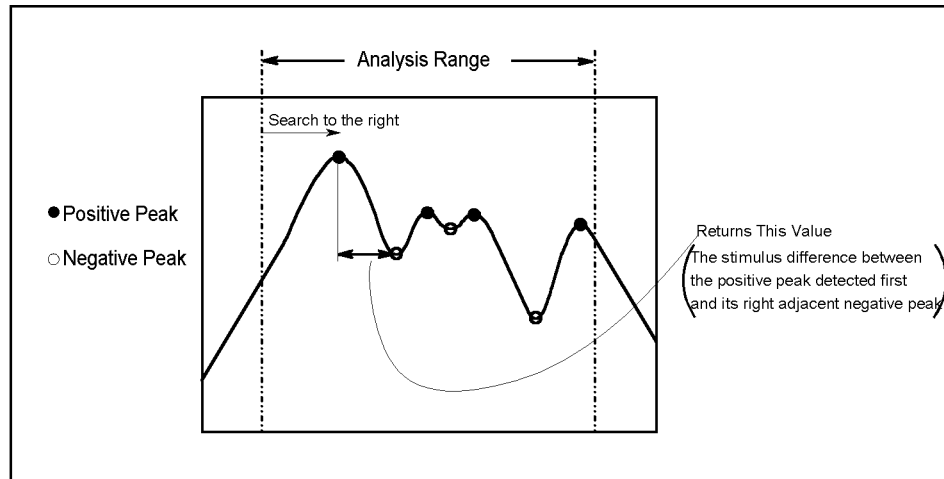
*Value* = FirstRightInterval(*Chan*)

**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
```



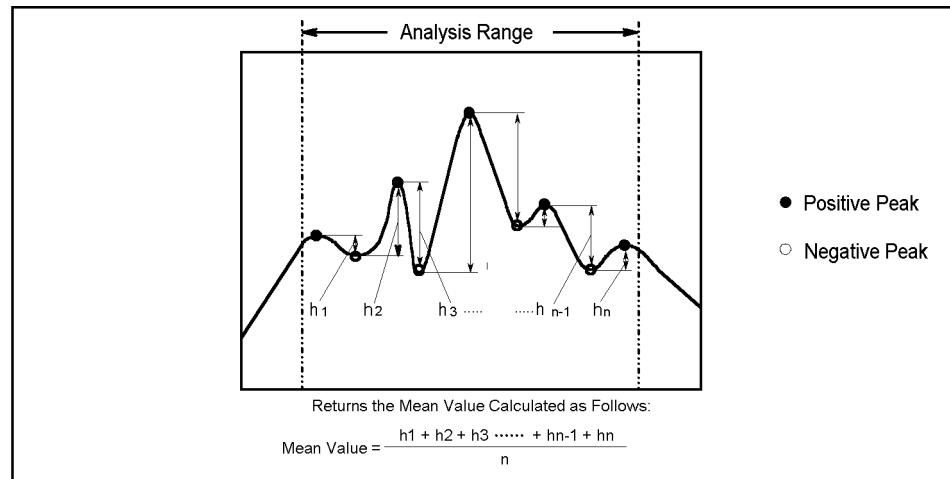
## GapMean(*Chan*)

**Syntax**  $Value = \text{GapMean}(Chan)$

**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
```

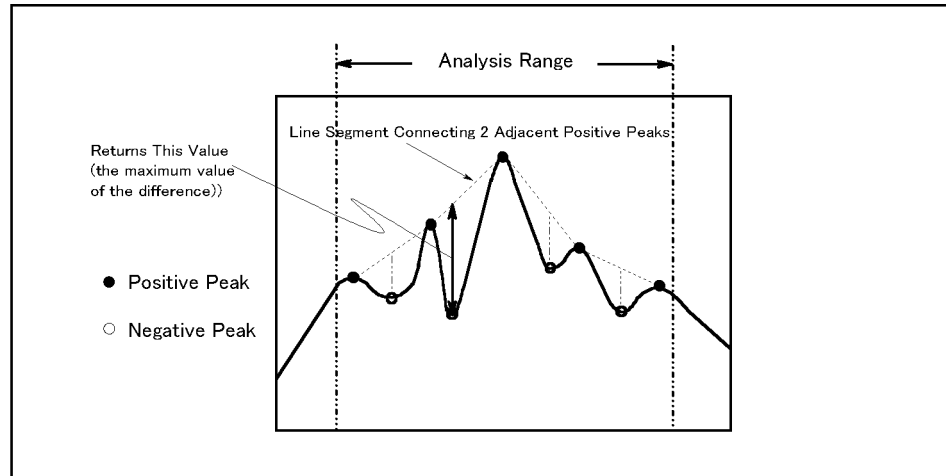
## MaxEnvelopeGap(*Chan*)

**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
```

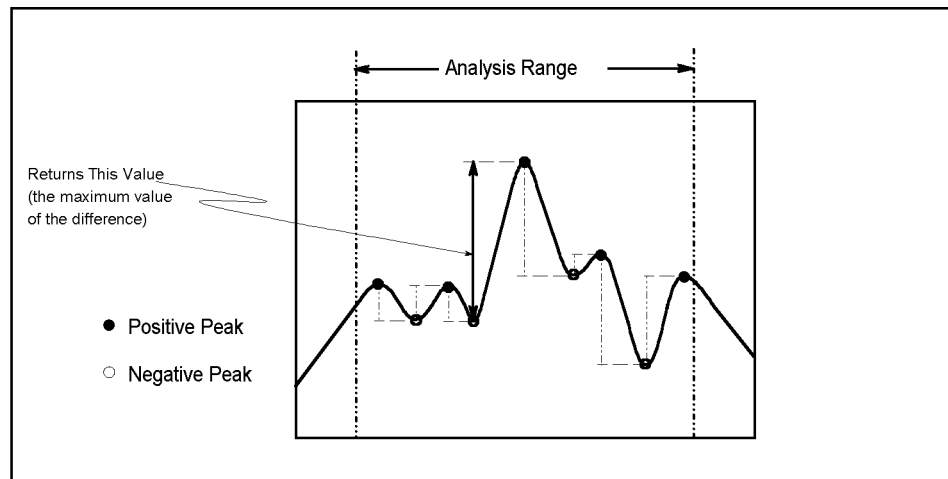
## MaxGap(*Chan*)

**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
```

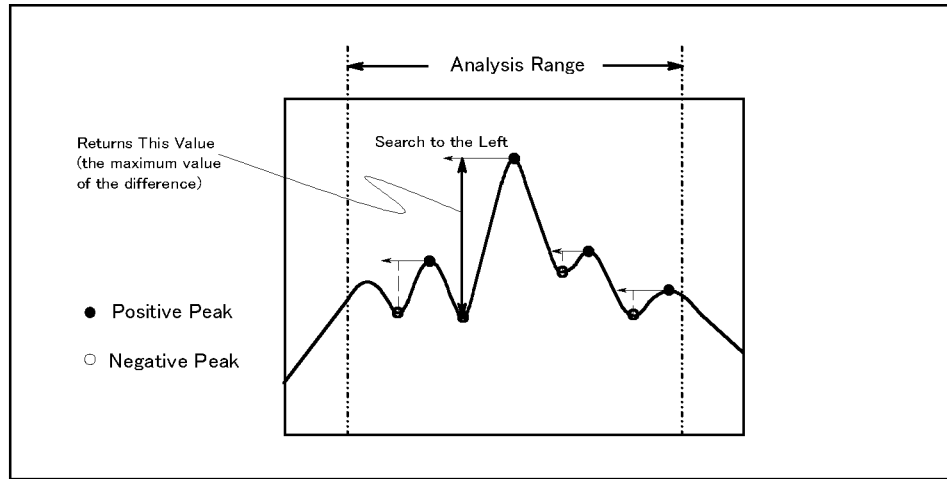
**MaxLeftGap(*Chan*)**

**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
```

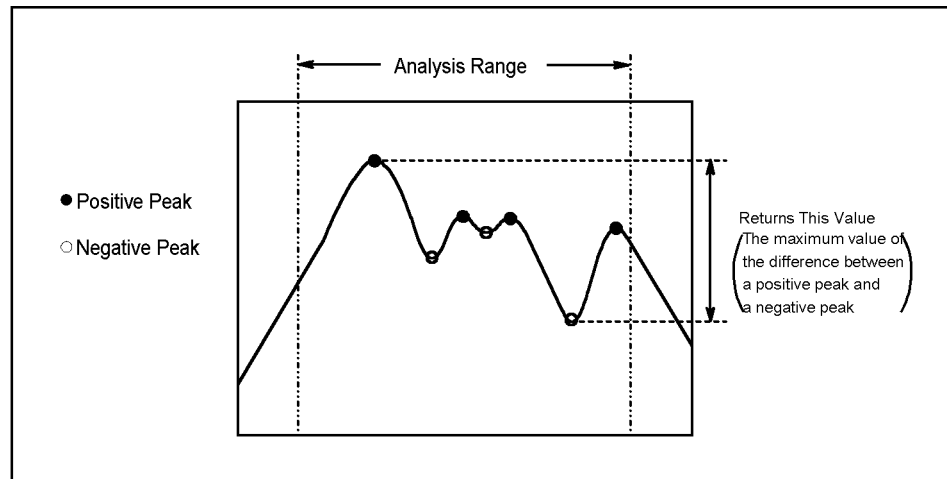
## MaxPeakToPeak(*Chan*)

**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
```

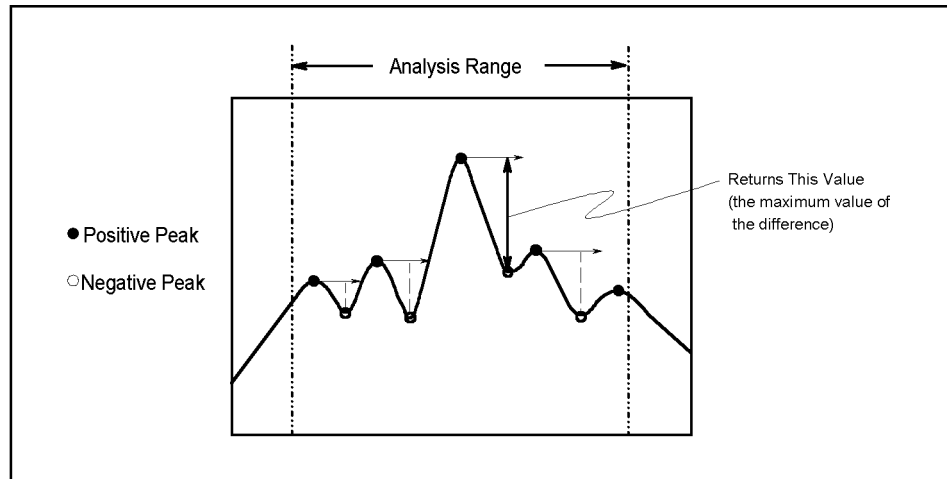
### MaxRightGap(*Chan*)

**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**

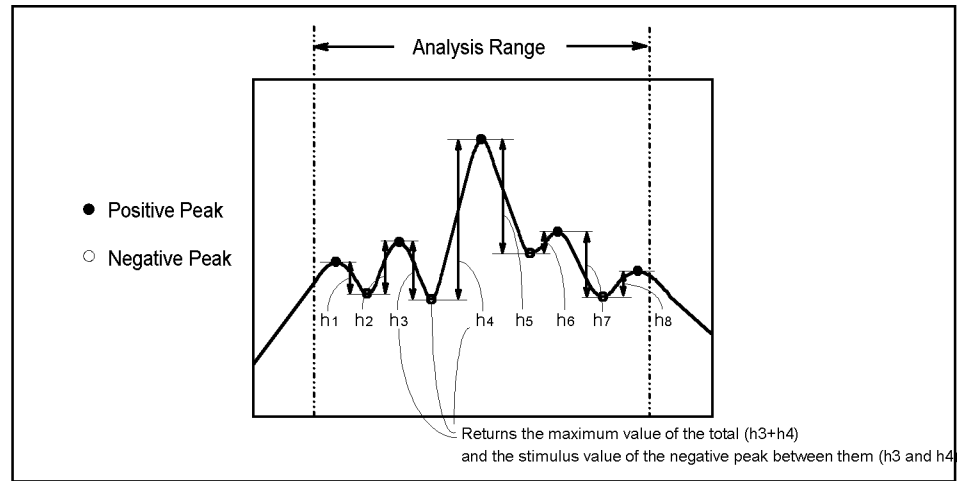
```
Dim Value As Double
Value = MaxRightGap(1)
MsgBox "Max Right Gap =" & Value
```

## 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
```

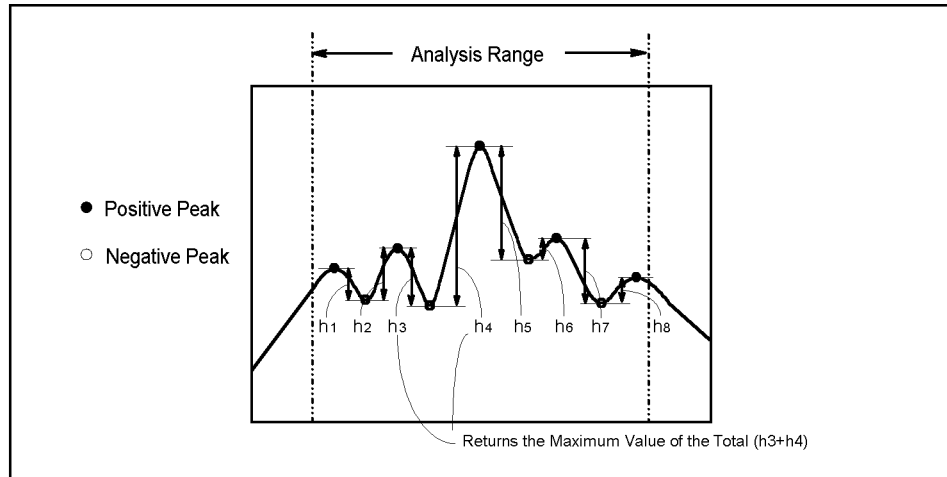
### MaxRippleValue(*Chan*)

**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



e5070ave029

#### 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**

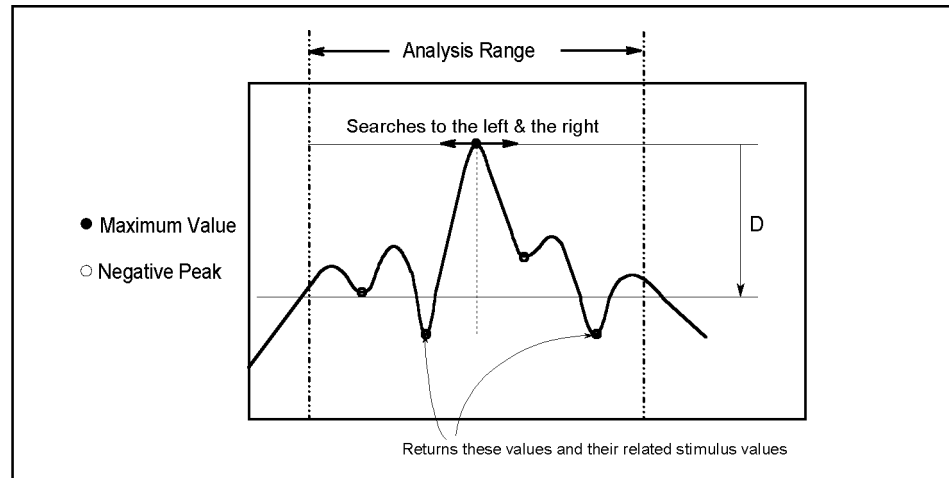
Call Pole(*Chan,D,LeftStim,LeftValue,RightStim,RightValue*)

**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**

	<b><i>Chan</i></b>
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.

	<b><i>D</i></b>
Description	Specifies the difference from the maximum value.
Data type	Double precision floating point type (Double)

**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
<b>ComplexSet(x,y)</b> on page 542	Sets a complex number. (Specify a real part and an imaginary part.)
<b>ComplexPolar(x,y)</b> on page 542	Sets a complex number. (Specify an absolute value and a phase angle.)
<b>ComplexSetArray(x)</b> on page 543	Converts a variant type or double floating point type array to a complex type array.
<b>ComplexAdd(x,y)</b> on page 539	Returns the result of the addition.
<b>ComplexSub(x,y)</b> on page 544	Returns the result of the subtraction.
<b>ComplexMul(x,y)</b> on page 541	Returns the result of the multiplication.
<b>ComplexDiv(x,y)</b> on page 540	Returns the result of the division.
<b>ComplexAbs(x)</b> on page 539	Returns the absolute value.
<b>ComplexArg(x)</b> on page 539	Returns the phase angle.
<b>ComplexNorm(x)</b> on page 542	Returns the square of the absolute value.
<b>ComplexConj(x)</b> on page 540	Returns the conjugate complex number.
<b>ComplexCos(x)</b> on page 540	Returns the cosine.
<b>ComplexCosh(x)</b> on page 540	Returns the hyperbolic cosine.
<b>ComplexSin(x)</b> on page 543	Returns the sine.
<b>ComplexSinh(x)</b> on page 543	Returns the hyperbolic sine.
<b>ComplexExp(x)</b> on page 541	Returns $e^x$ .
<b>ComplexLog(x)</b> on page 541	Returns the natural logarithm.
<b>ComplexLog10(x)</b> on page 541	Returns the common logarithm.
<b>ComplexSqrt(x)</b> on page 544	Returns the square root.

## Procedure Reference

This section describes the procedures in the complex operation library in alphabetical order.

### ComplexAbs(x)

<b>Syntax</b>	<i>Result</i> = ComplexAbs(x)
<b>Description</b>	Returns the absolute value of a complex number <i>x</i> .
<b>Data type</b>	<i>x</i> Complex type (Complex) <i>Result</i> Double precision floating point type (Double)
<b>Example of use</b>	<pre>Dim a As Complex, b As Double a = ComplexSet(1.5, 2.0) b = ComplexAbs(a)</pre>

### ComplexAdd(x,y)

<b>Syntax</b>	<i>Result</i> = ComplexAdd(x,y)
<b>Description</b>	Returns the result (x+y) of the addition of a complex number <i>x</i> and another <i>y</i> .
<b>Data type</b>	<i>x</i> Complex type (Complex) <i>y</i> Complex type (Complex) <i>Result</i> Complex type (Complex)
<b>Example of use</b>	<pre>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)</pre>

### ComplexArg(x)

<b>Syntax</b>	<i>Result</i> = ComplexArg(x)
<b>Description</b>	Returns the phase angle (radian) of a complex number <i>x</i> .
<b>Data type</b>	<i>x</i> Complex type (Complex) <i>Result</i> Double precision floating point type (Double)
<b>Example of use</b>	<pre>Dim a As Complex, b As Double, c As Double, pi As Double a = ComplexSet(1.5, 2.0) b = ComplexArg(a) pi = 3.14159265 c = b * 180 / pi       ` radian -&gt; degree</pre>

## ComplexConj(x)

<b>Syntax</b>	<i>Result</i> = ComplexConj( <i>x</i> )	
<b>Description</b>	Returns the conjugate complex number of a complex number <i>x</i> .	
<b>Data type</b>	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
<b>Example of use</b>	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexConj(a)</pre>	

## ComplexCos(x)

<b>Syntax</b>	<i>Result</i> = ComplexCos( <i>x</i> )	
<b>Description</b>	Returns the cosine (cos( <i>x</i> )) of a complex number <i>x</i> .	
<b>Data type</b>	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
<b>Example of use</b>	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexCos(a)</pre>	

## ComplexCosh(x)

<b>Syntax</b>	<i>Result</i> = ComplexCosh( <i>x</i> )	
<b>Description</b>	Returns the hyperbolic cosine (cosh( <i>x</i> )) of a complex number <i>x</i> .	
<b>Data type</b>	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
<b>Example of use</b>	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexCosh(a)</pre>	

## ComplexDiv(x,y)

<b>Syntax</b>	<i>Result</i> = ComplexDiv( <i>x</i> , <i>y</i> )	
<b>Description</b>	Returns the result ( <i>x</i> / <i>y</i> ) of the division of a complex number <i>x</i> and another <i>y</i> .	
<b>Data type</b>	<i>x</i>	Complex type (Complex)
	<i>y</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
<b>Example of use</b>	<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)

<b>Syntax</b>	<i>Result</i> = ComplexExp( <i>x</i> )	
<b>Description</b>	Returns $e^x$ .	
<b>Data type</b>	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
<b>Example of use</b>	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexExp(a)</pre>	

## ComplexLog(x)

<b>Syntax</b>	<i>Result</i> = ComplexLog( <i>x</i> )	
<b>Description</b>	Returns the natural logarithm ( $\log(x)$ ) of a complex number <i>x</i> .	
<b>Data type</b>	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
<b>Example of use</b>	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexLog(a)</pre>	

## ComplexLog10(x)

<b>Syntax</b>	<i>Result</i> = ComplexLog( <i>x</i> )	
<b>Description</b>	Returns the common logarithm ( $\log_{10}(x)$ ) of a complex number <i>x</i> .	
<b>Data type</b>	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
<b>Example of use</b>	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexLog10(a)</pre>	

## ComplexMul(x,y)

<b>Syntax</b>	<i>Result</i> = ComplexMul( <i>x</i> , <i>y</i> )	
<b>Description</b>	Returns the result ( $x \times y$ ) of the multiplication of a complex number <i>x</i> and another <i>y</i> .	
<b>Data type</b>	<i>x</i>	Complex type (Complex)
	<i>y</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
<b>Example of use</b>	<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)

<b>Syntax</b>	$Result = \text{ComplexNorm}(x)$	
<b>Description</b>	Returns the square of the absolute value of a complex number $x$ .	
<b>Data type</b>	$x$	Complex type (Complex)
	$Result$	Double precision floating point type (Double)
<b>Example of use</b>	<pre>Dim a As Complex, b As Double a = ComplexSet(1.5, 2.0) b = ComplexNorm(a)</pre>	

## ComplexPolar(x,y)

<b>Syntax</b>	$z = \text{ComplexPolar}(x,y)$	
<b>Description</b>	Sets a complex number to a complex type variable $z$ . Specify a complex number with an absolute value $x$ and a phase angle $y$ (radian).	
<b>Data type</b>	$x$	Double precision floating point type (Double)
	$y$	Double precision floating point type (Double)
	$z$	Complex type (Complex)
<b>Example of use</b>	<pre>Dim a As Complex, pi As Double pi = 3.14159265 a = ComplexPolar(2.5, 60 * pi / 180)</pre>	

## ComplexSet(x,y)

<b>Syntax</b>	$z = \text{ComplexSet}(x,y)$	
<b>Description</b>	Sets a complex number to a complex type variable $z$ . Specify a complex number with a real part $x$ and an imaginary part $y$ . (Sets $x$ and $y$ to $z.real$ and $z.imag$ respectively.)	
<b>Data type</b>	$x$	Double precision floating point type (Double)
	$y$	Double precision floating point type (Double)
	$z$	Complex type (Complex)
<b>Example of use</b>	<pre>Dim a as Complex a = ComplexSet(1.5, 2.0)</pre>	



## ComplexSetArray(x)

<b>Syntax</b>	$y = \text{ComplexSetArray}(x)$				
<b>Description</b>	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 $y$ .				
<b>Data type</b>	<table> <tr> <td><math>x</math></td> <td>Variant type (Variant) array or Double precision floating point type (Double) array</td> </tr> <tr> <td><math>y</math></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				
<b>Example of use</b>	<pre>Dim a as Variant, b as Complex a = SCPI.CALCulate(1).SElected.DATA.SDATA b = ComplexSetArray(a)</pre>				

## ComplexSin(x)

<b>Syntax</b>	$Result = \text{ComplexSin}(x)$				
<b>Description</b>	Returns the sine ( $\sin(x)$ ) of a complex number $x$ .				
<b>Data type</b>	<table> <tr> <td><math>x</math></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)				
<b>Example of use</b>	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexSin(a)</pre>				

## ComplexSinh(x)

<b>Syntax</b>	$Result = \text{ComplexSinh}(x)$				
<b>Description</b>	Returns the hyperbolic sine ( $\sinh(x)$ ) of a complex number $x$ .				
<b>Data type</b>	<table> <tr> <td><math>x</math></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)				
<b>Example of use</b>	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexSinh(a)</pre>				

## ComplexSqrt(x)

<b>Syntax</b>	<i>Result</i> = ComplexSqrt( <i>x</i> )	
<b>Description</b>	Returns the square root ( $\sqrt{x}$ ) of a complex number <i>x</i> .	
<b>Data type</b>	<i>x</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
<b>Example of use</b>	<pre>Dim a As Complex, b As Complex a = ComplexSet(1.5, 2.0) b = ComplexSqrt(a)</pre>	

## ComplexSub(x,y)

<b>Syntax</b>	<i>Result</i> = ComplexSub( <i>x</i> , <i>y</i> )	
<b>Description</b>	Returns the result ( $x - y$ ) of the subtraction of a complex number <i>x</i> and another <i>y</i> .	
<b>Data type</b>	<i>x</i>	Complex type (Complex)
	<i>y</i>	Complex type (Complex)
	<i>Result</i>	Complex type (Complex)
<b>Example of use</b>	<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>	

## Sample Program

```

:
:

Dim Dmy As Long
Dim s21_raw As Variant
Dim s31_raw As Variant
Dim s21_Comp As Complex
Dim s31_Comp As Complex
Dim trAce_ratio_comp As Complex
Dim trAce_ratio(401) As Double

SCPI.DISPlay.Split = "D1"
SCPI.DISPlay.WINDow(1).Split = "D12_34"
SCPI.CALCulate(1).PARAmeter.Count = 2
SCPI.CALCulate(1).PARAmeter(1).DEFine = "s21"
SCPI.CALCulate(1).PARAmeter(2).DEFine = "s31"
SCPI.SENSE(1).SWEep.POINTs = 201

:
:
:

SCPI.TRIGger.SEQuence.Source = "bus"
SCPI.TRIGger.SEQuence.SINGLE
Dmy = SCPI.IEEE4882.OPC

''' Get corrected data array
SCPI.CALCulate(1).PARAmeter(1).SElect
s21_raw = SCPI.CALCulate(1).SElected.DATA.SDATA
SCPI.CALCulate(1).PARAmeter(2).SElect
s31_raw = SCPI.CALCulate(1).SElected.DATA.SDATA

For i = 0 To 200

    ''' Copy corrected data array to the complex data array
    ''' to take advantage of complex operation library
    s21_Comp = ComplexSet(s21_raw(2 * i), s21_raw(2 * i + 1))
    s31_Comp = ComplexSet(s31_raw(2 * i), s31_raw(2 * i + 1))

    ''' Calculate the ratio of S31 and S21
    ''' S31/S21
    trAce_ratio_comp = ComplexDiv(s31_Comp, s21_Comp)

    trAce_ratio(2 * i) = trAce_ratio_comp.real
    trAce_ratio(2 * i + 1) = trAce_ratio_comp.imag

Next i

SCPI.CALCulate(1).PARAmeter.Count = 4

''' Write "S31/S21" data to corrected data array for the trace 3 (LogMag)
SCPI.CALCulate(1).PARAmeter(3).SElect
SCPI.CALCulate(1).SElected.Format = "MLOG"
SCPI.CALCulate(1).SElected.DATA.SDATA = trAce_ratio

''' Write "S31/S21" data to corrected data array for the trace 4 (Phase)
SCPI.CALCulate(1).PARAmeter(4).SElect
SCPI.CALCulate(1).SElected.Format = "PHASE"
SCPI.CALCulate(1).SElected.DATA.SDATA = trAce_ratio

:
:

```

Complex Operation Library  
**Sample Program**



---

## Manual Changes

To adapt this manual to your E5070B/E5071B, refer to Table A-1 and Table A-2.

**Table A-1** Manual Changes by Serial Number

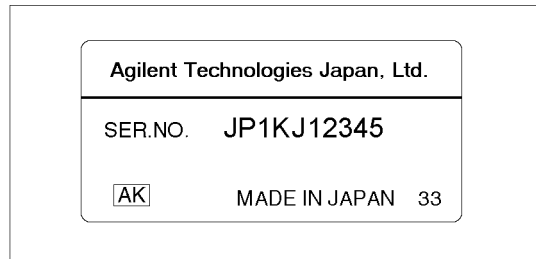
Serial Prefix or Number	Make Manual Changes

**Table A-2** Manual Changes by Firmware Version

Version	Make Manual Changes
3.0x	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



e5070agj029

## Change 1

The firmware revision 3.0x does not support the following COM objects. Please delete their descriptions in this manual.

- **SCPI.CALCulate(Ch).FSIMulator.EMBed.NETWork(Nwk). FILEname** on page 203
- **SCPI.CALCulate(Ch).FSIMulator.EMBed.NETWork(Nwk). TYPE** on page 204
- **SCPI.CALCulate(Ch).FSIMulator.EMBed.STATe** on page 205
- **SCPI.CALCulate(Ch).FSIMulator.EMBed.TOPology.A. PORTs** on page 206
- **SCPI.CALCulate(Ch).FSIMulator.EMBed.TOPology.B. PORTs** on page 207
- **SCPI.CALCulate(Ch).FSIMulator.EMBed.TOPology.C. PORTs** on page 208
- **SCPI.CALCulate(Ch).FSIMulator.EMBed.TYPE** on page 209
- **SCPI.SENSE(Ch).CORRection.COLLEct.ECAL.CCHeck. ACQuire** on page 405
- **SCPI.SENSE(Ch).CORRection.COLLEct.ECAL.UCHar** on page 413
- **SCPI.SENSE(Ch).CORRection.COLLEct.SIMPLified.SAVE** on page 421

The firmware revision 3.0x does not support the following functions. Please delete the descriptions about these functions in this manual

- ❑ Loading and executing program in batch process

Manual Changes  
**Manual Changes**



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