TEXIO
Test and Measurement Solutions

Programming instruction manual

Multi-Range DC Power Supply
PSW-A Series

PSW-360L30A	PSW-720L30A	PSW-1080L30A
PSW-360L80A	PSW-720L80A	PSW-1080L80A
PSW-360M160A	PSW-720M160A	PSW-1080M160A
PSW-360M250A	PSW-720M250A	PSW-1080M250A
PSW-360H800A	PSW-720H800A	PSW-1080H800A

B71-0534-01

CONTENTS

■ About the manual.

In order to be environmentally friendly and reduce waste, we are gradually discontinuing the use of paper or CD manuals that come with our products. Even if there is a description attached to the instruction manual, it may not be attached. The latest version of the instruction manual is posted on our website (https://www.texio.co.jp/download/).

■ About firmware version

The contents described in this document apply to PSW-Multi series main unit firmware version 2.03 or higher.

USING THE PRODUCT SAFELY

■ Preface

To use the product safely, read this instruction manual to the end. Before using this product, understand how to correctly use it.
If you read this manual but you do not understand how to use it, ask us or your local dealer. After you read this manual, save it so that you can read it anytime as required.

■ Notes on reading this instruction manual

◆ The contents of this instruction manual include technical terms in part of their explanation. If you do not understand those terms, do not hesitate to ask us or your local dealer.

■ Pictorial indication and warning character indication

This instruction manual and product show the warning and caution items required to safely use the product. The following pictorial indication and warning character indication are provided.

<Pictorial indication> 	Some part of this product or the instruction manual may show This pictorial indication. In this case, if the product is incorrectly used in that part, a serious danger may be brought about on the user's body or the product. To use the part with this pictorial indication, be sure to refer to this instruction manual.
<Warning character Indication>  **WARNING**	If you use the product, ignoring this indication, you may get killed or seriously injured. This indication shows that the warning item to avoid the danger is provided.
 **CAUTION**	If you incorrectly use the product, ignoring this indication, you may get slightly injured or the product may be damaged. This indication shows that the caution item to avoid the danger is provided.

USING THE PRODUCT SAFELY

WARNING

■ Do not remove the product's covers and panels

Never remove the product's covers and panels for any purpose.
Otherwise, the user's electric shock or a fire may be incurred.

■ Warning on using the product

The warning items given below are to avoid danger to the user's body and life and avoid the damage and deterioration of the product.
Use the product, observing the following warning and caution items.

■ Warning items on power supply

- Power supply voltage
  As the rated power supply voltage of the product, the range from 100 to 240 VAC can be used without being switched.
- Power cord
  Important: The attached power cord set can be used for this device only.
- Protection fuse
  If an input protection fuse is blown, the product does not operate. When the fuse is blown, the user can replace it. However, replace it correctly, observing the warning and caution items that are provided in the section of the instruction manual where the fuse replacement is explained. If the fuse is incorrectly replaced, a fire may occur.
- Changing the power supply voltage
  The rated power supply voltage cannot be changed. Use the product only at the rated power supply voltage indicated on the product. Otherwise, a fire may occur. The product's rated power supply voltage is from 100 to 240 VAC. Use the product in this range. (For use at a voltage higher than 125 VAC, Please confirm the voltage ratings of the power cord.)

■ Warning item on grounding

The product has the GND terminal on the panel surface to protect the user from electric shock and protect the product. Be sure to ground the product to safely use it.

USING THE PRODUCT SAFELY

WARNING

■ Warning item on installation environment

- Operating temperature

  Use the product within the operating temperature indicated in the rating column. If the product is used with the vents of the product blocked or in high ambient temperatures, a fire may occur.

- Operating humidity

  Use the product within the operating humidity indicated in the rating column. Watch out for condensation by a sharp humidity change such as transfer to a room with a different humidity. Also, do not operate the product with wet hands. Otherwise, an electric shock or fire may occur.

- Use in a gas

  Use in and around a place where an inflammable or explosive gas or steam is generated or stored may result in an explosion and fire. Do not operate the product in such an environment.

  Also, use in and around a place where a corrosive gas is generated or spreading causes a serious damage to the product. Do not use the product in such an environment.

- Do not let foreign matter in

  Do not insert metal and flammable materials into the product from its vent and spill water on it. Otherwise, an electric shock and fire may occur.

■ Warning item on abnormality while in use

If smoke or fire is generated from the product while in use, stop using the product, turn off the switch, and remove the power cord plug from the outlet. After confirming that no other devices catch fire, call the company or each sales office.

■ Front Panel

Please do not lift up the product, while touching the front grille.

USING THE PRODUCT SAFELY

CAUTION

■ Input/output terminal

Maximum input to the input terminals is specified to prevent the product from being damaged. Do not supply input, exceeding the specifications that are indicated in the "Rating" or "Caution on use" column in the instruction manual of the product. Otherwise, a product failure is caused. Also, do not supply power to the output terminals from the outside. Otherwise, a product failure is caused.

■ When the product is left unused for a long time

Be sure to remove the power plug from the outlet.

(Calibration)

Although the performance and specifications of the product are checked under strict quality control during shipment from the factory, they may aging rate because of aging rate in its parts. It is recommended to periodically calibrate the product so that it is used with its performance and specifications stable. For consultation about the product calibration, call the dealer or the company or each sales office where you bought the product.

(Daily maintenance)

When you clean off the dirt of the product covers, panels, and knobs, avoid solvents such as thinner and benzene. Otherwise, paint may peel off or the resin surface may be affected.

To wipe off the covers, panels, and knobs, use a soft cloth with neutral detergent in it. During cleaning, be careful that water, detergents, and other foreign matters do not get into the product.

If a liquid or metal gets into the product, an electric shock and fire are caused. During cleaning, remove the power cord plug from the outlet.

Use the product correctly and safely, observing the above warning and caution items. Because the instruction manual indicates caution items even in individual items, observe those caution items to correctly use the product.

If you have questions or comments about the content of the instruction manual, ask us or E-Mail us.

1. REMOTE CONTROL

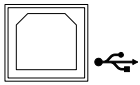
This chapter describes basic configuration of IEEE488.2 based remote control.

1.1. Interface Configuration

1.1.1. Configure USB Remote Interface

USB configuration	PC side connector	Type A, host
	This product side connector	Rear panel Type B, slave
	Speed	1.1/2.0 (full speed/high speed)
	USB Class	CDC (communications device class)

Panel operation

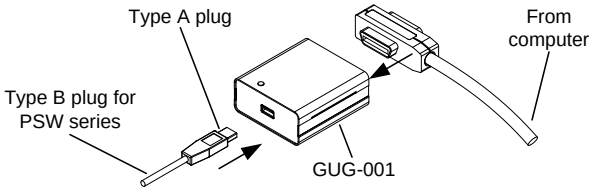
steps	Step instructions
1	Connect the USB cable to the rear panel USB B port. 
2	Press the Function key for the Normal configuration settings. Set the rear panel USB port to USB-CDC. F-22: 2

1.1.2. Configure GPIB Interface

To use GPIB, the optional GP-IB to USB (GUG-001) adapter must be used. The GPIB to USB adapter must be connected before this product is turned on. Only one GP-IB address can be used at a time.

GUG-001 connection and GP-IB settings

steps	Step instructions
1	Ensure this product is power off before proceeding.
2	Connect the USB cable to the rear panel USB B port.
3	Connect the USB cable type A plug to the USB A port of GUG-001. Connect the GP-IB cable from the GP-IB controller to the GP-IB port of GUG-001.



4 Turn this product on.

5 Press the Function key to enter the Normal configuration settings.

Set the real panel USB port to USB Host. F-22: 1

Set the GP-IB address. F-23: 0~30

GP-IB constraints

The maximum number of devices connected in one system is 15, including the controller (PC).

The cable length between each device is 2m or less, and the maximum total cable length in one system is 20m or less.

Loop connections and parallel connections of GP-IB cables are prohibited.

Only one address will be assigned to each device; duplication is prohibited. Also, turn on power to 2/3 of all connected devices.

1.1.3. Configure RS-232C Interface

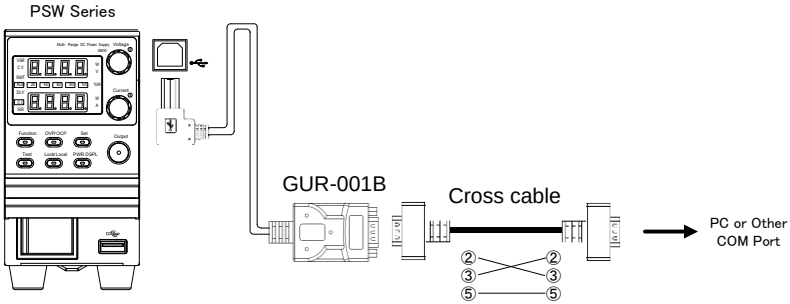
RS-232C control is possible by using the optional GUR-001B (RS-232C to USB) adapter.

GUR-001B connection and RS-232C settings

steps Step instructions

1 Ensure this product is power off before proceeding.

2 Connect the GUR-001B adapter to the USB-B port on the rear panel of this product. Connect to the controller using a cross cable.



3 Turn on the power of this product.

4 Press the Function key to make various RS-232C settings.

Set the real panel USB port to USB Host.	F-22: 1
Set the communication baud rate.	F-71: 0 - 7
Set the data length.	F-72: 0 / 1
Set the parity.	F-73: 0 / 1 / 2
Set the stop bit.	F-74: 0 / 1

RS-232C constraints Use “LF” as the delimiter.

1.1.4. Configure Ethernet Connection

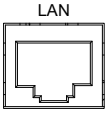
The Ethernet interface can be configured for a number of different applications. Ethernet can be configured for basic remote control or monitoring using a web server or it can be configured as a socket server.

This product supports both DHCP connections so this product can be automatically connected to an existing network or alternatively, network settings can be manually configured.

Ethernet configuration Parameters	
MAC Address (display only)	LAN
DHCP	IP Address
Subnet Mask	Gateway
DNS Address	Sockets Active
Web Server Active	Web Password Active
Web set password	0000~9999 (default 0000)
Port number: 2268 (fixed)	

Web Server Configuration

This configuration example will configure this product as a web server and use DHCP to automatically assign an IP address to this product.

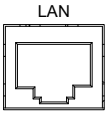
steps	Step instructions	
1	Connect the Ethernet cable from the network to the Ethernet port on the rear panel.	
2	Press the Function key for the Normal configuration settings.	
	Set the following LAN settings:	
	Enable LAN	F-36: 1
	Turn DHCP to enable	F-37: 1
	Turn the web server on	F-59: 1

Note — It may be necessary to cycle the power or refresh the web browser to connect to a network.

Sockets Server Configuration

This configuration example will configure this product sockets server.

The configuration settings instructions will manually assign an IP address to this product and enable the socket server. The socket server port number is 2268 (fixed) and cannot be set.

steps	Step instructions	
1	Connect the Ethernet cable from the network to the Ethernet port on the rear panel.	
2	Press the Function key for the Normal configuration settings.	
	Set the following LAN settings:	
	Enable LAN	F-36: 1
	Turn DHCP to disable	F-37: 0
	IP Address part 1 of 4	F-39: 172
	IP Address part 2 of 4	F-40: 16
	IP Address part 3 of 4	F-41: 5
	IP Address part 4 of 4	F-42: 133
	Subnet Mask part 1 of 4	F-43: 255
	Subnet Mask part 2 of 4	F-44: 255
	Subnet Mask part 3 of 4	F-45: 128
	Subnet Mask part 4 of 4	F-46: 0
	Gateway part 1 of 4	F-43: 172
	Gateway part 2 of 4	F-44: 16
	Gateway part 3 of 4	F-45: 21

Gateway part 4 of 4	F-46: 101
Enable Sockets	F-57: 1

1.1.5. USB Remote Control Function Check

Functionality check

Invoke a terminal application such as Realterm. This product will appear as a COM port on the PC.

To check the COM port No, see the Device Manager in the PC.

Note

For more information about sending and receiving remote commands using the Terminal application over a USB connection, refer to page 9.

Run this query command via the terminal after this product has been configured for USB remote control.

*idn?

This will return the manufacturer, model number, serial number, and firmware version.

Note

Please refer to the programming manual for details.

1.1.6. Using Realterm to Establish a Remote Connection

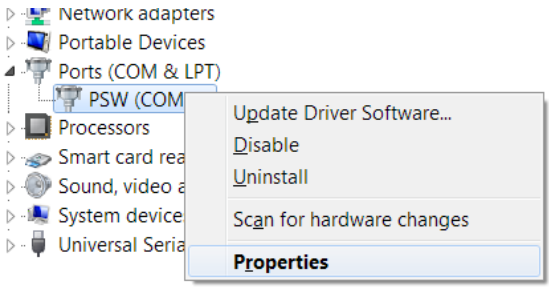
Realterm is a terminal program that can be used to communicate with a device attached to the serial port of a PC or via an emulated serial port via USB.

The following instructions apply to version 2.0.0.70. Even though Realterm is used as an example to establish a remote connection, any terminal program can be used that has similar functionality.

Note

Realterm can be downloaded for free on the Internet.

steps	Step instructions
1	Download Realterm and install according to the instructions on the Realterm website.
2	Connect this product via USB.
3	Find the COM port number to which this product is connected from Windows Device Manager. Double click the Ports icon to reveal the connected serial port devices and the COM port for each connected device. The baud rate, stop bit and parity settings can be viewed for the virtual COM port by right-clicking connected device and selecting the Properties option.



4 Start Realterm on the PC as an administrator.

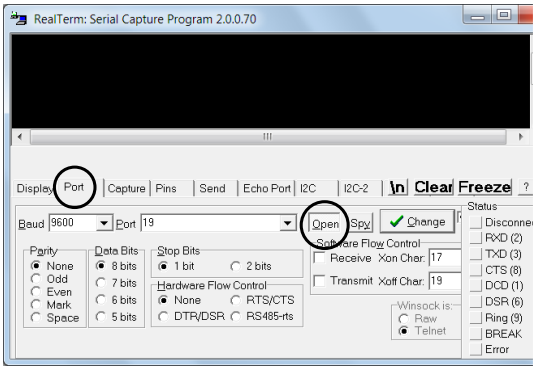
Tip: to run as an administrator, you can right click the Realterm icon in the Windows Start menu and select the Run as Administrator option.

5 After Realterm has started, click on the Port tab.

Enter settings for the connection's baud rate, parity, data bits, stop bits, and port number.

The Hardware Flow Control, Software Flow Control options can be left at the default settings.

Press Open to connect to this product.



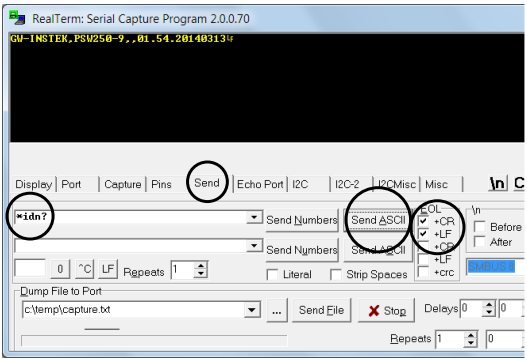
6 Click on the Send tab.

In the EOL configuration, check on the +CR and +LF check boxes.

Enter the query:

*idn?

Click on Send ASCII.



7 The terminal display will return the following:
manufacturer, model, serial number, version

8 If Realterm fails to connect to this product, please check all the cables and settings and try again.

1.1.7. GP-IB Remote Control Function Check

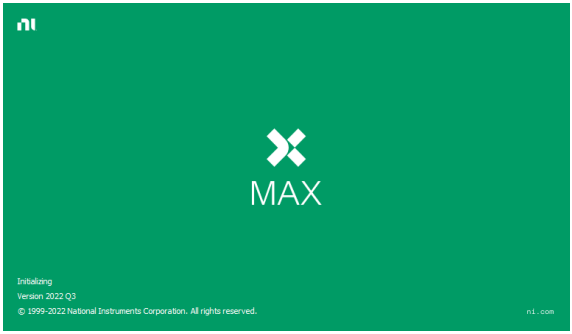
Its possible use National Instruments Measurement and Automation Explorer (NI MAX) to check if GP-IB connection is working properly. Use of NI MAX requires NI-VISA to be installed.

After installing NI-VISA, download NI-488.2 and complete the installation. NI-488.2 can be downloaded from the NI website www.ni.com. Find it on the NI website by searching for "NI-488.2 Download."

The following feature checks are based on version 2022 Q3.

Note — NI-VISA can be downloaded from the NI website www.ni.com. Find it on the NI website by searching for "NI-VISA Download."

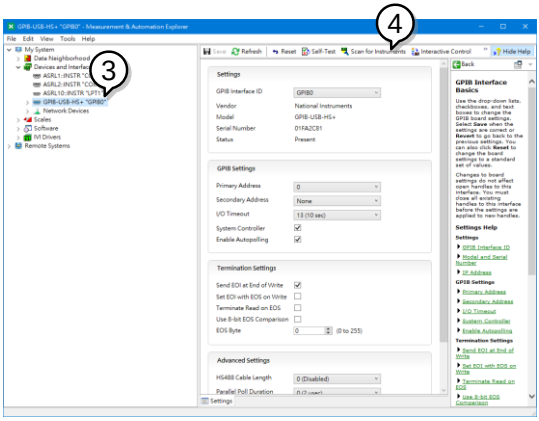
steps	Step instructions
1	Complete the setup steps above.
2	Start the Measurement and Automation Explorer (MAX) program. When using Windows, click in the following order: Start > All Programs > National Instruments > NI MAX



The Measurement & Automation Explorer initial splash screen.

3 From the Configuration panel access;
My System>Devices and Interfaces>GPIB0(GPIB-USB-HS+)

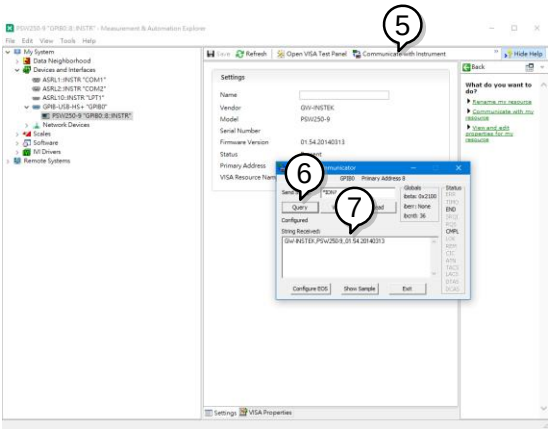
4 Press the Scan for Instruments button.



5 Click on Communicate with Instrument.

6 In the NI-488.2 Communicator window, enter "*IDN?" in the Send String text box.
Click on the Query button to send the *IDN?

7 The String Received text box will display the query return: manufacturer, model, serial number, version



8 The function check is complete.

1.1.8. Socket Server Function Check

Its possible use National Instruments Measurement and Automation Explorer (NI MAX) to check if soket server connection is working properly. Use of NI MAX requires NI-VISA to be installed.

The following feature checks are based on version 2022 Q3.

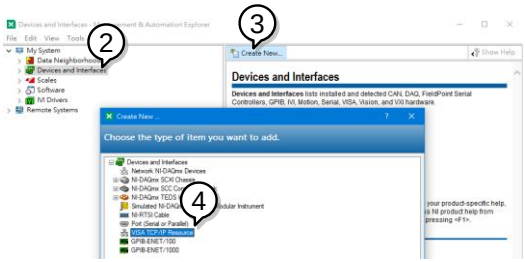
Note NI-VISA can be downloaded from the NI website www.ni.com. Find it on the NI website by searching for "NI-VISA Download."

steps	Step instructions
1	Start the NI Measurement and Automation Explorer (MAX) program. When using Windows, click in the following order: Start > All Programs > National Instruments > Measurement & Automation

2 From the Configuration panel access;
My System > Devices and Interfaces > Network Devices

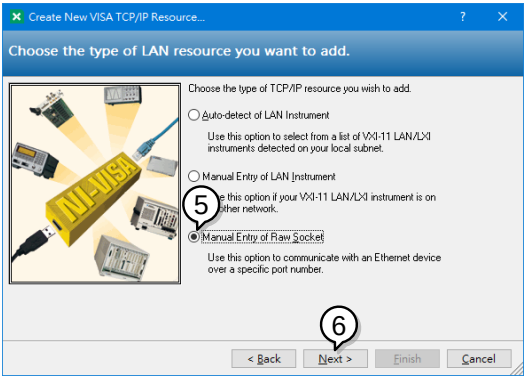
3 Click Create New... .

4 Select VISA TCP/IP Resource.



5 Select Manual Entry of Raw Socket from the popup window.

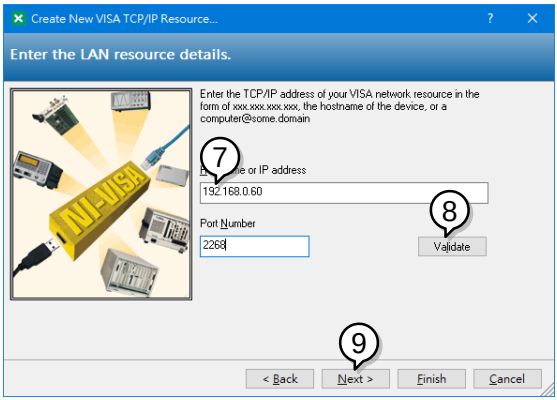
6 Click Next.



7 Enter the IP address and the port number of this product. The port number is fixed at 2268.

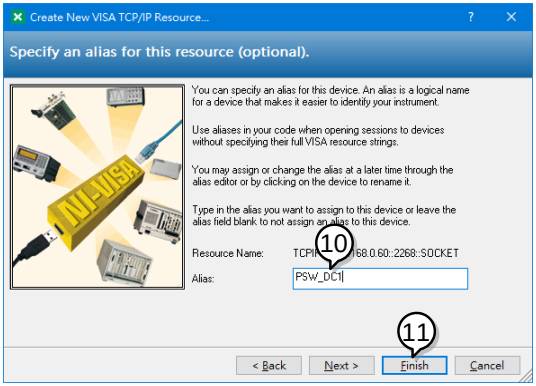
8 Click the Validate button. A popup box will appear when successful.

9 Click Next.



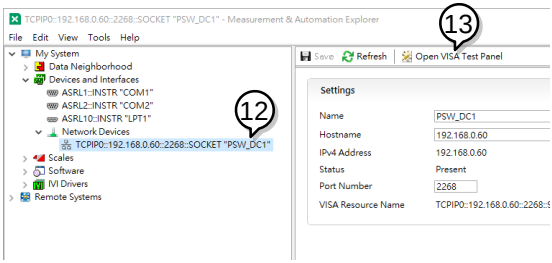
10 Next configure the Alias (name) of this product connection. In this example the Alias is: PSW_DC1

11 Click finish.



12 The IP address of this product will now appear under Network Devices in the configuration panel. Select this icon.

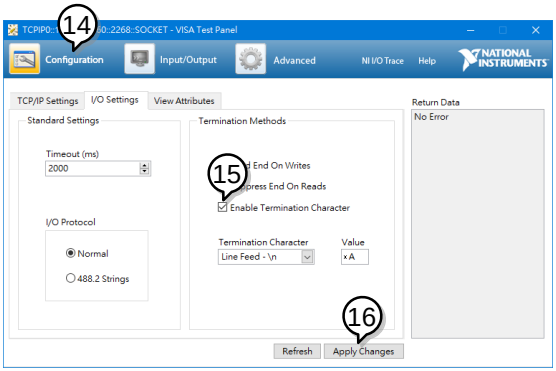
13 Press Open VISA Test Panel.



14 Click Configuration icon.

15 In the I/O Settings tab, select the Enable Termination Character check box. Ensure Line Feed - :\n is selected as the line feed character.

16 Click Apply Changes.

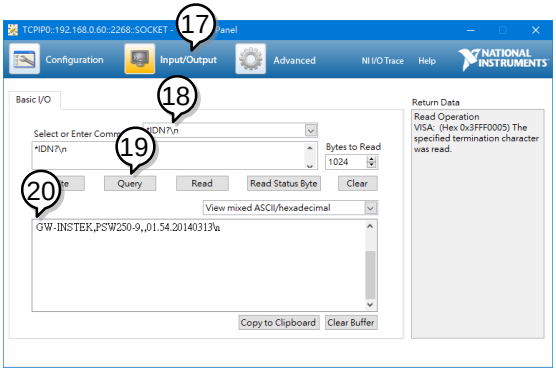


17 Click the Input/Output icon.

18 Ensure *IDN? :\n is selected in the Select or Enter Command dropdown text box.

19 Click the Query button.

20 The *IDN? query should be returned to the buffer area:



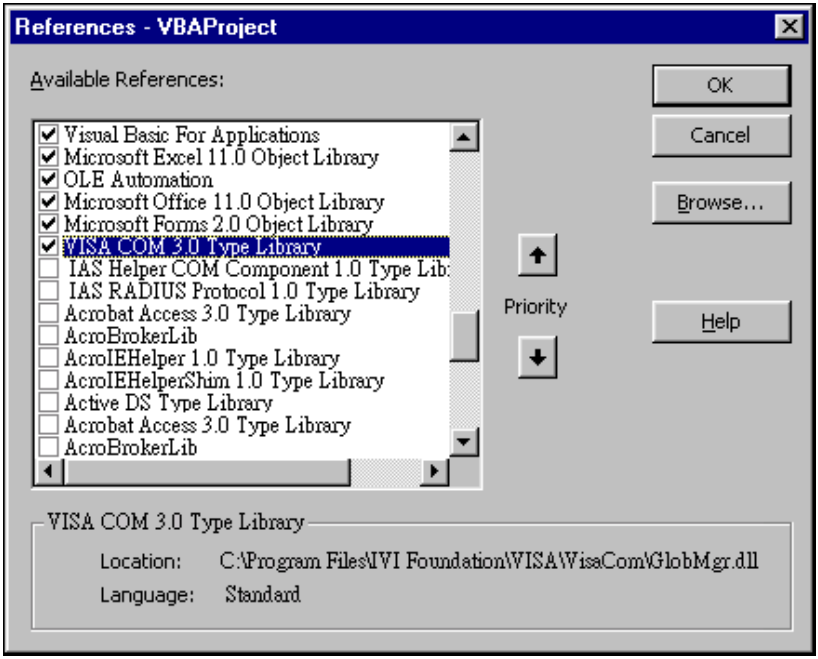
Note Please refer to the programming manual for more information.

1.2. Socket Server Examples

1.2.1. Visual Basic Example

The following visual basic programming example uses the VISA COM 3.0

Type Library. The example will connect to this product using the IP address of 172.15.5.133 over port 2268. The program will send the *IDN? to this product, print the return string and then close the connection.



```
'Create VISA ResourceManager object
    Dim rm As New VisaComLib.ResourceManager
    Dim accessMode As VisaComLib.accessMode
    Dim serial As String
    Dim timeOut As Integer
    Dim optionString As String
    Dim psw As VisaComLib.IMessage
    Dim pswcom As VisaComLib.FormattedIO488
    Dim pswsfc As VisaComLib.IAsyncMessage


Private Sub CommandButton1_Click()
    accessMode = VisaComLib.accessMode.NO_LOCK

    timeOut = 0

    optionString = ""

    'Connect to the PSW

    Set psw = rm.Open("TCPIP0::172.16.5.133::2268::SOCKET", _
        accessMode, _
        timeOut, _
        optionString)
    Set pswsfc = psw
    pswsfc.TerminationCharacterEnabled = True

    'Query the System Identify Name
    psw.WriteString ("*IDN?" & vbLf)

    Worksheets("Sheet1").Cells(1, 5) = psw.ReadString(256)

    'Close the communication
    psw.Close

End Sub
```

1.2.2. C++ Example

The following program creates a connection to this product and sets the voltage to 3.3 volts and the current 1.5 amps. The voltage and current reading are then read back and the connection is closed.

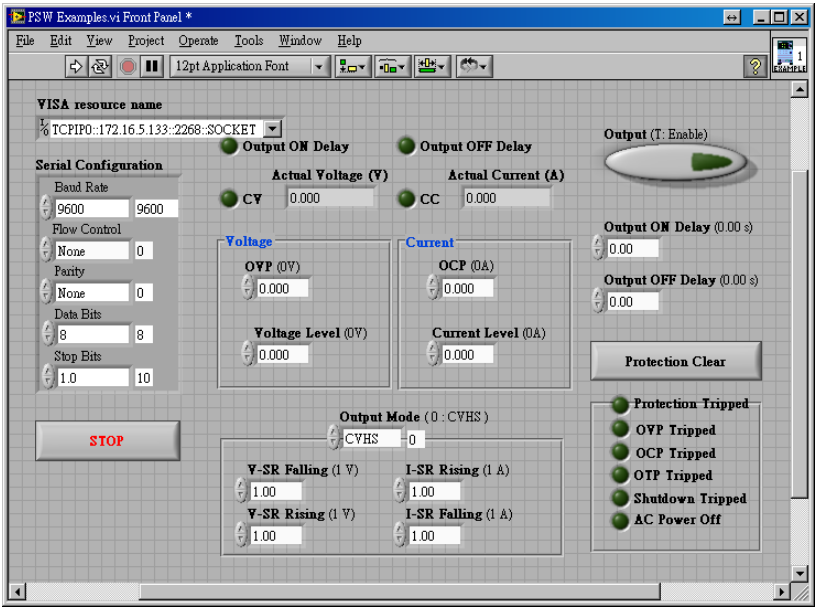

Note

Add visa32.lib to the project library when building the following sample program.

```
#include "stdio.h"
#include "string.h"
#include "visatype.h"
#include "visa.h"
#define IPaddr "172.16.20.181"
int main(int argc, char* argv[])
{
    ViSession defaultRm, instr;
    // Create VISA ResourceManager object
    ViStatus status = viOpenDefaultRM(&defaultRm);
    if (status < VI_SUCCESS)
    {
        // Initialization error
        return -1;
    }
    ViChar rsc[256];
    sprintf(rsc, "TCPIP0::%s::2268::SOCKET", IPaddr);
    ViAccessMode accessMode = VI_NO_LOCK;
    ViUInt32 timeout = 0;
    // Connect the device
    viOpen(defaultRm, rsc, accessMode, timeout, &instr);
    /* Set the timeout for message-based communication          */
    status = viSetAttribute(instr, VI_ATTR_TMO_VALUE, 5000);
    status = viSetAttribute(instr, VI_ATTR_TERMCHAR, 10);
    status = viSetAttribute(instr,  VI_ATTR_TERMCHAR_EN, VI_TRUE);
    ViUInt32 count;
    // Set the Voltage to 3.3, Current to 1.5
    ViBuf buf = (ViBuf)":volt 3.3;:curr 1.5\n";
    viWrite(instr, buf, (ViUInt32)strlen((ViPChar)buf), &count);

    // Query the Voltage, and Current
    buf = (ViBuf)":apply?\n";
    status =viWrite(instr, buf, (ViUInt32)strlen((ViPChar)buf), &count);
    ViChar result[257];
    status =viRead(instr, (ViPBuf)result, 256, &count);
    if (status=VI_SUCCESS_TERM_CHAR)
    {
      result[count] = 0;
      printf("Voltage(V), Current(A)= %s\n", result);
    }else
      printf("Error\n");

    // Close the device
    viClose(instr);
    viClose(defaultRm);

    return 0;
}
```

1.2.3. LabVIEW Example

The following picture shows a LabView programming example for this product.


PSW Examples.vi Front Panel *
File Edit View Project Operate Tools Window Help
12pt Application Font
VISA resource name
TCPIP0::172.16.5.133::2268::SOCKET
Serial Configuration
Baud Rate
9600
9600
Flow Control
None
0
Parity
None
0
Data Bits
8
8
Stop Bits
1.0
10
STOP
Output ON Delay
Output OFF Delay
Actual Voltage (V)
Actual Current (A)
CV
0.000
CC
0.000
Voltage
OVP (0V)
0.000
Voltage Level (0V)
0.000
Current
OCP (0A)
0.000
Current Level (0A)
0.000
Output Mode (0 : CVHS)
CVHS
0
V-SR Falling (1 V)
1.00
V-SR Rising (1 V)
1.00
I-SR Rising (1 A)
1.00
I-SR Falling (1 A)
1.00
Output (T: Enable)
Output ON Delay (0.00 s)
0.00
Output OFF Delay (0.00 s)
0.00
Protection Clear
Protection Tripped
OVP Tripped
OCP Tripped
OTP Tripped
Shutdown Tripped
AC Power Off

2. Command

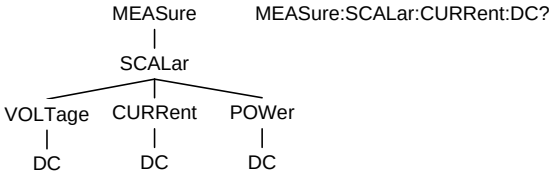
2.1. Command Syntax

Compatible Standard	IEEE488.2	Partial compatibility
	SCPI, 1999	Partial compatibility

Command Structure

SCPI commands follow a tree-like structure, organized into nodes. Each level of the command tree is a node. Each keyword in a SCPI command represents each node in the command tree. Each keyword (node) of a SCPI command is separated by a colon (:).

For example, the diagram below shows an SCPI sub-structure and a command example.



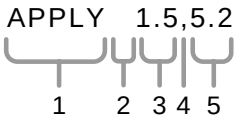
Command types

There are many different instrument commands and queries. Commands send instructions or data to a unit, and queries receive data or status information from a unit.

Types	Description
Single command	A single command with/without a parameter. Example “*IDN?”
Query command	A query is a simple or compound command followed by a question mark (?). A parameter (data) is returned. Example “meas:curr:dc?”
Compound command	Two or more commands on the same command line. Compound commands are separated with either a semi-colon (;) or a semi-colon and a colon (;:). A semi-colon is used to join two related commands, with the caveat that the last command must begin at the last node of the first command. A semi-colon and colon are used to combine two commands from different nodes. Example “meas:volt:dc?;:meas:curr:dc?”

Command Forms

Commands and queries have two different forms, long and short. The command syntax is written with the short

	form of the command in capitals and the remainder (long form) in lower case. The commands can be written in capitals or lower-case, just so long as the short or long forms are complete. An incomplete command will not be recognized. Below are examples of correctly written commands.
Long form example	STATus:OPERation:NTRansition? STATUS:OPERATION:NTRANSITION? status:operation:ntransition?
Short form example	STAT:OPER:NTR? stat:oper:ntr?
Square Brackets	Commands that contain square brackets indicate that the contents are optional. The function of the command is the same with or without the square bracketed items, as shown below. Both “DISPlay:MENU[:NAME]?” and “DISPlay:MENU?” are both valid forms.
Command Format	 1: Command header 2: Space (half-width) 3: Parameter 1 4: Comma (no space before/after comma) 5: Parameter 2

Parameters	Type	Description	Example
	<Boolean>	Boolean logic	0, 1
	<NR1>	integers	0, 1, 2, 3
	<NR2>	Number with decimal point	0.1, 3.14, 8.5
	<NR3>	Numbers containing floating points	4.5e-1, 8.25e+1
	<NRf>	Either NR1, 2, or 3	1, 1.5, 4.5e-1
	<block data>	Definitive length arbitrary block data. A single decimal digit followed by data. The decimal digit specifies how many 8-bit data bytes follow.	

End code	LF	Line feed code

2.2. Command List

2.2.1. Abort Commands

Command name	Overview	Page
ABORt	Cancel all trigger operations	31

2.2.2. Apply Commands

Command name	Overview	Page
APPLy	Set both voltage and current values	31

2.2.3. Display Commands

Command name	Overview	Page
DISPlay:MENU[:NAME]	Select and query display menu	32
DISPlay[:WINDow] :TEXT:CLEar	Clear the text on the display	32
DISPlay[:WINDow] :TEXT[:DATA]	Set and query the text on the display	33
DISPlay:BLINk	Set and query turning on/off the flashing display	33

2.2.4. Initiate Commands

Command name	Overview	Page
INITiate[:IMMediate]:NAME	Initiate TRANsient or OUTPut trigger	34

2.2.5. Measure Commands

Command name	Overview	Page
MEASure[:SCALar] :ALL[:DC]	Returns the measured average output current and voltage.	35
MEASure[:SCALar] :CURRent[:DC]	Returns the measured average output current.	35
MEASure[:SCALar] :VOLTage[:DC]	Returns the measured average output voltage.	35
MEASure[:SCALar] :POWer[:DC]	Returns the measured average output power.	35

2.2.6. Output Commands

Command name	Overview	Page
OUTPut:DELay:ON	Set and query output on delay time	36
OUTPut:DELay:OFF	Set and query output off delay time	36
OUTPut:MODE	Select and query the V-I mode	37
OUTPut[:STATe] [:IMMediate]	Set and query output on/off	37
OUTPut[:STATe]:TRIGgered	Set and query output on/off when software trigger occurs	38
OUTPut:PROTection:CLEar	Clear the operating status of the protection circuit	38
OUTPut:PROTection :TRIPped	Returns the protection circuit operating status.	38

2.2.7. Sense Command

Command name	Overview	Page
SENSe:AVERage:COUNt	Set and query measurement averaging level	39
SENSe:DLOG:PERiod	Sets and queries the logging interval for the logging function.	39
SENSe:DLOG:STATe	Sets and queries the logging function operation settings and data output destination.	40

2.2.8. Status Commands

Command name	Overview	Page
STATus:OPERation [:EVENt]	Operation Status Event register.	41
STATus:OPERation :CONDition	Query the Operation Status Condition register.	41
STATus:OPERation:ENABle	Set and query the Operation Status Enable register.	42
STATus:OPERation :PTRansition	Set or query the Positive Transition filter of the Operation Status register.	42

STATus:OPERation :NTRansition	Set and query the Negative Transition filter of the Operation Status register.	43
STATus:QUEStionable [:EVENt]	Query the Questionable Status Event register.	43
STATus:QUEStionable :CONDition	Query the Questionable Status Condition register.	43
STATus:QUEStionable :ENABle	Set and query the Questionable Status Enable register.	44
STATus:QUEStionable :PTRansition	Set and query the Positive Transition filter of the Questionable Status register.	44
STATus:QUEStionable :NTRansition	Set and query the Negative Transition filter of the Questionable Status register.	45
STATus:PRESet	Reset registers/filters to default values.	45

2.2.9. Source Commands

Command name	Overview	Page
[SOURce:]CURRent [:LEVel][:IMMediate] [:AMPLitude]	Sets or queries the current value in A unit.	46
SOURce:]CURRent [:LEVel]:TRIGgered [:AMPLitude]	Sets or queries the setting current value when the software trigger is generated.	47
[SOURce:]CURRent :PROTection[:LEVel]	Sets or queries the OCP value.	47
[SOURce:]CURRent :PROTection:STATe	Turns OCP on or off.	48
[SOURce:]CURRent :SLEW:RISing	Sets or queries the rising current slew rate.	49
[SOURce:]CURRent :SLEW:FALLing	Sets or queries the falling current slew rate.	49
[SOURce:]RESistance [:LEVel][:IMMediate] [:AMPLitude]	Sets or queries the internal resistance.	50
[SOURce:]VOLTage	Sets or queries the setting	51

[:LEVel][:IMMediate] [:AMPLitude]	voltage value.	
[SOURce:]VOLTage[:LEVel] :TRIGgered[:AMPLitude]	Sets or queries the setting voltage value when the software trigger is generated.	51
[SOURce:]VOLTage :PROTection[:LEVel]	Sets or queries the OVP value.	52
[SOURce:]VOLTage :SLEW:RISing	Sets or queries the rising voltage slew rate.	53
[SOURce:]VOLTage :SLEW:FALLing	Sets or queries the falling voltage slew rate.	54
[:SOURce]:VOLTage :PROTection:LOW:STATe	Sets or queries the enable/disable of tUVP function.	54
[:SOURce]:VOLTage :PROTection:LOW:DELay	Sets or queries the tUVP delay time.	55
:SOURce]:VOLTage :PROTection:LOW[:LEVel]	Sets or queries the tUVP voltage level.	56

2.2.10. Trigger Commands

Command name	Overview	Page
TRIGger:TRANsient [:IMMediate]	Generates a software trigger.	56
TRIGger:TRANsient :SOURce	Sets or queries the trigger source for the transient system.	57
TRIGger:OUTPut [:IMMediate]	Generates a software trigger for the output trigger system.	57
TRIGger:OUTPut:SOURce	Sets or queries the trigger source for the output system.	57
[:SOURce]:VOLTage :PROTection:LOW:STATe	Sets or queries the enable/disable of tUVP function.	54
[:SOURce]:VOLTage :PROTection:LOW:DELay	Sets or queries the tUVP delay time.	55
:SOURce]:VOLTage :PROTection:LOW[:LEVel]	Sets or queries the tUVP voltage level.	56

2.2.11. System Commands

Command name	Overview	Page
SYSTem:BEEPer [:IMMediate]	Sets or queries the duration of the buzzer from this product.	58
SYSTem:CONFigure :BEEPer[:STATe]	Sets or queries the buzzer state on/off.	59
SYSTem:CONFigure :BLEeder[:STATe]	Sets or queries the status of the bleeder resistor.	59
SYSTem:CONFigure :BTRip[:IMMediate]	Trips the power switch. Even if this command is executed, the power switch will not be tripped.	60
SYSTem:CONFigure :BTRip:PROTection	Enables/Disables the power switch trip when the OVP or OCP protection are tripped. Even if this command is executed, the power switch will not be tripped.	60
SYSTem:CONFigure :CURRent:CONTrol	Sets or queries the CC control mode.	61
SYSTem:CONFigure :VOLTage:CONTrol	Sets or queries the CV control mode.	61
SYSTem:CONFigure :MSLave	Sets or queries parallel and series operation of equipment.	62
SYSTem:CONFigure :OUTPut:EXTernal[:MODE]	Sets or queries the external output logic.	63
SYSTem:CONFigure :OUTPut:PON[:STATe]	Sets or queries the unit to turn the output ON/OFF at power-up.	63
SYSTem:COMMunicate :ENABle	Enables/disables or queries remote interfaces and remote services.	64
SYSTem:COMMunicate :GPIB[:SELF]:ADDRess	Sets or queries the GP-IB address.	65
SYSTem:COMMunicate :LAN:IPADdress	Sets or queries LAN IP address.	65
SYSTem:COMMunicate :LAN:GATEway	Sets or queries the Gateway address.	66
SYSTem:COMMunicate	Sets or queries the LAN	66

:LAN:SMASk	subnet mask.	
SYSTem:COMMunicate :LAN:MAC	Returns the unit MAC address.	67
SYSTem:COMMunicate :LAN:DHCP	Sets or queries the turns DHCP on/off.	67
SYSTem:COMMunicate :LAN:DNS	Sets or queries the DNS address.	67
SYSTem:COMMunicate :LAN:HOSTname	Returns the host name.	68
SYSTem:COMMunicate :LAN:WEB:PACTive	Sets or queries whether the web password is on or off.	68
SYSTem:COMMunicate :LAN:WEB:PASSword	Sets or queries the web password.	69
SYSTem:COMMunicate :RLSTate	Sets or queries the control state of the instrument.	69
SYSTem:COMMunicate :USB:FRONt:STATe	Queries the front panel USB-A port state.	70
SYSTem:COMMunicate :USB:REAR:STATe	Queries the rear panel USB-B port state.	70
SYSTem:COMMunicate :USB:REAR:MODE	Sets or queries the rear panel USB-B port mode.	70
SYSTem:ERRor	Queries the error queue.	71
SYSTem:KEYLock:MODE	Sets or queries the output key operation in panel locked.	71
SYSTem:KLOCk	Sets or queries the front panel control as enables or disables.	72
SYSTem:INFormation	Queries the system information.	72
SYSTem:PRESet	Resets all the settings to the factory default settings.	73
SYSTem:VERSion	Returns the version of the SCPI specifications that the unit complies with.	73

2.2.12. Logging function commands

Command name	Overview	Page
FETCh:DLOG	Return logging data.	73

2.2.13. Fan stop function command

Command name	Overview	Page
CONTrol:FAN:STOP:STATe	Sets and queries the fan stop function.	75

2.2.14. Common Commands

Command name	Overview	Page
*CLS	Clear various registers.	76
*ESE	Sets or queries the Standard Event Status Enable register.	76
*ESR	Queries the Standard Event Status register.	76
*IDN	Queries the instrument ID.	77
*OPC	After all commands are processed, set the OPC bit in the Standard Event Status register. Returns 1 after all outstanding commands are completed.	77
*RST	Performs the instrument reset.	77
*SRE	Sets or queries the Service Request Enable register.	78
*STB	Queries the Status Byte register.	78
*TRG	Generate a trigger.	79
*TST	Executes a self test.	79
*WAI	No other commands or queries are executed until the outstanding command completes.	79

2.3. Command description

2.3.1. Abort Command

ABORt	Set →

Description	The ABORt command cancels all trigger actions. There is no response.
Syntax	ABORt

2.3.2. APPLy Command

APPLy	Set → → Query

Description	The APPLy command is used to set both the voltage and current. The voltage and current will be output as soon as the function is executed if the programmed values are within the accepted range. An execution error will occur if the programmed values are not within accepted ranges. The Apply command will set the voltage/current values but these values will not be reflected on the display until the Output is On or if the DISPlay:MENU:NAME 3 (set menu) command is used.	
Syntax	APPLy {<voltage>|MIN|MAX}[,{<current>|MIN|MAX}]	
Parameter	<voltage>	<NRf>: Configurable voltage value
	<current>	<NRf>: Configurable current value
	MIN	Minimum value of setting range.
	MAX	Maximum value of setting range.
Example	APPL 5.05,1.1 Sets the voltage and current to 5.05V and 1.1A.	
Query Syntax	APPLy?	
Return parameter	<NRf>: Already set voltage/current values	
Example	APPL? +5.050, +1.100 Returns voltage (5.05V) and current (1.1A) setting.	

2.3.3. Display Commands

DISPlay:MENU[:NAME]

Set → / → Query

Description	The DISPlay MENU command selects a screen menu or queries the current screen menu.	
Syntax	DISPlay:MENU[:NAME] <NR1>	
Parameter	<NR1>	
	0	Measurement Voltage Measurement Current
	1	Measurement Voltage Measurement Power
	2	Measurement Power Measurement Current
	3	Setting Voltage/Current value
	4	Setting OVP / OCP value
	55～99	Not Used
	100～199	Contents of F-00~99
Example	DISP:MENU:NAME 0 Set the display to the measurement voltage value and measurement current value.	
Query Syntax	DISPlay:MENU[:NAME]?	
Return parameter	Same as syntax parameter	
Example	DISPlay:MENU? 0 Display contents are Measurement Voltage and Measurement Current.	

DISPlay[:WINDow]:TEXT:CLEar

Set →

Description	Erases the text on the display set with the DISPlay[:WINDow]:TEXT[:DATA] command.
Syntax	DISPlay[:WINDow]:TEXT:CLEar
Example	DISP:TEXT:CLE Clears the text on display.

DISPlay[:WINDow]:TEXT[:DATA]

Set → / → Query

Description	Sets and queries the text displayed on the display. Setting the text overwrites the displayed text. Overwriting the display area with a shorter string may or may not overwrite the screen. Strings must be enclosed in quotes: "STRING". <string> can only contain ASCII characters 20H to 7EH.	
Syntax	DISPlay[:WINDow]:TEXT[:DATA] <string>	
Parameter	<string>	ASCII character 20H to 7EH can be used to in the string parameter. The string must be enclosed in quotes: “STRING”
Example	DISP:WIND:TEXT:DATA “STRING” Set the display section display to STRING.	
Query Syntax	DISPlay[:WINDow]:TEXT[:DATA]?	
Return parameter	Same as syntax parameter	
Example	DISP:WIND:TEXT:DATA? “STRING” Returns the text string set in the display area.	

DISPlay:BLINk

Set → / → Query

Description	Turns blink on or off for the display.	
Syntax	DISPlay:BLINk {0|1|OFF|ON}	
Parameter	0 / OFF	Turns blink OFF
	1 / ON	Turns blink ON
Example	DISP:BLIN ON,(@2) Turn on the blinking of display.	
Query Syntax	DISPlay:BLINk?	
Return parameter	0	Blink is off
	1	Blink is on
Example	DISP:BLIN? 0 Display is blink off state.	

2.3.4. Initiate Command

INITiate[:IMMediate]:NAME Set →

Description	The INITiate command starts the TRANsient or OUTPut trigger. Refer to “Trigger commands” on page 56.
Syntax	INITiate[:IMMediate]:NAME {TRANsient|OUTPut}
Parameter	TRANsient Starts the TRANsient trigger. OUTPut Starts the OUTPut trigger.
Example 1	Setting the transient system using triggers in immediate mode. TRIG:TRAN:SOUR IMM CURR:TRIG MAX VOLT:TRIG 5 **INIT:NAME TRAN** With this command, current and voltage will change to maximum current and 5V.
Example 2	Setting the transient system using triggers in BUS mode. TRIG:TRAN:SOUR BUS CURR:TRIG MAX VOLT:TRIG 5 **INIT:NAME TRAN** TRIG:TRAN (or *TRG) With TRIG:TRAN (or *TRG) command, current and voltage will change to maximum current and 5V.
Example 3	Setting the output system using triggers in immediate mode. TRIG:OUTP:SOUR IMM OUTP:TRIG 1 **INIT:NAME OUTP** With this command, the output changes to ON.
Example 4	The output system for the trigger in BUS mode. TRIG:OUTP:SOUR BUS OUTP:TRIG 1 **INIT:NAME OUTP** TRIG:OUTP (or *TRG) With TRIG:TRAN (or *TRG) command, the output

	changes to ON.

2.3.5. Measure Commands

MEASure[:SCALar]:ALL[:DC] → Query

Description	Returns the measurement average output current and voltage.
Query Syntax	MEASure[:SCALar]:ALL[:DC]?
Return parameter	<voltage>,<current> Returns the voltage (V) and current (A).
Example	MEAS:ALL? +5.000,+1.000 Output voltage and current value are 5.000V, 1.000A.

MEASure[:SCALar]:CURRent[:DC] → Query

Description	Returns the measurement average output current.
Query Syntax	MEASure[:SCALar]:CURRent[:DC]?
Return parameter	<current> Returns the current (A).
Example	MEASure:CURR? +1.000 Output current value is 1.000A

MEASure[:SCALar]:VOLTage[:DC] → Query

Description	Returns the measurement average output voltage.
Query Syntax	MEASure[:SCALar]:VOLTage[:DC]?
Return parameter	<voltage> Returns the voltage (V).
Example	MEASure:VOLT? +5.000 Output voltage value is 5.000V

MEASure[:SCALar]:POWer[:DC] → Query

Description	Returns the measurement average output power.
Query Syntax	MEASure[:SCALar]:POWer[:DC]?

Return parameter	<power> Returns the power (W).
Example	MEASure:POWer? +5 Output power value is 5W

2.3.6. Output Commands

Set →
→ Query

OUTPut:DELay:ON

Description	Sets the Delay Time in seconds for turning the output on. The delay is set to 0.00 by default.	
Syntax	OUTPut:DELay:ON <NRf>	
Parameter	<NR3>	0.00~99.99 seconds, where 0=no delay.
Example	OUTP:DEL:ON 1,(@2) Set the output on delay time to 1 second.	
Query Syntax	OUTPut:DELay:ON? [(@chanlist)]	
Return parameter	<NR3>	Returns the delay on time for output on in seconds.
Example	OUTP:DEL:ON? +10.00 The output on delay time setting value is 10 seconds.	

Set →
→ Query

OUTPut:DELay:OFF

Description	Sets the Delay Time in seconds for turning the output off. The delay is set to 0.00 by default.	
Syntax	OUTPut:DELay:OFF <NRf>	
Parameter	<NR3>	0.00~99.99 seconds, where 0=no delay.
Example	OUTP:DEL:OFF 1 Set the output off delay time to 1 second.	
Query Syntax	OUTPut:DELay:OFF?	
Return parameter	<NR3>	Returns the delay on time for output off in seconds.
Example	OUTP:DEL:OFF? +10.00	

	The output off delay time setting value is 10 seconds.

OUTPut:MODE

Set / Query

Description	Sets this product output mode. This is the equivalent to the F-03 (V-I Mode Slew Rate Select) settings.	
Syntax	OUTPut:MODE {<NR1>|CVHS|CCHS|CVLS|CCLS}	
Parameter	0 / CVHS	CV high speed priority
	1 / CCHS	CC high speed priority
	2 / CVLS	CV slew rate priority
	3 / CCLS	CC slew rate priority
Example	OUTP:MODE CVHS Set V-I mode slew rate to CV high speed priority.	
Query Syntax	OUTPut:MODE? [(@chanlist)]	
Return parameter	0	CV high speed priority
	1	CC high speed priority
	2	CV slew rate priority
	3	CC slew rate priority
Example	OUTP:MODE? 0 The V-I mode slew rate is set to CV high speed priority.	

OUTPut[:STATe][:IMMediate]

Set / Query

Description	Turns the output on or off.	
Syntax	OUTPut[:STATe][:IMMediate] {OFF|ON|0|1}	
Parameter	0 / OFF	Turns the output off.
	1 / ON	Turns the output on.
Example	OUTP ON Turn on output.	
Query Syntax	OUTPut[:STATe][:IMMediate]?	
Return parameter	0	Output off state
	1	Output on state
Example	OUTP?	

	1 Output is on.	

OUTPut[:STATe]:TRIGgered

Set → / → Query

Description	Turns the output on or off when a software trigger is generated.	
Syntax	OUTPut[:STATe]:TRIGgered {OFF|ON|0|1}	
Parameter	0 / OFF	Turns the output off when a software trigger is generated.
	1 / ON	Turns the output on when a software trigger is generated.
Example	OUTP:TRIG ON Turns on output when a software trigger is generated.	
Query Syntax	OUTPut[:STATe]:TRIGgered?	
Return parameter	0	The output turns off when a software trigger is generated.
	1	The output turns on when a software trigger is generated.
Example	OUTP:TRIG? 1 Set to turn on the output when a software trigger is generated.	

OUTPut:PROTection:CLEar

Set →

Description	Clears the overvoltage, overcurrent, and overtemperature (OVP, OCP, OTP) protection circuit operating status. The AC protection circuit cannot be cleared.
Syntax	OUTPut:PROTection:CLEar
Example	OUTP:PROT:CLE Clears the protection circuit operating status.

OUTPut:PROTection:TRIPped

→ Query

Description	Returns the operating status of the protection circuit

	(OVP, OCP, OTP).	
Query Syntax	OUTPut:PROTection:TRIPped?	
Return parameter	0	Protection circuit is not activated.
	1	Protection circuit is activated.
Example	OUTP:PROT:TRIP? 0 Protection circuits is not tripped.	

2.3.7. Sense Command

Set →
→ Query

SENSe:AVERage:COUNt

Description	Sets the level of measurement averaging. Same as F-17 settings.	
Syntax	SENSe:AVERage:COUNt {<NR1>|LOW|MIDDle|HIGH}	
Parameter	0 / LOW	Set measurement averaging level to Low
	1 / MIDDle	Set measurement averaging level to Middle
	2 / HIGH	Set measurement averaging level to High
Example	SENS:AVER:COUN LOW Set measurement averaging level to Low	
Query Syntax	SENSe:AVERage:COUNt?	
Return parameter	0	Measurement averaging level setting is Low
	1	Measurement averaging level setting is Middle
	2	Measurement averaging level setting is High
Example	SENS:AVER:COUN? 0 Measurement averaging level setting is Low.	

Set →
→ Query

SENSe:DLOG:PERiod

Description	Sets and queries the logging interval for the logging function.

⚠Caution	Log data does not have timestamps. If change the logging interval while logging, the measurement time will not be known.	
Syntax	SENSe:DLOG:PERiod {<NRf>|MINimum|MAXimum }	
Parameter	<NRf>	0.1 - 999.9 seconds
	MINimum	Minimum logging interval (0.1 seconds)
	MAXimum	Maximum logging interval (999.9 seconds)
Example 1	SENSe:DLOG:PERiod 10 Set the logging interval to 10 seconds.	
Example 2	SENSe:DLOG:PERiod MIN,(@2) Set the logging interval to the minimum.	
Query Syntax	SENSe:DLOG:PERiod? [MINimum|MAXimum]	
Return parameter	<NRf>	Setted logging interval time, Unit: seconds
	MINimum	Minimum logging interval
	MINimum	Maximum logging interval
Example 1	SENSe:DLOG:PERiod? 10.0 The logging interval is set to 10 seconds.	
Example 2	SENSe:DLOG:PERiod? MIN 0.1 The minimum logging interval is 0.1 seconds.	

SENSe:DLOG:STATe

Set / Query

Description	Sets and queries the logging function operation settings and data output destination.	
Syntax	SENSe:DLOG:STATe {0|1|2}	
Parameter	0	Turns off execution of the logging function.
	1	Execute logging function Data output destination: Front USB port
	2	Execute logging function Data output destination: Remote communications
Example	SENS:DLOG:STAT 1 The logging data is output to the front USB port and the logging function is executed.	

Query Syntax	SENSe:DLOG:STATe?	
Return parameter	0	The logging function is turned off.
	1	The data output destination is the front USB port and the logging function is running.
	2	The data output destination is the remote communication and the logging function is running.
Example	SENS:DLOG:STAT? 2 The data output destination is the front USB port, and the logging function is running.	

2.3.8. Status Commands

STATus:OPERation[:EVENt] → Query

Description	Queries the bit sum of the Operation Status Event register. After the query response, the contents of the register are cleared.	
Query Syntax	STATus:OPERation[:EVENt]?	
Return parameter	<NR1>	Returns the bit sum of the Operation Status Event register.
Example	STAT:OPER? 0 The bits in the operation status event register have a total of 0.	

STATus:OPERation:CONDition → Query

Description	Queries the bit sum of Operation Status Condition register. This query will not clear the register.	
Query Syntax	STATus:OPERation:CONDition?	
Return parameter	<NR1>	Returns the bit sum of the Operation Status Condition register.
Example	STAT:OPER:COND? 0 The bits in the Operation Status Condition register have a total of 0.	

Set →
→ Query

STATus:OPERation:ENABle

Description	Sets or queries the Operation Status Enable register by the bit sums.
Syntax	STATus:OPERation:ENABle <NR1>
Parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:OPER:ENAB 256 Set the Operation Status Enable register to 256 (CV).
Query Syntax	STATus:OPERation:ENABle?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:OPER:ENAB? 256 The bits in the Operation Status Enable register is 256 (CV).

Set →
→ Query

STATus:OPERation:PTRansition

Description	Sets or queries the Positive Transition filter of the Operation Status register by the bit sums.
Syntax	STATus:OPERation:PTRansition <NR1>
Parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:OPER:PTR 256 Set the Positive Transition filter of the Operation Status register to 256 (CV).
Query Syntax	STATus:OPERation:PTRansition?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:OPER:PTR? 256 The setting content of the Positive Transition filter of the Operation Status register is 256 (CV).

Set → / → Query

STATus:OPERation:NTRansition

Description	Sets or queries the Negative Transition filter of the Operation Status register by the bit sums.
Syntax	STATus:OPERation:NTRansition <NR1>
Parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:OPER:NTR 256 Set the Negative Transition filter of the Operation Status register to 256 (CV).
Query Syntax	STATus:OPERation:NTRansition?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:OPER:NTR? 256 The setting content of the Negative Transition filter of the Operation Status register is 256 (CV).

→ Query

STATus:QUEStionable[:EVENt]

Description	Queries the bit sum of the Questionable Status Event register. After the query response, the contents of the register are cleared.
Query Syntax	STATus:QUEStionable[:EVENt]?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:QUES? 0 The bits in the Questionable Status Event register have a total of 0.

→ Query

STATus:QUEStionable:CONDition

Description	Queries the bit sum of the Questionable Status Condition register. This query will not clear the register.
Query Syntax	STATus:QUEStionable:CONDition?

Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:QUES:COND? 0 The bits in the Questionable Status Condition register have a total of 0.

STATus:QUEStionable:ENABle

Set →
→ Query

Description	Sets or queries the Questionable Status Enable register by the bit sums.
Syntax	STATus:QUEStionable:ENABle <NR1>
Parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:QUES:ENAB 1 Set the Questionable Status Enable register to 1 (OV).
Query Syntax	STATus:QUEStionable:ENABle?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:QUES:ENAB? 1 The setting content of the Questionable Status Enable register is 1 (OV).

STATus:QUEStionable:PTRansition

Set →
→ Query

Description	Sets or queries the Positive Transition filter of the Questionable Status register by bit sum.
Syntax	STATus:QUEStionable:PTRansition <NR1>
Parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:QUES:PTR 1 Set the Positive Transition filter of the Questionable Status register to 1.
Query Syntax	STATus:QUEStionable:PTRansition?

Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:QUES:PTR? 1 The setting content of the Positive Transition filter of the Questionable Status register is 1.

STATus:QUEStionable:NTRansition

Set →
→ Query

Description	Sets or queries the Negative Transition filter of the Questionable Status register by bit sum.
Syntax	STATus:QUEStionable:NTRansition <NR1>
Parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:QUES:NTR 1 Set the Negative Transition filter of the Questionable Status register to 1.
Query Syntax	STATus:QUEStionable:NTRansition?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	STAT:QUES:NTR? 1 The setting content of the Negative Transition filter of the Questionable Status register is 1.

STATus:PRESet

Set →

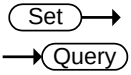
Description	This command resets the ENABle register, the PTRansistion filter and NTRansistion filter on the Operation Status and Questionable Status Registers. The registers/filters will be reset to a default value.

Default Register/Filter Values	Setting
Questionable Status Enable	0x0000
Questionable Status Positive Transition	0x7FFF
Questionable Status Negative Transition	0x0000
Operation Status Enable	0x0000
Operation Status Positive Transition	0x7FFF

	Operation Status Negative Transition	0x0000
	Positive Transition filters are all set high (0x7FFF) and the Negative Transition filters are all set low (0x0000). I.e., only positive transitions will be recognized for the Questionable Status and Operation Status registers.	
Syntax	STATus:PRESet	

2.3.9. Source Commands

[SOURce:]CURRent[:LEVel][:IMMediate]
[:AMPLitude]



Description	Sets or queries the setting current value in A unit. In the case of a current value set externally (from the analog control connector), the set current value is returned.	
Syntax	[SOURce:]CURRent[:LEVel][:IMMediate] [:AMPLitude] {<NRf>|MIN|MAX}	
Parameter	<NRf>	0 to 105% of rated current value.
	MIN	Minimum current value.
	MAX	Maximum current value.
Example	CURR 1.5 Set the current value to 1.5A.	
Query Syntax	[[SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude]? or [SOURce:]CURRent[:LEVel][:IMMediate] [:AMPLitude]? {MIN|MAX}	
Return parameter	<NRf>	Setted current value.
	MIN	Minimum current value.
	MAX	Maximum current Value.
Example 1	CURR? +1.500 Returns the setting current (1.5A).	
Example 2	CURR? MAX +37.800 Returns the maximum possible current value (37.8A).	

[SOURce:]CURRent[:LEVel]:TRIGgered[:AMPLitude]

Set → / → Query

Description	Sets or queries the setting current value in amperes when the software trigger is generated.	
Syntax	[SOURce:]CURRent[:LEVel]:TRIGgered [:AMPLitude] {<NRf>|MIN|MAX}	
Parameter	<NRf>	0 to 105% of rated current value.
	MIN	Minimum current value.
	MAX	Maximum current value.
Example	CURR:TRIG 1.5 Set the setting current value when a software trigger is generated to 1.5A.	
Query Syntax	[SOURce:]CURRent[:LEVel]:TRIGgered[:AMPLitude]? or [SOURce:]CURRent[:LEVel]:TRIGgered [:AMPLitude]? {MIN|MAX}	
Return parameter	<NRf>	Setted current value.
	MIN	Minimum current value.
	MAX	Maximum current value.
Example 1	CURR:TRIG? +1.500 The setting current value when a software trigger is generated is 1.5A.	
Example 2	CURR:TRIG? MAX +37.800 Returns the maximum possible current value (37.8A) when a software trigger is generated.	

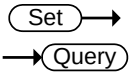
[SOURce:]CURRent:PROTection[:LEVel]

Set → / → Query

Description	Sets or queries the OCP (over-current protection) value in amps.
Syntax	[SOURce:]CURRent:PROTection [:LEVel] {<NRf>|MIN|MAX}

Parameter	<NRf>	OCP range in Amps.
	MIN	Minimum OCP value.
	MAX	Maximum OCP value.
Example	CURR:PROT 10 Set the OCP value to 10A.	
Query Syntax	[SOURce:]CURRent:PROTection[:LEVel]? or [SOURce:]CURRent:PROTection[:LEVel]? {MIN|MAX}	
Return parameter	<NRf>	Setted OCP value.
	MIN	Minimum OCP value.
	MAX	Maximum OCP value.
Example 1	CURR:PROT? +10.000 The setting OCP value is 10A.	
Example 2	CURR:PROT? MIN +3.600 Returns the minimum possible current level (3.6A) in OCP value.	

[SOURce:]CURRent:PROTection:STATe



Description	Turns OCP (over-current protection) on or off.	
Syntax	[SOURce:]CURRent:PROTection:STATe {0|1|OFF|ON}	
Parameter	0 / OFF	Turns the OCP off.
	1 / ON	Turns the OCP on.
Example	CURR:PROT:STAT OFF Turns the OCP off.	
Query Syntax	[SOURce:]CURRent:PROTection:STATe?	
Return parameter	0	OCP is off.
	1	OCP is on.
Example	CURR:PROT:STAT? 0 OCP setting is off.	

[SOURce:]CURRent:SLEW:RISing

Set → / → Query

Description	Sets or queries the rising current slew rate. This is only applicable for CC slew rate priority mode.	
Syntax	[SOURce:]CURRent:SLEW:RISing {<NRf>|MIN|MAX}	
Parameter	<NRf>	Rising current slew rate range.
	MIN	Minimum rising current slew rate.
	MAX	Maximum rising current slew rate.
Example	CURR:SLEW:RIS 10 Set the rising current slew rate to 10A/s.	
Query Syntax	[SOURce:]CURRent:SLEW:RISing? or [SOURce:]CURRent:SLEW:RISing? {MIN|MAX}	
Return parameter	<NRf>	Setted rising current slew rate value.
	MIN	Minimum rising current slew rate.
	MAX	Maximum rising current slew rate.
Example 1	CURR:SLEW:RIS? +10.00 The rising current slew rate is 10.00A/s.	
Example 2	CURR:SLEW:RIS? MIN +0.01 Returns the minimum rising current slew rate (0.01A/s).	

[SOURce:]CURRent:SLEW:FALLing

Set → / → Query

Description	Sets or queries the falling current slew rate. This is only applicable for CC slew rate priority mode.	
Syntax	[SOURce:]CURRent:SLEW:FALLing {<NRf>|MIN|MAX}	
Parameter	<NRf>	Fslling current slew rate range.
	MIN	Minimum falling current slew rate.
	MAX	Maximum falling current slew rate.
Example	CURR:SLEW:FALL 10 Set the fall current slew rate to 10A/s.	
Query Syntax	SOURce:]CURRent:SLEW:FALLing?	

	or [SOURce:]CURRent:SLEW:FALLing? {MIN|MAX}	
Return parameter	<NRf>	Setted falling current slew rate value.
	MIN	Minimum falling current slew rate.
	MAX	Maximum falling current slew rate.
Example 1	CURR:SLEW:FALL? +10.00 The falling current slew rate is 10.00A/s.	
Example 2	CURR:SLEW:FALL? MIN +0.01 Returns the minimum falling current slew rate (0.01A/s).	

[SOURce:]RESistance[:LEVel][:IMMediate][:AMPLitude]

Set / Query

Description	Sets or queries the internal resistance in ohms.	
Syntax	[SOURce:]RESistance[:LEVel][:IMMediate][:AMPLitude] {<NRf>|MIN|DEF|MAX}	
Parameter	<NRf>	Internal resistance in ohms.
	MIN	Minimum internal resistance in ohms.
	MAX	Maximum internal resistance in ohms.
Example	RESistance 0.417 Set the Internal resistance to 0.417Ω.	
Query Syntax	[SOURce:]RESistance[:LEVel][:IMMediate][:AMPLitude]? or [SOURce:]RESistance[:LEVel][:IMMediate][:AMPLitude]? {MIN|MAX}	
Return parameter	<NRf>	Setted Internal resistance in ohms.
	MIN	Minimum internal resistance in ohms.
	MAX	Maximum internal resistance in ohms.
Example 1	RES? +0.417 The Internal resistance is 0.417Ω.	
Example 2	RES? MAX +0.833	

	Returns the maximum internal resistance (0.833Ω).

[SOURce:]VOLTage [:LEVel][:IMMediate][:AMPLitude]

Set / Query

Description	Sets or queries the setting voltage value in V unit. In the case of a voltage value set externally (from the analog control connector), the set voltage value is returned.	
Syntax	[SOURce:]VOLTage[:LEVel][:IMMediate] [:AMPLitude] {<NRf>|MIN|MAX}	
Parameter	<NRf>	0 to 105% of rated voltage value.
	MIN	Minimum voltage value.
	MAX	Maximum voltage value.
Example	VOLT 30 (@2) Set the CH2 voltage value to 30V.	
Query Syntax	[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]? or [SOURce:]VOLTage[:LEVel][:IMMediate] [:AMPLitude]? {MIN|MAX}	
Return parameter	<NRf>	Setted voltage value.
	MIN	Minimum voltage value.
	MAX	Maximum voltage Value.
Example 1	CURR? +30.000 Returns the setting voltage (30V).	
Example 2	CURR? MAX +31.500 Returns the maximum possible voltage value (31.5V).	

[SOURce:]VOLTage[:LEVel]:TRIGgered[:AMPLitude]

Set / Query

Description	Sets or queries the setting voltage value in amperes when the software trigger is generated.
Syntax	[SOURce:]VOLTage[:LEVel]:TRIGgered [:AMPLitude] {<NRf>|MIN|MAX}

Parameter	<NRf>	0 to 105% of rated voltage value.
	MIN	Minimum voltgage value.
	MAX	Maximum current value.
Example	VOLT:TRIG 30 Set the setting voltage value when a software trigger is generated to 30V.	
Query Syntax	[SOURce:]VOLTage[:LEVel]:TRIGgered[:AMPLitude]? or [SOURce:]VOLTage[:LEVel]:TRIGgered [:AMPLitude]? {MIN|MAX}	
Return parameter	<NRf>	Setted voltage value.
	MIN	Minimum voltgage value.
	MAX	Maximum voltage value.
Example 1	VOLT:TRIG? +30.000 The setting voltage value when a software trigger is generated is 30V.	
Example 2	VOLT:TRIG? MAX +31.500 Returns the maximum possible voltage value (31.5V) when a software trigger is generated.	

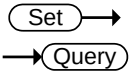
[SOURce:]VOLTage:PROTection[:LEVel]

Set → / → Query

Description	Sets or queries the OVP (over-voltage protection) value in volts.	
Syntax	[SOURce:]VOLTage:PROTection [:LEVel] {<NRf>|MIN|MAX}	
Parameter	<NRf>	OVP range in Amps.
	MIN	Minimum OVP value.
	MAX	Maximum OVP value.
Example	VOLT:PROT 10 Set the OVP value to 10AV	
Query Syntax	[SOURce:]VOLTage:PROTection[:LEVel]? or [SOURce:]VOLTage:PROTection[:LEVel]? {MIN|MAX}	

Return parameter	<NRf>	Setted OVP value.
	MIN	Minimum OVP value.
	MAX	Maximum OVP value.
Example 1	VOLT:PROT?	
	+10.000	
	The setting OVP value is 10V.	
Example 2	VOLT:PROT? MIN	
	+33.000	
	Returns the maximum possible voltage level (33V) in OVP value.	

[SOURce:]VOLTage:SLEW:RISing



Description	Sets or queries the rising voltage slew rate. This is only applicable for CV slew rate priority mode.	
Syntax	[SOURce:]VOLTage:SLEW:RISing {<NRf>|MIN|MAX}	
Parameter	<NRf>	Rising voltage slew rate range.
	MIN	Minimum rising voltage slew rate.
	MAX	Maximum rising voltage slew rate.
Example	VOLT:SLEW:RIS 10	
	Set the rise voltage slew rate to 10V/s.	
Query Syntax	[SOURce:]VOLT:SLEW:RISing?	
	or	
	[SOURce:]VOLT:SLEW:RISing? {MIN|MAX}	
Return parameter	<NRf>	Setted rise voltage slew rate value.
	MIN	Minimum rising voltage slew rate.
	MAX	Maximum rising voltage slew rate.
Example 1	VOLT:SLEW:RIS?	
	+10.00	
	The rising current slew rate is 10.00V/s.	
Example 2	VOLT:SLEW:RIS? MIN	
	+0.01	
	Returns the minimum rising voltage slew rate (0.01V/s).	

[SOURce:]VOLTage:SLEW:FALLing

Set → / → Query

Description	Sets or queries the falling voltage slew rate. This is only applicable for CV slew rate priority mode.	
Syntax	[SOURce:]VOLTage:SLEW:FALLing {<NRf>|MIN|MAX}	
Parameter	<NRf>	Falling voltage t slew rate range.
	MIN	Minimum falling voltage slew rate.
	MAX	Maximum falling voltage slew rate.
Example	VOLT:SLEW:FALL 10 Set the fall voltage slew rate to 10V/s.	
Query Syntax	[SOURce:]VOLTage:SLEW:FALLing? or [SOURce:]VOLTage:SLEW:FALLing? {MIN|MAX}	
Return parameter	<NRf>	Setted fallimg voltage slew rate value.
	MIN	Minimum falling voltage slew rate.
	MAX	Maximum falling voltage slew rate.
Example 1	VOLT:SLEW:FALL? +10.00 The falling voltage slew rate is 10.00V/s.	
Example 2	VOLT:SLEW:FALL? MIN +0.01 Returns the minimum falling voltage slew rate (0.01V/s).	

[:SOURce]:VOLTage:PROTection:LOW:STATe

Set → / → Query

Description	Sets or queries the enable/disable of tUVP function.	
Syntax	[:SOURce]:VOLTage:PROTection:LOW:STATe <NR1>	
Parameter	0	tUVP function disabled
	1	Enable: compare by instantaneous value voltage
	2	Enable: compare by average value voltage
Example	:VOLT:PROT:LOW:STAT 1 Enable the tUVP function under instantaneous value voltage comparison conditions.	

Query Syntax	[:SOURce]:VOLTage:PROTection:LOW:STATe?	
Return parameter	0	tUVP function disabled
	1	Enable: compare by instantaneous value voltage
	2	Enable: compare by average value voltage
Example	:VOLT:PROT:LOW:STAT? 1 The tUVP function is enabled under the instantaneous value voltage comparison condition.	

[:SOURce]:VOLTage:PROTection:LOW:DELay

Set → / → Query

Description	Sets or queries the tUVP delay time.	
Syntax	[:SOURce]:VOLTage:PROTection:LOW :DELay {<NRf>|MINimum|MAXimum}	
Parameter	NRf	0.1 ~ 60.0(Second)
	MINimum	Set to minimum tUVP delay time
	MAXimum	Set to maximum tUVP delay time
Example	:VOLT:PROT:LOW:DELay 1.5 Set the tUVP delay time to 1.5 seconds.	
Query Syntax	[:SOURce]:VOLTage:PROTection:LOW:DELay? or [:SOURce]:VOLTage:PROTection:LOW :DELay? {MIN|MAX}	
Return parameter	NRf	Setted tUVP delay time value
	MIN	Minimum tUVP delay time value
	MAX	Maximum tUVP delay time value
Example 1	:VOLT:PROT:LOW:DELay? 1.5 The tUVP delay time is set to 1.5 seconds.	
Example 2	:VOLT:PROT:LOW:DELay? MIN 0.1 The minimum setting tUVP delay time is 0.1 seconds.	

[:SOURce]:VOLTage:PROTection:LOW[:LEVel] Set / Query

Description	Sets or queries the tUVP voltage level.	
Syntax	[:SOURce]:VOLTage:PROTection :LOW[:LEVel] {<NRf>|MINimum|MAXimum}	
Parameter	NRf	tUVP voltage value: 0.1V ~ rated voltage
	MINimum	Minimum tUVP voltage value: 0.1V
	MAXimum	Maximum tUVP voltage value: Rated voltage
Example	:VOLTage:PROT:LOW 2 Set the tUVP voltage value to 2V.	
Query Syntax	[:SOURce]:VOLTage:PROTection:LOW:DELay? or [:SOURce]:VOLTage:PROTection:LOW :DELay? {MIN|MAX}	
Return parameter	NRf	tUVP voltage setting value
	MIN	Minimum tUVP voltage value
	MAX	Maximum tUVP voltage value
Example 1	:VOLT:PROT:LOW:DEL? 2 The tUVP voltage value is set to 2V.	
Example 2	:VOLT:PROT:LOW:DEL? MIN 0.1 The minimum setting tUVP voltage value is 0.1V.	

2.3.10. Trigger Commands

TRIGger:TRANsient[:IMMediate] Set

Description	Generates a software trigger for the transient trigger system. On a trigger, sets the voltage & current.
Syntax	TRIGger:TRANsient[:IMMediate]
Example	TRIG:TRAN (@2) Generates a software trigger.
Related Commands	[SOURce:]CURRent[:LEVel]:TRIGgered[:AMPLitude] Refar to Page 47. [SOURce:]VOLTage[:LEVel]:TRIGgered[:AMPLitude]

	Refar to Page 51.

TRIGger:TRANsient:SOURce

Set → / → Query

Description	Sets or queries the trigger source for the transient system.	
Syntax	TRIGger:TRANsient:SOURce {BUS|IMMediate}	
Parameter	BUS	Internal software trigger. Waits for the *TRG (or IEEE 488.1 “get” group execute trigger) command to start the trigger.
	IMMediat	Starts the trigger immediately. (default)
Example	TRIG:TRAN:SOUR BUS Set the trigger source to BUS.	
Query Syntax	TRIGger:TRANsient:SOURce?	
Return parameter	BUS	Internal software trigger.
	IMMediat	Starts the trigger immediately.
Example	TRIG:TRAN:SOUR? BUS The trigger source is BUS (Internal software trigger).	

TRIGger:OUTPut [:IMMediate]

Set →

Description	Generates a software trigger for the output trigger system. On a trigger, sets the output state.
Syntax	TRIGger:OUTPut [:IMMediate]
Example	TRIG:OUTP Generates a software trigger for the output trigger system.
Related Commands	OUTPut[:STATe]:TRIGgered Refar to Page 38.

TRIGger:OUTPut:SOURce

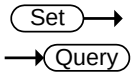
Set → / → Query

Description	Sets or queries the trigger source for the output system.
Syntax	TRIGger:OUTPut:SOURce {BUS|IMMediate}

Parameter	BUS	Internal software trigger. Waits for the *TRG (or IEEE 488.1 “get” group execute trigger) command to start the trigger.
	IMMediat	Starts the trigger immediately. (default)
Example	TRIG:OUTPut:SOUR BUS Set the output trigger system trigger source to BUS.	
Query Syntax	TRIGger:OUTPut:SOURce?	
Return parameter	BUS	Internal software trigger.
	IMMediat	Starts the trigger immediately.
Example	TRIG:OUTP:SOUR? BUS The output trigger system trigger source is BUS (internal software trigger).	

2.3.11. System Command

SYSTem:BEEPer[:IMMediate]



Description	Sets or queries the duration of the buzzer from this product. Specify the buzzer duration in seconds. With this command setting, this product will make a buzzer sound.	
Syntax	SYSTem:BEEPer [:IMMediate] {<NR1>|MINimum|MAXimum}	
Parameter	<NR1>	Sets the buzzer time：0 ~ 3600 seconds.
	MINimum	Sets the buzzer time to the minimum (0 seconds).
	MAXimum	Sets the buzzer time to the maximum (3600 seconds).
Example	SYST:BEEP 10 When the buzzer time is set to 10 seconds, the buzzer sound will sound for 10 seconds.	
Query Syntax	SYSTem:BEEPer[:IMMediate]? [MINimum|MAXimum]	
Return parameter	<NR1>	Remaining buzzer time.
	MINimum	Minimum buzzer time.
	MAXimum	Maximum buzzer time.
Example 1	SYST:BEEP 10	

	“after a 2 second wait”
	SYST:BEEP?
	8
	The first command turns on the buzzer for 10 seconds. After 2 seconds, run the "SYSTEM:BEEP?" command.
	The query returns the remaining buzzer time (8 s).
Example 2	SYST:BEEP? MAX
	3600
	Returns the maximum settable buzzer time (3600s).

SYSTem:CONFigure:BEEPer[:STATe]

Set → / → Query

Description	Sets or queries the buzzer state on/off.	
Syntax	SYSTem:CONFigure:BEEPer[:STATe] {OFF|ON|0|1}	
Parameter	0 / OFF	Turns the buzzer off.
	1 / ON	Turns the buzzer on.
Example	SYST:CONF:BEEP ON	
	Turns the buzzer on.	
Query Syntax	SYSTem:CONFigure:BEEPer[:STATe]?	
Return parameter	0	Buzzer state is off.
	1	Buzzer state is on.
Example	SYST:CONF:BEEPer?	
	1	
	Buzzer state is on.	

SYSTem:CONFigure:BLEeder[:STATe]

Set → / → Query

Description	Sets or queries the status of the bleeder resistor.	
Syntax	SYSTem:CONFigure:BLEeder [:STATe] {OFF|ON|AUTO|0|1|2}	
Parameter	0 / OFF	Turns the bleeder resistor off.
	1 / ON	Turns the bleeder resistor on.
	2 / AUTO	Turns the AUTO mode on.
Example	SYST:CONF:BLE AUTO	

	Set the status of the bleeder resistor is AUTO.	
Query Syntax	SYSTem:CONFigure:BLEeder[:STATe]?	
Return parameter	0	Bleeder resistor state is off.
	1	Bleeder resistor state is on.
	2	Bleeder resistor state is AUTO.
Example	SYST:CONF:BLEeder? 2 The status of the bleeder resistor is AUTO.	

SYSTem:CONFigure:BTRip[:IMMediate]

Set

Description	Trips the power switch trip to turn shut down this product.
Syntax	SYSTem:CONFigure:BTRip[:IMMediate]
⚠Note	The PSW-M series is a power switch without a trip function. Even if this command is executed, the power switch will not be tripped.

SYSTem:CONFigure:BTRip:PROTection

Set

Query

Description	Enables/Disables the power switch trip when the OVP or OCP protection are tripped. This setting will take effect when this product is powered on again.	
Syntax	SYSTem:CONFigure:BTRip:PROTection {OFF|ON|0|1}	
Parameter	0 / OFF	Disables the power switch trip for OVP or OCP.
	1 / ON	Enables the power switch trip for OVP or OCP.
Example	SYST:CONF:BTR:PROT ON Sets enables the power switch trip for OVP or OCP.	
Query Syntax	SYSTem:CONFigure:BTRip:PROTection?	
Return parameter	0	The power switch trip state is disabled.
	1	The power switch trip state is enabled.
Example	SYST:CONF:BTR:PROT? 1 The power switch trip state is enabled.	

Note	The PSW-M series is a power switch without a trip function. Even if this command is executed, the power switch will not be tripped.

Set →
→ Query

SYSTem:CONFigure:CURRent:CONTrol

Description	Sets or queries the CC control mode (local control (panel), external voltage control, external resistance control). This setting will take effect when this product is powered on again.	
Syntax	SYSTem:CONFigure:CURRent:CONTrol {0|1|2|3}	
Parameter	0	Local (Panel) control.
	1	External voltage control.
	2	External resistance control. 10kΩ = Io max, 0kΩ = Io min.
	3	External resistance control. 10kΩ = Io min, 0kΩ = Io max.
Example	SYST:CONF:CURR:CONT 1 Set the CC control mode to External voltage control.	
Query Syntax	SYSTem:CONFigure:CURRent:CONTrol?	
Return parameter	0	Local (panel) control is set.
	1	External voltage control is set.
	2	External resistance control is set. 10kΩ = Io max, 0kΩ = Io min.
	3	External resistance control is set. 10kΩ = Io min, 0kΩ = Io max.
Example	SYST:CONF:CURR:CONT? 1 The CC control mode is External voltage control.	

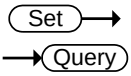
Set →
→ Query

SYSTem:CONFigure:VOLTage:CONTrol

Description	Sets or queries the CV control mode (local control (panel), external voltage control, external resistance control).

	This setting will take effect when this product is powered on again.	
Syntax	SYSTem:CONFigure:VOLTage:CONTrol {0|1|2|3}	
Parameter	0	Local (Panel) control.
	1	External voltage control.
	2	External resistance control. 10kΩ = Vo max, 0kΩ = Vo min.
	3	External resistance control. 10kΩ = Vo min, 0kΩ = Vo max.
Example	SYST:CONF:VOLT:CONT 1 Set the CV control mode to External voltage control.	
Query Syntax	SYSTem:CONFigure:VOLTage:CONTrol?	
Return parameter	0	Local (panel) control is set.
	1	External voltage control is set.
	2	External resistance control is set. 10kΩ = Vo max, 0kΩ = Vo min.
	3	External resistance control is set. 10kΩ = Vo min, 0kΩ = Vo max.
Example	SYST:CONF:VOLT:CONT? 1 The CV control mode is External voltage control.	

SYSTem:CONFigure:MSLave



Description	Sets or queries parallel and series operation of equipment. This setting will take effect when this product is powered on again.	
Syntax	SYSTem:CONFigure:MSLave {0|1|2|3|4}	
Parameter	0	Master (Independent operation, Series operation master)
	1	Parallel operation master (1 slave)
	2	Parallel operation master (2 slave)
	3	Parallel operation slave
	4	Series operating slave
Example	SYST:CONF:MSL 0	

	Set the unit operation mode to Master.	
Query Syntax	SYSTem:CONFigure:MSLave?	
Return parameter	0	Master is set.
	1	Parallel operation master (1 slave) is set.
	2	Parallel operation master (2 slave) is set.
	3	Parallel operation slave is set.
	4	Series operating slave is set
Example	SYST:CONF:MSL? 0 The unit operation mode is Master.	

SYSTem:CONFigure:OUTPut:EXTernal[:MODE]

Set / Query

Description	Sets or queries the external output logic as active high or active low. This setting will take effect when this product is powered on again.
Syntax	SYSTem:CONFigure:OUTPut :EXTernal[:MODE] {HIGH|LOW|0|1}
Parameter	0 / HIGH Active high 1 / LOW Active low
Example	SYST:CONF:OUTP:EXT LOW Set the external output logic to Active low.
Query Syntax	SYSTem:CONFigure:OUTPut:EXTernal[:MODE]?
Return parameter	0 Active high is set. 1 Active low is set.
Example	SYST:CONF:OUTP:EXT? 1 The external output logic is active low.

SYSTem:CONFigure:OUTPut:PON[:STATe]

Set / Query

Description	Sets or queries the unit to turn the output ON/OFF at power-up. This setting will take effect when this product is powered on again.

Syntax	SYSTem:CONFigure:OUTPut :PON[:STATe] {OFF|ON|0|1}	
Parameter	0 / OFF	Output off at power up.
	1 / ON	Output on at power up
Example	SYST:CONF:OUTP:PON ON Set the output to turn on when the power is turned on.	
Query Syntax	SYSTem:CONFigure:OUTPut :PON[:STATe]? [(@chanlist)]	
Return parameter	0	Output off at power up is set.
	1	Output on at power up is set
Example	SYST:CONF:OUTP:PON? 1 The output is set to be on when the power is turned on.	

SYSTem:COMMunicate:ENABle

Set / Query

Description	Enables/disables or queries remote interfaces and remote services. This setting will take effect when this product is powered on again.	
Syntax	SYSTem:COMMunicate:ENABle <mode>,<interface>	
Parameter <mode>	0 / OFF	Disables to the selected interface.
	1 / ON	Enables to the selected interface.
Parameter <interface>	GP-IB	Select GP-IB.
	USB	Select USB.
	LAN	Select LAN.
	SOKets	Select Sockets.
	WEB	Select the web server
Example	SYST:COMM:ENAB ON,USB Enables to the USB interface.	
Query Syntax	SYSTem:COMMunicate:ENABle? <interface>	
Return parameter	0	Selected interface is disabled.
	1	Selected interface is enabled.
Example	SYST:COMM:ENAB? USB 1	

	USB interface is enabled.

SYSTem:COMMunicate:GPIB[:SELF]:ADDRess

Set / Query

Description	Sets or queries the GP-IB address. This setting will take effect when t this product is powered on again.
Syntax	SYSTem:COMMunicate:GPIB[:SELF]:ADDRess <NR1>
Parameter	<NR1> 0 - 30
Example	SYST:COMM:GPIB:ADDR 15 Set the GP-IB address to 15.
Query Syntax	SYSTem:COMMunicate:GPIB[:SELF]:ADDRess?
Return parameter	<NR1> GP-IB address setting value
Example	SYST:COMM:GPIB:ADDR? 15 The GP-IB address setting value is 15.

SYSTem:COMMunicate:LAN:IPADdress

Set / Query

Description	Sets or queries LAN IP address. This setting will take effect when t this product is powered on again.
Syntax	SYSTem:COMMunicate:LAN:IPADdress <string>
Parameter	<string> LAN IP address in string format: “address” Applicable ASCII characters: 20H to 7EH
Example	SYST:COMM:LAN:IPAD “172.16.5.111” Sets the LAN IP address to 172.16.5.111.
Query Syntax	SYSTem:COMMunicate:LAN:IPADdress?
Return parameter	<string> LAN IP address setting value.
Example	SYST:COMM:LAN:IPAD? 172.16.5.111 The LAN IP address setting value is 172.16.5.111.

SYSTem:COMMunicate:LAN:GATEway

Set → / → Query

Description	Sets or queries the Gateway address. This setting will take effect when this product is powered on again.
Syntax	SYSTem:COMMunicate:LAN:GATEway <string>
Parameter	<string> Gateway address in string format: “address” Applicable ASCII characters: 20H to 7EH
Example	SYST:COMM:LAN:GATE “172.16.0.254” Sets the Gateway address to 172.16.0.254.
Query Syntax	SYSTem:COMMunicate:LAN:GATEway?
Return parameter	<string> Gateway address setting value.
Example	SYST:COMM:LAN:GATE? 172.16.0.254 The Gateway address setting value is 172.16.0.254.

SYSTem:COMMunicate:LAN:SMASk

Set → / → Query

Description	Sets or queries the LAN subnet mask. This setting will take effect when this product is powered on again.
Syntax	SYSTem:COMMunicate:LAN:SMASk <string>
Parameter	<string> LAN subnet mask in string format: “mask” Applicable ASCII characters: 20H to 7EH
Example	SYST:COMM:LAN:SMAS “255.255.0.0” Sets the LAN subnet mask to 255.255.0.0.
Query Syntax	SYSTem:COMMunicate:LAN:SMASk?
Return parameter	<string> LAN subnet mask setting value.
Example	SYST:COMM:LAN:SMAS? 172.16.0.254 The LAN subnet mask setting value is 255.255.0.0.

SYSTem:COMMunicate:LAN:MAC → Query

Description	Returns the unit MAC address as a string. The MAC address cannot be changed.	
Query Syntax	SYSTem:COMMunicate:LAN:MAC?	
Return parameter	<string>	Returns the MAC address in the following format. “FF-FF-FF-FF-FF-FF”
Example	SYST:COMM:LAN:MAC? 02-80-AD-20-31-B1 The MAC address setting value is 02-80-AD-20-31-B1.	

SYSTem:COMMunicate:LAN:DHCP → Set / Query

Description	Sets or queries the turns DHCP on/off. This setting will take effect when this product is powered on again.	
Syntax	SYSTem:COMMunicate:LAN:DHCP {OFF|ON|0|1}	
Parameter	0 / OFF	Turn DHCP off.
	1 / ON	Turn DHCP on.
Example	SYST:COMM:LAN:DHCP ON Set the turn DHCP on.	
Query Syntax	SYSTem:COMMunicate:LAN:DHCP?	
Return parameter	0	DHCP is turn off state.
	1	DHCP is turn on state.
Example	SYST:COMM:LAN:DHCP? 1 DHCP is turn on state.	

SYSTem:COMMunicate:LAN:DNS → Set / Query

Description	Sets or queries the DNS address. This setting will take effect when this product is powered on again.
Syntax	SYSTem:COMMunicate:LAN: DNS <string>

Parameter	<string>	DNS address in string format: “address” Applicable ASCII characters: 20H to 7EH
Example	SYST:COMM:LAN:DNS “172.16.1.252” Sets the DNS address to 172.16.1.252.	
Query Syntax	SYSTem:COMMunicate:LAN:GATEway?	
Return parameter	<string>	DNS address setting value.
Example	SYST:COMM:LAN: DNS? 172.16.1.252 The DNS address setting value is 172.16.1.252.	

SYSTem:COMMunicate:LAN:HOSTname → (Query)

Description	Returns the host name as a string.	
Query Syntax	SYSTem:COMMunicate:LAN:HOST?	
Return parameter	<string>	Returns the host name in the string format.
Example	SYST:COMM:LAN:HOST? P-160054 Returns the host name (P-160054).	

SYSTem:COMMunicate:LAN:WEB:PACTive → (Set) / → (Query)

Description	Sets or queries whether the web password is on or off. This setting will take effect when this product is powered on again.	
Syntax	SYSTem:COMMunicate:LAN :WEB:PACTive {OFF|ON|0|1}	
Parameter	0 / OFF	Web password off.
	1 / ON	Web password on.
Example	SYST:COMM:LAN:WEB:PACT ON Set Web password on.	
Query Syntax	SYSTem:COMMunicate:LAN:WEB:PACTive?	
Return parameter	0	Web password is off state.
	1	Web password is on state.
Example	SYST:COMM:LAN:WEB:PACT?	

	1 Web password is on state.

Set →
→ Query

SYSTem:COMMunicate:LAN:WEB:PASSword

Description	Sets or queries the web password. This setting will take effect when this product is powered on again.	
Syntax	SYSTem:COMMunicate:LAN:WEB:PASSword <NR1>	
Parameter	<NR1>	0 - 9999
Example	SYST:COMM:LAN:WEB:PASS 1234 Set the web password as 1234.	
Query Syntax	SYSTem:COMMunicate:LAN:WEB:PASSword?	
Return parameter	<NR1>	Setted Web password
Example	SYST:COMM:LAN:WEB:PASS? 1234 The set web password is 1234.	

Set →
→ Query

SYSTem:COMMunicate:RLSTate

Description	Sets or queries the control state of the instrument.	
Syntax	SYSTem:COMMunicate: RLSTate {LOCal|REMote|RWLock}	
Parameter	LOCal	Sets the instrument to front panel control.
	REMote	Sets the instrument to remote interface control.
	RWLock	Disables the front panel control and only allows the instrument to be controlled via the remote interface.
Example	SYST:COMM:RLST LOC Set the instrument control to front panel control.	
Query Syntax	SYSTem:COMMunicate:RLSTate?	
Return parameter	LOC	The instrument is set to front panel control.
	REM	The instrument is set to remote interface

		control.
	RWL	The front panel control is disabled. The instrument can only be controlled via the remote interface.
Example	SYST:COMM:RLST? LOC The instrument control set to front panel control.	

SYSTem:COMMunicate:USB:FRONt:STATe → Query

Description	Queries the front panel USB-A port state.	
Query Syntax	SYSTem:COMMunicate:USB:FRONt:STATe?	
Return parameter	0	Absent
	1	Mass Storage (USB memory)
Example	SYST:COMM:USB:FRON:STAT? 1 The front panel USB-A port state is Mass Storage.	

SYSTem:COMMunicate:USB:REAR:STATe → Query

Description	Queries the rear panel USB-B port state.	
Query Syntax	SYSTem:COMMunicate:USB:REAR:STATe?	
Return parameter	0	Not used
	2	USB-CDC
	3	GP-IB-USB adapter
	5	RS-232C-USB adapter
Example	SYST:COMM:USB:REAR:STAT? 0 The rear panel USB-B port state is not used.	

SYSTem:COMMunicate:USB:REAR:MODE → Set / → Query

Description	Sets or queries the rear panel USB-B port mode. This command is the equivalent to the F-22 configuration setting.
Syntax	SYSTem:COMMunicate:USB:REAR:MODE {0|1|2|3}

Parameter	0	Disable
	1	USB Host (GP-IB/ RS-232C)
	2	USB CDC: Auto detect speed
	3	USB CDC: Full speed
Example	SYST:COMM:USB:REAR:MODE 1 Sets the rear panel USB-B port mode to USB Host.	
Query Syntax	SYSTem:COMMunicate:USB:REAR:MODE?	
Return parameter	0	Disable
	1	USB Host (GP-IB/ RS-232C)
	2	USB CDC: Auto detect speed
	3	USB CDC: Full speed
Example	SYST:COMM:USB:REAR:MODE? 1 The rear panel USB-B port mode is USB Host.	
⚠Note	If the adapter (GP-IB/RS-232C) or PC is not connected to the USB-B port on the rear panel, parameters 1-3 cannot be set.	

SYSTem:ERRor

→(Query)

Description	Queries the error queue. The last error message is returned. A maximum of 32 errors are stored in the error queue.	
Query Syntax	SYSTem:ERRor?	
Return parameter	<NR1>, <string>	Returns an error code followed by an error message as a string. The string is returned as “string”.
Example	SYSTem:ERRor? -100, “Command error” Returns the error code (100) and error message (Command error) contents.	

SYSTem:KEYLock:MODE

(Set)→

→(Query)

Description	Sets or queries the output key operation in panel locked. This setting is the equivalent of the F-19 function setting.

Syntax	SYSTem:KEYLock:MODE {0|1}	
Parameter	0	Output can be turned off in panel locked.
	1	Output can be turned on/off in panel locked.
Example	SYST:KEYL:MODE 1 Set the output key turned on/off in panel locked.	
Query Syntax	SYSTem:KEYLock:MODE?	
Return parameter	0	The output key is set to turn output off in panel locked.
	1	The output key is set to turn output on/off in panel locked.
Example	SYST:KEYL:MODE? 1 The output key is set to turn output on/off in panel locked.	

SYSTem:KEYLock

Set → / → Query

Description	Sets or queries whether the front panel controls are enabled or disabled (key locked state).	
Syntax	SYSTem:KLOCk {OFF|ON|0|1}	
Parameter	0 / OFF	Sets the front panel control set to enabled.
	1 / ON	Sets the front panel control set to disabled.
Example	SYST:KLOC OFF,(@2) Sets the front panel control set to enabled.	
Query Syntax	SYSTem:KLOCk?	
Return parameter	0	Front panel controls setted enabled.
	1	Front panel controls setted disables.
Example	SYST:KLOC? 0 Front panel controls setted enabled.	

SYSTem:INFormation

→ Query

Description	Queries the system information. Returns the machine version, build date, keyboard CPLD version and analog CPLD version etc.
Query Syntax	SYSTem:INFormation?

Return parameter	Definite length arbitrary <block data> response.
Example	SYST:INF? #3212MFRS TEXIO,Model PSW-M720L11-13.5,SN TW0123456789,Firmware-Version 01.43.20130424, Keyboard-CPLD 0x30c,AnalogControl-CPLD 0x421,Kernel-BuiltON 2013-3-22,TEST-Version 01.00,TEST-BuiltON 2011-8-1,MAC 02-80-ad-20-31-b1 Returns the system information as a <block data>.

SYSTem:PRESet (Set)

Description	Resets all the settings to the factory default settings.
Syntax	SYSTem:PRESet
Example	SYST:PRES Resets all the settings to the factory default settings.

SYSTem:VERSion (Query)

Description	Returns the version of the SCPI specifications that the unit complies with.
Query Syntax	SYSTem:VERSion?
Return parameter	<string> 1999.0: Returns the SCPI version.
Example	SYST:VERS? 1999.0 Returns the version (1999.0) of the SCPI.

2.3.12. Logging function command

FETCh:DLOG (Query)

Description	Returns logging data with the request logging data command. The response data uses IEEE-488.2 binary block format. Please also refer to "4.2.5. Logging data output to the controller" in the operation manual.
Note	The maximum number of data returned at one time when logging is started is 1000. If data is accumulated in the main unit, issue the command again to retrieve the data.

	If there is no data in the main body, 0 data will be returned. Also, if logging has not started, no data will be returned. The LF of <end_code> indicating the end of data is not included in the number of binary bytes. The LF command is added to ensure consistency in communication processing.
	Please do not request logging data for multiple channels.
Query Syntax	FETCh:DLOG?
Response format	The following contents are output with one logging data output. Data is output consecutively without being separated by spaces or ",". “:X” in the data content is the amount of data. One data amount (X=1) is one 2-digit hexadecimal value. If X=2, there will be two 2-digit hexadecimal numbers. <Start code: 1><Number digits in data count: 1><Data count: 8><Reserved: 2><Checksum: 4> <Start number: 4><Sample period: 4> <Number of log data: 4>{Cell-0: 12} … {Cell-999: 12} <End code: 1>
{Cell-N}	<StateN: 4><VmeasN: 4><ImeasN: 4> (N: 0, …, 999)
Response parameters	Content
Start code	It means the beginning of data. This is a fixed value, expressed as "#" in ASCII notation.
Number digits in data count	This is the number of digits data when “Data count” is converted to a decimal number. In ASCII notation, it is "8". The number of digits in “Data count” will be 8 digits.
Data count	This is the amount of data between “Data count” and “End code”.
Reserved	It's a reservation number and doesn't mean anything. Fixed value data (X=2).
Checksum	This is the sum of the data values between “Checksum” and “End code”.
Start number	The logging data output count data since the logging function started is output starting from the lowest digit.
Sample period	Outputs the set logging time interval starting from the lower digits. Unit: ms
Number of log	“Number of log data” is the number of pieces of logging

data	data.Outputs the number of "Cell-N" to be output starting from the lower digit. Unit: pieces
StateN	This is the device status data (32Bit) during logging.
VmeasN	This is the voltage measurement value data during logging. Unit: mV
ImeasN	This is current measurement value data during logging.. Unit: mA
End code	It means the end of data. It is a fixed value and is "LF" in ASCII notation.
Example	FETC:DLOG? 2338303030303033300000610200000000000060EA 0000010000000180100009C610000000000000A The logging data is “1 logging count, CV mode OUTPUT on, 24.988V, 0A”.

2.3.13. Fan stop function command

Set →
→ Query

CONTrol:FAN:STOP:STATe

Description	Sets and queries the fan stop function.	
Note	Please set the fan stop time by manual operation.	
Syntax	CONTrol:FAN:STOP:STATe {0|1|OFF|ON}	
Parameter	0 / OFF	Turn off fan stop.
	1 / ON	Turn on fan stop.
Example	CONT:FAN:STOP:STAT ON Turn on fan stop.	
Query Syntax	CONTrol:FAN:STOP:STATe?	
Return parameter	0	Fan stop is off state
	1	Fan stop is on state
	2	Cooling is in progress with the fan stopped and on
Example	CONT:FAN:STOP:STAT? 1 Fan stop is in the ON state.	

2.3.14. Common Commands

*CLS

Set →

Description	The *CLS command clears the Standard Event Status, Operation Status and Questionable Status registers. The corresponding Enable registers in each of the above registers are not cleared. If a <NL> newline code immediately precedes a *CLS command, the Error Que and the MAV bit in the Status Byte Register is also cleared.
Syntax	*CLS
Example	*CLS Clears the Standard Event Status, Operation Status and Questionable Status registers.

*ESE

Set →
→ Query

Description	Sets or queries the bit sum of Standard Event Status Enable register.	
Syntax	*ESE <NR1>	
Parameter	<NR1>	0 - 255
Example	*ESE 255 Set the Standard Event Status Enable register to 255.	
Query Syntax	*ESE?	
Return parameter	<NR1>	The value set in the Standard Event Status Enable register.
Example	*ESE? 255 The Standard Event Status Enable register value are a bit sum of 255.	

*ESR

→ Query

Description	Queries the bit sum of Standard Event Status register. The Event Status register is cleared after it is read.
Query Syntax	*ESR?

Return parameter	<NR1>	The value set in the Standard Event Status register.
Example	*ESR? 255 The Standard Event Status register setting sum bits value is 255, and the register value is cleared.	

*IDN

Query

Description	Queries the manufacturer, model name, serial number, and firmware version of the instrument.	
Query Syntax	*IDN?	
Return parameter	<string>	Instrument ID string separated by ','.
Example	*IDN? < Manufacturer >,< Model name >,<Serial number >, < Firmware version >	

*OPC

Set

Query

Description	The *OPC command sets the OPC bit (bit0) of the Standard Event Status Register when all current commands have been processed.	
Syntax	*OPC	
Example	*OPC Sets the OPC bit of the Standard Event Status Register.	
Description	The *OPC? Query returns 1 when all the outstanding commands have completed.	
Query Syntax	*OPC?	
Return parameter	1	Returns 1 when all the outstanding commands have completed.
Example	*OPC? 1 Returns 1.	

*RST

Set

Description	Performs the instrument reset. Configures the instrument to a known configuration (default settings). This known configuration is independent of the usage history.	
Syntax	*RST	
Example	*RST Performs the instrument reset.	

*SRE

Set → / → Query

Description	Sets or queries the bits sum of Service Request Enable register. The Service Request Enable register determines which registers of the Status Byte register can generate service requests.	
Syntax	*SRE <NR1>	
Parameter	<NR1>	0 - 255
Example	*SRE 32 Set the bits sum of Service Request Enable register to 32.	
Query Syntax	*SRE?	
Return parameter	<NR1>	The value set in the Service Request Enable register.
Example	*SRE? 32 The Service Request Enable register setting sum bits value is 32.	

*STB

→ Query

Description	Queries the bit sum of the Status Byte register.	
Query Syntax	*STB?	
Return parameter	<NR1>	Returns the bit sum of the Status Byte register.
Example	*STB? 4 The Status Byte register setting sum bits value is 4.	

*TRG

Set →

Description	The *TRG command can generate a “get” (Group Execute Trigger). If the trigger command is not accepted, an error message is generated (-211, “Trigger ignored”).
Syntax	*TRG
Example	*TRG Generate a trigger.

*TST

→ Query

Description	Executes a self test.	
Query Syntax	*TST?	
Return parameter	<NR1>	Returns “0” if there are no errors. Returns an error code <NR1> if there is an error.
Example	*TST? 0 The instrument is no errors.	

*WAI

Set →

Description	Prevents any other commands or queries from being executed until all outstanding commands have completed.
Syntax	*WAI
Example	*WAI Execute the *WAI command.

3. Status Register Overview

To program this product effectively, the Status registers need to be understood. This chapter explains in detail how the Status registers are used and how to configure them.

3.1. Introduction to the Status Registers

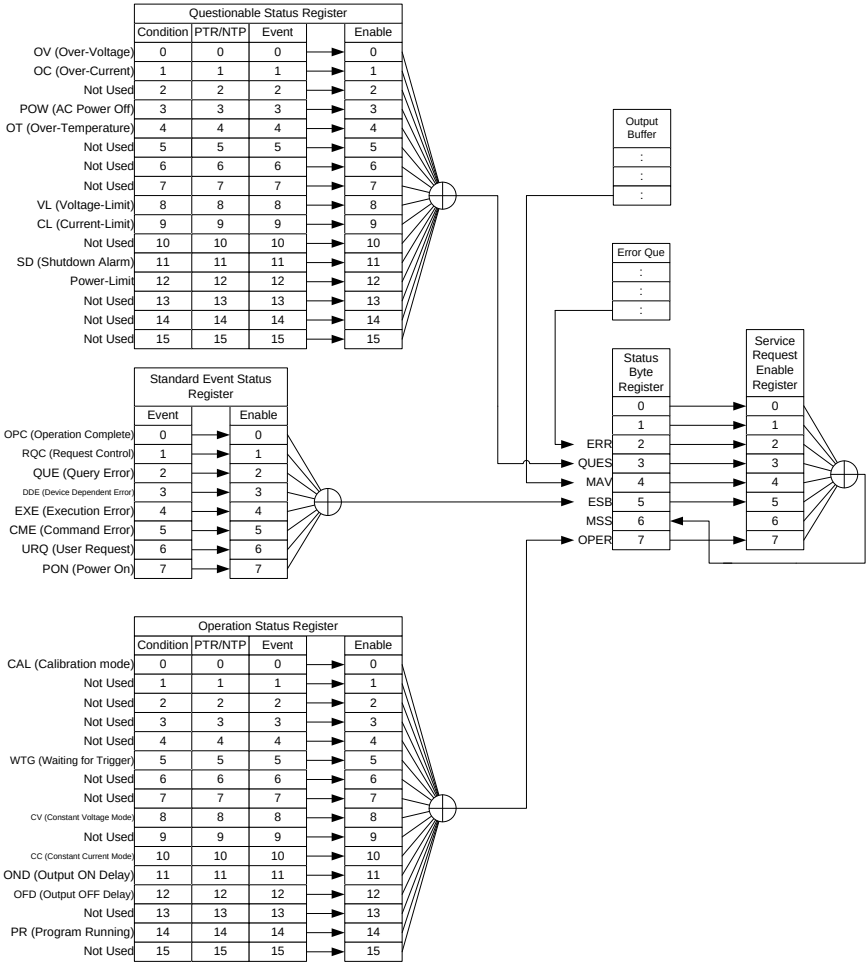
The status registers are used to determine the status of the power supply. The status registers maintain the status of the protection conditions, operation conditions and instrument errors.

This product has many register groups.:

- Questionable Status Register Group
- Standard Event Status Register Group
- Operation Status Register Group
- Status Register Group

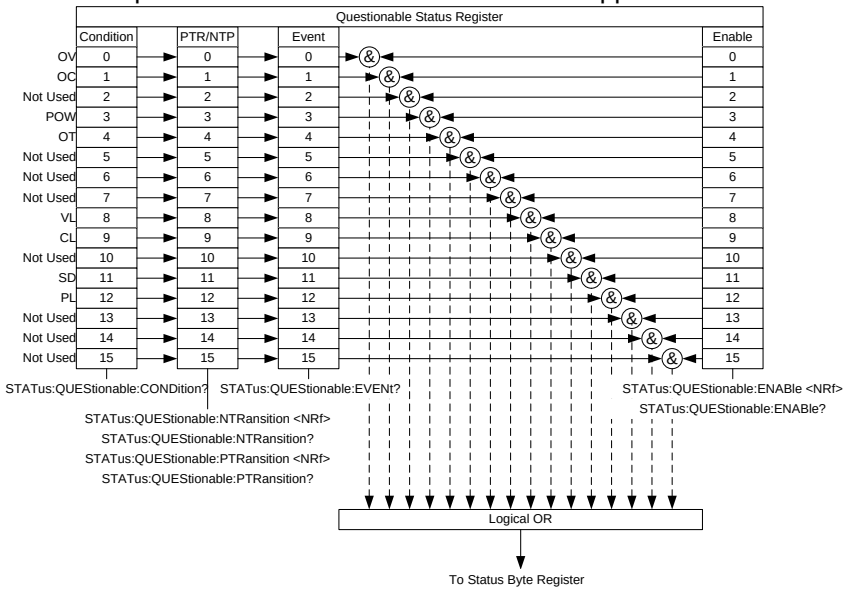
The next page shows the structure of the Status registers.

3.2. The Status Registers



3.3. Questionable Status Register Group

Overview The Questionable Status Register Group indicates if any protection modes or limits have been tripped.



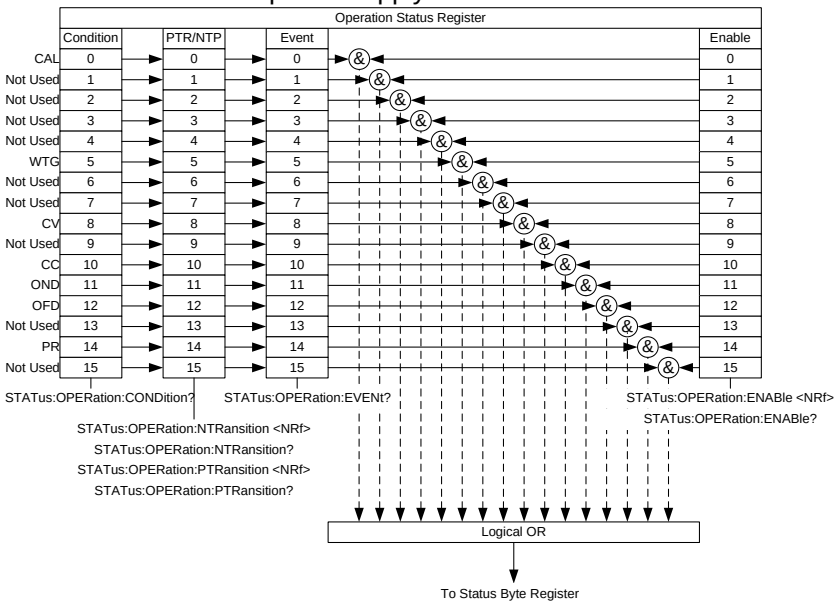
Bit Summary

Bit name	Event	Bit #	Bit Weight
OV	OV (Over-Voltage) Over voltage protection has been tripped	0	1
OC	OC (Over-Current) Over current protection has been tripped	1	2
POW	POW (AC Power Off) AC power switch is off	3	8
OT	OT (Over Temperature) Over temperature protection has been tripped	4	16
VL	VL (Voltage Limit) Voltage limit has been reached	8	256
CL	CL (Current Limit) Current limit has been reached	9	512
SD	Shutdown Alarm	11	2048
PL	Power-Limit	12	4096

Condition Register	The Questionable Status Condition Register indicates the status of the power supply. If a bit is set in the Condition register, it indicates that the event is true. Reading the condition register does not change the state of the condition register.
PTR/NTR Filters	The PTR/NTR (Positive/Negative transition) register determines the type of transition conditions that will set the corresponding bit in the Event Registers. Use the Positive transition filter to view events that change from false to positive, and use the negative transition filter to view events that change from positive to negative.
	Positive Transition 0→1 Negative Transition 1→0
Event Register	The PTR/NTR Register will dictate the type of transition conditions will set the corresponding bits in the Event Register. If the Event Register is read, it will be cleared to 0.
Enable Register	The Enable register determines which Events in the Event Register will be used to set the QUES bit in the Status Byte Register.

3.4. Operation Status Register Group

Overview The Operation Status Register Group indicates the operating status of the power supply.

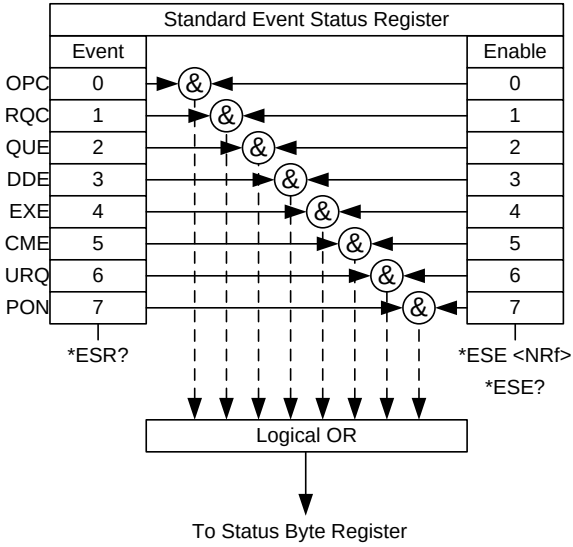


Bit Summary	Bit name	Event	Bit #	Bit Weight
	CAL	CAL (Calibration mode) Indicates if the PSW is in calibration mode.	0	1
	WTG	WTG (Waiting for trigger) Indicates if the PSW is waiting for a trigger.	5	32
	CV	CV (Constant voltage mode) Indicates if the PSW is in CV mode.	8	256
	CC	CC (Constant current mode) Indicates if the PSW is in CC mode.	10	1024
	OND	OND (Output ON Delay) Indicates if Output ON delay time is active	11	2048
	OFD	OFD (Output OFF Delay) Indicates if Output OFF delay time is active	12	4096
	PR	PR (Program Running) Indicates if a Test is running	13	8192

Condition Register	The Operation Status Condition Register indicates the operating status of the power supply. If a bit is set in the Condition register, it indicates that the event is true. Reading the condition register does not change the state of the condition register.
PTR/NTR Filters	The PTR/NTR (Positive/Negative transition) register determines the type of transition conditions that will set the corresponding bit in the Event Registers. Use the Positive transition filter to view events that change from false to positive, and use the negative transition filter to view events that change from positive to negative.
	Positive Transition 0→1 Negative Transition 1→0
Event Register	The PTR/NTR Register will dictate the type of transition conditions will set the corresponding bits in the Event Register. If the Event Register is read, it will be cleared to 0.
Enable Register	The Enable register determines which registered Events in the Event Register will be used to set the OPER bit in the Status Byte Register.

3.5. Standard Event Status Register Group

Overview The Standard Event Status Register Group indicates if any errors have occurred. The bits of the Event register are set by the error event queue.



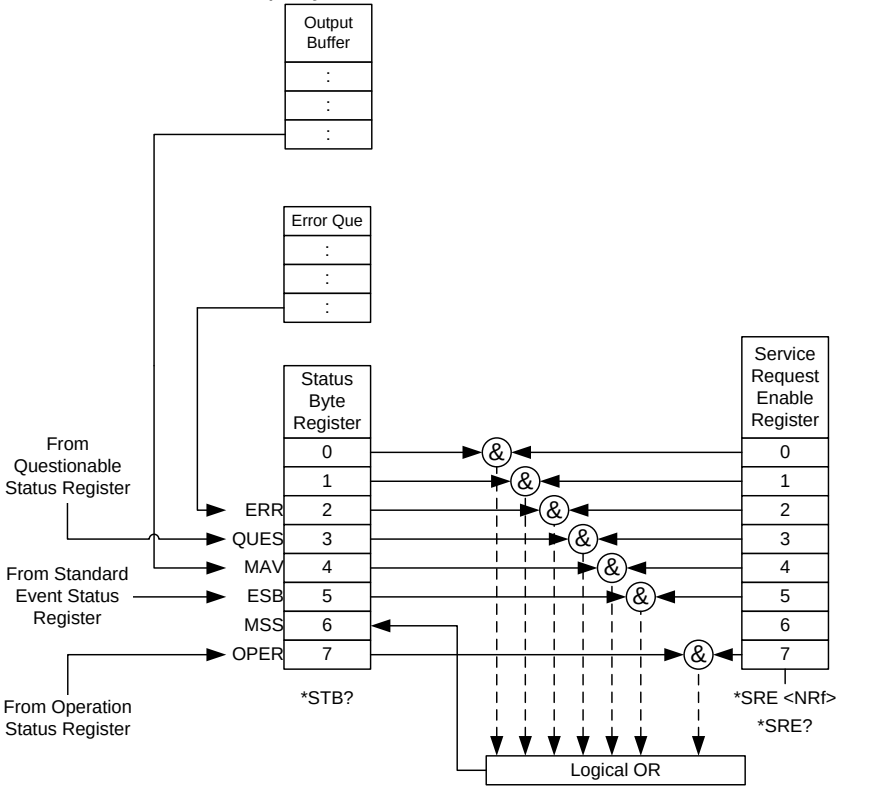
Bit Summary

Bit name	Event	Bit #	Bit Weight
OPC	OPC (Operation complete) The OCP bit is set when all selected pending operations are complete. This bit is set in response to the *OPC command.	0	1
RQC	Request control	1	2
QUE	QUE (Query Error) The Query Error bit is set in response to an error reading the Output Queue. This can be caused by trying to read the Output Queue when there is no data present.	2	4
DDE	DDE (Device Dependent Error) Device specific error.	3	8

	EXE	EXE (Execution Error) The EXE bit indicates an execution error due to one of the following: illegal command parameter, parameter out of range, invalid parameter, the command didn't execute due to an overriding operation condition.	4	16
	CME	CME (Command Error) The CME bit is set when a syntax error has occurred. The CME bit can also be set when a <GET> command is received within a program message.	5	32
	URQ	(User Request	6	64
	PON	PON (Power On) Indicates the power is turned on.	7	128
Event Register	Any bits set in the event register indicate that an error has occurred. Reading the Event register will reset the register to 0.			
Enable Register	The Enable register determines which Events in the Event Register will be used to set the ESB bit in the Status Byte Register.			

3.6. Status Byte Register Group

Overview The Status Byte register consolidates the status events of all the status registers. The Status Byte register can be read with the *STB? query and can be cleared with the *CLS command.



Bit Summary	Bit name	Event	Bit #	Bit Weight
	ERR	ERR (Error Event/Queue) If data is present in the Error queue, the ERR bit will be set.	2	4
	QUES	QUES (Questionable Status Register) The summary bit for the Questionable Status Register group.	3	8
	MAV	MAV (Message Available) This is set when there is data in the Output Queue waiting to be read.	4	16
	ESB	ESB (Event Summary Bit) The ESB is the summary bit for the Standard Event Status Register group.	5	32
	MSS	The MSS Bit is the summary of the Status Byte Register and Service Request register (bits 1-5, 7). This will be set to 1.	6	64
	OPER	OPER (Operation Status Register) OPER bit is the summary bit for the Operation Status Register Group.	7	128
Status Byte Register	Any bits set in the Status byte register acts as a summary register for all the three other status registers and indicates if there is a service request, an error in the Error Queue or data in the Output Queue. Reading the Status Byte register will reset the register to 0.			
Service Request Enable Register	The Service Request Enable Register controls which bits in the Status Byte Register are able to generate service requests.			

4. Error List

4.1. Command Errors

If a command error occurs, the Command Error bit (Bit 5: CME) in the Standard Event Status Register is set.

Error Code	Description
-100 Command Error	This is a general command error.
-102 Syntax error	Command string has invalid syntax.
-103 Invalid separator	There is an invalid delimiter in the command string.
-104 Data type error	There is a data type in the command string that is not allowed.
-108 Parameter not allowed	There are parameters that are not allowed.
-109 Missing parameter	There is a missing parameter.
-111 Header separator error	The command string contains a character that is not a valid header delimiter.
-112 Program mnemonic too long	There are long characters (more than 12 characters) in the header.
-113 Undefined header	Command with undefined header for device.
-114 Header suffix out of range	Header suffix is out of range.
-115 Unexpected number of parameters	The number of parameters is different.
-120 Numeric data error	There is an error in the numerical data.
-121 Invalid character in number	Numeric data contains invalid characters.
-128 Numeric data not allowed	Numerical data is not allowed.
-131 Invalid suffix	Invalid suffix used.
-141 Invalid character data	There is invalid character data.
-148 Character data not allowed	Character data is not allowed.
-151 Invalid string data	There is invalid string data.
-158 String data not allowed	String data is not allowed.
-160 Block data error	There is an error in block data.
-161 Invalid block data	Invalid block data.

-168 Block data not allowed	Blocked data is not allowed.
-178 Expression data not allowed	Data format not allowed.

4.2. Execution Errors

If an execution error occurs, the Execution Error bit (Bit 4: EXE) in the Standard Event Status register is set.

Error Code	Description
-200 Execution error	This is a general execution error.
-201 Invalid while in local	Execution is invalid due to device local status.
-203 Command protected	Execution is invalid due to command invalidation (protection).
-211 Trigger ignored	Trigger ignored.
-213 Init ignored	A new measurement start was ignored because another measurement was in progress.
-220 Parameter error	Parameter error.
-221 Settings conflict	It is not possible to execute due to the operating status of the device.
-222 Data out of range	Data is out of range.
-224 Illegal parameter value	Reception is invalid due to invalid parameter value.

4.3. Device Specific Errors

If a device-specific error occurs, the device-specific error bit (bit 3: DDE) in the Standard Event Status register is set.

Error Code	Description
-310 System error	This is a device system error.
-320 Storage fault	Data storage error.

4.4. Query Errors

If a query error occurs, the query error bit (bit 2: QUE) in the Standard Event Status register is set.

Error Code	Description
-400 Query error	Query error.

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Test and Measurement Solutions

TEXIO TECHNOLOGY CORPORATION

7F Towa Fudosan Shin Yokohama Bldg.
2-18-13, Shin Yokohama, Kohoku-ku, Yokohama, Kanagawa, 222-0033 Japan
http://www.texio.co.jp/