TEXIO
Test and Measurement Solutions

Programming manual

Multi-output wide range DC power supply
PSW-Multi Series

PSW-M720L11	PSW-M1080L111
PSW-M720L44	PSW-M1080L444
PSW-M720L55	PSW-M1080L555
PSW-M720H66	PSW-M1080H666
PSW-M720H88	PSW-M1080H888

B71-0538-01

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 1.10 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

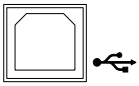
This chapter describes basic configuration of IEEE488.2 based remote control.

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

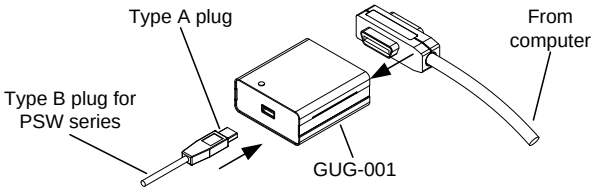
steps	Step instructions
1	Connect the USB cable to the rear panel USB B port. 
2	Press the Function key for the Normal configuration settings. Set the rear panel USB port to USB-CDC. F-22: 2

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 Ethernet Connection

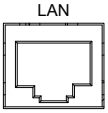
The Ethernet interface can be configured for a number of different applications. Ethernet can be configured for basic remote control or monitoring using a web server or it can be configured as a socket server.

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 Active
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.

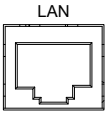
steps	Step instructions	
1	Connect the Ethernet cable from the network to the Ethernet port on the rear panel.	
2	Press the Function key for the Normal configuration settings.	
	Set the following LAN settings:	
	Enable LAN	F-36: 1
	Turn DHCP to enable	F-37: 1
	Turn the web server on	F-59: 1

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

1.1.4. 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 8.

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

*idn?

TEXIO,PSW-M1080L444,GJY130385,01.07.20240222

(manufacturer, model, serial number, version)

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

1.1.5. 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

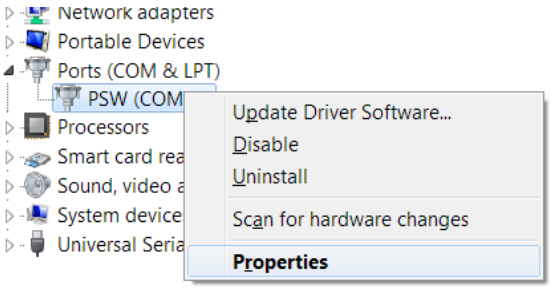
Realterm can be downloaded for free on the Internet.

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.

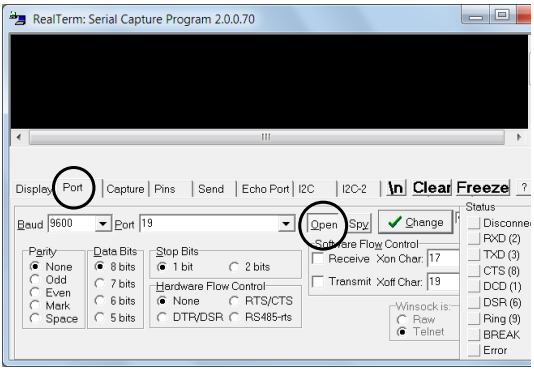
Tip: to run as an administrator, you can right click the Realterm icon in the Windows Start menu and select the Run as Administrator option.

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.



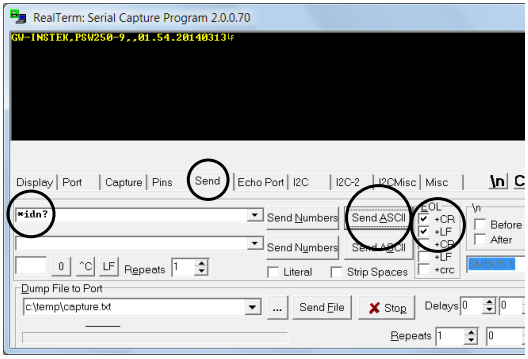
6 Click on the Send tab.

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:

TEXIO,PSW-M1080L444,GJY130385,01.07.20240222

(manufacturer, model, serial number, version)

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

1.1.6. GP-IB Remote Control Function Check

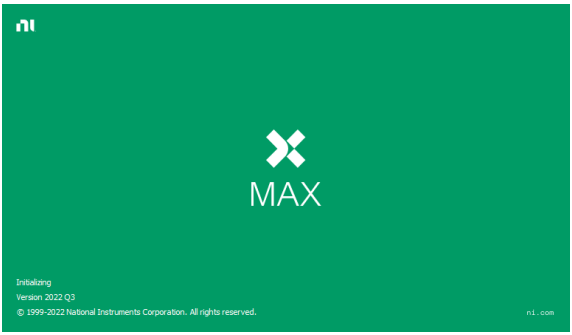
Its possible use National Instruments Measurement and Automation Explorer (NI MAX) to check if GP-IB connection is working properly. Use of NI MAX requires NI-VISA to be installed.

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."

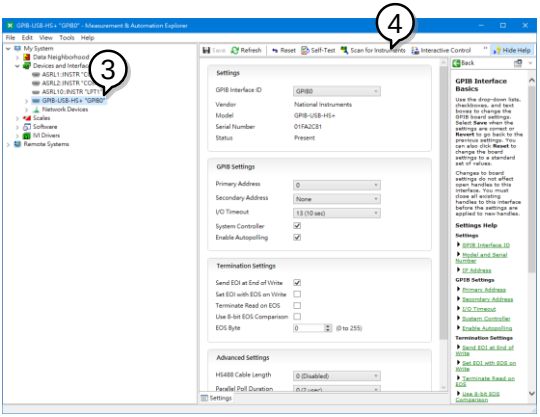
steps	Step instructions
1	Complete the setup steps above.
2	Start the Measurement and Automation Explorer (MAX) program. When using Windows, click in the following order: Start > All Programs > National Instruments > NI MAX



The Measurement & Automation Explorer initial splash screen.

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

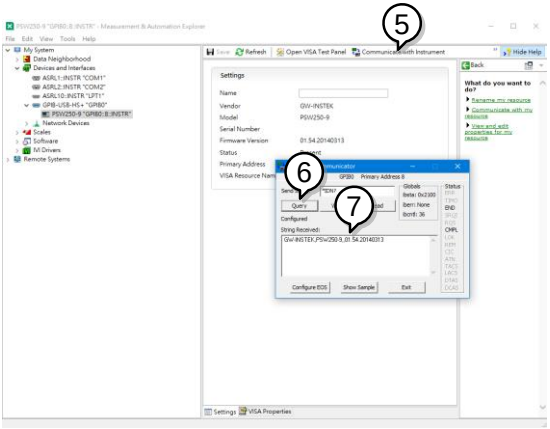
4 Press the Scan for Instruments button.



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:
TEXIO,PSW-M1080L444,GJY130385,01.07.20240222
(manufacturer, model, serial number, version)



8 The function check is complete.

1.1.7. Socket Server Function Check

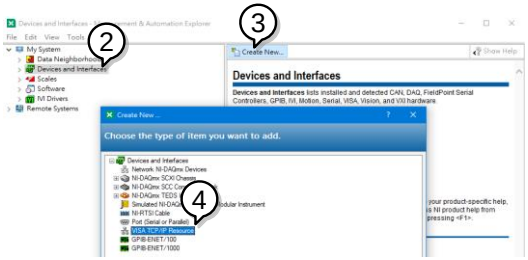
Its possible use National Instruments Measurement and Automation Explorer (NI MAX) to check if soket server connection is working properly. Use of NI MAX requires NI-VISA to be installed.

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."

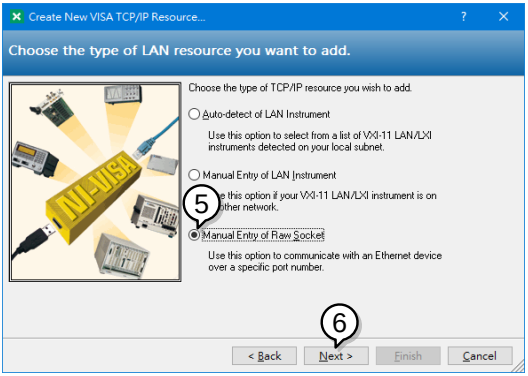
steps	Step instructions
1	Start the NI Measurement and Automation Explorer (MAX) program. When using Windows, click in the following order: Start > All Programs > National Instruments > Measurement & Automation

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.

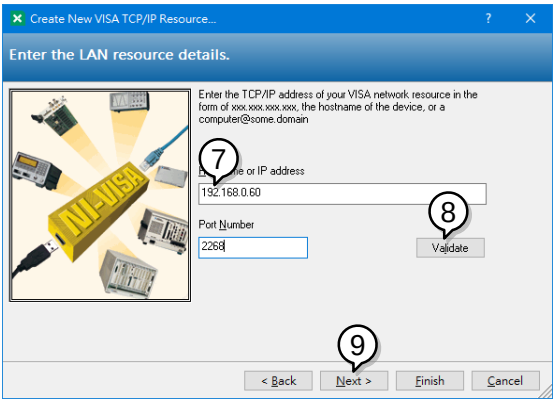
6 Click Next.



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

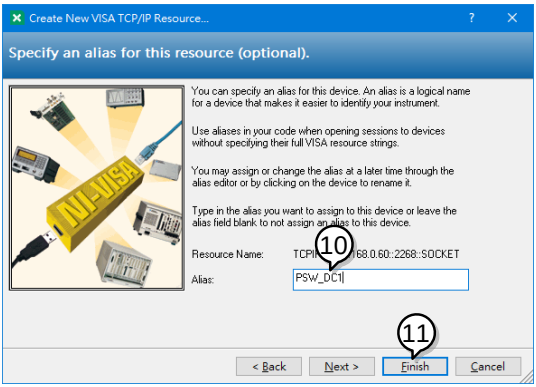
8 Click the Validate button. A popup box will appear when successful.

9 Click Next.



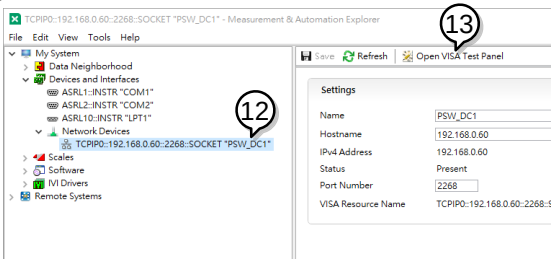
10 Next configure the Alias (name) of this product connection. In this example the Alias is: PSW_DC1

11 Click finish.



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

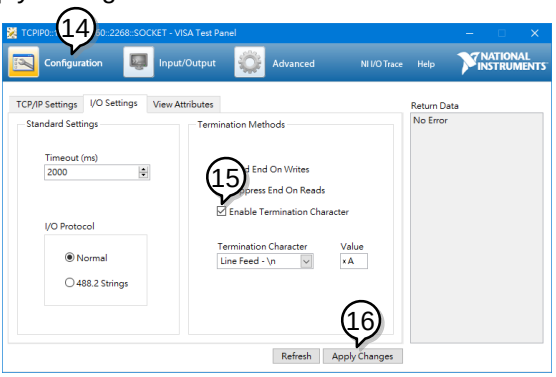
13 Press Open VISA Test Panel.



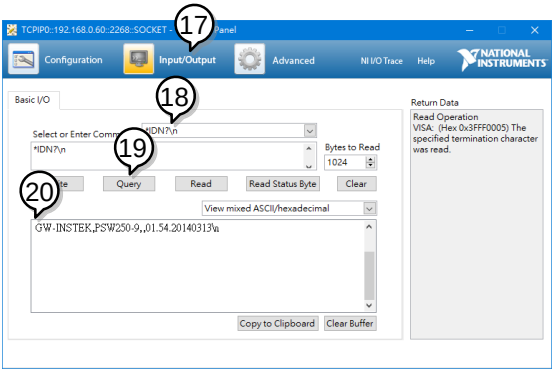
14 Click Configuration icon.

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: TEXIO,PSW-M1080L444,GJY130385,01.07.20240222 (manufacturer, model, serial number, version)



1.2. Remote state for each channel of the PSW-M series

When a command is sent from the controller to a specified channel of the PSW-M series, the command is sent to the specified channel via the module of channel 1. Therefore, channel 1 and the specified channel will be in remote state (REM mark displayed).

Channels that do not have the REM mark displayed can be operated from the panel. If you want to prohibit panel operation, first use the command ":SYSTem:COMMunicate:RLSTate ON" to set all channels to remote state (REM mark displayed).

2. Command

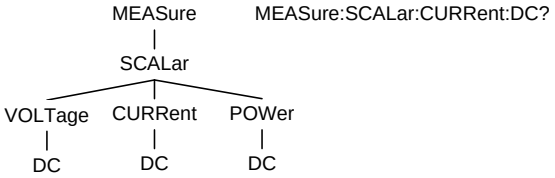
2.1. Command Syntax

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 (:).

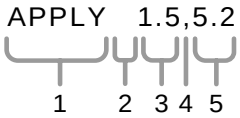
For example, the diagram below shows an SCPI sub-structure and a command example.



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. The ":" at the beginning of the command can be omitted. 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
<(@chanlist)>	Channel list	(@1) Command for channel 1 (@1, 2) Commands for channels 1 and 2 (@1:3) Commands for channels 1 ,2 and 3

Add the channel list after the command parameters. If there is no channel list, the command will be for channel 1.

If multiple channel lists are specified in the query command, the response parameters will be returned in the order in which the channel lists are listed, separated by ",".

<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	Line feed code	LF(0x0a)

2.2. Command List

2.2.1. Abort Commands

Command name	Overview	Page
ABORt	Cancel all trigger operations	29

2.2.2. Apply Commands

Command name	Overview	Page
APPLy	Set both voltage and current values	29

2.2.3. Display Commands

Command name	Overview	Page
:DISPlay:MENU[:NAME]	Select and query display menu	30
:DISPlay[:WINDow] :TEXT:CLEar	Clear the text on the display	31
:DISPlay[:WINDow] :TEXT[:DATA]	Set and query the text on the display	31
:DISPlay:BLINk	Set and query turning on/off the flashing display	31

2.2.4. Initiate Commands

Command name	Overview	Page
:INITiate[:IMMediate]:NAME	Initiate TRANsient or OUTPut trigger	32

2.2.5. Measure Commands

Command name	Overview	Page
:MEASure[:SCALar] :ALL[:DC]	Returns the measured average output current and voltage.	33
:MEASure[:SCALar] :CURRent[:DC]	Returns the measured average output current.	33
:MEASure[:SCALar] :VOLTage[:DC]	Returns the measured average output voltage.	34
:MEASure[:SCALar] :POWer[:DC]	Returns the measured average output power.	34

2.2.6. Output Commands

Command name	Overview	Page
:OUTPut:DELay:ON	Set and query output on delay time	34
:OUTPut:DELay:OFF	Set and query output off delay time	35
:OUTPut:MODE	Select and query the V-I mode	35
:OUTPut[:STATe] [:IMMediate]	Set and query output on/off	36
:OUTPut[:STATe] :TRIGgered	Set and query output on/off when software trigger occurs	36
:OUTPut:PROTection :CLEar	Clear the operating status of the protection circuit	37
:OUTPut:PROTection :TRIPped	Returns the protection circuit operating status.	37
:OUTPut:PROTection :SYNChronize	Set and query enable protection trigger synchronization function enable channel	38
:OUTPut[:STATe] :SYNChronize	Set and query output synchronization function enabled channel	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.	40
: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.	44
: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 Instrument Status register.	44
:STATus:QUEStionable :NTRansition	Set and query the Negative Transition filter of the Questionable Instrument Status register.	45
:STATus:OPERation :INSTrument :ISUMmary<1|2|3>[:EVENt]	Queries the Operation Instrument Isummary Status Event register for the specified channel.	45
:STATus:OPERation :INSTrument :ISUMmary<1|2|3> :CONDition	Queries the Operation Instrument Isummary Status Condition register for the specified channel.	46
:STATus:OPERation :INSTrument :ISUMmary<1|2|3>:ENABle	Sets or queries the Operation Instrument Isummary Status Enable register for the specified channel.	46

:STATus:OPERation :INSTrument :ISUMmary<1|2|3>: PTRansition	Sets or queries the Positive Transition filter of the Operation Instrument Isummary Status register for the specified channel.	47
:STATus:OPERation :INSTrument :ISUMmary<1|2|3> :NTRansition	Sets or queries the Negative Transition filter of the Operation Instrument Isummary Status register for the specified channel.	47
:STATus:QUEStionable :INSTrument :ISUMmary<1|2|3>[:EVENt]	Queries the Questionable Instrument Isummary Status Event register for the specified channel.	48
:STATus:QUEStionable :INSTrument :ISUMmary<1|2|3> :CONDition	Queries the Questionable Instrument Isummary Status Condition register for the specified channel.	48
:STATus:QUEStionable :INSTrument :ISUMmary<1|2|3>:ENABle	Sets or queries the Questionable Instrument Isummary Status Enable register for the specified channel.	49
:STATus:QUEStionable :INSTrument :ISUMmary<1|2|3> :PTRansition	Sets or queries the Positive Transition filter of the Questionable Instrument Isummary Status register for the specified channel.	49
:STATus:QUEStionable :INSTrument :ISUMmary<1|2|3> :NTRansition	Sets or queries the Negative Transition filter of the Questionable Instrument Isummary Status register for the specified channel.	50
:STATus:PRESet	Reset registers/filters to default values.	51

2.2.9. Source Commands

Command name	Overview	Page
[:SOURce]:CURRent [:LEVel][:IMMediate] [:AMPLitude]	Sets or queries the current value in A unit.	51

[:SOURce]:CURRent [:LEVel]:TRIGgered [:AMPLitude]	Sets or queries the setting current value when the software trigger is generated.	52
[:SOURce]:CURRent :PROTection[:LEVel]	Sets or queries the OCP value.	53
[:SOURce]:CURRent :PROTection:STATe	Turns OCP on or off.	54
[:SOURce]:CURRent :SLEW:RISing	Sets or queries the rising current slew rate.	54
[:SOURce]:CURRent :SLEW:FALLing	Sets or queries the falling current slew rate.	55
[:SOURce]:RESistance [:LEVel][:IMMediate] [:AMPLitude]	Sets or queries the internal resistance.	56
[:SOURce]:VOLTage [:LEVel][:IMMediate] [:AMPLitude]	Sets or queries the setting voltage value.	56
[:SOURce]:VOLTage [:LEVel]:TRIGgered [:AMPLitude]	Sets or queries the setting voltage value when the software trigger is generated.	57
[:SOURce]:VOLTage :PROTection[:LEVel]	Sets or queries the OVP value.	58
[:SOURce]:VOLTage :SLEW:RISing	Sets or queries the rising voltage slew rate.	59
[:SOURce]:VOLTage :SLEW:FALLing	Sets or queries the falling voltage slew rate.	60
[:SOURce]:VOLTage :PROTection:LOW:STATe	Sets or queries the enable/disable of tUVP function.	60
[:SOURce]:VOLTage :PROTection:LOW:DELay	Sets or queries the tUVP delay time.	61
[:SOURce]:VOLTage :PROTection:LOW[:LEVel]	Sets or queries the tUVP voltage level.	62
[:SOURce]:POWer[:LEVel] [:IMMediate][:AMPLitude]	Sets or queries the setting power value.	63

2.2.10. Trigger Commands

Command name	Overview	Page
:TRIGger:TRANsient [:IMMediate]	Generates a software trigger.	63
:TRIGger:TRANsient :SOURce	Sets or queries the trigger source for the transient system.	64
:TRIGger:OUTPut [:IMMediate]	Generates a software trigger for the output trigger system.	64
:TRIGger:OUTPut:SOURce	Sets or queries the trigger source for the output system.	65

2.2.11. System Commands

Command name	Overview	Page
:SYSTem:BEEPer [:IMMediate]	Sets or queries the duration of the buzzer from this product.	65
:SYSTem:CONFigure :BEEPer[:STATe]	Sets or queries the buzzer state on/off.	66
:SYSTem:CONFigure :BLEeder[:STATe]	Sets or queries the status of the bleeder resistor.	67
:SYSTem:CONFigure :CURRent:CONTrol	Sets or queries the CC control mode.	67
:SYSTem:CONFigure :VOLTage:CONTrol	Sets or queries the CV control mode.	68
:SYSTem:CONFigure :OUTPut:EXTernal[:MODE]	Sets or queries the external output logic.	69
:SYSTem:CONFigure :OUTPut:PON[:STATe]	Sets or queries the unit to turn the output ON/OFF at power-up.	69
:SYSTem:COMMunicate :ENABle	Enables/disables or queries remote interfaces and remote services.	70
:SYSTem:COMMunicate :GPIB[:SELF]:ADDRess	Sets or queries the GP-IB address.	71
:SYSTem:COMMunicate :LAN:IPADdress	Sets or queries LAN IP address.	71
:SYSTem:COMMunicate :LAN:GATEway	Sets or queries the Gateway address.	72

:SYSTem:COMMunicate :LAN:SMASk	Sets or queries the LAN subnet mask.	72
:SYSTem:COMMunicate :LAN:MAC	Returns the unit MAC address.	73
:SYSTem:COMMunicate :LAN:DHCP	Sets or queries the turns DHCP on/off.	73
:SYSTem:COMMunicate :LAN:DNS	Sets or queries the DNS address.	74
:SYSTem:COMMunicate :LAN:HOSTname	Returns the host name.	74
:SYSTem:COMMunicate :LAN:WEB:PACTive	Sets or queries whether the web password is on or off.	74
:SYSTem:COMMunicate :LAN:WEB:PASSword	Sets or queries the web password.	75
:SYSTem:COMMunicate :RLSTate	Sets or queries the control state of the instrument.	75
:SYSTem:COMMunicate :USB:FRONt:STATe	Queries the front panel USB-A port state.	76
:SYSTem:COMMunicate :USB:REAR:STATe	Queries the rear panel USB-B port state.	76
:SYSTem:COMMunicate :USB:REAR:MODE	Sets or queries the rear panel USB-B port mode.	77
:SYSTem:ERRor	Queries the error queue.	78
:SYSTem:KEYLock:MODE	Sets or queries the output key operation in panel locked.	78
:SYSTem:KLOCk	Sets or queries the front panel control as enables or disables.	79
:SYSTem:KLOCk :SYNChronize:STATe	Sets or queries whether the synchronization front panel control are enabled or disabled.	79
:SYSTem:INFormation	Queries the system information.	80
:SYSTem:PRESet	Resets all the settings to the factory default settings.	80
:SYSTem:VERSion	Returns the version of the SCPI specifications that the unit complies with.	80

2.2.12. Logging function commands

Command name	Overview	Page
:FETCh:DLOG	Return logging data.	81

2.2.13. Fan stop function command

Command name	Overview	Page
:CONTrol:FAN:STOP:STATe	Sets and queries the fan stop function.	82

2.2.14. Test mode function commands

Command name	Overview	Page
:PROGram:NAME	Sets and queries the test mode memory number.	83
:PROGram:STATe	Sets and queries the test mode enable/disable.	84
:PROGram:SEQuence	Sets and queries run and stop of the test mode.	84
:PROGram:SEQuence :STEP?	Query the running step number.	85

2.2.15. Common Commands

Command name	Overview	Page
*CLS	Clear various registers.	85
*ESE	Sets or queries the Standard Event Status Enable register.	86
*ESR	Queries the Standard Event Status register.	86
*IDN	Queries the instrument ID.	86
*OPC	After all commands are processed, set the OPC bit in the Standard Event Status register. Returns 1 after all outstanding commands are completed.	87
*RST	Performs the instrument reset.	87
*SRE	Sets or queries the Service Request Enable register.	88

*STB	Queries the Status Byte register.	88
*TRG	Generate a trigger.	88
*TST	Executes a self test.	89
*WAI	No other commands or queries are executed until the outstanding command completes.	89

2.3. Command description

2.3.1. Abort Command

ABORt — Set

Description	The ABORt command cancels the trigger actions of "TRIGger:TRANsient[:IMMediate]" and "TRIGger:OUTPut [:IMMediate]".
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}] [,(@chanlist)]	
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,(@2) Sets the voltage and current to 5.05V and 1.1A of CH2.	
Query Syntax	APPLy? [(@chanlist)]	
Return parameter	<NRf>: Already set voltage/current values	
Example 1	APPL? (@2) +5.050,+1.100 Returns voltage (5.05V) and current (1.1A) setting of CH2.	

Example 2	APPL? (@1:3) +1.000,+1.000,+2.000,+2.000,+3.000,+3.000 The setting values are returned in the following order: CH1 voltage, CH1 current, CH2 voltage, CH2 current, CH3 voltage, CH3 current.

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>[,(@chanlist)]	
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
	5～99	Not Used
	100～199	Contents of F-00~99
Example	:DISP:MENU:NAME 0,(@2) Set the display of CH2 to the measurement voltage value and measurement current value.	
Query Syntax	:DISPlay:MENU[:NAME]? [(@chanlist)]	
Return parameter	Same as syntax parameter	
Example	:DISPlay:MENU? (@2) 0 Display contents of CH2 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 [(@chanlist)]
Example	:DISP:TEXT:CLE (@2) Clears the text on CH2 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.	
Syntax	:DISPlay[:WINDow]:TEXT[:DATA] <string> [,(@chanlist)]	
Parameter	<string>	The string must be enclosed in alphanumeric quotation marks. Example: "STRING" ASCII character 20H to 7EH can be used to in the string parameter.
Example	:DISP:WIND:TEXT:DATA "STRING",(@2) Set the display section of CH2 display to STRING.	
Query Syntax	:DISPlay[:WINDow]:TEXT[:DATA]? [(@chanlist)]	
Return parameter	Same as syntax parameter	
Example	:DISP:WIND:TEXT:DATA? (@2) "STRING" Returns the text string set in the display area of CH2.	

:DISPlay:BLINk

Set →
→ Query

Description	Turns blink on or off for the display.
Syntax	:DISPlay:BLINk {0|1|OFF|ON}[,(@chanlist)]

Parameter	0 / OFF	Turns blink OFF
	1 / ON	Turns blink ON
Example	:DISP:BLIN ON,(@2) Turn on the blinking of the CH2 display.	
Query Syntax	:DISPlay:BLINk? [(@chanlist)]	
Return parameter	0	Blink is off
	1	Blink is on
Example	:DISP:BLIN? (@2) 0 CH2 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 63.
Syntax	:INITiate[:IMMediate]:NAME {TRANsient|OUTPut} [,(@chanlist)]
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,(@2) :CURR:TRIG MAX,(@2) :VOLT:TRIG 5,(@2) :INIT:NAME TRAN,(@2) With this command, CH2 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,(@2) :CURR:TRIG MAX,(@2) :VOLT:TRIG 5,(@2) :INIT:NAME TRAN,(@2) :TRIG:TRAN (@2) (or *TRG) With TRIG:TRAN (or *TRG) command, CH2 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,(@2) :OUTP:TRIG 1,(@2) :INIT:NAME OUTP,(@2) With this command, the output of CH2 changes to ON.
Example 4	The output system for the trigger in BUS mode. :TRIG:OUTP:SOUR BUS,(@2) :OUTP:TRIG 1,(@2) :INIT:NAME OUTP,(@2) :TRIG:OUTP (@2) (or *TRG) With TRIG:OUTP (or *TRG) command, the output of CH2 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]? [(@chanlist)]
Return parameter	<voltage>,<current> Returns the voltage (V) and current (A).
Example 1	:MEAS:ALL? (@2) +5.000,+1.000 Output voltage and current value of CH2 is 5.000V, 1.000A.
Example 2	:MEASure:ALL? (@1:3) +0.997,+1.000,+1.996,+2.000,+2.996,+3.000 The measured values are returned in the following order: CH1 Voltage, CH1 Current, CH2 Voltage, CH2 Current, CH3 Voltage, CH3 Current.

:MEASure[:SCALar]:CURRent[:DC] → Query

Description	Returns the measurement average output current.
Query Syntax	:MEASure[:SCALar]:CURRent[:DC]? [(@chanlist)]

Return parameter	<current> Returns the current (A).
Example	:MEASure:CURR? (@2) +1.000 Output current value of CH2 is 1.000A

:MEASure[:SCALar]:VOLTage[:DC] → Query

Description	Returns the measurement average output voltage.
Query Syntax	:MEASure[:SCALar]:VOLTage[:DC]? [(@chanlist)]
Return parameter	<voltage> Returns the voltage (V).
Example	:MEASure:VOLT? (@2) +5.000 Output voltage value of CH2 is 5.000V

:MEASure[:SCALar]:POWer[:DC] → Query

Description	Returns the measurement average output power.
Query Syntax	:MEASure[:SCALar]:POWer[:DC]? [(@chanlist)]
Return parameter	<power> Returns the power (W).
Example	:MEASure:POWer? (@2) +4.996992 Output power value of CH2 is 4.996992W

2.3.6. Output Commands

:OUTPut:DELay:ON → Set / Query

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>[,(@chanlist)]
Parameter	<NR3> 0.00~99.99 seconds, where 0=no delay.
Example	:OUTP:DEL:ON 1,(@2) Set the output on delay time of CH2 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? (@2) +10.00 The output on delay time setting value of CH2 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>[,(@chanlist)]	
Parameter	<NR3>	0.00~99.99 seconds, where 0=no delay.
Example	:OUTP:DEL:OFF 1,(@2) Set the output off delay time of CH2 to 1 second.	
Query Syntax	:OUTPut:DELay:OFF? [(@chanlist)]	
Return parameter	<NR3>	Returns the delay on time for output off in seconds.
Example	:OUTP:DEL:OFF? (@2) +10.00 The output off delay time setting value of CH2 is 10 seconds.	

Set →
→ Query

:OUTPut:MODE

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} [,(@chanlist)]	
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,(@2) Set V-I mode slew rate of CH2 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? (@2) 0 The V-I mode slew rate of CH2 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}[,(@chanlist)]	
Parameter	0 / OFF	Turns the output off.
	1 / ON	Turns the output on.
Example	:OUTP ON,(@2) Turn on CH2 output.	
Query Syntax	:OUTPut[:STATe][:IMMediate]? [(@chanlist)]	
Return parameter	0	Output off state
	1	Output on state
Example	:OUTP? (@2) 1 CH2 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}[,(@chanlist)]

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,(@2) Turns on CH2 output when a software trigger is generated.	
Query Syntax	:OUTPut[:STATe]:TRIGgered? [(@chanlist)]	
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? (@2) 1 CH2 is 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 [(@chanlist)]
Example	:OUTP:PROT:CLE (@2) Clears the protection circuit operating status of CH2.

:OUTPut:PROTection:TRIPped

Query

Description	Returns the operating status of the protection circuit (OVP, OCP, OTP).	
Query Syntax	:OUTPut:PROTection:TRIPped? [(@chanlist)]	
Return parameter	0	Protection circuit is not activated.
	1	Protection circuit is activated.
Example	:OUTP:PROT:TRIP? (@2) 0 Protection circuits of CH2 is not tripped.	

:OUTPut:PROTection:SYNChronize

Set → / → Query

Description	This command sets the channels on which to enable the protection trigger synchronization function. If two or more channels have the protection synchronization function enabled, when protection occurs on any channel, the protection state of the other channels will be synchronized.	
⚠Note	The protection trigger synchronization function operates with the following protection circuit.: OVP/OCP/SHUT DOWN signal input.	
Syntax	:OUTPut:PROTection:SYNChronize {0|1|OFF|ON} [,(@chanlist)]	
Parameter	0 / OFF	Turn off protection trigger synchronization.
	1 / ON	Turn on protection trigger synchronization.
Example	OUTP:PROT:SYNC ON,(@1,3) Enable the protection trigger synchronization function for CH1 and CH3.	
Query Syntax	:OUTPut:PROTection:SYNChronize? [(@chanlist)]	
Return parameter	0	Protection trigger synchronization is in off state.
	1	Protection trigger synchronization is in on state.
Example	:OUTP:PROT:SYNC? (@3) 1 CH3 protection trigger synchronization is on.	

:OUTPut[:STATe]:SYNChronize

Set → / → Query

Description	This command sets the channels on which to enable the output synchronization function. When output sync is enabled on two or more channels, when any channel turns its output on or off, the output status of the other channels will be synchronized.
Syntax	:OUTPut[:STATe]:SYNChronize {0|1|OFF|ON} [,(@chanlist)]

Parameter	0 / OFF	Turn off the output synchronization function
	1 / ON	Turn on the output synchronization function
Example	:OUTP:SYNC ON,(@1,3) CH1, CH3 are set to enable the output synchronization function.	
Query Syntax	:OUTPut[:STATe]:SYNChronize? [(@chanlist)]	
Return parameter	0	The output synchronization is in off state.
	1	The output synchronization is in on state.
Example	:OUTP:SYNC? (@3) 1 CH3 output synchronization is on.	

2.3.7. Sense Command

:SENSe:AVERage:COUNt

Set → / → Query

Description	Sets the level of measurement averaging. Same as F-17 settings.	
Syntax	:SENSe:AVERage :COUNt {<NR1>|LOW|MIDDle|HIGH}[,(@chanlist)]	
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,(@2) Set measurement averaging level of CH2 to Low	
Query Syntax	:SENSe:AVERage:COUNt? [(@chanlist)]	
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? (@2) 0 Measurement averaging level setting of CH2 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 }[,(@chanlist)]	
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:PER 10,(@2) Set the logging interval of CH2 to 10 seconds.	
Example 2	SENSe:DLOG:PER MIN,(@2) Set the logging interval of CH2 to the minimum.	
Query Syntax	:SENSe:DLOG :PERiod? [MINimum|MAXimum][(@chanlist)]	
Return parameter	<NRf>	Setted logging interval time, Unit: seconds
	MINimum	Minimum logging interval
	MINimum	Maximum logging interval
Example 1	:SENSe:DLOG:PER? (@2) 10.0 The logging interval for CH2 is set to 10 seconds.	
Example 2	:SENSe:DLOG:PER? MIN(@2) 0.1 The minimum logging interval for CH2 is 0.1 seconds.	

Set → / → Query

:SENSe:DLOG:STATe

Description	Sets and queries the logging function operation settings and data output destination.
Syntax	:SENSe:DLOG:STATe {0|1|2}[,(@chanlist)]

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,(@2) The logging data of CH2 is output to the front USB port and the logging function is executed.	
Query Syntax	:SENSe:DLOG:STATe? [(@chanlist)]	
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) 2 The data output destination for CH2 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.	

:STATus:OPERation:ENABle

Set / Query

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).	

:STATus:OPERation:PTRansition

Set / Query

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).

:STATus:OPERation:NTRansition

Set → / → Query

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).

:STATus:QUEStionable[:EVENt]

→ Query

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.

:STATus:QUEStionable:CONDition → Query

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:INSTrument:PTRansition → Set / Query

Description	Sets or queries the Positive Transition filter of the Questionable Instrument Status register by bit sum.
Syntax	:STATus:QUEStionable:INSTrument:PTRansition <NR1>
Parameter	<NR1> 0 ~ 32767: The bit sums

Example	:STAT:QUES:INST:PTR 1 Set the Positive Transition filter of the Questionable Instrument Status register to 1.
Query Syntax	:STATus:QUEStionable:INSTrument:PTRansition?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:QUES:INST:PTR? 1 The setting content of the Positive Transition filter of the Questionable Instrument Status register is 1.

:STATus:QUEStionable:INSTrument:NTRansition

Set → Query

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

:STATus:OPERation:INSTrument
:ISUMmary<1|2|3>[:EVENt]

→ Query

Description	Queries the bit sum of the Operation Instrument Isummary Status Event register. This query will clear the contents of the register. Use <1|2|3> to specify the channel number.
Query Syntax	:STATus:OPERation:INSTrument :ISUMmary<1|2|3>[:EVENt]?

Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:OPER:INST:ISUM1? 0 The bit sum of the Operation Instrument Isummary Status Event register of CH1 is 0.

:STATus:OPERation:INSTrument
:ISUMmary<1|2|3>:CONDition → Query

Description	Queries the bit sum of the Operation Instrument Isummary Status Condition register. This query will not clear the register. Use <1|2|3> to specify the channel number.
Query Syntax	:STATus:OPERation:INSTrument :ISUMmary<1|2|3>:CONDition?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:OPER:INST:ISUM1:COND? 0 The bit sum of the Operation Instrument Isummary Status Condition register of CH1 is 0.

:STATus:OPERation:INSTrument
:ISUMmary<1|2|3>:ENABle → Set / → Query

Description	Sets or queries the bit sum of the Operation Instrument Isummary Status Enable register. Use <1|2|3> to specify the channel number.
Syntax	:STATus:OPERation:INSTrument :ISUMmary<1|2|3>:ENABle <NR1>
Parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:OPER:INST:ISUM1:ENAB 1 Sets the bit sum of the Operation Instrument Isummary Status Enable register of CH1 to 1.
Query Syntax	:STATus:OPERation:INSTrument :ISUMmary<1|2|3>:ENABle?

Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:OPER:INST:ISUM1:ENABle? 1 The bit sum of the Operation Instrument Isummary Status Enable register of CH1 is 1.

:STATus:OPERation:INSTrument
:ISUMmary<1|2|3>:PTRansition

Set →
→ Query

Description	Sets or queries the bit sum of the Positive Transition filter of the Operation Instrument Isummary Status register. Use <1|2|3> to specify the channel number.
Syntax	:STATus:OPERation:INSTrument :ISUMmary<1|2|3>:PTRansition <NR1>
Parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:OPER:INST:ISUM1:PTR 1 Sets the bit sum of the Positive Transition filter of the Operation Instrument Isummary Status register of CH1 to 1.
Query Syntax	:STATus:OPERation:INSTrument :ISUMmary<1|2|3>:PTRansition?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:OPER:INST:ISUM1:PTR? 1 The bit sum of the Positive Transition filter of the Operation Instrument Isummary Status register of CH1 is 1.

:STATus:OPERation:INSTrument
:ISUMmary<1|2|3>:NTRansition

Set →
→ Query

Description	Sets or queries the bit sum of the Negative Transition filter of the Operation Instrument Isummary Status register. Use <1|2|3> to specify the channel number.

Syntax	:STATus:OPERation:INSTrument :ISUMmary<1|2|3>:NTRansition <NR1>
Parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:OPER:INST:ISUM1:NTR 1 Sets the bit sum of the Negative Transition filter of the Operation Instrument Isummary Status register of CH1 to 1.
Query Syntax	:STATus:OPERation:INSTrument :ISUMmary<1|2|3>:NTRansition?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:OPER:INST:ISUM1:NTR? 1 The bit sum of the Negative Transition filter of the Operation Instrument Isummary Status register of CH1 is 1.

:STATus:QUEStionable:INSTrument
:ISUMmary<1|2|3>[:EVENt]

→ Query

Description	Queries the bit sum of the Questionable Instrument Isummary Status Event register. This query will clear the contents of the register. Use <1|2|3> to specify the channel number.
Query Syntax	:STATus:QUEStionable:INSTrument :ISUMmary<1|2|3>[:EVENt]?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:QUES:INST:ISUM1? 0 The bit sum of the Questionable Instrument Isummary Status Event register of CH1 is 0.

:STATus:QUEStionable:INSTrument
:ISUMmary<1|2|3>:CONDition

→ Query

Description	Queries the bit sum of the Questionable Instrument Isummary Status Condition register. This query will not clear the register. Use <1|2|3> to specify the channel number.

Query Syntax	:STATus:QUEStionable:INSTrument :ISUMmary<1|2|3>:CONDition?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:QUES:INST:ISUM1:COND? 0 The bit sum of the Questionable Instrument Isummary Status Condition register of CH1 is 0.

:STATus:QUEStionable:INSTrument
:ISUMmary<1|2|3>:ENABle

Set → / → Query

Description	Sets or queries the bit sum of the Questionable Instrument Isummary Status Enable register. Use <1|2|3> to specify the channel number.
Syntax	:STATus:QUEStionable:INSTrument :ISUMmary<1|2|3>:ENABle <NR1>
Parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:QUES:INST:ISUM1:ENAB 1 Sets the bit sum of the Questionable Instrument Isummary Status Enable register of CH1 to 1.
Query Syntax	:STATus:QUEStionable:INSTrument :ISUMmary<1|2|3>:ENABle?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:QUES:INST:ISUM1:ENAB? 1 The bit sum of the Questionable Instrument Isummary Status Enable register of CH1 is 1.

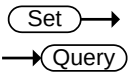
:STATus:QUEStionable:INSTrument
:ISUMmary<1|2|3>:PTRansition

Set → / → Query

Description	Sets or queries the bit sum of the Positive Transition filter of the Questionable Instrument Isummary Status register. Use <1|2|3> to specify the channel number.

Syntax	:STATus:QUEStionable:INSTrument :ISUMmary<1|2|3>:PTRansition <NR1>
Parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:QUES:INST:ISUM1:PTR 1 Sets the bit sum of the Positive Transition filter of the Questionable Instrument Isummary Status register of CH1 to 1.
Query Syntax	:STATus:QUEStionable:INSTrument :ISUMmary<1|2|3>:PTRansition?
Return parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:QUES:INST:ISUM1:PTR? 1 The bit sum of the Positive Transition filter of the Questionable Instrument Isummary Status register of CH1 is 1.

:STATus:QUEStionable:INSTrument :ISUMmary<1|2|3>:NTRansition



Description	Sets or queries the bit sum of the Negative Transition filter of the Questionable Instrument Isummary Status register. Use <1|2|3> to specify the channel number.
Syntax	:STATus:QUEStionable:INSTrument :ISUMmary<1|2|3>:NTRansition <NR1>
Parameter	<NR1> 0 ~ 32767: The bit sums
Example	:STAT:QUES:INST:ISUM1:NTR 1 Sets the bit sum of the Negative Transition filter of the Questionable Instrument Isummary Status register of CH1 to 1.
Query Syntax	:STATus:QUEStionable:INSTrument :ISUMmary<1|2|3>:NTRansition?
Return parameter	<NR1> 0 ~ 32767: The bit sums

Example	:STAT:QUES:INST:ISUM1:NTR? 1 The bit sum of the Negative Transition filter of the Questionable Instrument Isummary Status register of CH1 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:PRES

2.3.9. Source Commands

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

Set →
→ Query

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}[,(@chanlist)]

Parameter		
	<NRf>	0 to 105% of rated current value.
	MIN	Minimum current value.
	MAX	Maximum current value.

Example	:CURR 1.5,@2 Set the CH2 current value to 1.5A.	
Query Syntax	[:SOURce]:CURRent[:LEVel][:IMMediate][:AMPLitude]? [(@chanlist)] or [:SOURce]:CURRent[:LEVel][:IMMediate][:AMPLitude]? {MIN|MAX}[,(@chanlist)]	
Return parameter	<NRf>	Setted current value.
	MIN	Minimum current value.
	MAX	Maximum current Value.
Example 1	:CURR? (@2) +1.500 Returns the CH2 setting current (1.5A).	
Example 2	:CURR? MAX,(@2) +37.800 Returns the maximum possible current value (37.8A) of CH2.	

[: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}[,(@chanlist)]	
Parameter	<NRf>	0 to 105% of rated current value.
	MIN	Minimum current value.
	MAX	Maximum current value.
Example	:CURR:TRIG 1.5,(@2) Set the setting current value when a software trigger is generated on CH2 to 1.5A.	
Query Syntax	[:SOURce]:CURRent[:LEVel]:TRIGgered[:AMPLitude]? [(@chanlist)] or [:SOURce]:CURRent[:LEVel]:TRIGgered[:AMPLitude]? {MIN|MAX}[,(@chanlist)]	

Return parameter	<NRf>	Setted current value.
	MIN	Minimum current value.
	MAX	Maximum current value.
Example 1	:CURR:TRIG? (@2) +1.500 The setting current value when a software trigger is generated on CH2 is 1.5A.	
Example 2	:CURR:TRIG? MAX,(@2) +37.800 Returns the maximum possible current value (37.8A) when a software trigger is generated on CH2.	

[: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}[,(@chanlist)]	
Parameter	<NRf>	OCP range in Amps.
	MIN	Minimum OCP value.
	MAX	Maximum OCP value.
Example	:CURR:PROT 10,(@2) Set the OCP value of CH2 to 10A.	
Query Syntax	[:SOURce]:CURRent:PROTection[:LEVel]? [(@chanlist)] or [:SOURce]:CURRent:PROTection [:LEVel]? {MIN|MAX}[,(@chanlist)]	
Return parameter	<NRf>	Setted OCP value.
	MIN	Minimum OCP value.
	MAX	Maximum OCP value.
Example 1	:CURR:PROT? (@2) +10.000 The setting OCP value on CH2 is 10A.	
Example 2	:CURR:PROT? MIN,(@2) +3.600 Returns the minimum possible current level (3.6A) in OCP value.	

[:SOURce]:CURRent:PROTection:STATe

Set → / → Query

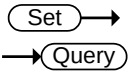
Description	Turns OCP (over-current protection) on or off.	
Syntax	[:SOURce]:CURRent:PROTection :STATe {0|1|OFF|ON}[,(@chanlist)]	
Parameter	0 / OFF	Turns the OCP off.
	1 / ON	Turns the OCP on.
Example	:CURR:PROT:STAT OFF,(@2) Turns the OCP off on CH2.	
Query Syntax	[:SOURce]:CURRent:PROTection:STATe? [(@chanlist)]	
Return parameter	0	OCP is off.
	1	OCP is on.
Example	:CURR:PROT:STAT? (@2) 0 OCP setting for CH2 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}[,(@chanlist)]	
Parameter	<NRf>	Rising current slew rate range.
	MIN	Minimum rising current slew rate.
	MAX	Maximum rising current slew rate.
Example	:CURR:SLEW:RIS 10,(@2) Set the CH2 rising current slew rate to 10A/s.	
Query Syntax	[:SOURce]:CURRent:SLEW:RISing? (@chanlist)] or [:SOURce]:CURRent:SLEW :RISing? {MIN|MAX}[,(@chanlist)]	
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? (@2) +10.000 The rising current slew rate of CH2 is 10.000A/s.
Example 2	:CURR:SLEW:RIS? MIN,(@2) +0.010 Returns the minimum rising current slew rate (0.010A/s) of CH2.



[:SOURce]:CURRent:SLEW:FALLing

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}[,(@chanlist)]	
Parameter	<NRf>	Fslling current slew rate range.
	MIN	Minimum falling current slew rate.
	MAX	Maximum falling current slew rate.
Example	:CURR:SLEW:FALL 10,(@2) Set the CH2 fall current slew rate to 10A/s.	
Query Syntax	[:SOURce]:CURRent:SLEW:FALLing? [(@chanlist)] or [:SOURce]:CURRent:SLEW :FALLing? {MIN|MAX}[,(@chanlist)]	
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? (@2) +10.000 The falling current slew rate of CH2 is 10.000A/s.	
Example 2	:CURR:SLEW:FALL? MIN,(@2) +0.010 Returns the minimum falling current slew rate (0.010A/s) of CH2.	

[: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}[,(@chanlist)]	
Parameter	<NRf>	Internal resistance in ohms.
	MIN	Minimum internal resistance in ohms.
	MAX	Maximum internal resistance in ohms.
Example	:RES 0.417,@2 Set the CH2 Internal resistance to 0.417Ω.	
Query Syntax	[:SOURce]:RESistance[:LEVel][:IMMediate][:AMPLitude]? [(@chanlist)] or [:SOURce]:RESistance[:LEVel][:IMMediate][:AMPLitude]? {MIN|MAX}[,(@chanlist)]	
Return parameter	<NRf>	Setted Internal resistance in ohms.
	MIN	Minimum internal resistance in ohms.
	MAX	Maximum internal resistance in ohms.
Example 1	:RES? (@2) +0.417 The Internal resistance of CH2 is 0.417Ω.	
Example 2	:RES? MAX,(@2) +0.833 Returns the maximum internal resistance (0.833Ω) of CH2.	

[: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}[,(@chanlist)]

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]? [(@chanlist)] or [:SOURce]:VOLTage[:LEVel][:IMMediate][:AMPLitude]? {MIN|MAX}[,(@chanlist)]	
Return parameter	<NRf>	Setted voltage value.
	MIN	Minimum voltage value.
	MAX	Maximum voltage Value.
Example 1	:VOLT? (@2) +30.000 Returns the CH2 setting voltage (30V).	
Example 2	:VOLT? MAX,(@2) +31.500 Returns the maximum possible voltage value (31.5V) of CH2.	

[: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}[,(@chanlist)]	
Parameter	<NRf>	0 to 105% of rated voltage value.
	MIN	Minimum voltgage value.
	MAX	Maximum current value.
Example	:VOLT:TRIG 30,(@2) Set the setting voltage value when a software trigger is generated on CH2 to 30V.	

Query Syntax	[:SOURce]:VOLTage[:LEVel]:TRIGgered [:AMPLitude]? [(@chanlist)] or [:SOURce]:VOLTage[:LEVel]:TRIGgered [:AMPLitude]? {MIN|MAX}[,(@chanlist)]	
Return parameter	<NRf>	Setted voltage value.
	MIN	Minimum voltgage value.
	MAX	Maximum voltage value.
Example 1	:VOLT:TRIG? (@2) +30.000 The setting voltage value when a software trigger is generated on CH2 is 30V.	
Example 2	:VOLT:TRIG? MAX,(@2) +31.500 Returns the maximum possible voltage value (31.5V) when a software trigger is generated on CH2.	

[: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}[,(@chanlist)]	
Parameter	<NRf>	OVP range in Amps.
	MIN	Minimum OVP value.
	MAX	Maximum OVP value.
Example	:VOLT:PROT 10,(@2) Set the OVP value of CH2 to 10AV	
Query Syntax	[:SOURce]:VOLTage:PROTection[:LEVel]? [(@chanlist)] or [:SOURce]:VOLTage:PROTection [:LEVel]? {MIN|MAX}[,(@chanlist)]	
Return parameter	<NRf>	Setted OVP value.
	MIN	Minimum OVP value.
	MAX	Maximum OVP value.

Example 1	:VOLT:PROT? (@2) +10.000 The setting OVP value on CH2 is 10V.
Example 2	:VOLT:PROT? MAX,(@2) +33.000 Returns the maximum possible voltage level (33V) in OVP value.

[:SOURce]:VOLTage:SLEW:RISing

Set → / → Query

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}[,(@chanlist)]	
Parameter	<NRf>	Rising voltage slew rate range.
	MIN	Minimum rising voltage slew rate.
	MAX	Maximum rising voltage slew rate.
Example	:VOLT:SLEW:RIS 10,(@2) Set the CH2 rise voltage slew rate to 10V/s.	
Query Syntax	[:SOURce]:VOLT:SLEW:RISing? [(@chanlist)] or [:SOURce]:VOLT:SLEW :RISing? {MIN|MAX}[,(@chanlist)]	
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? (@2) +10.000 The rising current slew rate of CH2 is 10.000V/s.	
Example 2	:VOLT:SLEW:RIS? MIN,(@2) +0.010 Returns the minimum rising voltage slew rate (0.010V/s) of CH2.	

Set →
→ Query

[:SOURce]:VOLTage:SLEW:FALLing

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} [,(@chanlist)]	
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,(@2) Set the CH2 fall voltage slew rate to 10V/s.	
Query Syntax	[:SOURce]:VOLTage:SLEW:FALLing? [(@chanlist)] or [:SOURce]:VOLTage:SLEW :FALLing? {MIN|MAX}[,(@chanlist)]	
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? (@2) +10.000 The falling voltage slew rate of CH2 is 10.000V/s.	
Example 2	:VOLT:SLEW:FALL? MIN,(@2) +0.010 Returns the minimum falling voltage slew rate (0.010V/s) of CH2.	

Set →
→ Query

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

Description	Sets or queries the enable/disable of tUVP function.
Syntax	[:SOURce]:VOLTage:PROTection:LOW :STATe <NR1>[,(@chanlist)]

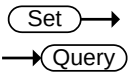
Parameter	0	tUVP function disabled
	1	Enable: compare by instantaneous value voltage
	2	Enable: compare by average value voltage
Example	:VOLT:PROT:LOW:STAT 1,(@2) Enable the CH2 tUVP function under instantaneous value voltage comparison conditions.	
Query Syntax	[:SOURce]:VOLTage:PROTection:LOW :STATe? [(@chanlist)]	
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? (@2) 1 The tUVP function of CH2 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}[,(@chanlist)]	
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:DEL 1.5,(@2) Set the CH2 tUVP delay time to 1.5 seconds.	
Query Syntax	[:SOURce]:VOLTage:PROTection:LOW :DELay? [(@chanlist)] or [:SOURce]:VOLTage:PROTection:LOW :DELay? {MIN|MAX}[,(@chanlist)]	

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:DEL? (@2) 1.500 The tUVP delay time of CH2 is set to 1.500 seconds.	
Example 2	:VOLT:PROT:LOW:DEL? MIN(,@2) 0.100 The minimum setting tUVP delay time for CH2 is 0.100 seconds.	



[:SOURce]:VOLTage:PROTection:LOW[:LEVel]

Description	Sets or queries the tUVP voltage level.	
Syntax	[:SOURce]:VOLTage:PROTection :LOW[:LEVel] {<NRf>|MINimum|MAXimum} [,(@chanlist)]	
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,(@2) Set the CH2 tUVP voltage value to 2V.	
Query Syntax	[:SOURce]:VOLTage:PROTection:LOW :DEL? [(@chanlist)] or [:SOURce]:VOLTage:PROTection:LOW :DEL? {MIN|MAX}[,(@chanlist)]	
Return parameter	NRf	tUVP voltage setting value
	MIN	Minimum tUVP voltage value
	MAX	Maximum tUVP voltage value
Example 1	:VOLT:PROT:LOW:DEL? (@2) +2.000 The tUVP voltage value of CH2 is set to 2.000V.	

Example 2	:VOLT:PROT:LOW:DEL? MIN,(@2) +0.010 The minimum setting tUVP voltage value of CH2 is 0.010V.

[:SOURce]:POWer[:LEVel][:IMMediate][:AMPLitude]

Set → / → Query

Description	Sets or queries the setting power value in W unit.	
Syntax	[:SOURce]:POWer[:LEVel][:IMMediate] [:AMPLitude] {<NR1>|MINimum|MAXimum}[,(@chanlist)]	
Parameter	<NRf>	The power value can be set within the range of 1 to 105% of the rated power [W].
	MIN	Minimum power value.
	MAX	Maximum power value.
Example	:POW 100,(@2) Set the power value of CH2 to 100W.	
Query Syntax	[:SOURce]:POWer[:LEVel][:IMMediate] [:AMPLitude]? [(@chanlist)] or [:SOURce]:POWer[:LEVel][:IMMediate] [:AMPLitude]? {MIN|MAX}[,(@chanlist)]	
Return parameter	<NRf>	Setted power value.
	MIN	Minimum power value.
	MAX	Maximum power Value.
Example 1	:POW? (@2) 100.0 Returns the setting power (100.0W) of CH2.	
Example 2	:POW? MAX,(@2) 378.0 Returns the maximum possible power value (378.0W) of CH2.	

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] [(@chanlist)]
Example	:TRIG:TRAN (@2) Generates a software trigger to CH2.
Related Commands	[:SOURce]:CURRent[:LEVel]:TRIGgered[:AMPLitude] Refar to Page 52. [:SOURce]:VOLTage[:LEVel]:TRIGgered[:AMPLitude] Refar to Page 57.

:TRIGger:TRANsient:SOURce

Set / Query

Description	Sets or queries the trigger source for the transient system.	
Syntax	:TRIGger:TRANsient :SOURce {BUS|IMMediate}[,(@chanlist)]	
Parameter	BUS	Internal software trigger. Waits for a trigger command (TRIG:TRAN) to start the trigger.
	IMMediat	Starts the trigger immediately. (default)
Example	:TRIG:TRAN:SOUR BUS,(@2) Set the trigger source for CH2 to BUS.	
Query Syntax	:TRIGger:TRANsient:SOURce? [(@chanlist)]	
Return parameter	BUS	Internal software trigger.
	IMMediat	Starts the trigger immediately.
Example	:TRIG:TRAN:SOUR? (@2) BUS The trigger source of CH2 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] [(@chanlist)]
Example	TRIG:OUTP (@2) Generates a software trigger for the output trigger system on CH2.

Related Commands	:OUTPut[:STATe]:TRIGgered Refar to Page 36.

:TRIGger:OUTPut:SOURce

Set / Query

Description	Sets or queries the trigger source for the output system.	
Syntax	:TRIGger:OUTPut :SOURce {BUS|IMMediate}[,(@chanlist)]	
Parameter	BUS	Internal software trigger. Waits for a trigger command (TRIG:OUTP) to start the trigger.
	IMMediat	Starts the trigger immediately. (default)
Example	:TRIG:OUTPut:SOUR BUS,(@2) Set the CH2 output trigger system trigger source to BUS.	
Query Syntax	:TRIGger:OUTPut:SOURce? [(@chanlist)]	
Return parameter	BUS	Internal software trigger.
	IMMediat	Starts the trigger immediately.
Example	:TRIG:OUTP:SOUR? (@2) BUS The output trigger system trigger source for CH2 is BUS (internal software trigger).	

2.3.11. System Command

:SYSTem:BEEPer[:IMMediate]

Set / Query

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:BEEP? 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}[,(@chanlist)]	
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,(@2) Set the status of the bleeder resistor is AUTO on CH2.	
Query Syntax	SYSTem:CONFigure:BLEeder[:STATe]? [(@chanlist)]	
Return parameter	0	Bleeder resistor state is off.
	1	Bleeder resistor state is on.
	2	Bleeder resistor state is AUTO.
Example	:SYST:CONF:BLEed? (@2) 2 The status of the bleeder resistor of CH2 is AUTO.	

:SYSTem:CONFigure:CURRent:CONTrol

Set → / → Query

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}[,(@chanlist)]	
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,(@2) Set the CC control mode of CH2 to External voltage control.	
Query Syntax	:SYSTem:CONFigure:CURRent:CONTrol? [(@chanlist)]	
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? (@2) 1 The CC control mode of CH2 is External voltage control.	

:SYSTem:CONFigure:VOLTage:CONTrol

Set / Query

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}[,(@chanlist)]	
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,(@2) Set the CV control mode of CH2 to External voltage control.	
Query Syntax	:SYSTem:CONFigure:VOLTage:CONTrol? [(@chanlist)]	

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? (@2) 1 The CV control mode of CH2 is External voltage control.	

: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}[,(@chanlist)]
Parameter	0 / HIGH Active high 1 / LOW Active low
Example	:SYST:CONF:OUTP:EXT LOW,(@2) Set the external output logic of CH2 to Active low.
Query Syntax	:SYSTem:CONFigure:OUTPut :EXTernal[:MODE]? [(@chanlist)]
Return parameter	0 Active high is set. 1 Active low is set.
Example	:SYST:CONF:OUTP:EXT? (@2) 1 The external output logic of CH2 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}[,(@chanlist)]	
Parameter	0 / OFF	Output off at power up.
	1 / ON	Output on at power up
Example	:SYST:CONF:OUTP:PON ON,(@2) Set the CH2 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? (@2) 1 The CH2 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>	GPIB	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.	

Set → / → Query

:SYSTem:COMMunicate:GPIB[:SELF]:ADDRess

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.	

Set → / → Query

:SYSTem:COMMunicate:LAN:IPADdress

Description	Sets or queries LAN IP address. This setting will take effect when the power of this product is turned on again. Also, it can be set at F-37:0.	
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.	

Set / Query

:SYSTem:COMMunicate:LAN:GATEway

Description	Sets or queries the Gateway address. This setting will take effect when this product is powered on again. Also, it can be set at F-37:0.	
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.	

Set / Query

:SYSTem:COMMunicate:LAN:SMASk

Description	Sets or queries the LAN subnet mask. This setting will take effect when this product is powered on again. Also, it can be set at F-37:0.	
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:SMAS?	

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.	

Set → / → Query

:SYSTem:COMMunicate:LAN:DNS

Description	Sets or queries the DNS address. This setting will take effect when this product is powered on again. Also, it can be set at F-37:0.	
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:DNS?	
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.	

→ Query

:SYSTem:COMMunicate:LAN:HOSTname

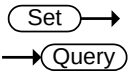
Description	Returns the host name as a string.	
Query Syntax	:SYSTem:COMMunicate:LAN:HOST?	
Return parameter	<string>	Returns the host name in the string format.
Example	:SYST:COMM:LAN:HOST? P-160054 Returns the host name (P-160054).	

Set → / → Query

:SYSTem:COMMunicate:LAN:WEB:PACTive

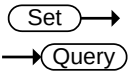
Description	Sets or queries whether the web password is on or off. This setting will take effect when this product is powered on again.	
Syntax	:SYSTem:COMMunicate:LAN :WEB:PACTive {OFF|ON|0|1}	
Parameter	0 / OFF	Web password off.
	1 / ON	Web password on.

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.



: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.



:SYSTem:COMMunicate:RLSTate

Description	Sets or queries the control state of the instrument.
Syntax	:SYSTem:COMMunicate :RLSTate {LOCal|REMote|RWLock}[,(@chanlist)]

Parameter	LOCal	Place the device in local mode. The front panel controls are enabled.
	REMote	Place the device in remote mode. To shift to local mode, operate the Local key.
	RWLock	Place the device in remote mode. Local key operations are disabled, and only local commands are valid for switching to local mode.
Example	:SYST:COMM:RLST LOC,(@2) Set CH2 to local mode.	
Query Syntax	:SYSTem:COMMunicate:RLSTate? [(@chanlist)]	
Return parameter	LOC	The device is set to local mode.
	REM	The device is set to remote mode.
	RWL	The device is set to remote mode and only local commands are valid to switch to local mode.
Example	:SYST:COMM:RLST? (@2) LOC CH2 is set to local mode.	

: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 usage status of the rear panel USB-B port.
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? 2 The USB-B port is used as a USB-CDC.	

: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. This setting will take effect when this product is powered on again.	
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:ERR? -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}[,(@chanlist)]	
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,(@2) Set the output key of CH2 turned on/off in panel locked.	
Query Syntax	:SYSTem:KEYLock:MODE? [(@chanlist)]	
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? (@2) 1 The CH2 output key is set to turn output on/off in panel locked.	

Set →
→ Query

:SYSTem:KEYLock

Description	Sets or queries whether the front panel controls are enabled or disabled (key locked state).	
Syntax	:SYSTem:KLOCk {OFF|ON|0|1}[,(@chanlist)]	
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 of CH2 set to enabled.	
Query Syntax	:SYSTem:KLOCk? [(@chanlist)]	
Return parameter	0	Front panel controls setted enabled.
	1	Front panel controls setted disables.
Example	:SYST:KLOC? (@2) 0 Front panel controls of CH2 setted enabled.	

Set →
→ Query

:SYSTem:KEYLock:SYNChronize:STATe

Description	Sets or queries whether Key Lock/Local sync enable/disable.	
Syntax	:SYSTem:KLOCk:SYNChronize:STATe {0|1|OFF|ON}	
Parameter	0 / OFF	Disable Key Lock/Local Sync.
	1 / ON	Enable Key Lock/Local sync.
Example	:SYST:KLOC:SYNC:STAT ON Enable Key Lock/Local sync.	
Query Syntax	:SYSTem:KLOCk:SYNChronize:STATe?	
Return parameter	0	Key Lock/Local sync is disabled.
	1	Key Lock/Local sync is enabled.
Example	:SYST:KLOC:SYNC:STATe? 1 Key Lock/Local sync is 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? #3239MFRS TEXIO,Model PSW-M1080L444, SN GJY130385, Firmware-Version 01.07.20240222, Keyboard-CPLD 0x32766564, AnalogControl-CPLD 0x31766564, Kernel-BuiltON 2023-3-10, TEST-Version 01.01,TEST-BuiltON 2011-10-31, MAC 00-22-24-03-b8-b3,NumberOfChannels 3 Returns the system information as a <block data>.

:SYSTem:PRESet → Set

Description	Resets all the settings to the factory default settings.
Syntax	:SYSTem:PRESet [(@chanlist)]
Example	:SYST:PRES (@2) Resets all the settings to the factory default settings of CH2.

: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? [(@chanlist)]
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 data	“Number of log data” is the number of pieces of logging 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? (@2) 2338303030303033300000610200000000000060EA 0000010000001801000 09C610000000000000A The logging data of CH2 is “1 logging count, CV mode OUTPUT on, 24.988V, 0A”.

For setting the logging interval for the logging function, refer to the “:SENSe:DLOG:PERiod” command (page 40).

For the logging function operation settings and data output destination settings, refer to the ”:SENSe:DLOG:STATe” command (page 40).

2.3.13. Fan stop function command

:CONTrol:FAN:STOP:STATe

Set → / → Query

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}[,(@chanlist)]

Parameter	0 / OFF	Turn off fan stop.
	1 / ON	Turn on fan stop.
	3	Fan stop automatically.
Example	:CONT:FAN:STOP:STAT ON,(@2) Turn on fan stop for CH2.	
Query Syntax	:CONTrol:FAN:STOP:STATe? [(@chanlist)]	
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
	3	Fan stop automatic execution
Example	:CONT:FAN:STOP:STAT? (@2) 1 CH2 fan stop is in the ON state.	

2.3.14. Test mode function commands

For test mode, there is no command to set and save script data in the internal memory of the PSW-M power supply. To save script data to the internal memory, please use manual operation (see “4.5. Test Mode Function” in the main unit instruction manual) or a web browser.

:PROGram:NAME

Set → / → Query

Description	Sets and queries the test mode memory number.	
Syntax	:PROGram:NAME "<NR1>"[,(@chanlist)]	
Parameter	<NR1>	Memory number: 1～10
Example	:PROG:NAME "1",(@2) Specify memory number 1 for CH2 test mode. (t-01: 1)	
Query Syntax	:PROGram:NAME? [(@chanlist)]	
Return parameter	Same as syntax parameter.	
Example	:PROG:NAME? (@2) "1" The CH2 test mode is specified in memory number 1.	

:PROGram:STATe

Set / Query

Description	Sets and queries the test mode enable/disable for the memory number specified by the ":PROGram:NAME" command. If the memory number for the test mode is not specified, the test mode cannot be enabled.	
Syntax	:PROGram:STATe {STOP|RUN}[,(@chanlist)]	
Parameter	RUN	Enable test mode.
	STOP	Disable test mode.
Example	:PROG:STAT RUN,(@2) Enable CH2 test mode.	
Query Syntax	:PROGram:STATe? [(@chanlist)]	
Return parameter	STOP|RUN,"Specified memory number"	
Example	:PROG:STAT? (@1:2) RUN,"2",STOP,"1" CH1 replies that test mode is enabled in memory number 2, and CH2 replies that test mode is disabled in memory number 1.	

:PROGram:SEQuence

Set / Query

Description	Sets and queries whether to run or stop the specified test mode enabled by the ":PROGram:STATe" command. The memory number of the test mode is specified, and the test mode is executed with the test mode enabled.	
Syntax	:PROGram:SEQuence {STOP|RUN}[,(@chanlist)]	
Parameter	RUN	Run the test mode.
	STOP	Stop the test mode.
Example	:PROG:SEQ RUN,(@2) Run CH2 test mode.	
Query Syntax	:PROGram:SEQuence? [(@chanlist)]	

Return parameter	RUN|WAIT|STOP, Specified memory number,Run step number	
	RUN	Test mode running
	WAIT	Test mode stopped
	STOP	Test mode disabled state
Example	:PROG:SEQ? (@1:2) RUN,2,4,STOP,0,0 CH1 is running the fourth test mode at step number 2, and CH2 replies that the test mode is disabled.	

:PROGram:SEQuence:STEP → Query

Description	Queries the running step number of the running test mode.
Query Syntax	:PROGram:SEQuence:STEP? [(@chanlist)]
Return parameter	<NR1> Running step number
Example	:PROG:SEQ:STEP? (@1:2) 4,3 CH1 is running step number 4, and CH2 is running step number 3.

2.3.15. 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? TEXIO,PSW-M1080L444,GJY130385,01.07.20240222 Reply in the next order. < Manufacturer >,< Model name >,<Serial number >, < Firmware version >, <Firmware creation year/month/day>

*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

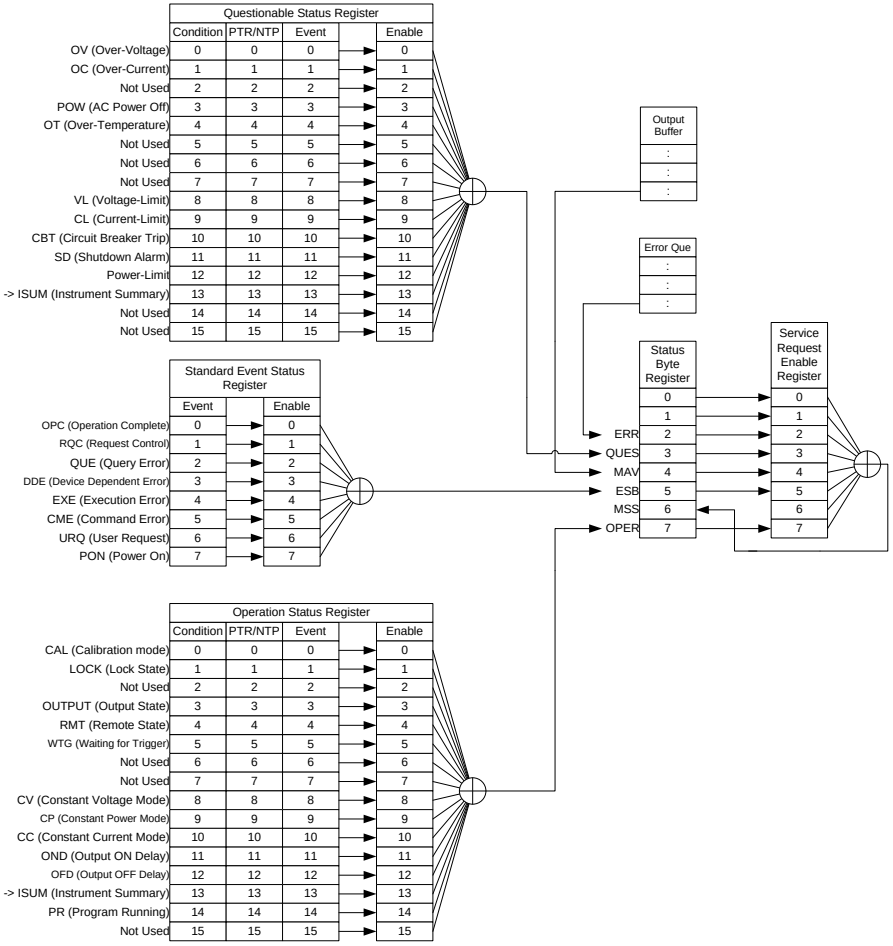
The status registers are used to determine the status of the power supply. The status registers maintain the status of the protection conditions, operation conditions and instrument errors.

This product has many register groups.:

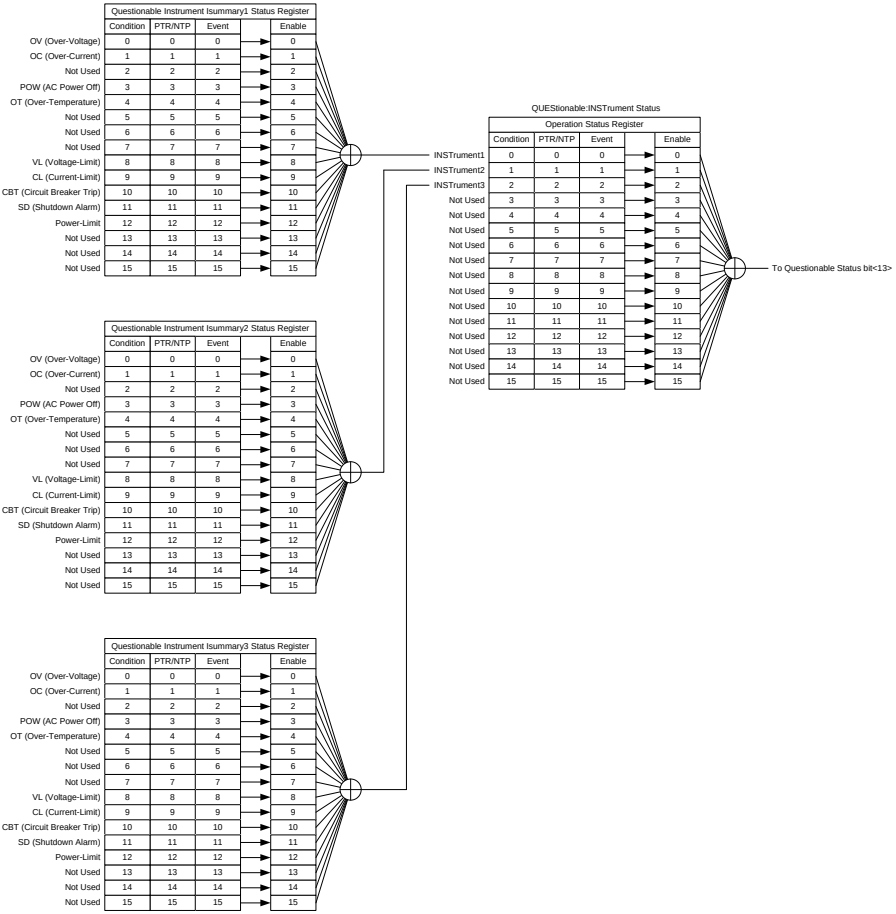
- Questionable Status Register Group
- Standard Event Status Register Group
- Operation Status Register Group
- Status Byte Register
- Service Request Enable Register
- Service Request Generation
- Error Queue
- Output Buffer
- Questionable Instrument Status Register Group
- Operation Instrument Status Register Group

The next page shows the structure of the Status registers.

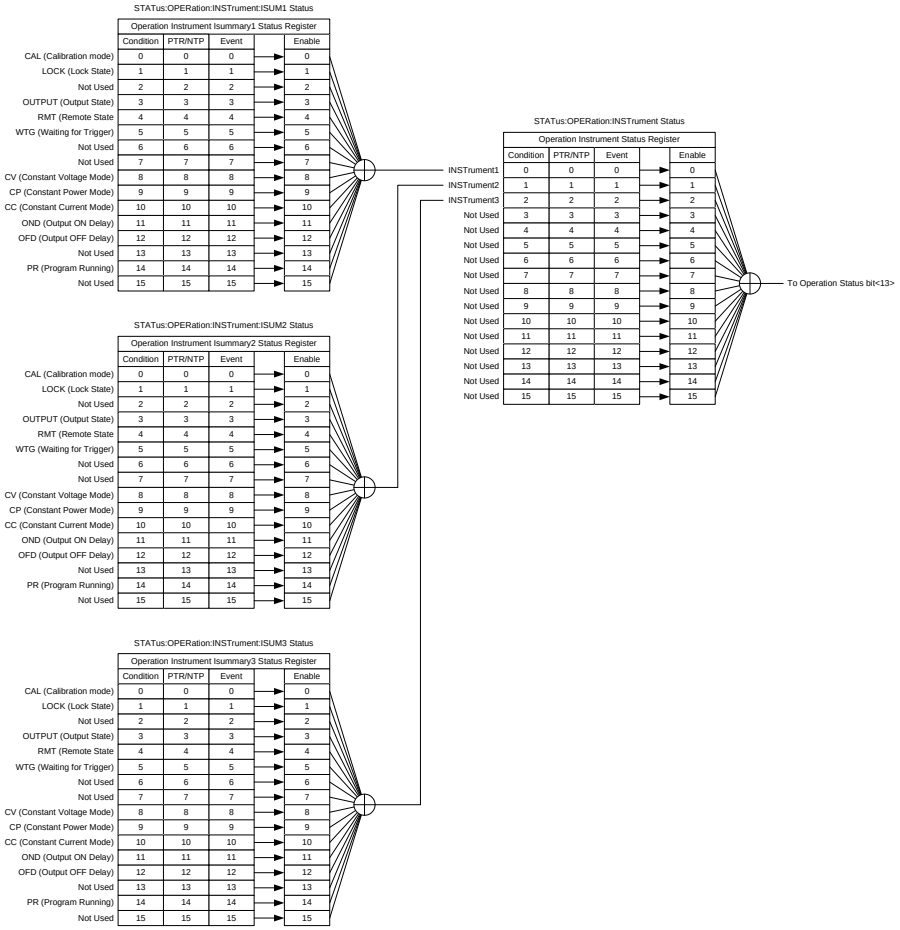
3.2. The Status Registers



3.3. Questionable Instrument Status Registers

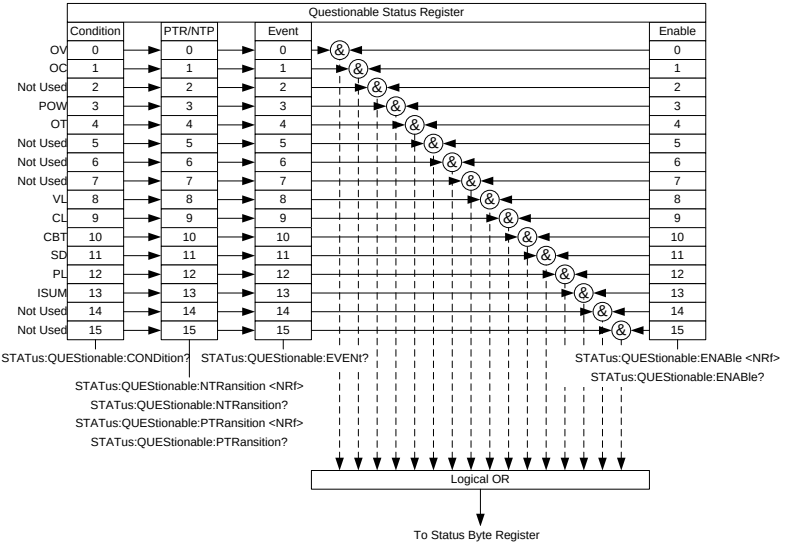


3.4. Operation Instrument Status Registers

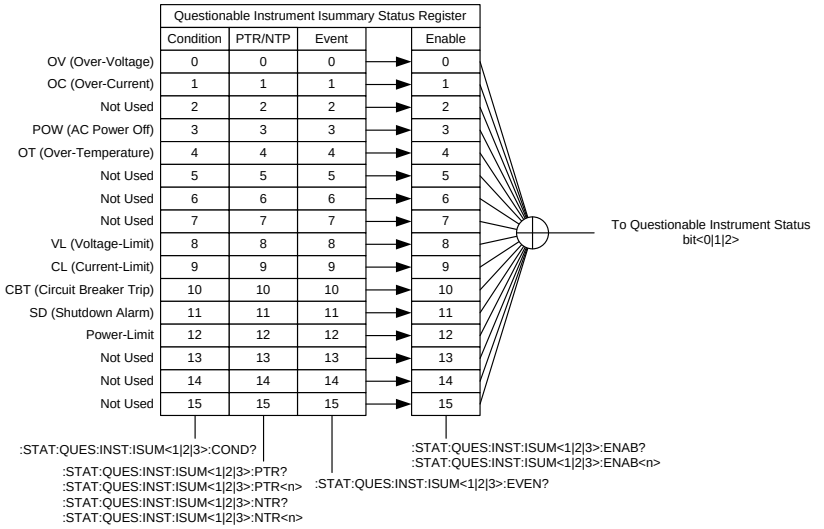


3.5. Questionable Status Register Group

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



(PSW-Multi only)



Bit Summar

Bit name	Description	Bit #	Bit weight
OV	Over voltage protection has been tripped	0	1
OC	Over current protection has been tripped	1	2
POW	AC power switch is off	3	8
OT	Over temperature protection has been tripped	4	16
VL	Output status above rated voltage	8	256
CL	Output status above rated current	9	512
CBT	Circuit Breaker Trip	10	1024
SD	Shutdown Alarm	11	2048
PL	Power-Limit	12	4096
ISUM	Instrument Summary	13	8192

Condition Register

The Questionable Status Condition Register indicates the status of this product. 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

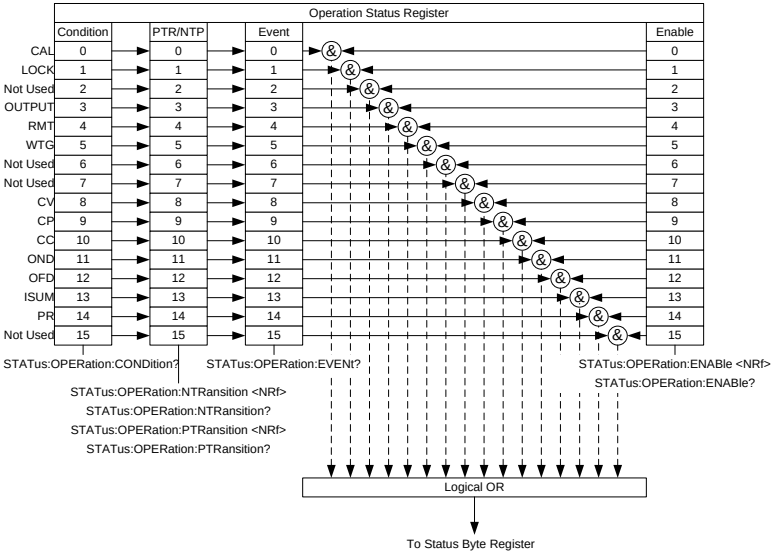
The PTR/NTR Register will dictate the type of transition conditions will set the corresponding bits in the Event Register. If the Event Register is read, it will be cleared to 0.

Enable Register

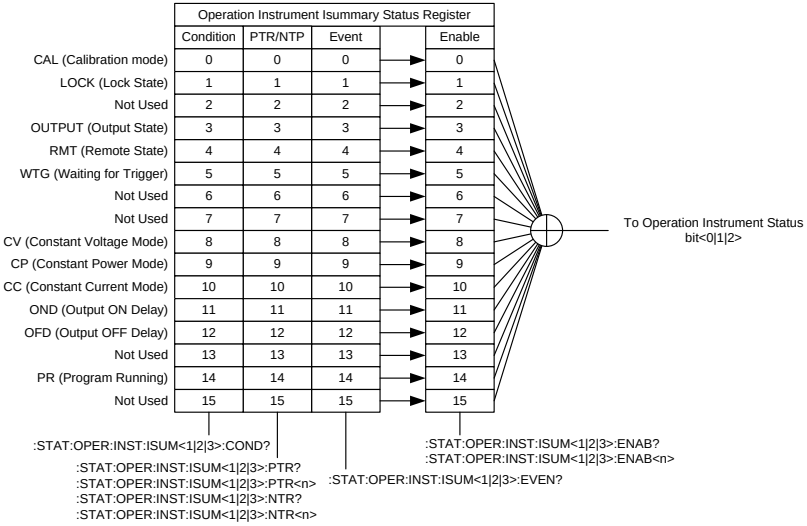
The Enable register determines which Events in the Event Register will be used to set the QUES bit in the Status Byte Register.

3.6. Operation Status Register Group

The Operation Status Register Group indicates the operating status of this product.



(PSW-Multi only)



Bit Summar

Bit name	Description	Bit #	Bit weight
CAL	Indicates if this product is in calibration mode.	0	1
LOCK	Panel control lock status.	1	2
OUTPUT	Output on state.	3	8
RMT	Remote state.	4	16
WTG	Indicates if this product is waiting for a trigger.	5	32
CV	Indicates if this product is in CV mode.	8	256
CP	Indicates if this product is in CP mode.	9	512
CC	Indicates if this product is in CC mode.	10	1024
OND	Indicates if Output ON delay time is active.	11	2048
OFD	Indicates if Output OFF delay time is active.	12	4096
ISUM	Instrument Summary	13	8192
PR	Indicates if a Test is running.	14	16384

Condition Register

The Operation Status Condition Register indicates the operating status of this product. 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

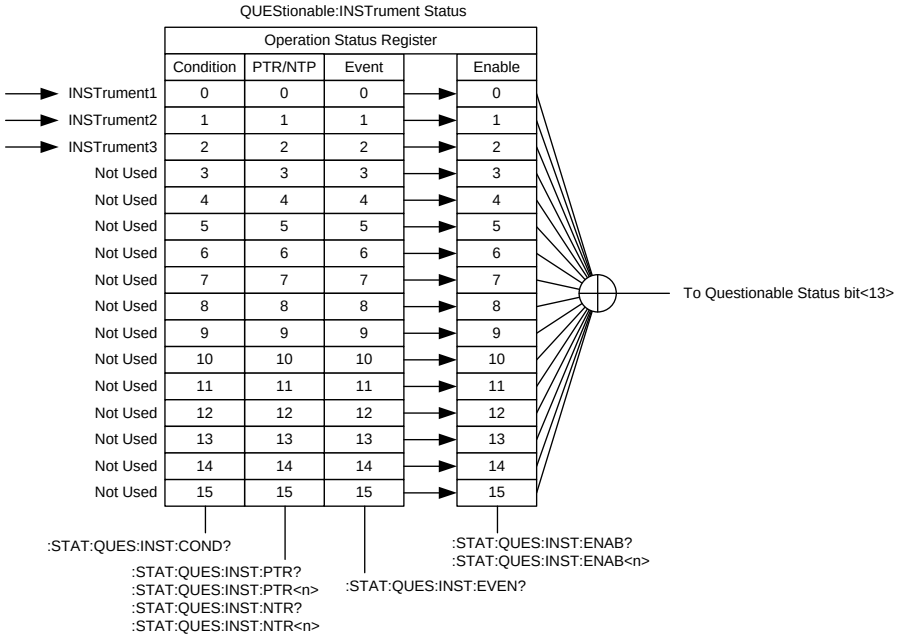
Event Register

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.

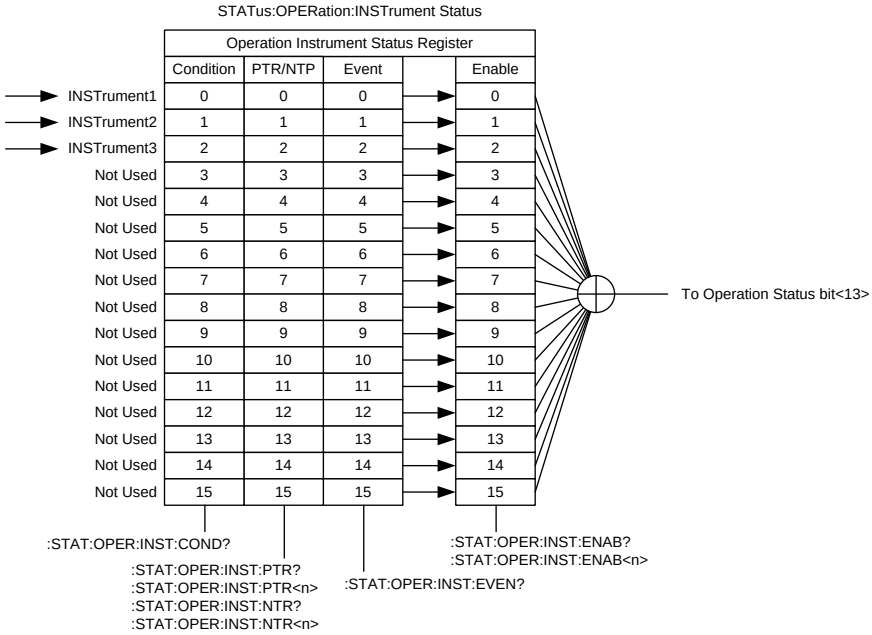
3.7. Questionable Instrument Status Register Group



Bit Summar

Bit name	Description	Bit #	Bit weight
INST 1	Summary bit of channel 1	0	1
INST 2	Summary bit of channel 2	1	2
INST 3	Summary bit of channel 3	2	4

3.8. Operation Instrument Status Register Group

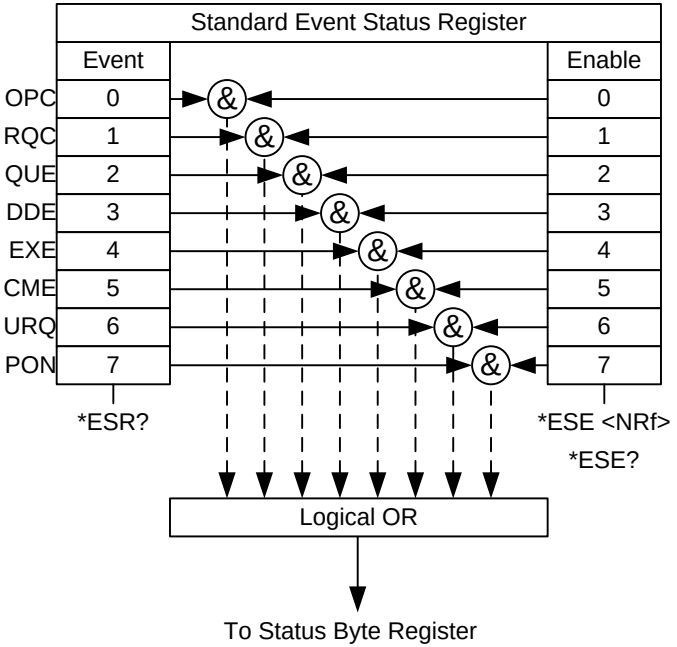


Bit Summar

Bit name	Description	Bit #	Bit weight
INST 1	Summary bit of channel 1	0	1
INST 2	Summary bit of channel 2	1	2
INST 3	Summary bit of channel 3	2	4

3.9. Standard Event Status Register Group

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 Summar

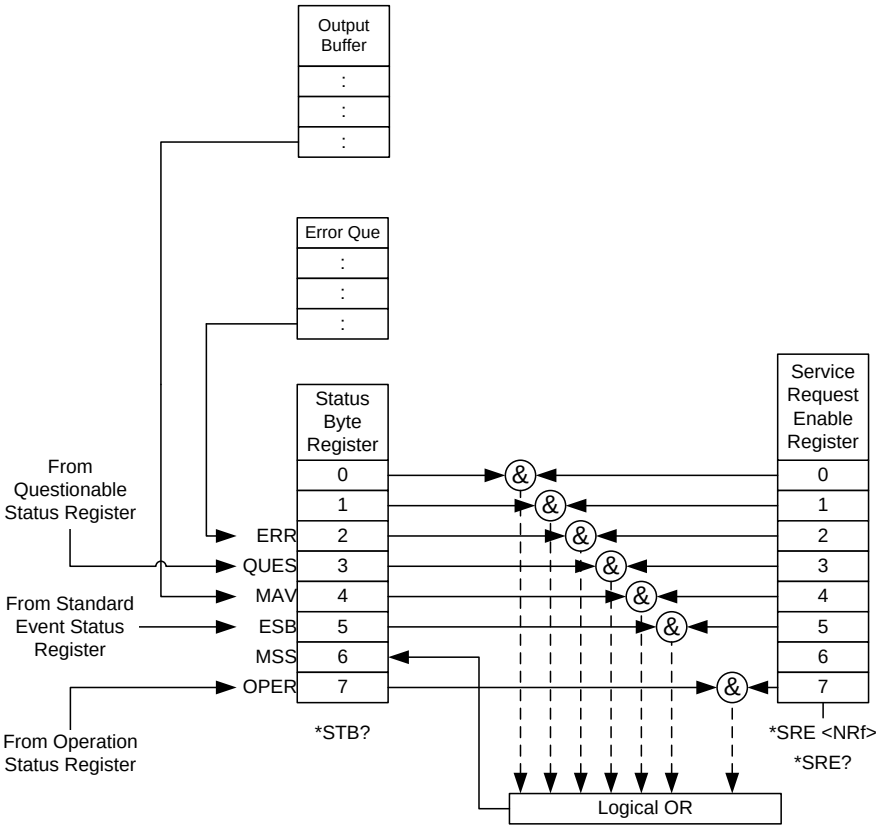
Bit name	Description	Bit #	Bit weight
OPC	The OCP bit is set when all selected pending operations are complete. This bit is set in response to the *OPC command.	0	1
RQC	Request control	1	2
QUE	The Query Error bit is set in response to an error reading the Output Queue. This can be caused by trying to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

EXE	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	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	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.

3.10. Status Byte Register & Service Request Enable Register

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 Summar

Bit name	Description	Bit #	Bit weight
ERR	If data is present in the Error queue, the ERR bit will be set.	2	4
QUES	The summary bit for the Questionable Status Register group.	3	8
MAV	This is set when there is data waiting to be read in the Output Buffer.	4	16
ESB	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 0-5, 7). This will be set to 1.	6	64
OPER	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 Buffer. 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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