

PROGRAMMING MANUAL

PROGRAMMABLE HIGH PRECISION DC POWER SUPPLY

PPR Series



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The latest version of the instruction manual is posted on our website (<https://www.texio.co.jp/download/>).

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 in the instruction manual that the product is included, it may not be included.

■ About the Firmware version

This instruction manual is compatible with firmware version 1.31 and later.

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1 GETTING STARTED

This chapter describes the power supply in a nutshell, including its main features and front / rear panel introduction. After going through the overview, please read the theory of operation to become familiar with the operating modes, protection modes and other safety considerations.



1.1 PPR Series Overview

1.1.1 Lineup

Model	Voltage	Current	Power	GP-IB
PPR20-5	0-20V	0-5A	100W	-
PPR20-5G	0-20V	0-5A	100W	○
PPR32-3	0-32V	0-3A	96W	-
PPR32-3G	0-32V	0-3A	96W	○

1.1.2 Main Features

Features	2.4-inch TFT-LCD Panel.
	Low noise: Temperature controlled cooling fan.
Interface	Remote sensing to compensate for voltage drop in load leads .
	Output On/Off delay control.
	CV, CC priority start function. (prevents overshoot with output ON)
	Adjustable voltage and current slew rates.
	Bleeder circuit ON/OFF setting.
	OVP, OCP and OTP protection.
	Supports test sequence.
	With 3 measuring currents function.
	Built-in USB and LAN interface.
	GPIB interface (G Type).
	External trigger control function.

2 MENU CONFIGURATION

2.1 Interface

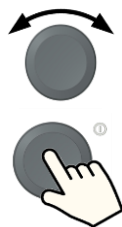
LAN The PPR series use the Ethernet LAN (Local Area Network) port for a number of different applications. Ethernet can be configured as a socket server.

1. Scroll knob key to move to LAN field followed by click knob key to enter the LAN page.

2025/02/10	
LAN	15:46:08
MAC Address	00:22:24:6A:B1:B9
DHCP	Off
IP Address	192.168.000.123
Subnet Mask	255.255.255.000
Gateway IP	192.168.000.001
Return	



2. There are several relevant settings for LAN interface as following details. Use knob key to scroll and click to configure each setting.



MAC Address Displays the MAC address in 6 parts. This setting is not configurable.
0x00 to 0xFF

DHCP Turns DHCP on or off .When DHCP is Off, the following IP Address, Subnet Mask, Gateway IP and DNS Address are configurable.
Off, On

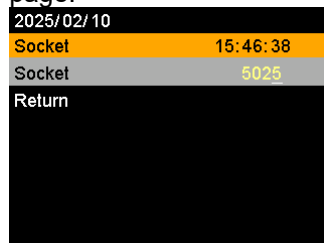
IP Address Sets the default IP address. IP address 1 to 4 splits the IP address into four sections.
0 to 255, 0 to 255, 0 to 255, 0 to 255

Subnet Mask Sets the subnet mask. The subnet mask is split into four parts.
0~255, 0~255, 0~255, 0~255

Gateway IP Sets the gateway address. The gateway address is split into 4 parts.
0 to 255, 0 to 255, 0 to 255, 0 to 255

Socket The Socket port is fixed in 5025 (Not configurable) and is specifically for when Ethernet LAN is configured as a socket server.

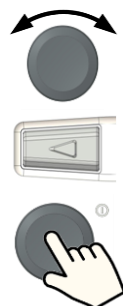
3. Scroll knob key to move to Socket field followed by click knob key to enter the Socket page.



4. The Socket info is as follows

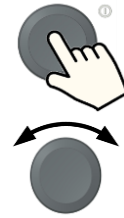
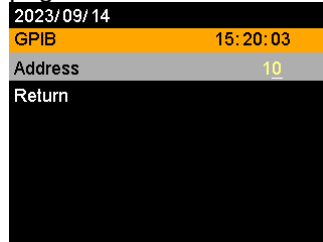
Select Port The Socket port is fixed in 5025.

5. Scroll knob key to move to Return field followed by clicking knob key to return back to the previous page. Also, it is available to return by clicking the left arrow key.



GPIO The PPR series use the GPIO connector for basic remote control.

6. Scroll knob key to move to GPIB field followed by click knob key to enter the GPIB page.

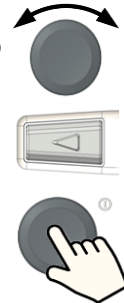


7. There is only an Address field for GPIB interface as the following detail. Use knob key to scroll and click to configure Address setting.



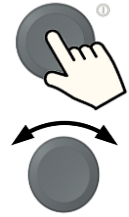
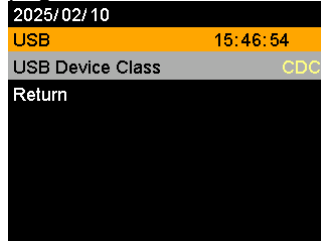
Address Displays the GPIB address.
1 to 30

8. Scroll knob key to move to Return field followed by clicking knob key to return back to the previous page. Also, it is available to return by clicking the left arrow key.

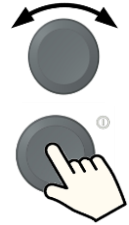


USB The PPR series use the USB B-type port for basic remote control.

9. Scroll knob key to move to USB field followed by click knob key to enter the USB page.



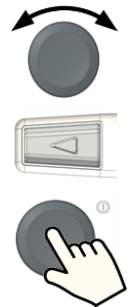
10. There is only an USB field for USB interface as the following detail. Use knob key to scroll and click to configure USB setting.



USB
Device
Class

Sets the USB Device Class.
CDC,TMC

11. Scroll knob key to move to Return field followed by clicking knob key to return back to the previous page. Also, it is available to return by clicking the left arrow key.



3 COMMUNICATION INTERFACE

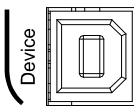
This chapter describes basic configuration of IEEE488.2 based remote control.

3.1 USB Remote Interface

3.1.1 Configuration

USB	PC side connector	Type A, host
Configuration	PPR side connector	Rear panel Type B, slave
	Speed	2.0 (full speed)
	USB Class	USB-CDC / USB-TMC

- Steps
1. Connect the USB cable to the rear panel USB B port.



2. Set the USB Device Class setting as CDC
3. The indicator will be shown when a remote connection has been established.

3.1.2 USB CDC Function Check

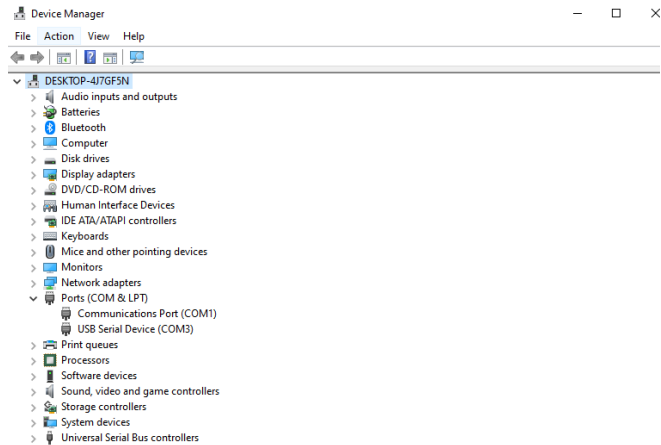
Background To test the USB CDC functionality, National Instruments Measurement and Automation Explorer can be used. This program is available on the NI website, www.ni.com., via a search for the VISA Runtime Engine page, or “downloads” at the following URL, <http://www.ni.com/visa/>

Requirement Operating System: Windows 10,11

s

- Functionality check
1. In case of Window 10 64 bits, once the USB Cable was connected to PC correctly for a while (around 1 min).
 2. Then it will automatically grab the device driver and appear" Device is ready".

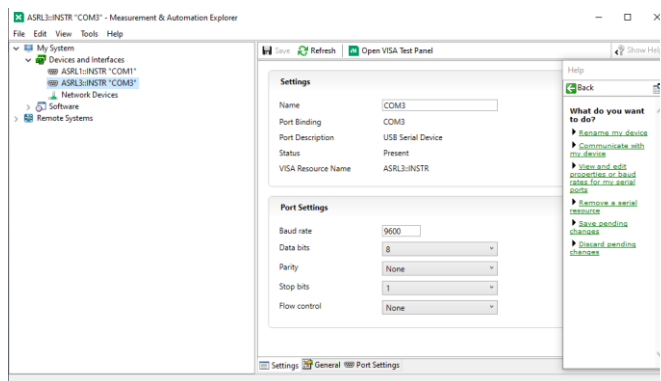
3. Double check the "Device Manager". The port should like below.



4. Start the NI MAX, Start > NI MAX

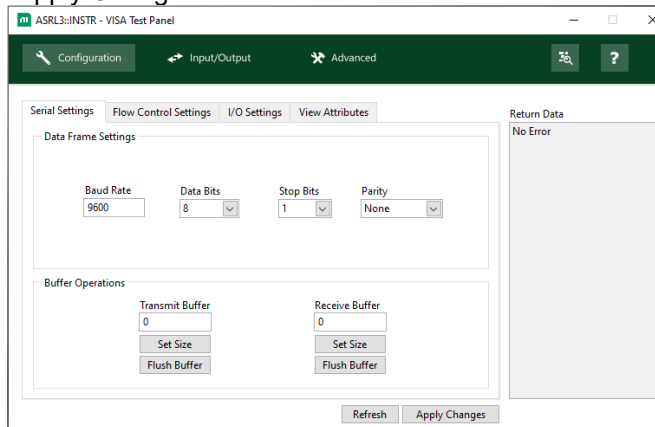


5. From the Configuration panel access; My System > Devices and Interfaces > ASRL3::INSTR "COM3" (for this example)



6. Click Open VISA Test Panel

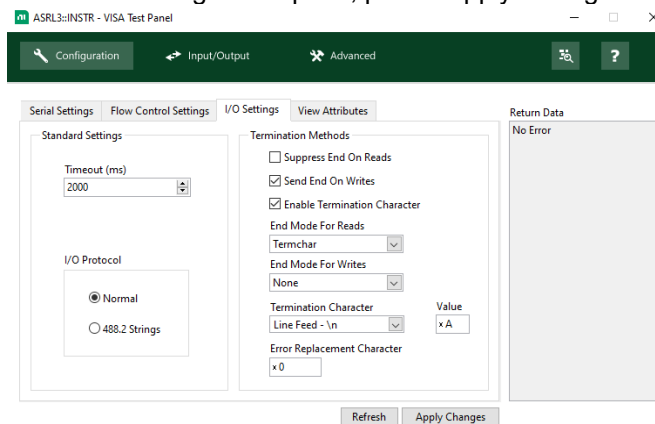
7. Click Configuration, set the “Serial Settings”, when the setting is complete, customer needs to press “Apply Changes”.



8. Click Configuration > I/O Settings

9. Make sure the Enable Termination Character check box is checked, and the terminal character is \n (Value: xA).

When the setting is complete, press “Apply Changes”.



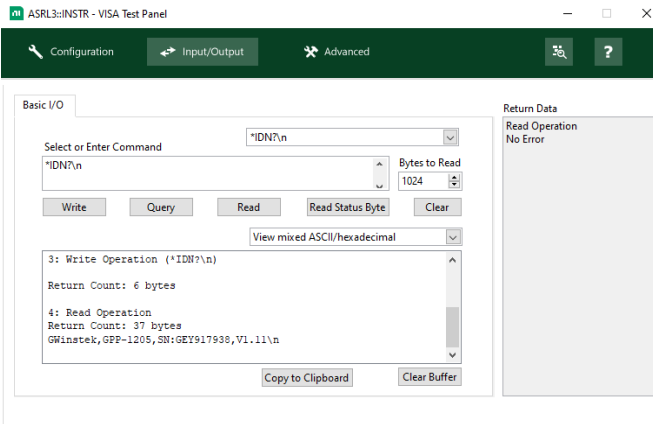
10. Click the Input/Output icon.

11. Enter *IDN? in the Select or Enter Command dialog box if it is not already.

12. Click the Query button.

13. The *IDN? query will return the Manufacturer, model name, serial number and firmware version in the dialog box.

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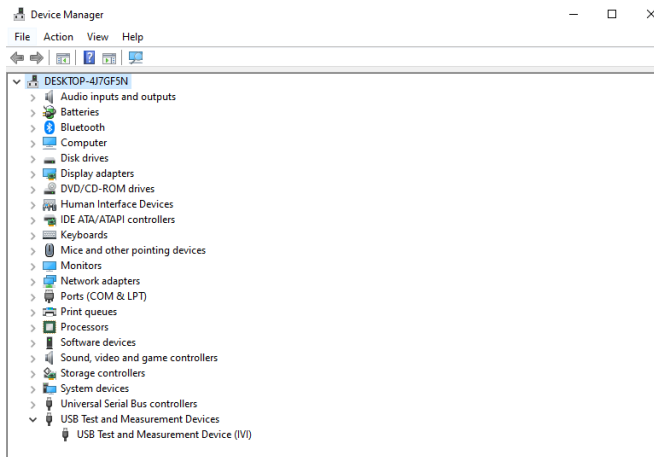


3.1.3 USB TMC Function Check

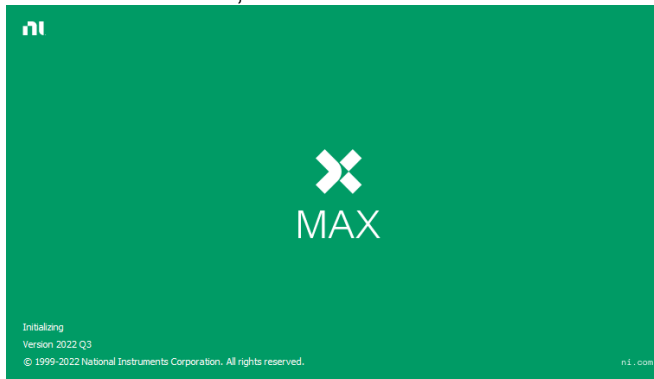
Background To test the USB TMC functionality, National Instruments Measurement and Automation Explorer can be used. This program is available on the NI website, www.ni.com., via a search for the VISA Runtime Engine page, or “downloads” at the following URL, <http://www.ni.com/visa/>

Requirements Operating System: Windows 10,11

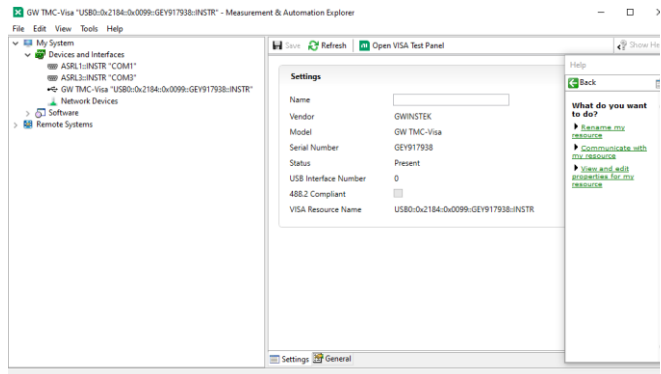
Functionality check 1. If it has already been installed NI VISA , Then the driver program will automatically appear.



2. Start the NI MAX, Start > NI MAX

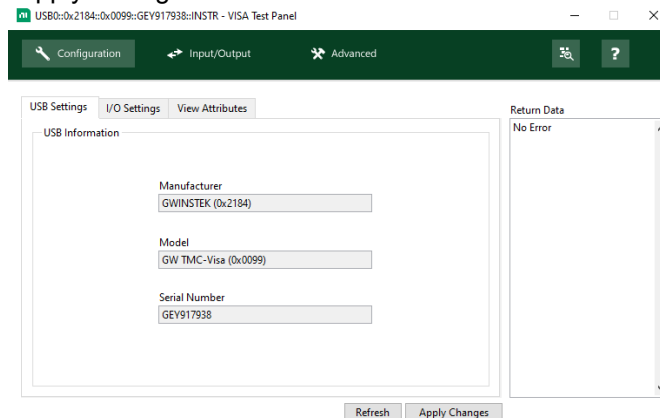


3. From the Configuration panel access; My System > Devices and Interfaces > TEXIO TMC-Visa USB0:0x098F::0x0181::GEY917938::INSTR (for this example)



4. Click Open VISA Test Panel

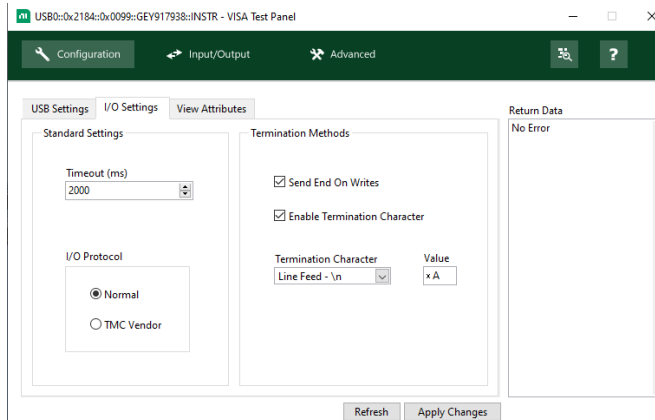
5. Click Configuration, set the “USB Settings”, when the setting is complete, customer needs to press “Apply Changes”.



6. Click Configuration > I/O Settings

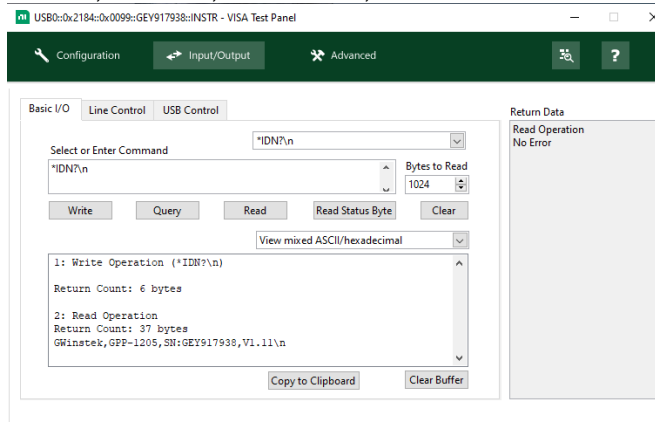
7. Make sure the Enable Termination Character check box is checked, and the terminal character is \n (Value: xA).

When the setting is complete, press “Apply Changes”.



8. Click the Input/Output icon.
9. Enter *IDN? in the Select or Enter Command dialog box if it is not already.
10. Click the Query button.
11. The *IDN? query will return the Manufacturer, model name, serial number and firmware version in the dialog box.

TEXIO ,PPR20-5,GEY917929,V1.10



3.2 GPIB Remote Interface

3.2.1 Configuration

Only one GPIB address can be used at a time.

Configure
GPIB

1. Ensure the PPR is off before proceeding.
2. Connect the GPIB cable from a GPIB controller to the GPIB port on the PPR.
3. Turn the PPR on.
4. Set the GPIB Address setting per application.
5. The indicator will be shown when a remote connection has been established.

GPIB
constraints

- ❑ •Maximum 15 devices altogether, 20m cable length, 2m between each device
- ❑ •Unique address assigned to each device
- ❑ •At least 2/3 of the devices turned On
- ❑ •No loop or parallel connection

3.2.2 GPIB Function Check

Background To test the GPIB functionality, National Instruments Measurement and Automation Explorer can be used. This program is available on the NI website, www.ni.com., via a search for the VISA Run-time Engine page, or “downloads” at the following URL, <http://www.ni.com/visa/>

Requirements Operating System: Windows 10,11

Functionality check 1. Start the NI Measurement and Automation Explorer (MAX) program. Using Windows, press:

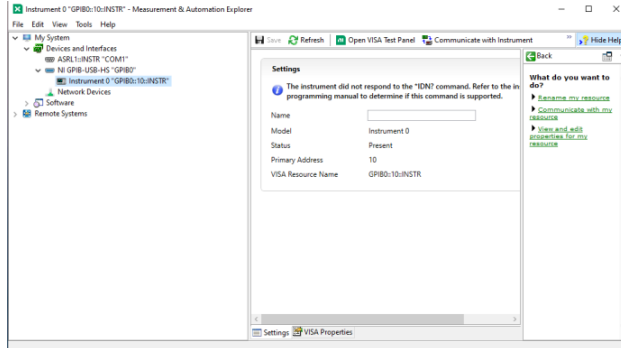
Start>All Programs>National Instruments>Measurement & Automation



2. From the Configuration panel access;

My System>Devices and Interfaces>GPIB

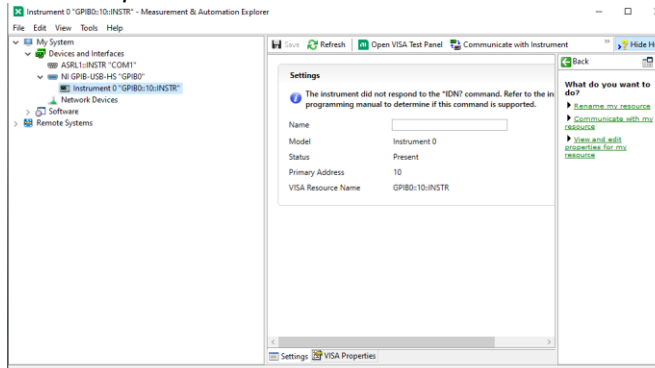
3. Press *Scan for Instruments*.



4. Select the device (GPIB address of PPR) that now appears in the *System>Devices and Interfaces > GPIB-USB-HS "GPIBX"* node.

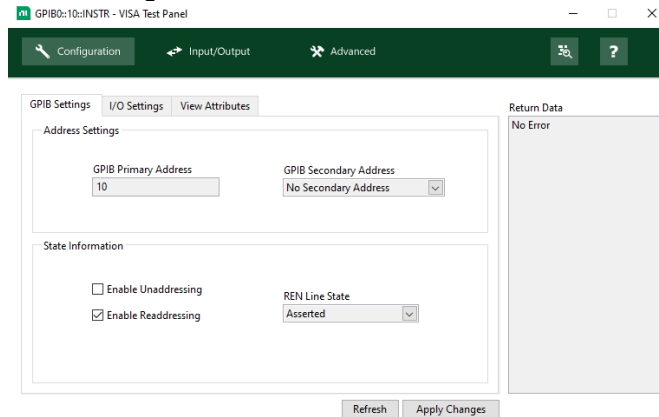
5. Click on the *VISA Properties* tab on the bottom.

6. Click *Open Visa Test Panel*.



7. Click on *Configuration*.

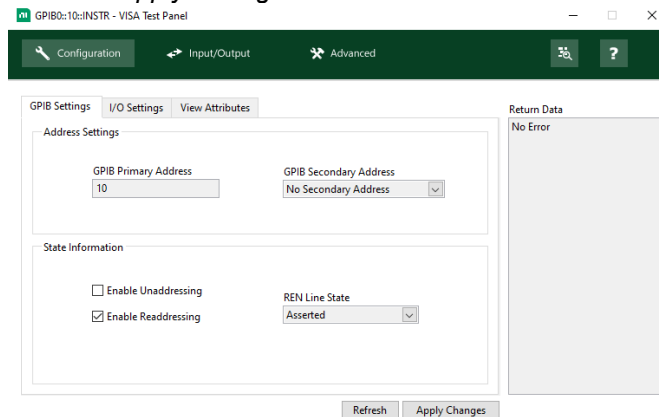
8. Click on the *GPIB Settingstab* and confirm that the GPIB settings are correct.



9. Click on the *I/O Settingstab*.

10. Make sure the *Enable Termination Character* check box is checked, and the terminal character is \n (Value: xA).

11. Click *Apply Changes*.



12. Click on *Input/Output*.

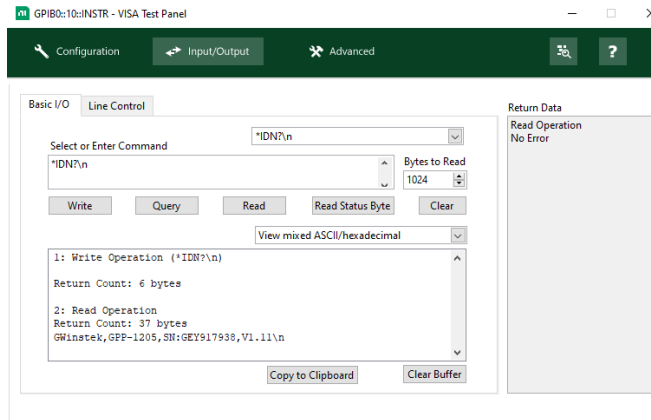
13. Click on the *Basic/Otab*.

14. Enter *IDN? in the *Select or Enter Command* drop down box.

15. Click *Query*.

16. The *IDN? query will return the Manufacturer, model name, serial number and firmware version in the dialog box.

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3.3 Configure Ethernet Connection

The PPR series supports both DHCP connections so the instrument can be automatically connected to an existing network or alternatively, network settings can be manually configured.

Ethernet configuration For details on how to configure the Ethernet settings, please see the configuration chapter on [page 105](#).

Parameters	MAC Address (display only)	
	DHCP On/Off	IP Address
	Subnet Mask	Gateway IP

3.3.1 Configuration

Configuration This configuration example will configure the PPR socket server.

The following configuration settings will manually assign the PPR an IP address and enable the socket server. The socket server port number is fixed at 5025.

1. Connect an Ethernet cable from the network to the rear panel Ethernet port.
2. Turn Off DHCP setting followed by setting the relevant settings including IP Address, Subnet Mask, Gateway IP.
3. The indicator will be shown when a remote connection has been established.

3.3.2 Socket Server Function Check

Background To test the socket server functionality, National Instruments Measurement and Automation Explorer can be used. This program is available on the NI website, www.ni.com., via a search for the VISA Runtime Engine page, or “downloads” at the following URL, <http://www.ni.com/visa/>

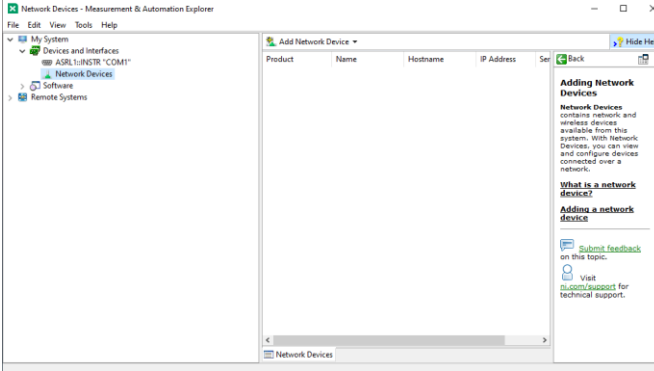
Requirement Operating System: Windows 10, 11
s

Functionality check

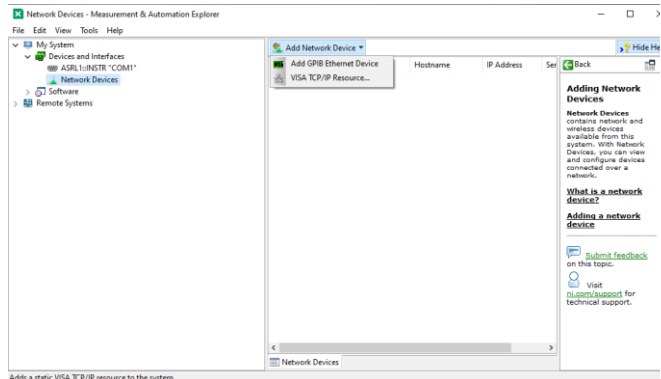
1. Start the NI Measurement and Automation Explorer (MAX) program. Using Windows, press. *Start>All Programs>National Instruments>Measurement & Automation*



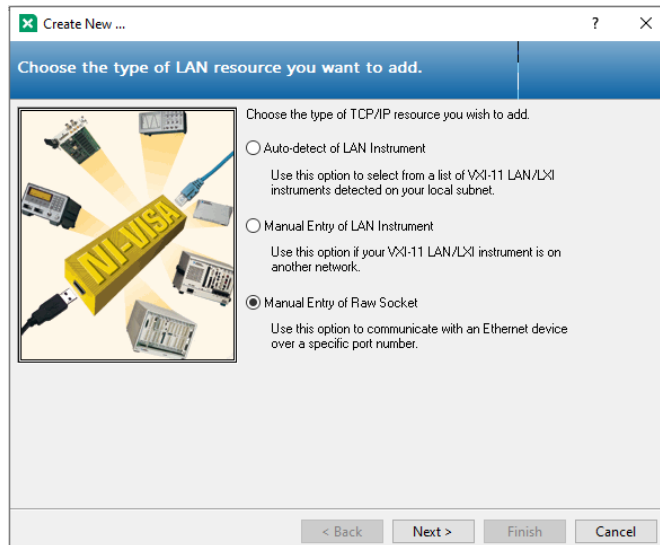
2. From the Configuration panel access; *My System>Devices and Interfaces>Network Devices*



3. Press *Add New Network Device>Visa TCP/IP Resource...*



4. Select *Manual Entry of Raw Socket* from the popup window.

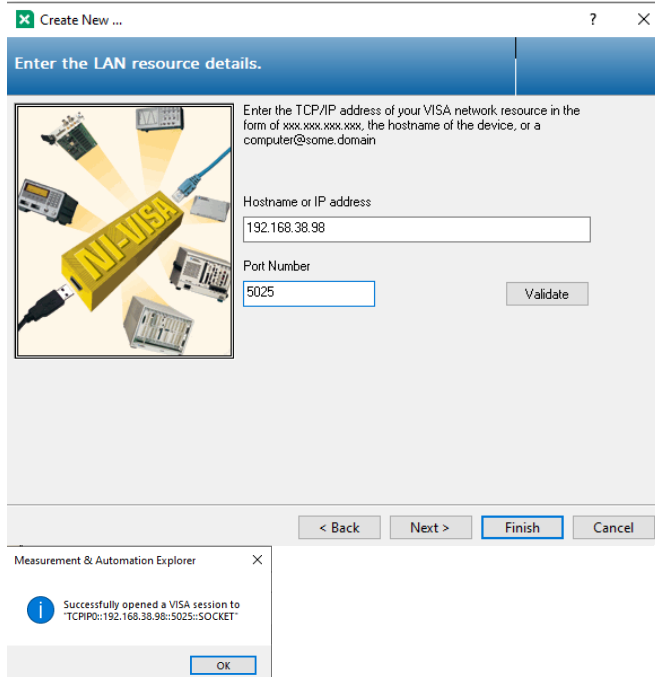


5. Enter the IP address and the port number of the PPR. The port number is default at 5025.

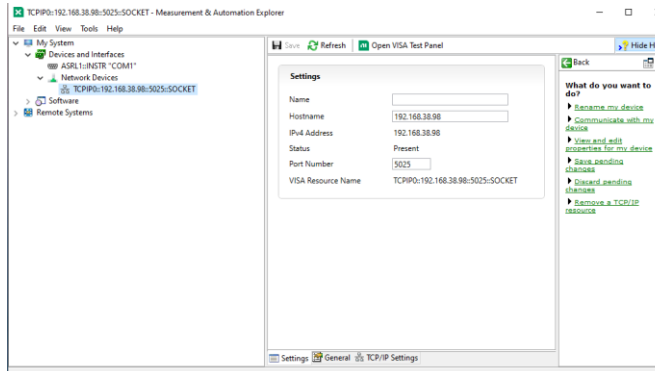
6. Click the Validate button.

7. A popup will appear if a connection is successfully established.

8. Click Next.

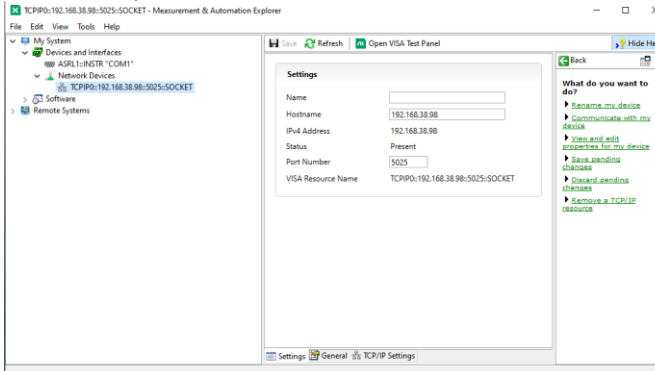


9. Next configure the Alias (name) of the PPR connection. In this example the Alias is: GPP_DC1
10. Click finish.



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

12. Click *Open VISA Test Panel*.

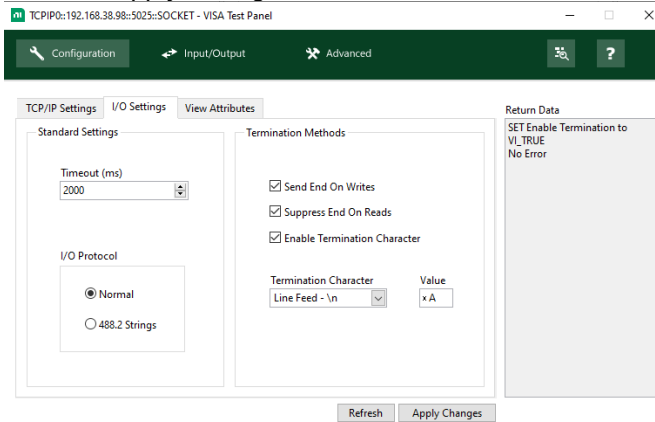


13. Click the *Configuration* icon,

14. Click on *I/O Settings*.

15. Make sure the *Enable Termination Character* check box is checked, and the terminal character is \n (Value: xA).

16. Click *Apply Changes*.



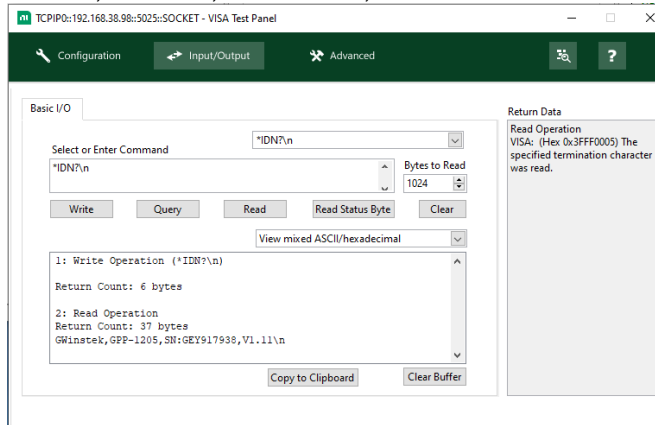
17. Click the *Input/Output* icon.

18. Enter *IDN? in the *Select or Enter Command* dialog box if it is not already.

19. Click the *Query* button.

20. The *IDN? query will return the Manufacturer, model name, serial number and firmware version in the dialog box.

TEXIO ,PPR20-5,GEY917929,V1.10

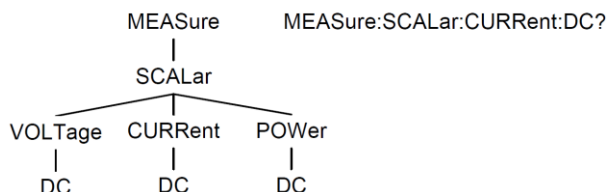


4 Command Syntax

Compatible standard IEEE488.2 SCPI, 1999 Partial compatibility 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 a number of different instrument commands and queries. A command sends instructions or data to the unit and a query receives data or status information from the unit.

Command types

Simple A single command with/without a parameter

Example *IDN?

Compound 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 Query meas:volt:dc?;;meas:curr:dc?
 A query is a simple or compound command followed by a question mark (?). A parameter (data) is returned.

Example meas:curr:dc?

Command forms Commands and queries have two different forms, long and short. The command syntax is written with the short form of the command in capitals and the remainder (long form) in lower case.

The commands can be written in capitals or lower-case, just so long as the short or long forms are complete. An incomplete command will not be recognized.

Below are examples of correctly written commands:

Long SENSE:RECO:rdER:STATe?
 form SENSE:RECORDER:STATE?
 sense:recorder:state?
 Short SENS:RECO:STAT?
 form sens:reco:stat?

Command Format

APPLY 1.5,5.2



1. Command header
2. Space
3. Parameter 1
4. Comma (no space before/after comma)
5. Parameter 2

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 "OUTPut[:STATe]?" and "OUTPut?" are both valid forms.

Braces {} Commands that contain braces indicate one item within the braces must be chosen. Braces are not sent with the command.

Angled Brackets <> Angle brackets are used to indicate that a value must be specified for the parameter. See the parameter description below for details. Angled brackets are not sent with the command.

Bars	Bars are used to separate multiple parameter choices in the command format.		
Parameters	Type	Description	Example
	<Boolean>	Boolean logic	0, 1/ON, OFF
	<NR1>	integers	0, 1, 2, 3
	<NR2>	decimal numbers	0.1, 3.14, 8.5
	<NR3>	floating point	4.5e-1, 8.25e+1
	<NRf>	any of NR1, 2, 3	1, 1.5, 4.5e-1
	<NRf+>	NRf type with a suffix including	1, 1.5, 4.5e-1
Message terminators	<Numeric>	MINimum, MAXimum or DEFault parameters.	MAX, MIN,
	<aard>	Arbitrary ASCII characters.	
	LF CR	line feed code (new line) and carriage return.	
	LF	line feed code (new line)	
	EOI	IEEE-488 <i>EOI</i> (End-Or-Identify)	

5 Command Detail

5.1 Common Commands

5.1.1 *IDN?

→ Query

Description Returns the power supply manufacturer, model name, serial number and firmware version number

TEXIO,PPR32-3,TW1234567,V1.00

Query Syntax ***IDN?**

Return parameter <string>

Example ***IDN?**

TEXIO,PPR32-3,TW1234567,V1.00

Returns the identification of the power supply.

5.1.2 *RST

Set →

Description Performs a device reset. Configures the unit to a known configuration (default settings). This known configuration is independent of the usage history.

Note Note the *RST command will not delete instrument save states in memory.

Syntax ***RST**

5.1.3 *TST?

→ Query

Description Performs a system self-test and returns a pass or fail judgment. An error message will be generated if the self test fails.

Note The error message can be read with the SYST:ERR? query.

Query Syntax	*TST?	
Return parameter	0	Pass judgment
	1	Fail judgment
Example	*TST? 0	
	The power supply passed the self-test.	

5.1.4 *OPC

Set →

Description	This command sets the Operation Complete Bit (bit 0) of the Standard Event Status Register after the power supply has completed all pending operations. For the PPR, the *OPC command is used to indicate when a sequence has completed.
-------------	--

Note	Before the OPC bit is set, other commands may be executed.
------	--

Syntax ***OPC**

5.1.5 *OPC?

→ Query

Description	Returns the OPC bit to the output buffer when all pending operations have completed. I.e. when the OPC bit is set.
-------------	--

Note	Commands cannot be executed until the *OPC? query has completed.
------	--

Query Syntax ***OPC?**

Return parameter	1
------------------	---

Example	*OPC? 1
	Returns a "1" when all pending operations are complete.

5.1.6 *TRG

Set →

Description	Generate a trigger event for power supply.
-------------	--

Note Before the OPC bit is set, other commands may be executed.

Syntax ***TRG**

5.1.7 *CLS

Set →

Description The *CLS command clears all the event registers, the error queue and cancels an *OPC command.

Syntax ***CLS**

5.1.8 *ESE

Set →
→ Query

Description The Standard Event Status Enable command determines which events in the Standard Event Status register can set the Event Summary Bit (ESB) of the Status Byte register. Any bit positions set to 1 enable the corresponding event. Any enabled events set bit 5 (ESB) of the Status Byte register.

Note The *CLS command clears the event register, but not the enable register.

Syntax ***ESE <enable value>**

Parameter <enable value> 0 to 255

Example ***ESE 20**

Sets a bit weight of 20 (bits 2 and 4).

Query Syntax ***ESE?**

Return Parameter <NR1> Returns the bit sum of the Standard Event Status Enable register.

Example ***ESE?**

4

Bit 2 is set.

5.1.9 *ESR?

→ Query

Description Reads and clears the Standard Event Status Register. The bit weight of the standard event status register is returned.

Note	The *CLS will also clear the standard event status register.
Query Syntax	*ESR?
Return Parameter	<NR1> Returns the bit sum of the Standard Event Status (Event) register and clears the register.
Query Example	*ESR? 5 Returns the bit weight of the standard event status register (bit 0 and 2).

5.1.10 *STB?

→ Query

Description	Reads the Status byte condition register.
Note	Bit 6, the master summary bit, is not cleared.
Syntax	*STB?

5.1.11 *SRE

Set →

→ Query

Description	The Service Request Enable Command determines which events in the Status Byte Register are allowed to set the MSS (Master summary bit). Any bit that is set to "1" can cause the MSS bit to be set.
Note	The *CLS command clears the status byte event register, but not the enable register.
Syntax	*SRE <enable value>
Parameter	<enable value> 0 to 255
Example	*SRE 12 Sets a bit weight of 12 (bits 2 and 3) for the service request enable register.
Query Syntax	*SRE?
Return Parameter	<NR1> Returns the bit sum of the Service Request Enable register.
Query Example	*SRE? 12

Returns the bit weight of the status byte enable register.

5.1.12 *SAV

Set →

Description Saves the settings into memory slot M1 to M5.

Syntax ***SAV <NR1>**

parameter **<NR1>** 0 to 4 (as memory M1 to M5)

5.1.13 *RCL

Set →

Description Recalls the contents stored in memory slot M1 to M5.

Syntax ***RCL <NR1>**

parameter **<NR1>** 0 to 4 (as memory M1 to M5)

1 ~ 5 (as mem

5.2 Measure Commands

5.2.1 :MEASure:ALL

→ Query

Description Takes a measurement and returns the average output current and voltage.

Syntax **:MEASure:ALL?**

Example **:MEASure:ALL?**

0.0000,0.00000,0.000 00

<voltage>, <current>, <pow er> Returns the voltage (V), current (A), power (W) respectively.

5.2.2 :MEASure:CURREnt

→ Query

Description Takes a measurement and returns the average output current.

Syntax **:MEASure:CURREnt?**

Example **:MEASure:CURREnt?**

0.0000

Returns the current in amps.

5.2.3 :MEASure:VOLTage

→ Query

Description Takes a measurement and returns the average output voltage.

Syntax **:MEASure:VOLTage?**

Example	:MEASure:VOLTage? 0.0000 Returns the voltage in volts.
---------	---

5.2.4 :MEASure:POWer →

Description	Takes a measurement and returns the average output power.
-------------	---

Syntax	:MEASure:POWer?
--------	------------------------

Example	:MEASure:POWer? 0.0000 Returns the power measured in watts.
---------	--

5.2.5 :MEASure:CURREnt:RANGE → →

Description	Sets or queries the current measurement range.
-------------	--

Syntax	:MEASure:CURREnt:RANGE {<NR1> IH IM IL}
--------	--

Query Syntax	:MEASure:CURREnt:RANGE?
--------------	--------------------------------

Parameter	<table border="0"> <tr> <td style="background-color: #f0f0f0; padding: 2px;">IH 1</td> <td>Current measurement IH range.</td> </tr> <tr> <td style="background-color: #f0f0f0; padding: 2px;">IM 2</td> <td>Current measurement IM range.</td> </tr> <tr> <td style="background-color: #f0f0f0; padding: 2px;">IL 3</td> <td>Current measurement IL range.</td> </tr> <tr> <td style="background-color: #f0f0f0; padding: 2px;"><NR1></td> <td>Returns the current measurement range.</td> </tr> </table>	IH 1	Current measurement IH range.	IM 2	Current measurement IM range.	IL 3	Current measurement IL range.	<NR1>	Returns the current measurement range.
IH 1	Current measurement IH range.								
IM 2	Current measurement IM range.								
IL 3	Current measurement IL range.								
<NR1>	Returns the current measurement range.								

Return parameter	
------------------	--

5.3 Output Commands

5.3.1 :OUTPut:DELAy:ON → →

Description	Sets the Delay Time in seconds for turning the output on. The delay is set to 0.00 by default.
-------------	--

Syntax	:OUTPut:DELAy:ON {<NR2> MINimum MAXimum}
--------	---

Query Syntax	:OUTPut:DELAy:ON?
--------------	--------------------------

Parameter	<table border="0"> <tr> <td style="background-color: #f0f0f0; padding: 2px;"><NR2></td> <td>0.00 to 359999.99 seconds, where 0 = no delay.</td> </tr> </table>	<NR2>	0.00 to 359999.99 seconds, where 0 = no delay.
<NR2>	0.00 to 359999.99 seconds, where 0 = no delay.		

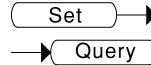
Return parameter	<table border="0"> <tr> <td style="background-color: #f0f0f0; padding: 2px;">"0.00"</td> <td>Returns the delay on time in seconds until the output is turned on.</td> </tr> </table>	"0.00"	Returns the delay on time in seconds until the output is turned on.
"0.00"	Returns the delay on time in seconds until the output is turned on.		

5.3.2 :OUTPut:DELAy:OFF → →

Description	Sets the Delay Time in seconds for turning the output off. The delay is set to 0.00 by default.
-------------	---

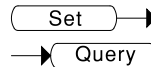
Syntax	:OUTPut:DELaY:OFF {<NR2> MINimum MAXimum}	
Query Syntax	:OUTPut:DELaY:OFF?	
Parameter	<NR2>	0.00 to 359999.99 seconds, where 0 = no delay.
Return parameter	"0.00"	Returns the delay on time in seconds until the output is turned off.

5.3.3 :OUTPut:MODE



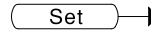
Description	Sets the PPR output mode. This is the equivalent to the Output menu (V-I Slew Rate Select) settings.	
Syntax	:OUTPut:MODE {<NR1> CVHS CCHS CVLS CCLS}	
Query Syntax	:OUTPut:MODE?	
Parameter	CVHS 0 CCHS 1 CVLS 2 CCLS 3 <NR1>	CV high speed priority CC high speed priority CV slew rate priority CC slew rate priority Returns the output mode.
Return parameter		

5.3.4 :OUTPut[:STATe]



Description	Turns the output on or off.	
Syntax	:OUTPut[:STATe] { <bool> OFF ON }	
Query Syntax	:OUTPut[:STATe]?	
Parameter	OFF 0 ON 1 <NR1>	Turns the output off. Turns the output on. Returns output status of the instrument.
Return parameter		

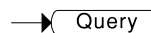
5.3.5 :OUTPut:PROTEction:CLEAr



Description	Clears over-voltage, over-current and over-temperature (OVP, OCP, OTP) protection circuits.	
-------------	---	--

Syntax **:OUTPut:PROTEction:CLEAr**

5.3.6 :OUTPut:PROTEction:TRIPped



Description	Queries the unit to see if a protection circuit has been tripped.	
-------------	---	--

Syntax **:OUTPut:PROTEction:TRIPped?**

Return	<boolean>	0 = No protection error 1 = A protection error had occurred
--------	-----------	--

5.4 Sense Commands

5.4.1 :SENSe:AVERAge:COUNT

Set →
→ Query

Description	Sets or queries the level of smoothing for the average setting.									
Syntax	:SENSe:AVERAge:COUNT {<NR1> LOW MIDDLE HIGH}									
Query Syntax	:SENSe:AVERAge:COUNT									
Parameter	<table><tr><td>OFF</td><td> 0</td></tr><tr><td>LOW</td><td> 1</td></tr><tr><td>MIDDLE</td><td> 2</td></tr><tr><td>HIGH</td><td> 3</td></tr></table>	OFF	0	LOW	1	MIDDLE	2	HIGH	3	Default setting Low setting Middle setting High setting
OFF	0									
LOW	1									
MIDDLE	2									
HIGH	3									
Return parameter	<NR1>	Returns the average setting.								

5.4.2 :SENSe:RECOOrder:STATe

Set →
→ Query

Description	Enables or disables the recorder setting.									
Syntax	:SENSe:RECOOrder:STATe {<NR1>}									
Query Syntax	:SENSe:RECOOrder:STATe?									
Parameter	<table><tr><td>0</td><td>Disable recorder.</td></tr><tr><td>1</td><td>Enable recorder. The data is stored in the USB storage when USB storage plug in.</td></tr><tr><td>2</td><td>Enable recorder, The data is sent to the USB device interface when the remote control read data.</td></tr><tr><td>3</td><td>Enable recorder, The data is sent to the LAN interface when the remote control read data.</td></tr></table>	0	Disable recorder.	1	Enable recorder. The data is stored in the USB storage when USB storage plug in.	2	Enable recorder, The data is sent to the USB device interface when the remote control read data.	3	Enable recorder, The data is sent to the LAN interface when the remote control read data.	
0	Disable recorder.									
1	Enable recorder. The data is stored in the USB storage when USB storage plug in.									
2	Enable recorder, The data is sent to the USB device interface when the remote control read data.									
3	Enable recorder, The data is sent to the LAN interface when the remote control read data.									
Return parameter	<NR1>	Returns the recorder setting.								

5.4.3 :SENSe:RECOOrder:PERIOD

Set →
→ Query

Description	Sets the sample period in seconds for recorder.	
Syntax	:SENSe:Recorder:PERIOD {<NR2> MINimum MAXimum}	
Query Syntax	:SENSe:RECOOrder:PERIOD?	
Parameter	<NR2>	1 to 999 seconds.

Return parameter **<NR2>** Returns the sample period setting.

5.5 Status Commands

For an overview of all the status registers, their associated register contents and the system diagram..

5.5.1 :STATus:OPERation[:EVENT]

Description Queries the Operation Status Event register and clears the contents of the register.

Syntax **:STATus:OPERation[:EVENT]?**

Return **<NR1>** Returns the bit sum of the Operation Status Event register.

5.5.2 :STATus:OPERation:CONDition

Description Queries the Operation Status register. This query will not clear the register.

Syntax **:STATus:OPERation:CONDition?**

Return **<NR1>** Returns the bit sum of the Operation Condition register.

5.5.3 :STATus:OPERation:ENABLE

Description Sets or queries the bit sum of the Operation Status Enable register.

Syntax **:STATus:OPERation:ENABLE <NR1>**

Query Syntax **:STATus:OPERation:ENABLE?**

Parameter **<NR1>** 0 to 32767

Return **<NR1>** 0 to 32767

parameter

5.5.4 :STATus:QUESTionable[:EVENT]

Description Queries the bit sum of the Questionable Status Event register. This query will also clear the contents of the register.

Syntax **:STATus:QUESTionable[:EVENT]?**

Return **<NR1>** 0 to 32767

parameter

5.5.5 :STATus:QUEStionable:CONDition

→ Query

Description Queries the status (bit sum) of the Questionable Status register. This query will not clear the register.

Syntax **:STATus:QUEStionable:CONDition?**

Return **<NR1>** 0 to 32767

parameter

5.5.6 :STATus:QUEStionable:ENABLE

Set →

→ Query

Description Sets or queries the bit sum of the Questionable Status Enable register.

Syntax **:STATus:QUEStionable:ENABLE <NR1>**

Query Syntax **:STATus:QUEStionable:ENABLE?**

Parameter **<NR1>** 0 to 32767

Return **<NR1>** 0 to 32767

parameter

5.5.7 :STATus:PRESet

Set →

Description This command resets the ENABLE register and Questionable Status Registers. The registers will be reset to a default value.

Default Register/Filter Values	Setting
QUEStionable Status Enable	0x0000
Operation Status Enable	0x0000

Syntax **:STATus:PRESet**

5.6 Source Commands

5.6.1 [:SOURce]:CURRent

Set →

→ Query

Description Sets or queries the current level in amps.

Syntax **[:SOURce]:CURRent {<NR2>(A)|MINimum|MAXimum}**

Query Syntax **[:SOURce]:CURRent?**

Parameter	<NR2> 0 % to 105 % of the rated current output level.
	MIN Minimum current level.
	MAX Maximum current level.

Return parameter	<NR2>	0 % to 105 % of the rated current output level.
	MIN	Minimum current level.
	MAX	Maximum current level.
Example	SOUR:CURR? 1.00000 Returns the current level in amps.	

5.6.2

Set →

→ Query

[[:SOURce]:CURRent:PROTection:STATe

Description

Sets or queries the OCP function.

Syntax

[[:SOURce]:CURRent:PROTection:STATe {<bool>|OFF|ON}

Query Syntax

[[:SOURce]:CURRent:PROTection:STATe?

Parameter

OFF | 0

Turns OCP off

ON | 1

Turns OCP on

Return parameter

<bool>

Returns the setting in <bool> format.

Example

SOUR:CURR:PROT:STAT?
Returns the status of the OCP function

5.6.3	[:SOURce]:CURRent:PROTection:D		Set →
ELay			→ Query
Description	Sets the Delay Time for OCP in seconds. The delay is set to 0.20 by default.		
Syntax	[:SOURce]:CURRent:PROTection:DElay {<NR2> MINimum MAXimum}		
Query Syntax	[:SOURce]:CURRent:PROTection:DElay?		
Parameter	<NR2>	0.20 to 2.5 seconds	
	MAX	The maximum allowed delay time	
	MIN	The minimum allowed delay time	
Return parameter	<NR2>	Returns the delay time in seconds	
Example	SOUR:CURR:PROT:DEL MAX Sets the current protection delay to the maximum		

5.6.4 [:SOURce]:CURRent:PROTection		Set → → Query
Description	Sets or queries the OCP (over-current protection) level in amps.	
Syntax	[:SOURce]:CURRent:PROTection[:LEVel]{<NR2>(A) MINimum MAXimum}	
Query Syntax	[:SOURce]:CURRent:PROTection[:LEVel]?	

Parameter	<NR2>	Current protection level. Minimum: Irated x 0.05 Maximum: Irated x 1.1
	MAX	Maximum current level.
	MIN	Minimum current level.
Return parameter	<NR2>	Returns the current protection level.
Example	SOUR:CURR:PROT? 5.00 Returns the current level in amps.	

5.6.5 [:SOURce]:CURRent:PROTection:TRIPped

→

Description	Returns the state of the current protection circuits.	
Query Syntax	[:SOURce]:CURRent:PROTection:TRIPped?	
Return parameter	<bool>	Returns protection status.
Example	SOUR:CURR:PROT:TRIP? 0 The protection circuit has not been tripped.	

5.6.6 [:SOURce]:CURRent:SLEWrate:RISing

→
→

Description	Sets or queries the falling current slew rate. This is only applicable for CC slew rate priority (CCLS) mode.	
Syntax	[:SOURce]:CURRent:SLEWrate:RISing {<NR2>(A) MINimum MAXimum}	
Query Syntax	[:SOURce]:CURRent:SLEWrate:RISing?	
Parameter	<NR2>	Per step is between 0.00001 A/msec and depend on the unit type: 0.01 A/msec.
	MAX	Maximum: Depend on the unit type: 0.01 A/msec.
	MIN	Minimum rising current slew rate is 0.00001 A/msec.
Return parameter	<NR2>	Returns the step current in amps.
Example	SOUR:CURR:SLEW:RIS? 0.00200 Sets the rising current slew rate to 0.00200 A/ms.	

5.6.7 [:SOURce]:CURRent:SLEWrate:FALLing

Set →
→ Query

Description	Sets or queries the rising current slew rate. This is only applicable for CC slew rate priority (CCLS) mode.	
Syntax	[:SOURce]:CURRent:SLEWrate:FALLing {<NR2>(A) MINimum MAXimum}	
Query Syntax	[:SOURce]:CURRent:SLEWrate:FALLing?	
Parameter	<NR2>	Per step is between 0.00001 A/msec and depend on the unit type: 0.01 A/msec.
	MAX	Maximum: Depend on the unit type: 0.01 A/msec.
	MIN	Minimum rising current slew rate is 0.00001 A/msec.
Return parameter	<NR2>	Returns the step current in amps.
Example	SOUR:CURR:SLEW:FALL MAX Sets the falling current slew rate to the maximum.	

5.6.8 [:SOURce]:MODE?

→ Query

Description	Returns the status of the output mode (CC, CV, Off) of the power supply. The interface will return "CV" if the supply is in Constant Voltage Mode, "CC" if the supply is in Constant Current Mode or "OFF" if the supply output is off.	
Query Syntax	[:SOURce]:MODE?	
Return parameter	CC	OUTPUT:ON / CC mode
	CV	OUTPUT:ON / CV mode
	OFF	OUTPUT:OFF
Example	:SOUR:MODE? CC The power supply is currently in CC mode.	

5.6.9 [:SOURce]:VOLTage

Set →
→ Query

Description	Sets or queries the voltage level in volts.	
Syntax	[:SOURce]:VOLTage {<NR2>(V) MINimum MAXimum}	
Query Syntax	[:SOURce]:VOLTage?	

Parameter	<NR2>	0 % to 105 % of the rated output voltage in volts.
	MAX	Maximum voltage level
	MIN	Minimum voltage level
Return parameter	<NR2>	Returns the voltage level in volts

Example **SOUR:VOLT 10.0**
Sets the voltage level to 10 volts.

5.6.10 [:SOURce]:VOLTage:

Set →

PROTection:STATe

→ Query

Description	Sets or queries the OVP function.	
Syntax	[:SOURce]:VOLTage:PROTection:STATe {<bool> OFF ON}	
Query Syntax	[:SOURce]:VOLTage:PROTection:STATe?	
Parameter	OFF 0	Turns OVP off
	ON 1	Turns OVP on
Return parameter	<bool>	Returns the setting in <bool> format.

Example **SOUR:VOLT:PROT:STAT?**
Returns the status of the OVP function

5.6.11 [:SOURce]:VOLTage:PROTection

Set →

→ Query

Description	Sets or queries the overvoltage protection level.	
Syntax	[:SOURce]:VOLTage:PROTection {<NR2>(V) MINimum MAXimum}	
Query Syntax	[:SOURce]:VOLTage:PROTection?	
Parameter	<NR2>	Minimum: Vrated x 0.05 Maximum: Vrated x 1.1
	MAX	Maximum OVP level
	MIN	Minimum OVP level
Return parameter	<NR2>	Minimum: Vrated x 0.05 Maximum: Vrated x 1.1
	MAX	Maximum OVP level
	MIN	Minimum OVP level

Example **SOUR:VOLT:PROT MAX**
Sets the OVP level to its maximum.

5.6.12 [:SOURce]:VOLTage:PROTection

:TRIPped

→ Query

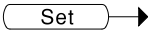
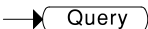
Description	Sets or queries the overvoltage protection level.
-------------	---

Query Syntax	[[:SOURce]:VOLTage:PROTection:TRIPped?	
Return	<bool>	
parameter	0	Protection not tripped
	1	Protection tripped
Example	SOUR:VOLT:PROT:TRIP? 0 Indicates that the OVP protection has not been tripped.	

5.6.13 [[:SOURce]:VOLTage:SLEWrate:RISing		Set → → Query
Description	Sets or queries the rising voltage slew rate. This is only applicable for CV slew rate priority (CVLS) mode.	
Syntax	[[:SOURce]:VOLTage:SLEWrate:RISing {<NR2>(V) MINimum MAXimum}	
Query Syntax	[[:SOURce]:VOLTage:SLEWrate:RISing?	
Parameter	<NR2>	Per step is between 0.0001 V/msec and depend on the unit type: 0.04 V/msec.
	MAX	Maximum: Depend on the unit type: 0.04 V/msec.
	MIN	Minimum rising voltage slew rate is 0.0001 V/msec.
Return parameter	<NR2>	Returns the slew rate in V/msec.
Example	SOUR:VOLT:SLEW:RIS MAX Sets the rising voltage slew rate to its maximum.	

5.6.14 [[:SOURce]:VOLTage:SLEWrate:FALLing		Set → → Query
Description	Sets or queries the falling voltage slew rate. This is only applicable for CV slew rate priority (CVLS) mode.	
Syntax	[[:SOURce]:VOLTage:SLEWrate:FALLing {<NR2>(V) MINimum MAXimum}	
Query Syntax	[[:SOURce]:VOLTage:SLEWrate:FALLing?	
Parameter	<NR2>	Per step is between 0.0001 V/msec and depend on the unit type: 0.04 V/msec.
	MAX	Maximum: Depend on the unit type: 0.04 V/msec.
	MIN	Minimum rising voltage slew rate is 0.0001 V/msec.
Return parameter	<NR2>	Returns the slew rate in V/msec.

Example **SOUR:VOLT:SLEW:FALL MIN**
 Sets the falling voltage slew rate to its minimum.

5.6.15 [:SOURce]:VOLTage:SENSe  

Description Sets or queries the remote sense.

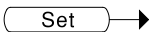
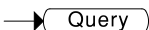
Syntax **[:SOURce]:VOLTage:SENSe**
{<NR2>|INTernal|EXTernal}

Query Syntax **[:SOURce]:VOLTage:SENSe?**

Parameter **<NR2>**
 INTernal | 0 Sets remote sense 2 wire
 EXTernal | 1 Sets remote sense 4 wire

Return
 parameter
 Example **SOUR:VOLT: SENS EXT**
 Sets remote sense 4 wire.

5.7 System Commands

5.7.1 :SYSTem:CONFigure:BEEPer[:STATe]  

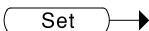
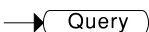
Description Sets or queries the protect buzzer state on/off.

Syntax **:SYSTem:CONFigure:BEEPer[:STATe]**
{<bool>|OFF|ON}

Query Syntax **:SYSTem:CONFigure:BEEPer[:STATe]?**

Parameter **OFF | 0** Turns the buzzer off.
 ON | 1 Turns the buzzer on.

Return
 parameter **<bool>** Returns the buzzer status.

5.7.2 :SYSTem:CONFigure:BLEeder[:STATe]  

Description Sets or queries the status of the bleeder resistor.

Syntax **:SYSTem:CONFigure:BLEeder[:STATe]**
{<NR1>|OFF|ON}

Query Syntax **:SYSTem:CONFigure:BLEeder[:STATe]?**

Parameter **OFF | 0** Turns the bleeder resistor off.
 ON | 1 Turns the bleeder resistor on.

Return
 parameter **<NR1>** Returns bleeder resistor status.

5.7.3 :SYSTem:CONFigure:PON[:STATe]

Set

Query

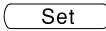
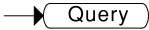
Description	Sets the output state at power-on. This is the equivalent to the PWR On Config menu (Power On Status) settings. These settings only apply after the unit has been reset.	
Syntax	:SYSTem:CONFigure:OUTPut:PON[:STATe]{<NR1> {DEFAult OFF}}{SAVE ON}}	
Query Syntax	:SYSTem:CONFigure:OUTPut:PON[:STATe]?	
Parameter	DEF 0	The PPR turns on in the same state the unit was in prior to the factory default setting. The output is set to off (default).
	SAVE 1	The PPR turns on in the same state the unit was in prior to the previous shut down.
Return parameter	0	The power on output setting is "DEF".
	1	The power on output setting is "SAVE".

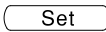
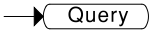
5.7.4 :SYSTem:CONFigure:TRIGger:INPut:SOURce

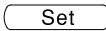
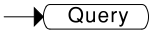
Set

Query

Description	Sets or queries what action will be performed on receiving a trigger. This is the equivalent to the TRIG Control menu (Trigin Action) settings.	
Syntax	:SYSTem:CONFigure:TRIGger:INPut:SOURce{<NR1> NONE OUTPut SETTing MEMory}	
Query Syntax	:SYSTem:CONFigure:TRIGger:INPut:SOURce?	
Parameter	NONE 0	No input trigger.
	OUTPut 1	Toggles the output on receiving a trigger.
	SETTing 2	Sets the voltage/current on receiving a trigger.
	MEMory 3	Sets the voltage/current on receiving a trigger.
Return parameter	<NR1>	Returns the input source

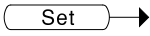
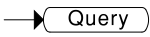
5.7.5 :SYSTem:CONFigure:TRIGger:INPut:LEVel  	
Description	Sets or queries the logic used to input trigger level. This is the equivalent to the TRIG Control menu (Trigin Level) settings.
Syntax	:SYSTem:CONFigure:TRIGger:INPut:LEVel {<NR1> LOW HIGH}
Query Syntax	:SYSTem:CONFigure:TRIGger:INPut:LEVel?
Parameter	LOW 0 Active low. HIGH 1 Active high.
Return parameter	<NR1> Returns the trigger input level.

5.7.6 :SYSTem:CONFigure:TRIGger:OUTPut:SOURce  	
Description	Sets or queries the output trigger source. This is the equivalent to the TRIG Control menu (Trigout Source) settings.
Syntax	:SYSTem:CONFigure:TRIGger:OUTPut:SOURce {<NR1> NONE OUTPut SETTing MEMory}
Query Syntax	:SYSTem:CONFigure:TRIGger:OUTPut:SOURce ?
Parameter	NONE 0 No output trigger. OUTPut 1 Output trigger is generated by a change in the output. SETTing 2 Output trigger is generated when a setting is changed. MEMory 3 Output trigger is generated when a memory setting is loaded.
Return parameter	<NR1> Returns the output source.

5.7.7 :SYSTem:CONFigure:TRIGger:OUTPut:LEVel  	
Description	Sets or queries the logic used to output trigger level. This is the equivalent to the TRIG Control menu (Trigin Level) settings.
Syntax	:SYSTem:CONFigure:TRIGger:OUTPut:LEVel {<NR1> LOW HIGH}
Query Syntax	:SYSTem:CONFigure:TRIGger:OUTPut:LEVel?
Parameter	<NR1>

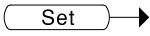
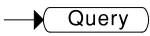
Return parameter	LOW 0	Sets the output trigger to active low.
	High 1	Sets the output trigger to active high.
	<NR1>	Returns the trigger output level.

5.7.8 :SYSTem:CONFigure:TRIGger:INPut:VOLTage

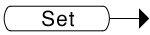
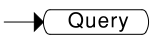
Description	Sets or queries the voltage level in volts when a trigger in/software trigger has been generated.	
Syntax	:SYSTem:CONFigure:TRIGger:INPut:VOLTage{<NR2>(V) MINimum MAXimum}	
Query Syntax	:SYSTem:CONFigure:TRIGger:INPut:VOLTage?	
Parameter	<NR2>	0 % to 105 % of the rated voltage output in volts.
	MIN	Minimum current level.
	MAX	Maximum current level.
Return parameter	<NR2>	Returns the voltage level.

5.7.9 :SYSTem:CONFigure:TRIGger:INPut:CURRent

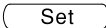
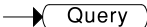
Description	Sets or queries the current level in amps when a software trigger has been generated.	
Syntax	:SYSTem:CONFigure:TRIGger:INPut:CURRent{<NR2>(A) MINimum MAXimum}	
Query Syntax	:SYSTem:CONFigure:TRIGger:INPut:CURRent?	
Parameter	<NR2>	0 % to 105 % of the rated current output in amps.
	MIN	Minimum current level.
	MAX	Maximum current level.
Return parameter	<NR2>	Returns the current level.

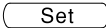
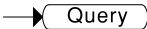
5.7.10 :SYSTem:CONFigure:TRIGger:INPut:MEMory

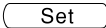
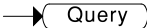



Description	Sets or queries which memory is loaded when a trigger input is received and the trigger input is configured to load a memory setting. This is the equivalent to the TRIG Control menu (Trigin Memory) settings.	
Syntax	:SYSTem:CONFigure:TRIGger:INPut:MEMory<NR1>	

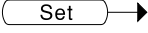
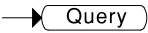
Query Syntax	:SYSTem:CONFIgure:TRIGger:INPut:MEMory?	
Parameter	<NR1>	1 (M1) to 5 (M5).
	MIN	
	MAX	
Return parameter	<NR1>	Returns the memory setting.

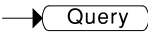
5.7.11 :SYSTem:COMMUnicate:GPIB:A		
DDress		
Description	Sets or queries the GPIB address. Note: the setting will only be valid after the power has been cycled.	
Syntax	:SYSTem:COMMUnicate:GPIB[:SELF]:ADDRess <NR1>	
Query Syntax	:SYSTem:COMMUnicate:GPIB[:SELF]:ADDRess ?	
Parameter	<NR1>	1 to 30
Return parameter	<NR1>	1 to 30
Example	SYST:COMM:GPIB:ADDR 15 Sets the GPIB address to 15.	

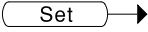
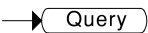
5.7.12 :SYSTem:COMMUnicate:LAN:IPA		
Ddress		
Description	Sets or queries LAN IP address. Note: the setting will only be valid after the power has been cycled.	
Syntax	:SYSTem:COMMUnicate:LAN:IPADdress <string>	
Query Syntax	:SYSTem:COMMUnicate:LAN:IPADdress?	
Parameter	<string>	LAN IP address in string format ("address") Applicable ASCII characters: 20H to 7EH
Return 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 IP address to 172.16.5.111.	

5.7.13 :SYSTem:COMMUnicate:LAN:GA		
Teway		
Description	Sets or queries the Gateway address. Note: the setting will only be valid after the power has been cycled.	

Syntax	:SYSTem:COMMunicate:LAN:GATeway	
Query Syntax	<string>	
Parameter	:SYSTem:COMMunicate:LAN:GATeway?	Gateway address in string format ("address")
Return parameter	<string>	Applicable ASCII characters: 20H to 7EH Gateway address in string format ("address") Applicable ASCII characters: 20H to 7EH
Example	SYST:COMM:LAN:GAT 172.16.0.254 Sets the LAN gateway to 172.16.0.254.	

5.7.14 :SYSTem:COMMunicate:LAN:SMAsk		
Ask		
Description	Sets or queries the LAN subnet mask. Note: the setting will only be valid after the power has been cycled.	
Syntax	:SYSTem:COMMunicate:LAN:SMAsk <string>	
Query Syntax	:SYSTem:COMMunicate:LAN:SMASK?	
Parameter	<string>	Subnet mask in string format ("mask") Applicable ASCII characters: 20H to 7EH
Return parameter	<string>	Subnet mask in string format ("mask") Applicable ASCII characters: 20H to 7EH
Example	SYST:COMM:LAN:SMASK 255.255.0.0 Sets the LAN mask to 255.255.0.0.	

5.7.15 :SYSTem:COMMunicate:LAN:MAC		
C		
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 Returns the MAC address.	

5.7.16 :SYSTem:COMMunicate:LAN:DHCP		
CP		
Description	Turns DHCP on/off. Queries the DHCP status. Note: the setting will only be valid after the power has been cycled.	

Syntax	:SYSTem:COMMunicate:LAN:DHCP {<bool> OFF ON}	
Query Syntax	:SYSTem:COMMunicate:LAN:DHCP?	
Parameter	OFF 0	DHCP off
	ON 1	DHCP on
Return parameter	<bool>	Returns the DHCP status.

5.7.17 :SYSTem:COMMunicate:TCPIp:CONTROL

→
→

Description	Queries the socket port number.	
Query Syntax	:SYSTem:COMMunicate:TCPIp:CONTROL?	
Return parameter	<NR1>	0000 to 9999
Example	SYST:COMM:TCP:CONT? 2268 Returns the socket port number	

5.7.18 :SYSTem:ERRor

→

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	<string>	Returns an error code followed by an error message as a single string.
Example	SYSTem:ERRor? -100 Command error	

5.7.19 :SYSTem:KLOCK

→
→

Description	Enables or disables the front panel key lock.	
Syntax	:SYSTem:KLOCK {<bool> OFF ON }	
Query Syntax	:SYSTem:KLOCK?	
parameter	OFF 0	Panel lock: allow output off.
	ON 1	Panel lock: allow output on/off.
Return parameter	0	Panel lock: allow output off.
	1	Panel lock: allow output on/off.

5.7.20 :SYSTem:ERRor:ENABLE

→

Description	Clears the Error Queue and enables all error messages to be placed in the System Error Queue.	
-------------	---	--

Syntax **:SYSTem:ERRor:ENABLE**

5.7.21 :SYSTem:VERSion

→ Query

Description Returns the version of the PPR SCPI version.

Query Syntax **:SYSTem:VERSion?**

Return parameter **<string>** Returns the SCPI version as a string.

Example **SYST:VERS?**
1999.9

5.7.22 :SYSTem:KEYBoard:BEEPer

Set →

→ Query

Description Sets or queries the keyboard buzzer state on/off. This is the equivalent to the Buzzer menu (Keyboard)settings.

Syntax **:SYSTem:KEYBoard:BEEPer {<bool>|OFF|ON}**

Query Syntax **:SYSTem:KEYBoard:BEEPer?**

parameter **0 | OFF** Turns the keyboard buzzer off.

1 | ON Turns the keyboard buzzer on.

Return parameter **<bool>** Returns the keyboard buzzer status.

5.7.23 :SYSTem:LOCal

Set →

Description Disable remote control mode.

Syntax **:SYSTem:LOCal**

Example **SYST:LOC**

Sets the operating mode to local.

5.8 Apply Commands

5.8.1 :APPLy

Set →

→ Query

Description The apply command sets the voltage and current at the same time.

Syntax **:APPLy {<NRf>(V)|MINimum|MAXimum[,<NRf>(A)|MINimum|MAXimum]}**

Query Syntax **:APPLy?**

Parameter	<NRf>(V) MINimum MAXimum <NRf>(A) MINimum MAXimum	Voltage setting. Minimum voltage level Maximum voltage level Current setting. Minimum voltage level Maximum voltage level
Return parameter	<NRf>(V) MINimum MAXimum <NRf>(A) MINimum MAXimum	Voltage setting. Minimum voltage level Maximum voltage level Current setting. Minimum voltage level Maximum voltage level
Example	APPL MIN, MIN Sets the current and voltage to the minimum settings.	

5.9 Sequence Commands

5.9.1 :SEQUence:ENABLE

Set →

Description	Enable or disable sequence function.	
Syntax	:SEQUence:ENABLE{ON OFF}	
Parameter	OFF ON	Turns the sequence function off. Turns the sequence function on.
Example	SEQUence:ENABLE ON Turns the sequence function on.	

5.9.2 :SEQUence:SAVE:INTernal

Set →

Description	Saves the sequence output file to the designated location of internal storage. {1 2 3 4 5} represent the storage locations of 5 files within the internal storage individually.	
Syntax	:SEQUence:SAVE:INTernal{1 2 3 4 5 }	
Parameter	<NR1>	1 to 5 (as memory 1 to 5)

5.9.3 :SEQUence:LOAD:INTrenal

Set →

Description	Recalls the sequence output file saved in the designated location from internal storage. {1 2 3 4 5} represent the storage locations of 5 files within the internal storage individually.	
Syntax	:SEQUence:LOAD:INTernal{1 2 3 4 5 }	

Parameter	<NR1>	1 to 5 (as memory 1 to 5)
-----------	-------	---------------------------

5.9.4 :SEQUence:SAVE:UDISK

Set

→

Description

Saves the sequence output file to the designated location of external storage. SEQU_<NR1>.CSV indicates the designated location of external storage with file format in either usb:\<name>.CSV. Storage location cannot be designated when sequence function is enabled.

Syntax

:SEQUence:SAVE:UDISK SEQU_<NR1>.CSV

Parameter

<NR1>

0 to 255

--	--	--

5.9.5 :SEQUence:LOAD:UDISK

Set

→

Description

Recalls the sequence output file saved in the designated location from external storage. SEQU_<NR1>.CSV indicates the designated location of external storage.

Syntax

:SEQUence:LOAD:UDISK SEQU_<NR1> .CSV

Parameter

<NR1>

0 to 255

--	--	--

5.9.6 :SEQUence:RUN

Set

→

→ Query

Description

Start output with the first sequence .

Syntax

:SEQUence:RUN{ON|OFF }

Parameter

OFF

Stop the sequence function.

ON

Start the sequence function.

--	--	--

5.9.7 :SEQUence:STATe

Set

→

→ Query

Description

Queries the state of sequence output .

Query Syntax

:SEQUence:STATe?

Return parameter

OFF

Sequence not enabled

ON

The sequence is in a run state.

Ready

The sequence is in a ready state.

Pause	The sequence is paused during the execution of the sequence script. When a sequence is paused, transmit instruction SEQUENCE:RUN ON to continue running the sequence.
TRIGIN	During the execution of the sequence script, the sequence is in a waiting trigger state. The Trigin status will be held until trig-in signal is received by PPR series unit.

5.10 Load Commands

5.10.1 :LOAD:CV

Set →

Description Sets Channel as Load CV mode. Automatically switch to power mode after closing LOAD mode.

Syntax **:LOAD:CV{ON|OFF}**

Parameter

OFF 0	OFF
ON 1	ON

Example :LOAD:CV ON
Sets Channel as Load CV mode.

5.10.2 :LOAD:CC

Set →

Description Sets Channel as Load CC mode.

Syntax **:LOAD:CC{ON|OFF}**

Parameter

OFF 0	OFF
ON 1	ON

Example :LOAD:CC ON
Sets Channel as Load CC mode.

5.10.3 :LOAD:MODE

→ Query

Description Queries Channel work mode.
3 modes below: CV Load, CC Load, Source

Syntax **:LOAD:MODE?**

Parameter

0	CV Load
1	CC Load
255	Source

Example :LOAD:MODE?
Queries Channel work mode.

6 Status Register Overview

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

6.1 Introduction to the Status Registers

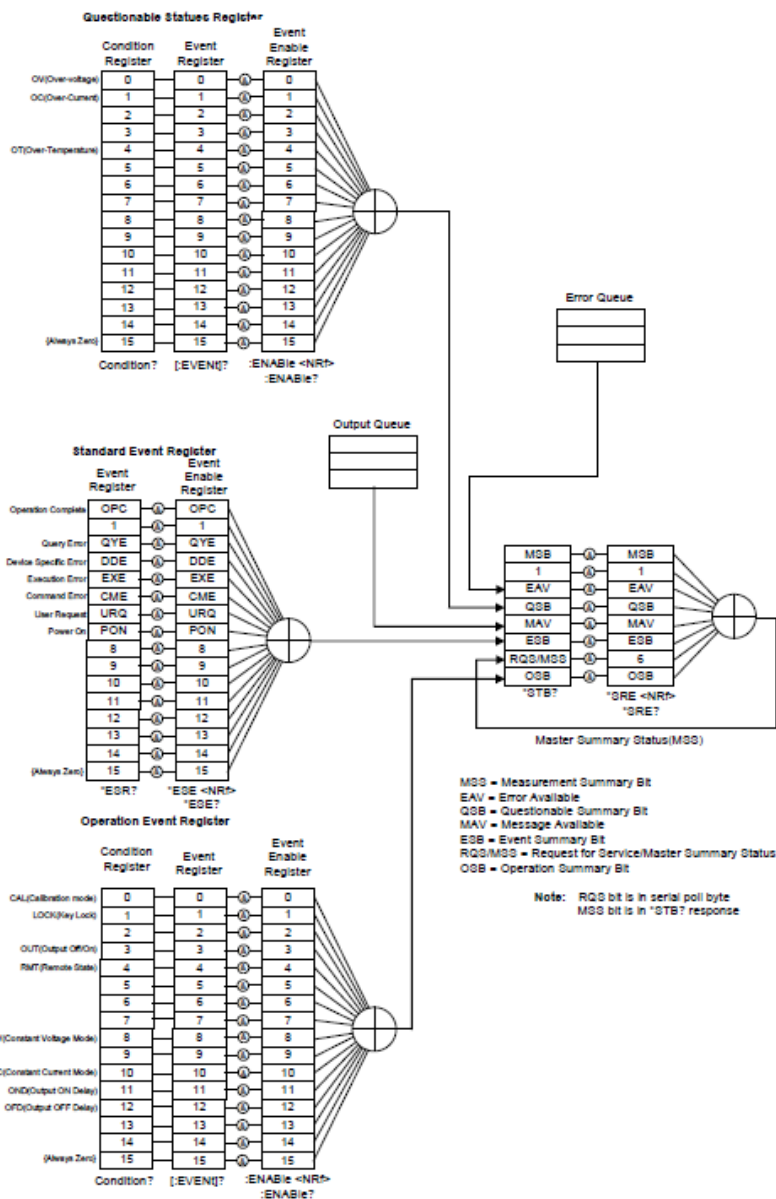
Overview

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. The PPR Series have a number of 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

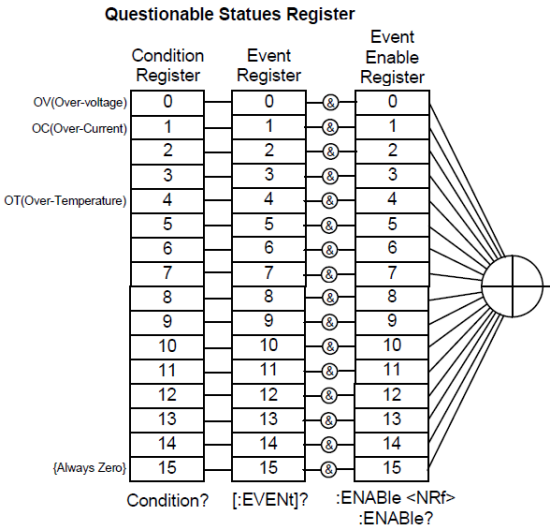
The next page shows the structure of the Status registers.

6.2 The Status Registers



6.3 Questionable Status Register Group

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



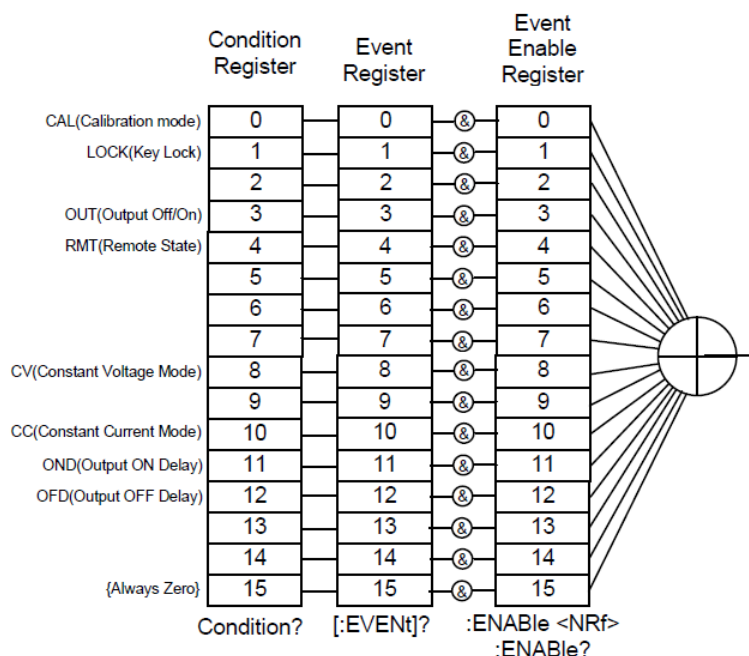
Bit Summary	Event	Bit	Bit Weight
	OV (Over-Voltage)	0	1
	Over voltage protection has been tripped		
	OC (Over-Current)	1	2
	Over current protection has been tripped		
	OTP(Over Temperature Protection)	4	16
	Over temperature protection has been tripped		
Condition Register	The Questionable Status Condition Register indicates the status of the power supply. If a bit is set in the Condition register, it indicates that the event is true. Reading the condition register does not change the state of the condition register.		
Event Register	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.

6.4 Operation Status Register Group

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

Operation Event Register

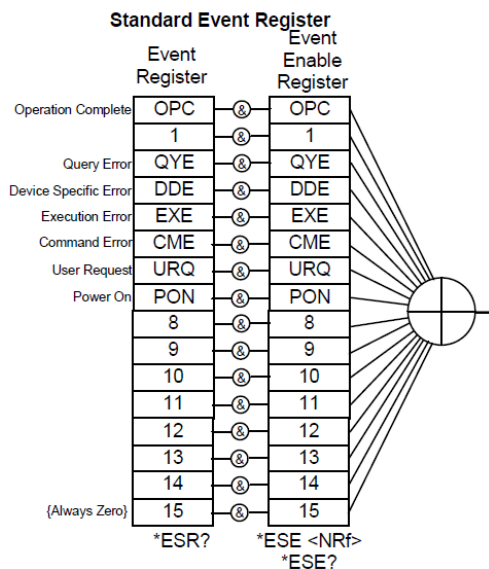


Bit Summary	Event	Bit	Bit Weight
	CAL (Calibration mode) Indicates if the PPR is in calibration mode.	0	1
	LOCK (Key Lock) Keyboard locked.	1	2
	OUT(Output off/on) Output off/on state.	3	8
	RMT(Remote state) Remote state	4	16
	CV (Constant voltage mode) Indicates if the PPR is in CV mode.	8	256
	CC (Constant current mode) Indicates if the PPR is in CC mode.	10	1024
	OND (Output ON Delay) Indicates if Output ON delay time is active	11	2048
	OFD (Output OFF Delay) Indicates if Output OFF delay time is active	12	4096
Condition Register	The Operation Status Condition Register indicates the operating status of the power supply. If a bit is set in the Condition register, it indicates that the event is true. Reading the condition register does not change the state of the condition register.		
Event 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.		
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.		

6.5 Standard Event Status Registers

Overview

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



Bit Summary

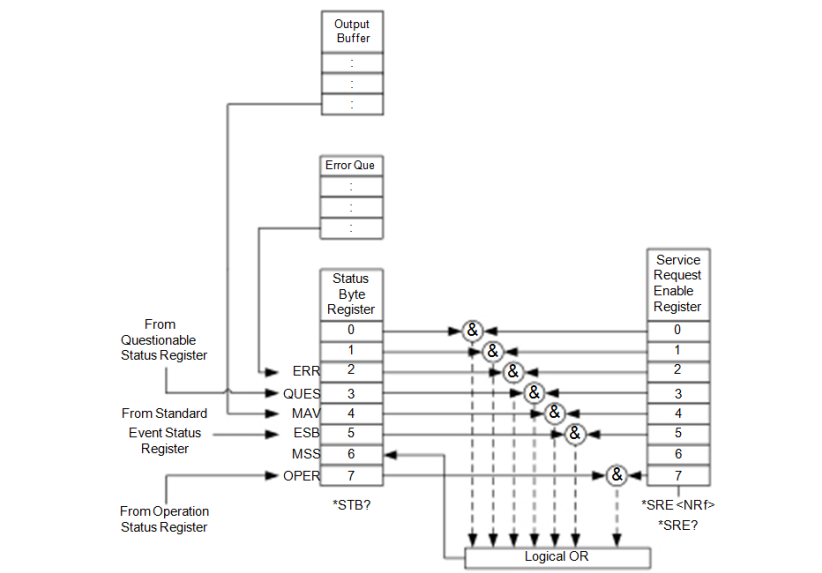
Event	Bit	Bit Weight
OPC (Operation complete)	0	1
The OPC bit is set when all selected pending operations are complete. This bit is set in response to the *OPC command.		
QYE (Query Error)	2	4
The Query Error bit is set in response to an error reading the Output Queue. This can be caused by trying to read the Output Queue when there is no data present.		

	DDE (Device Dependent Error)	3	8
	Device specific error.		
	EXE (Execution Error)	4	16
	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.		
	CME (Command Error)	5	32
	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.		
	PON (Power On)	7	128
	Indicates the power is turned on.		
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.		

6.6 Status Byte Register & Service Request Enable Register

Overview

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



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

7 Error List

7.1 Command Error Codes

Overview An <error/event number> in the range [-199 , -100] indicates that an IEEE 488.2 syntax error has been detected by the instrument's parser. The occurrence of any error in this class shall cause the command error bit (bit 5) in the event status register (IEEE 488.2, section 11.5.1) to be set. One of the following events has occurred:

An IEEE 488.2 syntax error has been detected by the parser. That is, a controller-to-device message was received which is in violation of the IEEE 488.2 standard. Possible violations include a data element which violates the device listening formats or whose type is unacceptable to the device.

An unrecognized header was received.

Unrecognized headers include incorrect device-specific headers and incorrect or unimplemented IEEE 488.2 common commands.

Events that generate command errors shall not generate execution errors, device-specific errors, or query errors; see the other error definitions in this chapter.

-101 Invalid character

An invalid character was used in the command string. Example: #, \$, %.

SOURCE:VOLT 12#

-102 Syntax error

Invalid syntax was used in the command string.

Example: An unexpected character may have been encountered, like an unexpected space.

SOURCE: VOLT 1

-103 Invalid separator

An invalid separator was used in the command string. Example: a space, comma or colon was incorrectly used.

SOURCE:VOLT 1|2

-108 Parameter not allowed

The command received more parameters than were expected. Example: An extra (not needed) parameter was added to a command
OUTPUT OPEN

-109 Missing parameter

The command received less parameters than expected. Example: A required parameter was omitted.
SOURCE:VOLT .

-113 Undefined header

An undefined header was encountered. The header is syntactically correct. Example: the header contains a character mistake.
SOURCE:VOLTA

-131 Invalid suffix

An invalid suffix was used. Example: An unknown or incorrect suffix may have been used with a parameter.
SOURCE:VOLT +A

-148 Character data not allowed

A legal character data element was encountered where prohibited by the device. Example: Using a suffix when not allowed.
SOURCE:VOLT 1ma

-158 String data not allowed

An unexpected character string was used where none were expected. Example: A character string is used instead of a valid parameter.
SOURCE:VOLT "1.1v"

7.2 Execution Errors

Overview

An <error/event number> in the range [-299 , -200] indicates that an error has been detected by the instrument's execution control block. The occurrence of any error in this class shall cause the execution error bit (bit 4) in the event status register (IEEE 488.2, section 11.5.1) to be set. One of the following events has occurred:

A <PROGRAM DATA> element following a header was evaluated by the device as outside of its legal input range or is otherwise inconsistent with the device's capabilities.

A valid program message could not be properly executed due to some device condition.

Execution errors shall be reported by the device after rounding and expression evaluation operations have taken place. Rounding a numeric data element, for example, shall not be reported as an execution error. Events that generate execution errors shall not generate Command Errors, device-specific errors, or Query Errors; see the other error definitions in this section.

--223 Data out of range

Indicates that a command was received but the data in the output buffer from a previous command was lost.

7.3 Device Specific Errors

Overview An <error/event number> in the range [-399 , -300] or [1 , 32767] indicates that the instrument has detected an error which is not a command error, a query error, or an execution error; some device operations did not properly complete, possibly due to an abnormal hardware or firmware condition. These codes are also used for self-test response errors. The occurrence of any error in this class should cause the device-specific error bit (bit 3) in the event status register (IEEE 488.2, section 11.5.1) to be set. The meaning of positive error codes is device-dependent and may be enumerated or bit mapped; the <error message>string for positive error codes is not defined by SCPI and available to the device designer.

Note that the string is not optional; if the designer does not wish to implement a string for a particular error, the null string should be sent (for example, 42,""). The occurrence of any error in this class should cause the device-specific error bit (bit 3) in the event status register (IEEE 488.2, section 11.5.1) to be set. Events that generate device-specific errors shall not generate command errors, execution errors, or query errors; see the other error definitions in this section.

-350 Query INTERRUPTED

Indicates that a command was received but the data in the output buffer from a previous command was lost.

7.4 Query Errors

Overview An <error/event number> in the range [-499 , -400] indicates that the output queue control of the instrument has detected a problem with the message exchange protocol described in IEEE 488.2, chapter 6. The occurrence of any error in this class shall cause the query error bit (bit 2) in the event status register (IEEE 488.2, section 11.5.1) to be set. These errors correspond to message exchange protocol errors described in IEEE 488.2, section 6.5. One of the following is true:
An attempt is being made to read data from the output queue when no output is either present or pending;
Data in the output queue has been lost.
Events that generate query errors shall not generate command errors, execution errors, or device-specific errors; see the other error definitions in this section.

-410 Query INTERRUPTED

Indicates that a command was received but the data in the output buffer from a previous command was lost.

8 PPR Factory Default Settings

The following default settings are the factory configuration settings for the power supply.

For details on how to return to factory default settings, see page62.

Initial	Default Setting
Output	Off
LOCK	Disabled
Voltage Set	0.000 V
Current Set	0.0000 A
Output	Default Setting
Output On Dly(Delay)	00(hour):00(minute):00.00(sec)
Output Off Dly(Delay)	00(hour):00(minute):00.00(sec)
Remote Sense	2 Wire
V/I Slew Rate	CVHS = CV high speed priority
R_V(Rising Voltage) Slew Rate	0.04 V/ms
F_V(Falling Voltage) Slew Rate	0.04 V/ms
R_C(Rising Current) Slew Rate	0.01 A/ms
F_C(Falling Current) Slew Rate	0.01 A/ms
Measurement	Default Setting
Measure Average	Off
Current Range	IH
Mode Control	Default Setting
Mode	Source
PWR(Power) On Config	Default Setting
Power On Status	Default
Utility -Buzzer	Default Setting
Protect	On
Keyboard	Off
Utility -Bleeder	Default Setting
Bleeder	On
Utility -Keyboard	Default Setting
Lock Mode	Output On/Off
Protect	Default Setting
Voltage Limit	On
OVP Level	1.1 x Vrate
Current Limit	On
OCF Level	1.1 x Irate
OCF Delay	0.20 s



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