Programmable DC Electronic Load

PEL-2000A Series

PROGRAMMING MANUAL

ISO-9001 CERTIFIED MANUFACTURER

GW INSTEK

Good Will Instrument Co., Ltd.
No. 7-1, Jhongsing Rd., Tucheng City, Taipei County 236, Taiwan.

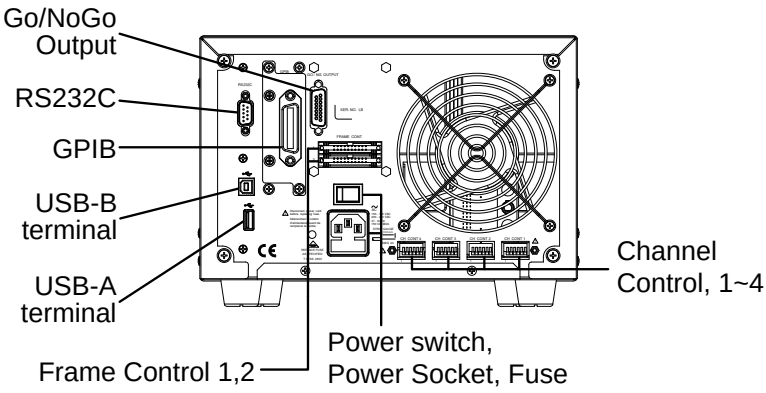
Table of Contents

INTERFACE OVERVIEW

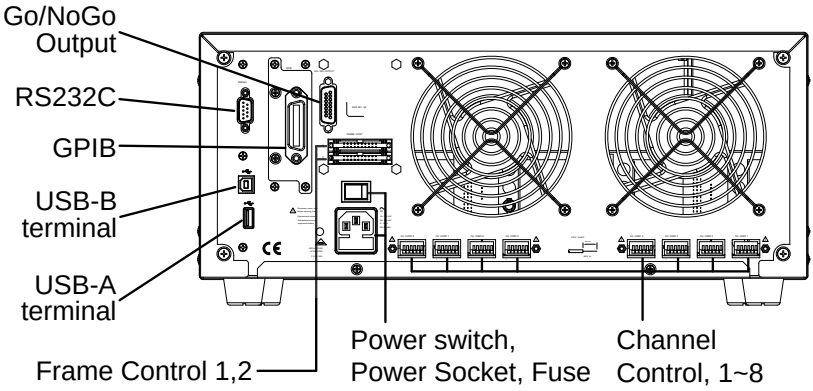
This manual describes how to use the PEL-2000A's remote command functionality and lists the command details. The Overview chapter describes how to configure the PEL-2000A USB/ RS232/ LAN/ GPIB remote control interface.

Rear Panel Overview

PEL-2002A



PEL-2004A



Configuring the USB Interface

USB Interface Connection

Connection

For USB remote connection, use the USB-B port on the mainframe front panel.

Configuring USB Connection

Background

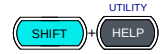
Of the three interface options, USB is the easiest to use.

USB connection

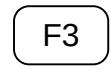
PC side connection	Type A, host
PEL-2000A side connector	Type B, device
Speed	1.1/2.0(full speed)

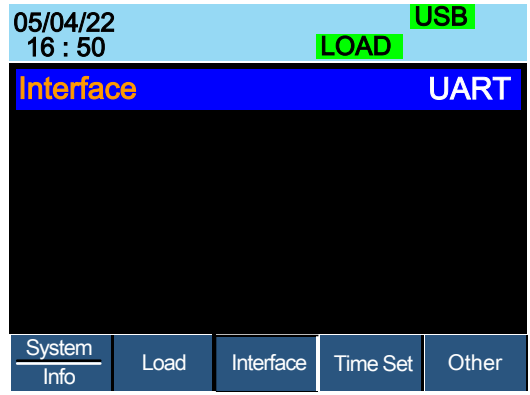
Panel operation

1. Press the Shift Key then the Help key to access the Utility menu.

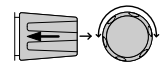


2. Press F3 (Interface Menu).



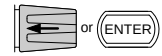


3. If the Interface mode is not USB, use the Selector knob to edit Interface.

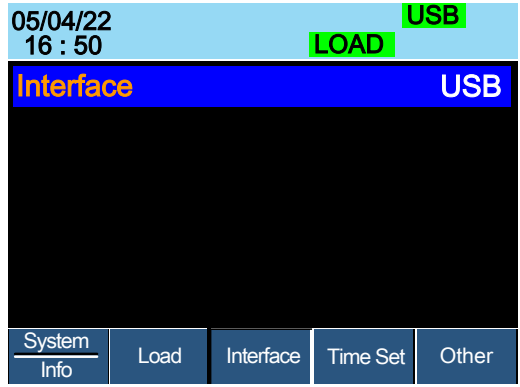


4. Choose USB.

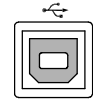
5. Press the Selector knob to confirm.



6. The Interface will become USB.



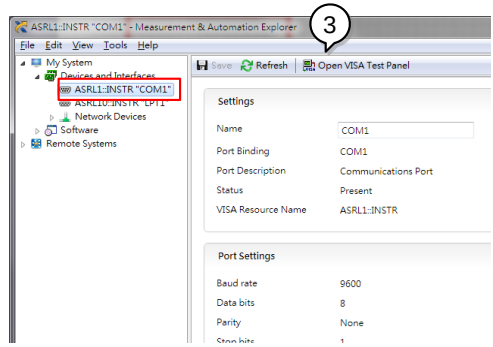
7. Connect the USB cable to the USB-B slave port on the rear.



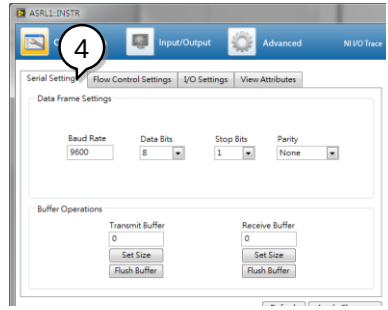
8. When the PC asks for the USB driver, select gw_pel2k.inf (downloadable from the GW Instek website, www.gwinstek.com, PEL-2000A product corner).

USB CDC Function Check

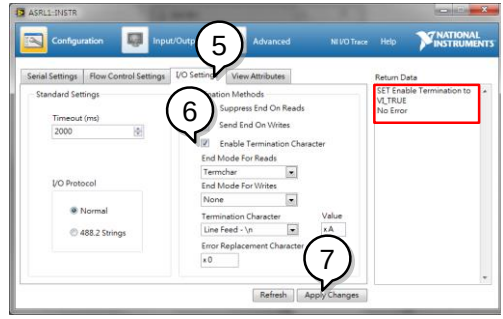
Background	To test the UART, and USB CDC functionality, National Instruments Measurement and Automation Explorer can be used. This program is available on the NI website, www.ni.com., via a search for the VISA Run-time Engine page, or "downloads" at the following URL, http://www.ni.com/visa/
Requirements	Operating System: Windows XP, 7, 8, 10
Note	Functionality check can only be performed after the cable connection has been completed and the PEL-2000A interface has been set. Users can adjust the model name to PEL-2000A or PEL-2000B. For more details about the setting, please refer to the section **Adjusting QueryModeName** on page 212.
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,** select the corresponding port which is connected to PEL-2000A via USB, UART interface. 3. In this example (NI MAX Version 18.0.0f0), we assume that PEL-2000A series is connected COM 1(ASRL1), after selecting the ASRL1::INSTR "COM1", click the Open VISA Test Panel.



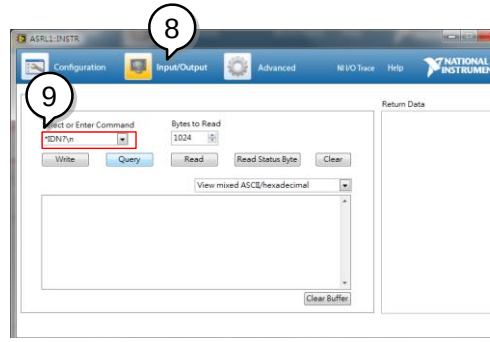
4. In the ASRL Settings page. You can see the information of Serial Settings.



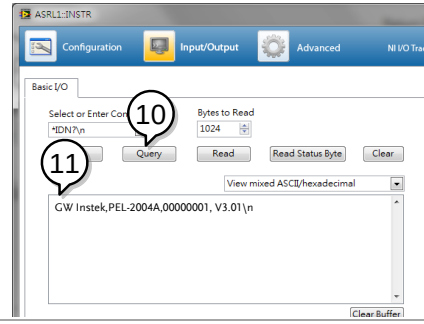
5. Click on I/O Settings.
6. Make sure the *Enable Termination Character* check box is checked, and the terminal character is \n (Value: xA).
7. Click *Apply Changes*.



8. Click the *Input/Output* icon.
9. Enter *IDN?\n in the *Select or Enter Command* dialog box if it is not already.



10. Click the *Query* button.
11. The *IDN?\n query will return the Manufacturer, model name, serial number and firmware version in the dialog box.
GW Instek,PEL-2004A,00000001, V3.01\n



Note

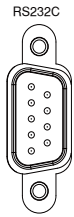
The COM port corresponding to the USB CDC will exist until the USB driver is well installed. If you want to do the USB CDC function check, the VISA resource name should be changed to the COM port which is occupied by the USB CDC protocol as a virtual com port in your system.

Configuring UART Interface

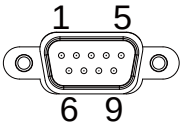
Configuring UART Connection

RS-232C configuration	Connector	DB-9, Male
	Baud rate	9600
	Parity	None
	Data bit	8
	Stop bit	1

Connect the RS-232C cable (part no. GTL-232) to the rear panel port: DB-9 male connector.



Pin assignment



2: RxD (Receive data)

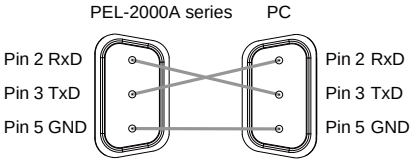
3: TxD (Transmit data)

5: GND

1, 4, 6, 7, 8, 9: No connection

PC connection

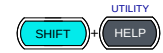
Use the Null Modem connection as shown in the diagram below.



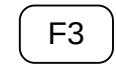
UART settings RS232

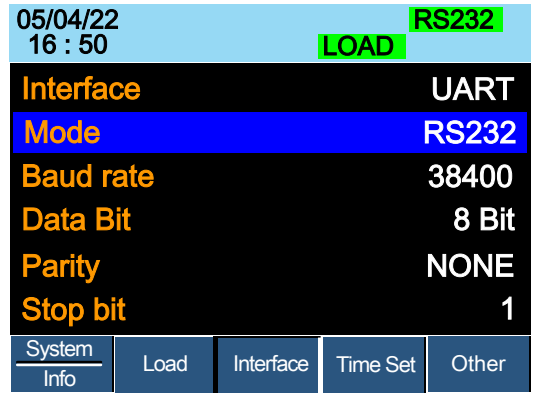
Panel operation

1. Press the Shift Key then the Help key to access the Utility menu.

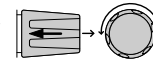


2. Press the Shift Key then the Help key to access the Utility menu.





3. If the interface is not set to RS232, use the selector knob to change the interface to RS232.



4. Edit the Baud rate, Data Bits, Parity, Stop bits.

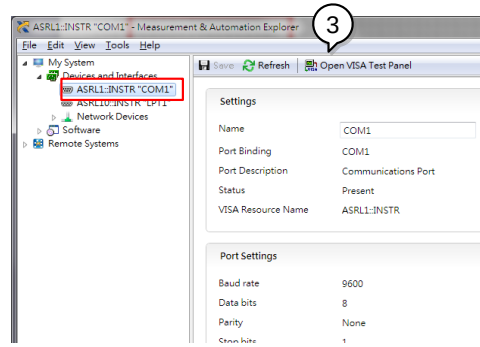
Mode	RS232
Baud rate	2400, 4800, 9600, 19200, 38400, 57600,115200
Data Bit	7,8
Parity	None, Odd, Even
Stop Bit	1,2

Note

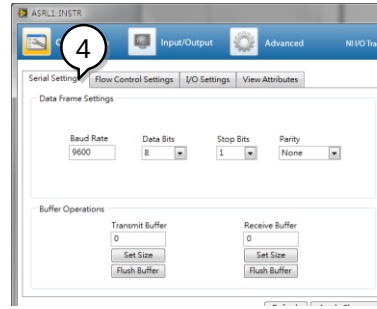
When RS232 Mode is selected, the Address setting is not available for assignation.

UART Function Check

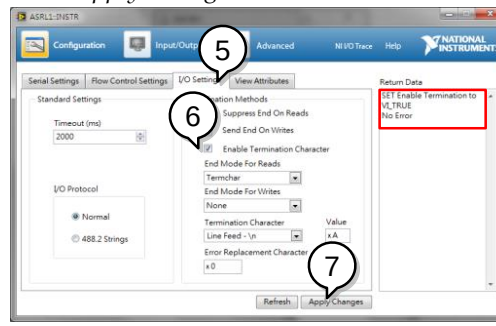
Background	To test the UART, and USB CDC functionality, National Instruments Measurement and Automation Explorer can be used. This program is available on the NI website, www.ni.com., via a search for the VISA Run-time Engine page, or "downloads" at the following URL, http://www.ni.com/visa/
Requirements	Operating System: Windows XP, 7, 8, 10
⚠ Note	Functionality check can only be performed after the cable connection has been completed and the PEL-2000A interface has been set. Users can adjust the model name to PEL-2000A or PEL-2000B. For more details about the setting, please refer to the section **Adjusting QueryModeName** on page 212.
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,** select the corresponding port which is connected to PEL-2000A via USB, UART interface. 3. In this example (NI MAX Version 18.0.0f0), we assume that PEL-2000A series is connected COM 1(ASRL1), after selecting the ASRL1::INSTR "COM1", click the Open VISA Test Panel.



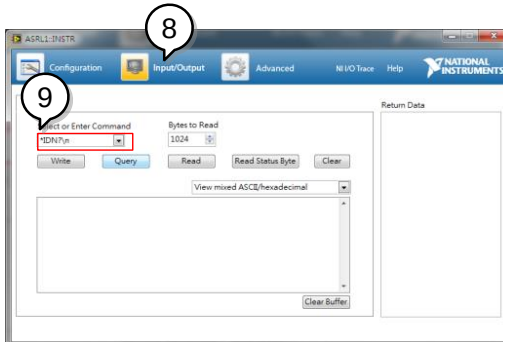
4. In the ASRL Settings page. You can see the information of Serial Settings.



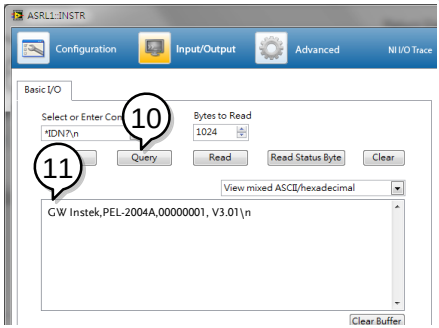
5. Click on I/O Settings.
6. Make sure the *Enable Termination Character* check box is checked, and the terminal character is \n (Value: xA).
7. Click *Apply Changes*.



8. Click the *Input/Output* icon.
9. Enter *IDN?\n in the *Select or Enter Command* dialog box if it is not already.

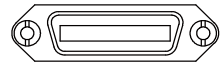


10. Click the *Query* button.
11. The *IDN?\n query will return the Manufacturer, model name, serial number and firmware version in the dialog box.
GW Instek,PEL-2004A,00000001, V3.01\n

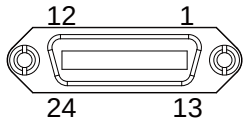


Configuring the GPIB Interface

Configure GPIB interface

Interface function codes	The interface function codes for the Electronic Load are listed as the following table.	
	Code	Interface function
	SH1	Source Handshake capability
	AH1	Acceptor Handshake capability
	T5	Talker (basic talker, serial poll, unaddressed to talk on LAG)
	L4	Listener (basic listener, unaddressed to listen on LAG)
	SR1	Service Request capability
	RL0	No Remote/Local capability
	PP0	No Parallel Poll capability
	DC1	Device Clear capability
	DT0	No Device Trigger capability
	C0	No Controller capability
	E1	Open collector bus drivers
	TE0	No Extended Talker capability
	LE0	No Extended Listener capability
Connection	Connect the GPIB cable to the rear panel port: 24-pin female connector.	

Pin assignment



Pin1	Data line 1	Pin13	Data line 5
Pin2	Data line 2	Pin14	Data line 6
Pin3	Data line 3	Pin15	Data line 7
Pin4	Data line 4	Pin16	Data line 8
Pin5	EOI	Pin17	REN
Pin6	DAV	Pin18	Ground
Pin7	NRFD	Pin19	Ground
Pin8	NDAC	Pin20	Ground
Pin9	IFC	Pin21	Ground
Pin10	SRQ	Pin22	Ground
Pin11	ATN	Pin23	Ground
Pin12	Shield (screen)	Pin24	Signal ground

GPIB constraints

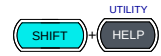
- Maximum 15 devices altogether, 20m cable length, 2m between each device
- Unique address assigned to each device
- At least 2/3 of the devices turned On
- No loop or parallel connection

Configuring the GPIB Address

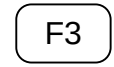
Background	When using GPIB, an address must be specified.
Parameters	Address 01~30

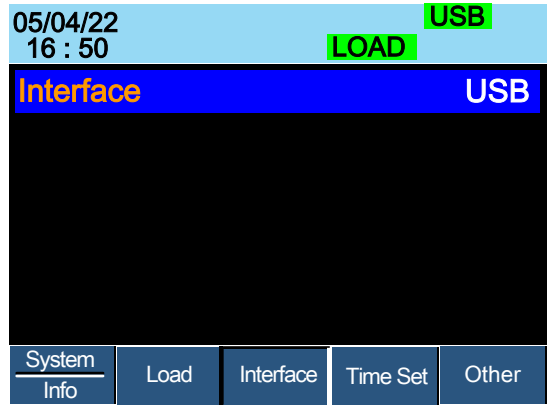
Panel operation

1. Press the Shift Key then the Help key to access the Utility menu.

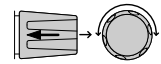


2. Press F3 (Interface Menu).



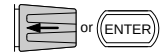


3. If the Interface mode is not GPIB, use the Selector knob to edit Interface.

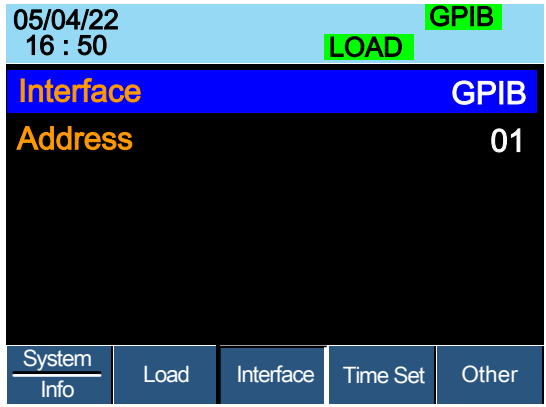


4. Choose GPIB.

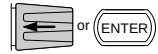
5. Press the Selector knob or Enter to confirm selection.



6. The GPIB menu appears.



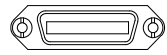
7. Use the selector knob to edit the GPIB address.



8. Edit the GPIB address.

   Range 1 ~ 30

9. Connect the GPIB cable to the rear panel port: 24-pin female connector.



GPIB constraints

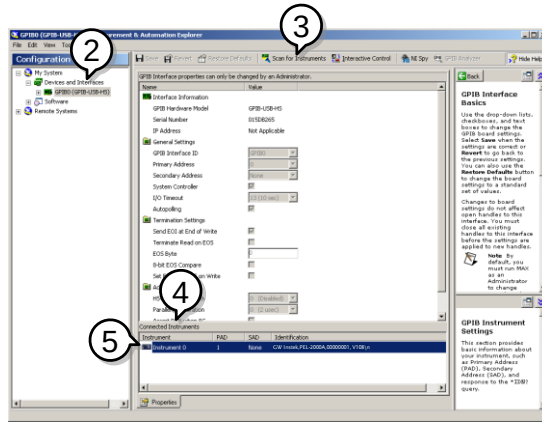
- Maximum 15 devices altogether, 20m cable length, 2m between each device
- Unique address assigned to each device
- At least 2/3 of the devices turned On
- No loop or parallel connection

Note

The GPIB Address must match that of the host machine.

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 XP, 7, 8, 10
Functionality check	Please use the National Instruments Measurement & Automation Controller software to confirm GPIB functionality. See the National Instrument website, http://www.ni.com for details.
Operation	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>GPIB0 3. Press the *Scan for Instruments* button. 4. In the *Connected Instruments* panel the PEL-2000A should be detected as *Instrument 0* with the address the same as that configured on the PEL-2000A. 5. Double click the *Instrument 0* icon.

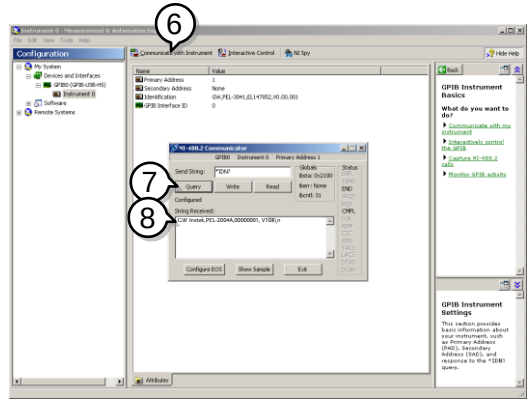


6. Click on *Communicate with Instrument*.
7. In the *NI-488.2 Communicator* window, ensure **IDN?* is written in the *Send String*: text box.

   Click on the *Query* button to send the **IDN?* query to the instrument.
8. The *String Received* text box will display the query return:

   GW Instek,PEL-2004A,00000001, V3.01\n

   (manufacturer, model, serial number, version)



9. The function check is complete.

Configuring Ethernet Interface

Configuring Ethernet Connection

Background	When using Ethernet a number of parameters need to be set. These include DHCP On/Off, IP Address, Subnet Mask and Gateway. When setting Ethernet parameters, ensure they match that of the network.				
Parameters	DHCP	On/Off			
	IP Address	0~255	0~255	0~255	0~255
	Subnet Mask	0~255	0~255	0~255	0~255
	Gateway	0~255	0~255	0~255	0~255
Configuration	This configuration example will configure the PEL-2000A socket server. The following configuration settings will manually assign the PEL-2000A an IP address and enable the socket server. The socket server port number is fixed at 2268.				
Steps	1. Connect an Ethernet cable from the network to the rear panel Ethernet port. You will see the led indicator next to Ethernet port lighting.				

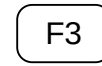
Rear panel of PEL-2000A

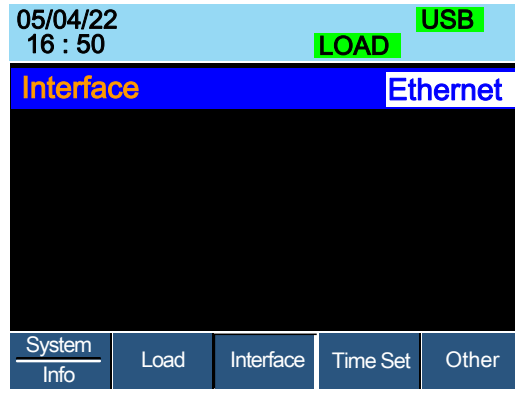
2. Power on the PEL-2000A.

Panel operation

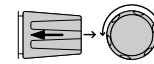
3. Press the Shift Key then the Help key to access the Utility menu.

4. Press F3 (Interface Menu).

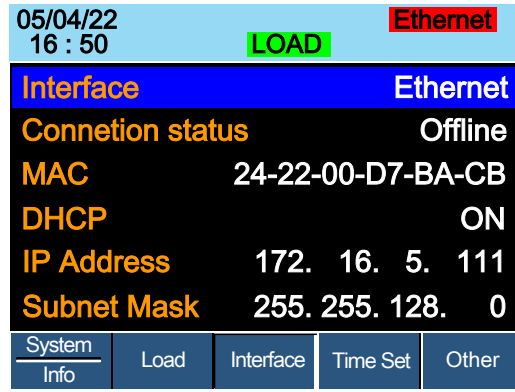




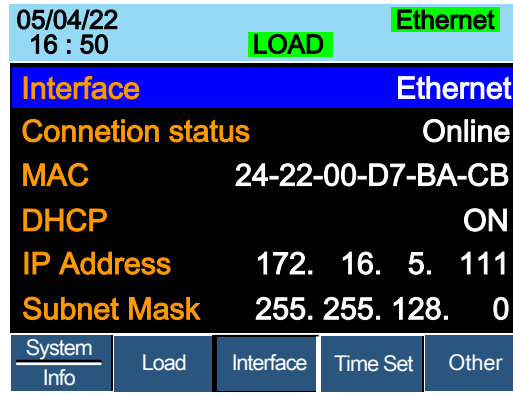
5. If the interface is not set to Ethernet, use the selector knob to change the interface to Ethernet.



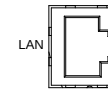
6. Choose Ethernet. Confirm that connection status turn form Offline to Online



7. Check if indicator "Ethernet" turns in green and connection status becomes online status.



8. Connect the LAN RJ45 connector to the RJ45 female socket on the rear panel.



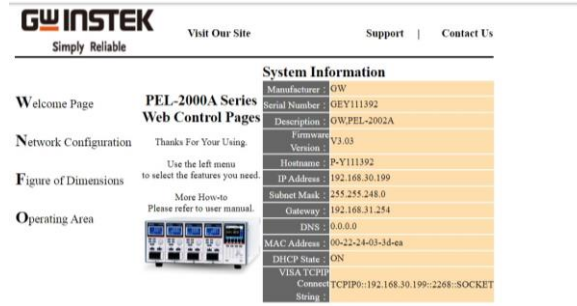
Web Server Function Check

Functionality check

The web server allows you to check the function settings of the PEL-2000A.

Enter the IP address of the PEL-2000A in a web browser.

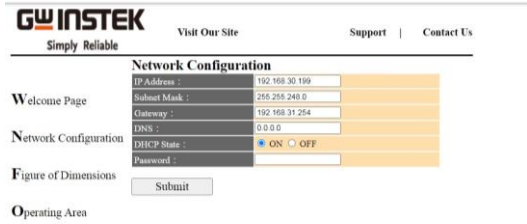
The web browser interface appears.



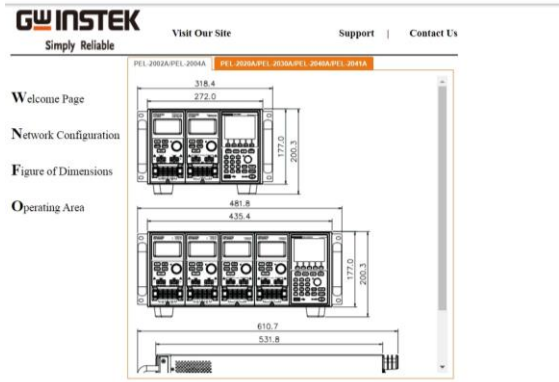
The web browser interface allows you to access the following:

- Network configuration settings
- PEL-2000A dimensions
- Operating area diagram

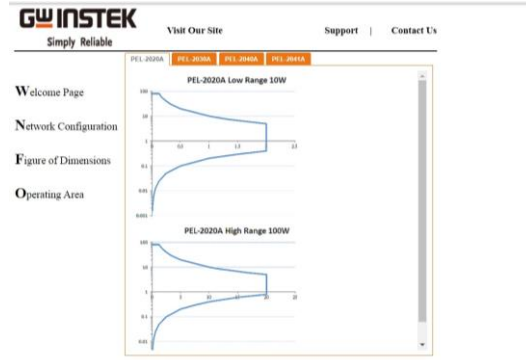
You can click the Network Configuration to see the configuration information.



You can click the Figure of dimension to see the device dimensions information.

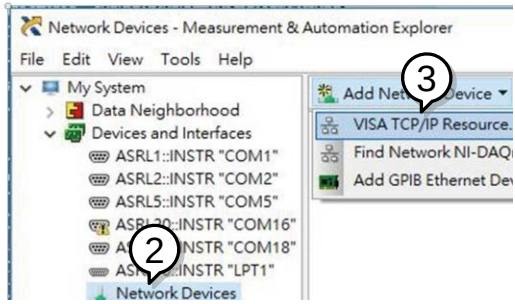


You can click the Operating area to see the Load operating area.

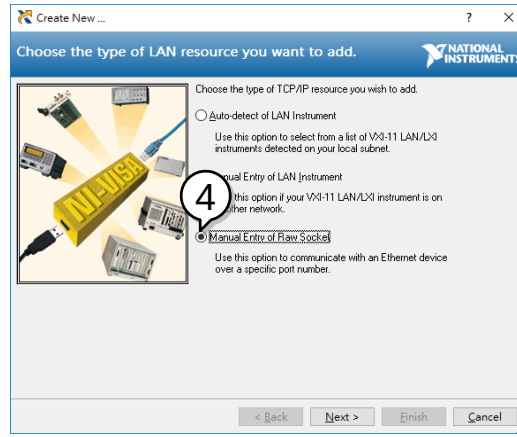


Socket Server Function Check

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 Run-time Engine page, or "downloads" at the following URL, http://www.ni.com/visa/
Requirements	Operating System: Windows XP, 7, 8, 10
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.

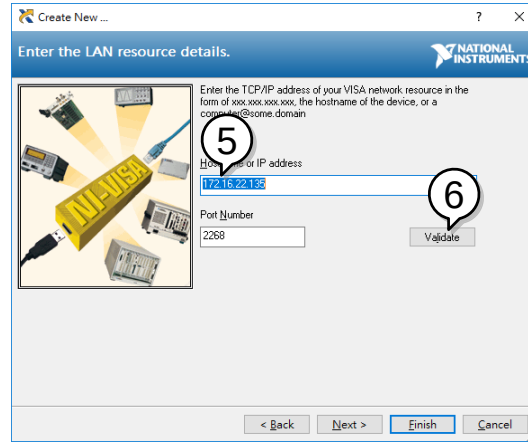


4. Select *Manual Entry of Raw Socket* from the popup window.

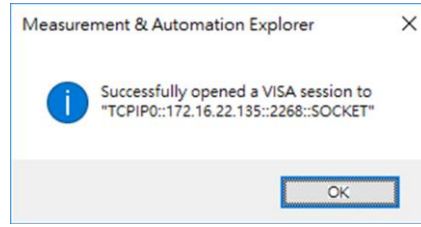


5. Enter the IP address and the port number of the PEL-2000A. The port number is fixed at 2268.

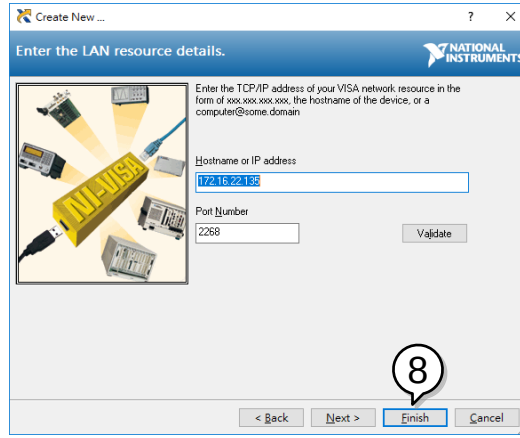
6. Click the Validate button.



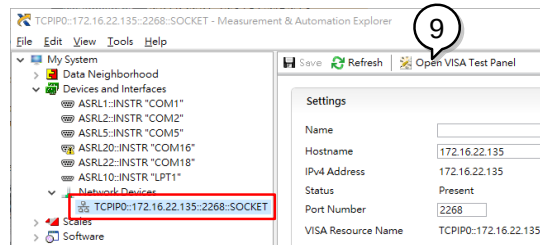
7. A popup will appear if a connection is successfully established. If not,check the Load device IP address configuare. Then click OK botton and Next botton.



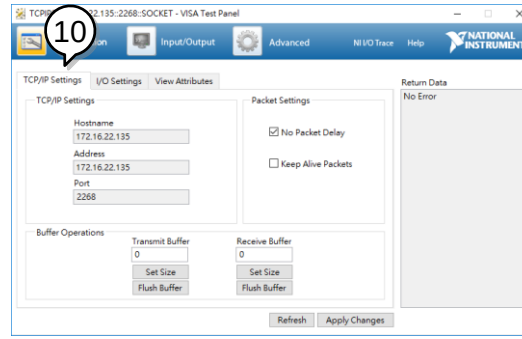
8. Click the Finish button.



9. You can see the network device is setup successful. Click *Open VISA Test Panel*.



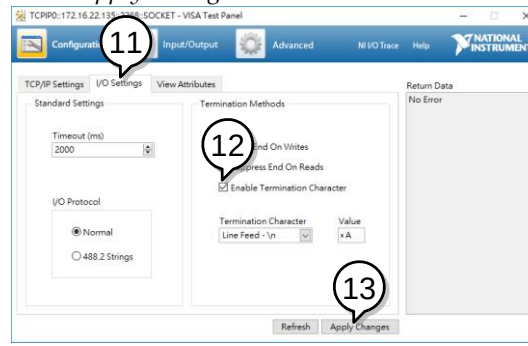
10. In the TCP/IP Settings page. You can see the information of TCP/IP.



11. Click on I/O Settings.

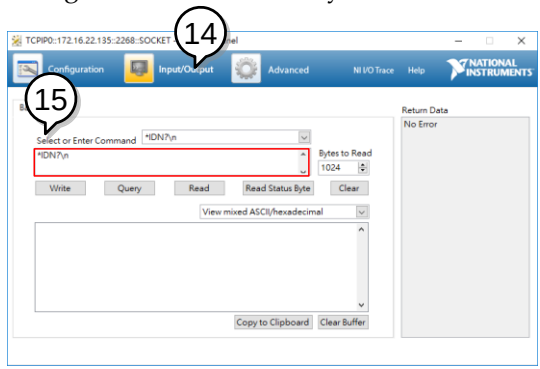
12. Make sure the *Enable Termination Character* check box is checked, and the terminal character is \n (Value: xA).

13. Click *Apply Changes*.



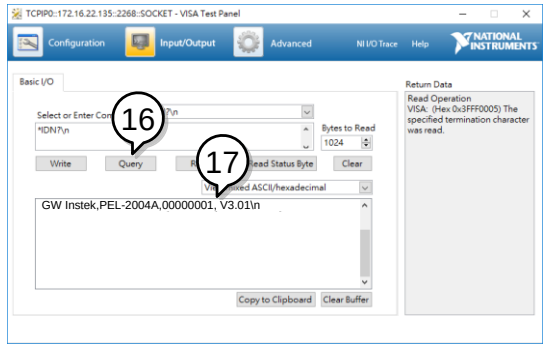
14. Click the *Input/Output* icon.

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

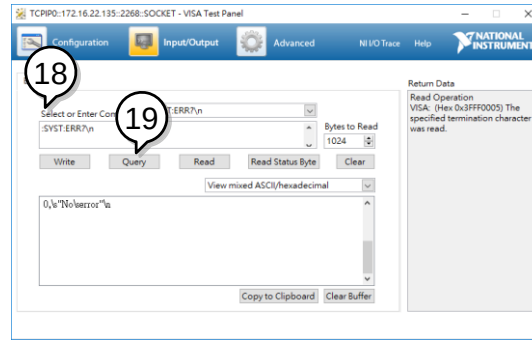


16. Click the *Query* button.

17. The *IDN?\n query will return the Manufacturer, model name, serial number and firmware version in the dialog box.
GW Instek,PEL-2004A,00000001, V3.01\n



18. You can key in the command ":SYST:ERR\n"
19. Click the *Query* button. You will get the return messagn of error.



COMMAND OVERVIEW

The Command overview chapter lists all the PEL-2000A commands and command queries .The command syntax section shows you the basic rules you have to apply when using commands.

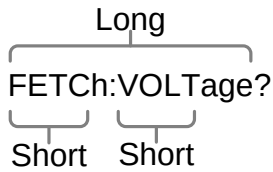
Command Syntax

Compatible standard	• IEEE488.2, 1992 (fully compatible) • SCPI, 1994 (partially compatible)
Command types	There are a number of different instrument commands and queries. A command sends instructions or data to the electronic load and a query receives data or status information from the electronic load.

Command Types	
Simple	A single command with/without a parameter
Example	*OPC
Compound	Two or more commands separated by a colon (:) with/without a parameter
Example	UTILITY:SOUND 1
Query	A query is a simple or compound command followed by a question mark (?). A parameter (data) is returned.
Example	UTILITY:SOUND?

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	FETCh:VOLTage?	FETCH:VOTAGE?
	fetch:voltage?	
SHORT	FETC:VOLT?	fetc:volt?

Square Brackets

Commands that contain squares 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.

Example:

:LOAD[:STATe]

= :LOAD:STATe

= :LOAD

Command format

1: command header
2: single space
3: parameter
4: message terminator

Parameter	Type	Description	Example
	<Boolean>	Boolean logic	0, 1
	<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 including MIN (minimum) and MAX (maximum) limits of the parameter.	1, 1.5, 4.5e-1 MAX, MIN

	<aard>	Arbitrary ascii characters.
	<block data>	IEEE-488.2 binary block data. The block data is comprised of five parts: #216<16_bytes_data><NL> ab c d e a. Initialization character (#) b. Digit length (in ASCII) of the number of bytes c. Number of bytes d. Binary data e. New line character
Message terminator	LF∧END	line feed code (hexadecimal 0A) with END message
	LF	line feed code
	<dab>∧END	last data byte with END message

⚠ Note — In case of setting the parameter which is less than setting resolution, the setting value will round down to a smaller value which closed to the setting value.

⚠ Note — The receiving buffer size of this unit is 40k Bytes. Do not send the IEEE-488.2 binary block data to this unit at once data transformation. It may cause an unexpected error.

List of Commands in Functional Order

COMMAND DETAILS

The Command details chapter shows the detailed syntax, equivalent panel operation, and example for each command. For the list of all commands, see page36 for details. Before programming the PEL-2000A electronic load, please become familiar with the Status registers, detailed on page 202.

Common commands

*CLS

Status Command

Description	Clears: Channel Status Register Channel Summary Register Questionable Status Register Standard Events Register Operation Status Register Error Queue When the *CLS command follows a program message terminator <nl>, the following is cleared: Output Queue See page 202 for details.
Syntax	*CLS
Example	*CLS

*ESE

Status Command

Description	The Standard Event Status Enable command determines which events in the Standard Event Status Event 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. See page 210 for details.			
Syntax	*ESE <NRf>			
Parameter	<NRf>	Bit(s) Set	<NRf>	Bit(s) Set
	1	OPC	32	CME
	8	DDE	64	~
	16	EXE	128	~
Example	*ESE 40		Sets CME and DDE events in the Standard Event Status Event Register.	
Query Syntax	*ESE?			
Return Parameter	<NR1>	Bit(s) Set	<NR1>	Bit(s) Set
	1	OPC	32	CME
QYE	8	DDE	64	~
	16	EXE	128	~
Example	*ESE? 32		Returns the settings in the Standard Event Status Enable Register. Here CME is enabled.	

*ESR?

Status Command

Description	Reads the Standard Event Status Register. This command also clears the Standard Event Status Register. Page 209 for details.

Query Syntax	*ESR?			
Return Parameter	<NR1>	Bit(s) Set	<NR1>	Bit(s) Set
	1	OPC	32	CME
	8	DDE	64	~
	16	EXE	128	~
Example	*ESR? 48		The return value is the status reading of the standard Event Status Register.	

*IDN? System Command

Description	Returns the load generator identification.			
Query Syntax	*IDN?			
Return Parameter	<aard>	Data	<aard>	Data
	GW	Manufacturer	00000001	Serial No.
	PEL-2004A	Model	V3.01	Firmware Version
Example	*IDN? GW, PEL-2002A(B)/2004A(B), 00000001, V3.01		Returns the mainframe identification string.	

*OPC Status Command

Description	This command sets the OPC (Operation Command Bit) bit (bit 0) of the Standard Event Status Register after the mainframe has completed all pending operations. See page 209 for details.			
Syntax	*OPC			
Example	*OPC		Sets the OPC bit.	
Query Syntax	*OPC?			
Return Parameter	<NR1>	Operation	<NR1>	Operation

	0	Pending	1	Complete
Query Example	*OPC? 1		All pending operations are completed.	

*RCL

Status Command

Description	The Recall Instrument State command restores the instrument settings from a previously saved memory setting.	
Syntax	*RCL <NR1>	
Parameter	<NR1>	Recall Memory Setting
	1~120	1~120
Example	*RCL 1	Recalls Setting memory 1

*RDT?

System Command

Description	Returns the load module type in each channel in order from 1~8. If no frame is present a 0 is returned.	
Query Syntax	*RDT?	
Return Parameter	<aard>	Occupied Channel
	2020L	PEL-2020A(B) left channel
	0	Empty channel
Query Example	*RDT? 0,0,2020L,2020R,0,0,0,0	Channels 1-2 and 5-8 are empty; 3-4 is occupied by the PEL-2020A(B) load module.

*RST

Status Command

Description	Resets the mainframe by forcing the ABORt, *CLS, and LOAD:PROT:CLE command.
Syntax	*RST

Example	*RST

*SAV

All Channels

Description	Saves the data memory into the specified save slot.	
Syntax	*SAV <NR1>	
Parameter	<NR1>	Save slot
	1~120	1~120
Example	*SAV 2	Saves data memory to save slot 2

*SRE

Status Command

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" will cause the MSS bit to be set. See page 211 for details.			
Syntax	*SRE <NR1>			
Parameter	<NR1>	Bit(s) Set	<NR1>	Bit(s) Set
	4	CSUM	32	ESB
	8	QUES		
Example	*SRE 12		Sets bits CSUM and QUES in the Service Request Enable register.	
Query Syntax	*SRE?			
Return Parameter	<NR1>	Bit(s) Set	<NR1>	Bit(s) Set
	4	CSUM	32	ESB
	8	QUES		
Example	*SRE? 32	Returns settings of the Service Request Enable Register. Here ESB is returned.		

*STB? Status Command

Description	Reads the Status Query Byte Register. The *STB? command does not clear the register. If the Master Summary Status bit (MSS) is set, it indicates that there is a reason for a service request.			
Query Syntax	*STB			
Return Parameter	<NR1>	Bit(s) Set	<NRf>	Bit(s) Set
	2	ERR	32	ESB
	4	CSUM	64	MSS
	8	QUES		
Query Example	*STB? 36		Returns status of a byte query in the Status Byte Register. Here CSUM and ESB are returned.	

*TST? Status Command

Description	Performs a system self-test and returns 0 if all tests passed. 1 is returned if a test failed.			
Query Syntax	*TST?			
Return Parameter	<NR1>	Test result	<NR1>	Test result
	0	Pass	1	Fail
Example	*TST? >0			

Abort Subsystem

:ABORt	All Channel Command

Description	Turns all electronic loads to OFF.
Syntax	:ABORt
Example	:ABORt

Channel Subsystem

:CHANnel[:LOAD]

Channel Specific Command

Description	Selects the channel that the channel specific commands use. This command will not change the channel in the display screen.	
Syntax	:CHANnel[:LOAD] <NR1>	
Parameter	<NR1>	Channel selected
	1~8	CH1 ~ CH8
	MAX	CH8
	MIN	CH1
Example	:CHAN 1	Sets channel 1 as the specific channel.
	:CHAN:LOAD 1	Sets channel 1 as the specific channel.
Query Syntax	:CHANnel? [LIST]	
Return Parameter	<NR1>	Current specific channel
	1~8	CH1 ~ CH8
	LIST	Lists available channels
Query Example	:CHAN? LIST 1, 2	Channel 1 and 2 are available.

:CHANnel:ACTive

Channel Specific Command

Description	This command is for compatibility with other instruments only and has no action.	
Syntax	:CHANnel ACTive {ON|1|OFF|1}	
Parameter	ON/1	Enabled
	OFF/0	Disabled
Example	:CHAN:ACT ON	Enables the specific channel.

:CHANnel:SYNCon

Channel Specific Command

Description	Turns independent mode on or off for the channel.	
Syntax	:CHANnel:SYNCon {ON|1|OFF|0}	
Parameter	ON/1	ON
	OFF/0	OFF
Example	:CHAN:SYNC ON	Enables the current channel to receive synchronized commands (synchronized commands is :RUN and Abort).
Query Syntax	:CHANnel:SYNCon?	
Return Parameter	<NR1>	Sync Status
	0	Independent mode is OFF
	1	Independent mode is ON
Query Example	:CHAN:SYNC? 0	Independent mode is set to OFF for the channel.

:CHANnel:SYNCon:ALL

All Channels

Description	Turns independent mode on or off for all the channels.	
Syntax	:CHANnel:SYNCon:ALL{ON|1|OFF|0}	
Parameter	ON/1	ON for all channels
	OFF/0	OFF for all channels
Example	:CHAN:SYNC:ALL ON	Enables all channel to receive synchronized commands (synchronized commands is :RUN and Abort).

:CHANnel:ID?

Channel Specific Command

Description	Queries the load module identity.			
Query Syntax	:CHANnel:ID?			
Return Parameter	<aard>	Data	<aard>	Data
	GW	Manufacturer	00000001	Serial No.
	PEL2020R	Channel load id	V3.01	Firmware Version.
Query Example	:CHAN:ID? GW, PEL2020R, 00000001, V3.01		Returns the load module identification string.	

:CHANnel:DISPlay

Channel Specific Command

Description	Sets or queries which channel is active on the mainframe display.	
Syntax	:CHANnel:DISPlay <NR1>	
Parameter	<NR1>	Channel displayed
	1~8	CH1 ~ CH8

	MAX	Last channel
	MIN	First channel
Example	:CHAN:DISP 1	Sets to the active channel on the display to ch1.
Query Syntax	:CHANnel:DISPlay? [MAX|MIN]	
Return Parameter	<NR1>	Channel displayed
	1~8	CH1 ~ CH8
	MAX/MIN	Returns the allowable maximum or minimum.
Query Example	:CHAN:DISP? 1	Channel 1 is currently active on the display.

:CHANnel:MEMO

Channel Specific Command

Description	Creates or returns the "memo" that is displayed in the "System Information" screen in the Utility Menu. This memo only applies to this specific channel. The memo will replace the serial number information in the "System Information" screen.	
Syntax	:CHANnel:MEMO <string>	
Parameter/ Return parameter	<string>	String containing memo.
Example	:CHAN:MEMO "this is a memo"	Sets to the memo to "this is a memo".
Query Syntax	:CHANnel:MEMO?	
Query Example	:CHAN:MEMO? this is a memo	Returns the memo message.

:MEMO?

Channel Specific Query

Description	Creates or returns the "memo" that is displayed in the "System Information" screen in the Utility Menu. This memo applies to the mainframe. The memo will replace the serial number information in the "System Information" screen.	
Syntax	:MEMO <string>	
Parameter/ Return parameter	<string>	String containing memo.
Example	:MEMO "this is a memo"	Set the memo to "this is a memo"
Query Syntax	:MEMO?	
Query Example	:MEMO? this is a memo	Returns the memo message.

CONFIGURE Subsystem

:CONFigure:VOLTage:ON

Channel Specific Command

Description	Sets Von (voltage on value). The allowable Von values are channel and load module specific.
Syntax	:CONFigure:VOLTage:ON <NRf>[MV|V|KV]
Parameter	<NRf>[MV|V|KV] Von

	3	3 volts
	30MV	30 millivolts
	30V	30 volts
Example	:CONF:VOLT:ON 30MV	Set Von to 30 millivolts.
Query Syntax	:CONFigure:VOLTage:ON?	
Return Parameter	<NR2> I unit = I volt	Von value (volts)
	1	1 volts
Query Example	:CONF:VOLT:ON? 0.03	Von is set as 30 millivolts (0.03 volts).

⚠ Note

The resolution is depended on the selected voltage range. For more details, please refer to PEL-2000A user manual.

For example, the 500V version will have another 125V voltage range.

Vrange	Resolution(V)
500	2
125	0.2
80	0.32
16	0.064

:CONFigure:VOLTage:RANGe

Channel Specific Command

Description	Sets Voltage range for CC mode.

⚠ Note

If the Von voltage set in the Voltage Range high exceeds the range of Low Range, it is automatically corrected to the maximum value of the Low Range when the Voltage Range is switched to low.

For commands on voltage range, please refer to the table below.

Voltage Range: High/Low commands

CV mode	High	: MODE CVH
	Low	: MODE CVL

CR mode	High Low	: MODE CRH : MODE CRL
CC mode	High Low	: CONF:VOLT:RANG H : CONF:VOLT:RANG L
CP mode	High Low	: CONF:VOLT:RANG H : CONF:VOLT:RANG L

Syntax	:CONFigure:VOLTage:RANGe <NRf>[V]|L|H	
Parameter	<NRf>[V] , L, H	Range
	16	Low range*
	80V	High range*
	L	Low range
	H	High range
	*Load module dependent, PEL-2020A(B) shown.	
Example	:CONF:VOLT:RANG L	Sets the range to Low for the channel.
Query Syntax	:CONFigure:VOLTage:RANGe?	
Return Parameter	<NR2>	Range
	16	Low PEL-2020A(B), 2030A(B), 2040A(B)
	125	Low PEL-2041A(B)
	80	High PEL-2020A(B), 2030A(B), 2040A(B)
	500	High PEL-2041A(B)
Query Example	:CONF:VOLT:RANG? 500	Returns the voltage range. In this case high for the PEL-2041A(B).

:CONFigure:VOLTage:LATch

Channel Specific Command

Description	Turn Von Latch on or off for the specific channel.
Syntax	:CONFigure:VOLTage:LATch{OFF|0|ON|1}

Parameter	{OFF|0|ON|1}	Von Latch
	OFF/0	Off
	ON/1	On
Example	:CONF:VOLT:LAT 1	Sets Von latch to ON.
Query Syntax	:CONFigure:VOLTage:LATch?	
Return Parameter	<NR1>	Von latch status
	0	Latched Off
	1	Latched On
Query Example	:CONF:VOLT:LAT?	Von latch is set to ON.
	1	

:CONFigure:AUTO:LOAD

All channels

Description	Configures the load generator for Auto Load On or Off at start up.	
Syntax	:CONFigure:AUTO:LOAD {OFF|0|ON|1}	
Parameter	{OFF|0|ON|1}	Auto Load
	OFF/0	Off
	ON/1	On
Example	:CONF:AUTO:LOAD ON	Configures Auto Load to On
Query Syntax	:CONFigure:AUTO:LOAD?	
Return Parameter	<NR1>	Auto Load Status
	0	Off
	1	On
Query Example	:CONF:AUTO:LOAD?	Auto load is On.
	1	

:CONFigure:AUTO:MODE

All channels

Description	Configures the Auto Load mode as (run) Program or Load.	
Syntax	:CONFigure:AUTO:MODE PROGRAM/0, LOAD/1	
Parameter	PROGRAM/0, LOAD/1	Auto Load Mode
	PROGRAM/0	PROGRAM
	LOAD/1	LOAD
Example	:CONF:AUTO:MODE 1	Configures Auto Load to LOAD
Query Syntax	:CONFigure:AUTO:MODE?	
Return Parameter	<NR1>	Auto Load Type Status
	0	PROGRAM MODE
	1	LOAD MODE
Query Example	:CONF:AUTO:MODE?	Auto load mode is to LOAD mode.
	1	

:CONFigure:SOUNd

Channel Specific Command

Description	Sets the keyboard operating and knob rotating make a sound.	
Syntax	:CONFigure:SOUNd {OFF|0|ON|1}	
Parameter	OFF/0	Off
	ON/1	On
Example	:CONF:SOUND ON	Configures the sound on.
Query Syntax	:CONFigure:SOUNd?	
Return Parameter	<NR1>	SOUND Status
	0	Off
	1	On

Query Example	:CONF:SOUN? 0	Sound is off for all channel and mainframe.

:CONFigure:REMote All Channels

Description	Turns remote control on or off for all interfaces.	
Syntax	:CONFigure:REMOTE {OFF|0|ON|1}	
Parameter	OFF/0	Off
	ON/1	On
Example	:CONF:REM 1	Turns Remote control on.

:CONFigure:ALARm:MASTer All Channels

Description	Sets the alarm sound of mainframe.	
Syntax	:CONFigure:ALARm:MASTer{OFF|0|ON|1}	
Parameter	OFF/0	Off
	ON/1	On
Example	:CONF: ALAR:MAST ON	Configures the alarm sound on for mainframe.
Query Syntax	:CONFigure:ALARm:MASTer?	
Return Parameter	<NR1>	Alarm sound status of mainframe
	0	Off
	1	On
Query Example	:CONF: ALAR:MAST? 0	Alarm sound is off for the mainframe.

:CONFigure:ALARm:SLAVe — All Channels

Description	Sets the alarm sound of slave module.	
Syntax	:CONFigure:ALARm:SLAVe{OFF|0|ON|1}	
Parameter	OFF/0	Off
	ON/1	On
Example	:CONF: ALAR:SLAV ON	Configures the alarm sound on for all slave modules.
Query Syntax	:CONFigure:ALARm:SLAVe?	
Return Parameter	<NR1>	Alarm sound status of all slave modules
	0	Off
	1	On
Query Example	:CONF: ALAR:SLAV? 0	Alarm sound is off for all of the slave modules.

:CONFigure:SAVE — All Channels

Description	This command is for compatibility with other instruments only and has no action.	
Syntax	:CONFigure:SAVE	
Example	:CONF:SAVE	Saves the configuration data for all channels into internal memory.

:CONFigure:LOAD — System Command

Description	Configures the load module selector knob as OLD or Updated.
Syntax	:CONFigure:LOAD {OLD|0|UPDATED|1}

Example	:CONF:LOAD UPDATED	Sets the load module selector knob as Updated.
Parameter	OLD/0	Old
	UPDATED/1	Updated
Example	:CONF:LOAD OLD	Configuration type set as OLD.
Query Syntax	:CONFigure:LOAD?	
Return Parameter	<NR1>	Configuration type
	0	Old
	1	Updated
Query Example	:CONF:LOAD?	Sets the load module selector configuration type as OLD.
	0	

:CONFigure:PROTection:CURRent:STATe

Channel Specific Command

Description	Sets the current protection for the specific channel on or off. The current protection can also be cleared.	
Syntax	:CONFigure:PROTection:CURRent:STATe {OFF|0|ON|1|CLEAR|2}	
Parameter	CLEAR/2	Cleared
	OFF/0	Off
	ON/1	On
Example	:CONF:PROT:CURR:STAT 1	Turns on current protection.
Query Syntax	: CONFigure:PROTection:CURRent:STATe?	
Return Parameter	<NR1>	Current Protection
	0	Off
	1	On
	2	Clear

Query Example	:CONF:PROT:CURR:STAT? 1	Current protection is turned on.

:CONFigure:PROTection:CURRent:LEVel

Channel Specific Command

Description	Sets the current protection level for the current/specific channel.	
Syntax	:CONFigure:PROTection:CURRent:LEVel <NRf>[A]|MIN|MAX	
Parameter	<NRf>	Current Protection Level
	.3	300mA
	0.3A	300mA
	300MA	300mA
	MIN	Sets to the minimum level
	MAX	Sets the current limit to the maximum level
Example	:CONF:PROT:CURR:LEV MAX	Sets the current limit to 20.40A (PEL2020A(B))
Query Syntax	:CONFigure:PROTection:CURRent:LEVel? [MIN|MAX]	
Return Parameter	<NRf> 1 unit = 1 amp	Current protection level
	1	1 amp.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:CONF:PROT:CURR:LEV? 0.30	Current protection level is at 300mA.
⚠ Note	The range of current protection level depends on the current using operating current range of slave module. The detail specifications of current protection range could be found “Over Current Protection” in the specification of user manual.	

:CONFigure:PROTection:VOLTage:STATe

Channel Specific Command

Description	Sets the voltage protection for the current/specific channel on or off. The voltage protection can also be cleared.	
Syntax	:CONFigure:PROTection:VOLTage:STATe {OFF|0|ON|1|CLEAR|2}	
Parameter	CLEAR/2	Clear
	OFF/0	Off
	ON/1	On
Example	:CONF:PROT:VOLT:STAT 1	Turns on voltage protection.
Query Syntax	:CONFigure:PROTection:VOLTage:STATe?	
Return Parameter	<NR1>	Voltage Protection state
	0	Off
	1	On
	2	Clear
Query Example	:CONF:PROT:VOLT:STAT? 0	Voltage protection is currently off.

:CONFigure:PROTection:VOLTage:LEVel

Channel Specific Command

Description	Sets the voltage protection level for the current/specific channel.	
Syntax	:CONFigure:PROTection:VOLTage:LEVel <NRf>[V]|MIN|MAX	
Parameter	<NRf>	Voltage Protection Level
	30	30 volts
	30V	30 volts
	MIN	Sets to the minimum level

	MAX	Sets the voltage limit to the maximum level
Example	:CONF:PROT:VOLT:LEV MAX	Sets the voltage limit to 81.6V (PEL-2020A(B))
Query Syntax	:CONFigure:PROTection:VOLTage:LEVel? [MIN|MAX]	
Return Parameter	<NRf> 1 unit = 1 volt	Voltage protection level
	1.00	1.00 volts.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:CONF:PROT:VOLT:LEV? 81.6000	Voltage protection level is at 81.6V.
⚠ Note	The range of voltage protection level depends on the current using operating voltage range of slave module. The detail specifications of voltage protection range could be found "Over Voltage Protection" in the specification of user manual.	

:CONFigure:PROTection:POWer:STATe

Channel Specific Command

Description	Sets the power protection for the current/specific channel on or off. The power protection can also be cleared.	
Syntax	:CONFigure:PROTection:POWer:STATe {OFF|0|ON|1|CLEAR|2}	
Parameter	CLEAR/2	Cleared
	OFF/0	Off
	ON/1	On
Example	:CONF:PROT:POW:STAT 1	Turns on power protection.
Query Syntax	: CONFigure:PROTection:POWer:STATe?	
Return Parameter	<NR1>	Power Protection

	0	Off
	1	On
	2	Clear
Query Example	:CONF:PROT:POW:STAT? 1	Power protection is currently on.

:CONFigure:PROTection:POWer:LEVel

Channel Specific Command

Description	Sets the power protection level for the current/specific channel.	
Syntax	:CONFigure:PROTection:POWer:LEVel <NRf>[W]|MIN|MAX	
Parameter	<NRf>	Power Protection Level
	200	200Watts
	200W	200Watts
	MIN	Sets to the minimum level
	MAX	Sets the power limit to the maximum level
Example	:CONF:PROT:POW:LEV MAX	Sets the power limit to 102W (PEL-2020A(B))
Query Syntax	:CONFigure:PROTection:POWEr:LEVel? [MIN|MAX]	
Return Parameter	<NRf>	Power protection level
	1 unit = 1 watt	Returns the power protection level in Watts.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:CONF:PROT:POW:LEV? 75	Power protection level is at 75 watts.

⚠ Note	The range of power protection level depends on the current using operating power range of slave module. The detail specifications of power protection range could be found "Over Power Protection" in the specification of user manual.

:CONFigure:PROTection:UVP:CLEar

All Channel Command

Description	Clears the under voltage protection status.	
Syntax	:CONFigure:PROTection:UVP:CLEar	
Example	:CONF:PROT:UVP:CLE	Clears the under voltage protection.

:CONFigure:PROTection:UVP:LEVel

Channel Specific Command

Description	Sets the under voltage protection level for the current/specific channel.	
Syntax	:CONFigure:PROTection:UVP:LEVel <NRf>[W]|MIN|MAX	
Parameter	<NRf>	UVP Level
	20	20 Volts
	20V	20 Volts
	MIN	Sets to the minimum level (OFF)
	MAX	Sets the voltage limit to the maximum level
Example	:CONF:PROT:UVP:LEV MIN	Sets the UVP limit to OFF
Query Syntax	:CONFigure:PROTection:UVP:LEVel? [MIN|MAX]	
Return Parameter	<NRf>	Power protection level
	1 unit = 1 volt	Returns the UVP level as volts.
	MAX/MIN	Returns the allowable maximum and minimum.

Query Example	:CONF:PROT:UVP:LEV? 75	UVP level is at 75 volts.
⚠ Note	The range of under voltage protection level depends on the current using operating voltage range of slave module. And the MIN(0) will disable the under voltage protection. The detail specifications of voltage protection range could be found in the specification of user manual.	

:CONFigure:RESPonse

Channel Specific Command

Description	Sets or queries the response rate for the specific channel.	
Syntax	:CONFigure:RESPonse {NORMAL|0|FAST|1}	
Parameter	NORMAL/0	Normal
	FAST/1	Fast
Example	:CONF:RESP 0	Response set to normal.
Query Syntax	: CONFigure:RESPonse?	
Return Parameter	<NR1>	Response
	0	Normal
	1	Fast
Query Example	:CONF:RESP? 1	Response is Fast.

:CONFigure:RESEt

Channel Specific Command

Description	Recalls the original factory default settings.
Syntax	:CONFigure:RESEt
Example	:CONF:RESE

:CONFigure:GROup:UNITs

Channel Specific Command

Description	Sets or queries the number load modules that can be used in the group mode.	
Syntax	CONFigure:GROup:UNITs<NRf>|MIN|MAX	
Parameter	<NRf>	Number of units
	MIN	Sets to the minimum number
	MAX	Sets to the maximum number
Example	CONF:GRO:UNIT 2	Sets the parallel mode to 2 units.
Query Syntax	CONFigure:GROup:UNITs? [MIN|MAX]	
Return Parameter	<NR1>	Returns the number of units
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	: CONF:GRO:UNIT? 2	2 units are set for the parallel mode.
⚠ Note	The PEL-2040A(B) and PEL-2041A(B) are fully support group mode(Para/Sync)	
	The PEL-2030A(B) does not support group function.	
	The dual channel of PEL-2020A(B) does support group function partially. It can support to group 2 units under the Sync mode only. That means the PEL-2020A(B) can be 2chx100W or 1chx200W.	

:CONFigure:GROup:MODE

Channel Specific Command

Description	Sets or queries the parallel mode.	
Syntax	:CONFigure:GROup:MODE {SYNC|0|PARALLEL|1}	
Parameter	SYNC, 0	Sync mode
	PARALLEL, 1	Parallel mode

Example	:CONF:GRO:MODE 0	Sets the parallel mode to SYNC.
Query Syntax	:CONFigure:GROup:MODE?	
Return Parameter	0	Sync mode
	1	Parallel mode
Query Example	:CONF:GRO:MODE? 0	The parallel mode is currently set to SYNC.

⚠ Note

The para setting allows the all the parallelized load modules to be operated as a single large load module.

Sync mode allows the settings of a single unit to be synchronized across all the other parallelized load modules.

The major difference is that the Para mode calculates the total amount of current on the screen of the Mainframe, and the Sync mode does not.

The PEL-2040A(B) and PEL-2041A(B) are fully support group mode (Para/Sync). The PEL-2030A(B) does not support group function.

The dual channel of PEL-2020A(B) does support group function partially. It can support to group 2 units under the Sync mode only. That means the PEL-2020A(B) can be 2chx100W or 1chx200W.

Utility Subsystem

:UTILity:AUTO:LOAD

System Command

Description	Sets the mainframe to auto mode. Upon startup the mainframe will turn loads/programs on.	
Syntax	:UTILity:AUTO:LOAD {OFF|0|ON|1}	
Parameter	OFF/0	Turns auto loading off
	ON/1	Turns auto loading on
Example	:UTIL:AUTO:LOAD 1	Turns auto loading on
Query Syntax	:UTILity:AUTO:LOAD?	
Return Parameter	<NR1>	Auto load status
	0	Auto loading is off
	1	Auto loading is on

Query Example	:UTIL:AUTO:LOAD? 1	The main frame is currently configured to auto load.

:UTILity:AUTO:MODE System Command

Description	Sets the mainframe auto mode as load or program. Upon startup the mainframe can automatically turn on loads or automatically run the last program.	
Syntax	:UTILity:AUTO:MODE {PROGRAM|0|LOAD|1}	
Parameter	PROGRAM/0	Sets the auto load mode to program
	LOAD/1	Sets the auto load mode to load.
Example	:UTIL:AUTO:MODE 1	Auto load mode is set to load.
Query Syntax	:UTILity:AUTO:MODE?	
Return Parameter	<NR1>	Auto load mode
	0	Program
	1	Load
Query Example	:UTIL:AUTO:MODE? 0	Auto load mode is set to Program.

:UTILity:SOUNd System Command

Description	Sets the keyboard operating and knob rotating make a sound.	
Syntax	:UTILity:SOUNd {OFF|0|ON|1}	
Parameter	OFF/0	Off
	ON/1	On
Example	:UTIL:SOUNd ON	Configures the sound on.
Query Syntax	:UTILity:SOUNd?	
Return Parameter	<NR1>	SOUND Status

	0	Off
	1	On
Query Example	:UTIL:SOUN? 0	Sound is off for all channel and mainframe.

:UTILity:REMote System Command

Description	Turns the remote control on or off.	
Syntax	:UTILity:REMote {OFF|0|ON|1}	
Parameter	OFF/0	Turns Remote control off
	ON/1	Turns remote control on
Example	:UTIL:REM 1	Turns remote control on.
Query Syntax	:UTILity:REMote?	
Return Parameter	<NR1>	Remote mode
	0	Off
	1	On
Query Example	:UTIL:REM? 1	Always under remote mode.

:UTILity:REMote:MODE System Command

Description	Sets the remote mode to fast or normal. When in fast mode, the panel interface is deactivated with an interface time of no more than 10ms. Normal mode has an interface time of 30~130ms. In normal mode the panel interface continues to update the screen in real-time.	
Syntax	:UTILity:REMote:MODE {NORMAL|0|FAST|1}	
Parameter	NORMAL/0	NORMAL
	FAST/1	FAST
Example	:UTIL:REM:MODE 1	Turns remote mode to fast.

Query Syntax	:UTILity:REMote:MODE?	
Return Parameter	<NR1>	Remote mode
	NORMAL/0	NORMAL
	FAST/1	FAST
Query Example	:UTIL:REM:MODE? 1	Remote mode is under fast mode.

:UTILity:TIME

System Command

Description	Sets the date and time on the mainframe.	
Syntax	:UTILity:TIME [aard]	
Parameter	[aard]	
	“201511131300” 1 2 3	1 Year 2 Month/Day 3 Time (24 hours)
Example	:UTIL:TIME “201501031343” Sets the time to 1:00 pm, January 3rd, 2015.	
Query Syntax	:UTIL:TIME?	
Return Parameter	[aard]	
	2015/11/13/13:00 1 2 3	1 Year 2 Month/Day 3 Time (24 hours)
Query Example	:UTIL:TIME? 2015/11/13/13:00	The date is November 13th, 2015. The time is 1:00 pm.

:UTILity:LOAD System Command

Description	Sets the knob control style. The load module control knobs can be set to operate independently (OLD style) to the mainframe or with the mainframe (UPDATED).	
Syntax	:UTILity:LOAD {OLD|0|Updated|1}	
Parameter	OLD/0	Old
	UPDATED/1	Updated
Example	:UTIL:LOAD 1	Set the knob style to update.
Query Syntax	:UTILity:LOAD?	
Return Parameter	<NR1>	Knob style
	0	Old
	1	Updated
Query Example	:UTIL:LOAD? 1	The knob style is set to Updated.

:UTILity:IDENtify System Command

Description	The outer display screen of mainframe will be flashing for help identify which mainframe is under control. This command will have no function while the system is under remote fast mode. (:UTIL:REM:MODE 1)	
Syntax	:UTILity:IDENtify {OFF|0|ON|1}	
Parameter	OFF/0	Turns message off
	ON/1	Turns message on
Example	:UTIL:IDEN 1	Turns the message on.

:UTILity:FRAMe System Command

Description	Turns Frame Link on or off.	
Syntax	:UTILity:FRAMe {OFF|0|ON|1}	
Parameter	{OFF|0|ON|1}	Frame Link
	OFF/0	off
	ON/1	on
Example	:UTIL:FRAM 1	Turns Frame Link on.
Query Syntax	:UTILity:FRAMe?	
Return Parameter	<NR1>	Frame Link
	0	Off
	1	On
Query Example	:UTIL:FRAM? 0	Frame Link is on.

:UTILity:HIGH:RESolution System Command

Description	ON: When there is difference between the measured value of voltage, current or power which displayed on the module panel and the setting value, the system will fine tune the load value so that the measured value close to the setting value. The system will perform and complete this action after loading is on in one second. OFF: The system won't perform any action when there is difference between the measured value of voltage, current or power which displayed on the module panel and the setting value.	
Syntax	:UTILity:HIGH:RESolution{OFF|0|ON|1}	
Parameter	OFF/0	Set High Resolution to off
	ON/1	Set High Resolution to on

Example	:UTIL:HIGH:RES 0	Set High Resolution to off.
Query Syntax	:UTILity:HIGH:RESolution?	
Return Parameter	<NR1>	Remote mode
	0	Off
	1	On
Query Example	:UTIL:HIGH:RES? 0	High Resolution is set to off.

:UTILity:SYSTem:MODE

System Command

Description	1: When any command is received, the Master panel will automatically enter the Remote fast mode. 0: The Master panel won't automatically enter the Remote fast mode.	
Syntax	:UTILity:SYSTem:MODE {OFF|0|ON|1}	
Parameter	OFF/0	Set System Mode to 0
	ON/1	Set System Mode to 1
Example	:UTIL:SYST:MODE 0	Set System Mode to 0.
Query Syntax	:UTILity:SYSTem:MODE?	
Return Parameter	<NR1>	System mode
	0	Off
	1	On
Query Example	:UTIL:SYST:MODE? 0	System Mode is set to 0.

:UTILity:VOLTage:LATCh:CLEar

System Command

Description	Auto: Load starts when the terminal voltage of module is higher than Von value. The system stops loading when the terminal voltage of module is close to 0V for more than 25ms and system is under the state of detecting Von again. Manual: The load starts when the terminal voltage of module exceeds the Von setting value. Loading keep going even if the terminal voltage of module close to 0V.	
Syntax	:UTILity:VOLTage:LATCh:CLEar{AUTO|0|MANUAL|1}	
Parameter	AUTO/0	Set Voltage Latch Clear to auto
	MANUAL/1	Set Voltage Latch Clear to manual
Example	:UTIL:VOLT:LATC:CLE 0	Set Voltage Latch Clear to auto.
Query Syntax	:UTILity:VOLTage:LATCh:CLEar?	
Return Parameter	<NR1>	Remote mode
	0	AUTO
	1	MANUAL
Query Example	:UTIL:VOLT:LATC:CLE? 0	Voltage Latch Clear is set to auto.

:UTILity:MEASure:PERiod

System Command

Description	You can select a measure sample rate through this setting, 200ms or 20ms are available for voltage and current sampling rate.	
Syntax	:UTILity:MEASure:PERiod{NORMAL|0|FAST|1}	
Parameter	NORMAL/0	Set Measure Period to 200ms
	FAST/1	Set Measure Period to 20ms
Example	:UTIL:MEAS:PER 0	Set Measure Period to 200ms

Query Syntax	:UTILity:MEASure:PERiod?	
Return Parameter	<NR1>	Remote mode
	0	NORMAL
	1	FAST
Query Example	:UTIL:MEAS:PER? 0	Measure Period is set to 200ms.

:UTILity:JOG:SHUTTLE:CONTrol System Command

Description	ON: After this setting is enabled, the settings value will be adjusted by slave knob in Jog Shuttle mode when you adjust the setting value. The interval value is adjusted according to the knob speed. OFF: If this setting is disabled, the settings value will be adjusted by slave knob in the form of fixed compartment when you adjust the setting value.	
Syntax	:UTILity:JOG:SHUTTLE:CONTrol{OFF|0|ON|1}	
Parameter	OFF/0	Set Jog Shuttle Control to OFF
	ON/1	Set Jog Shuttle Control to ON
Example	:UTIL:JOG:SHUTTLE:CONT 0	Set Jog Shuttle Control to OFF.
Query Syntax	:UTILity:JOG:SHUTTLE:CONTrol?	
Return Parameter	<NR1>	Remote mode
	0	OFF
	1	ON
Query Example	:UTIL:JOG:SHUTTLE:CONT? 0	Jog Shuttle Control is set to OFF.

:UTILity:RVP:LOAD:OFF System Command

Description	ON: When RVP is detected, Alarm will display on the screen and stop loading. OFF: When RVP is detected, Alarm will display on the screen but loading is kept on.	
Syntax	:UTILity:RVP:LOAD:OFF{OFF|0|ON|1}	
Parameter	OFF/0	Set RVP Load Off to OFF
	ON/1	Set RVP Load Off to ON
Example	:UTIL:RVP:LOAD:OFF 0	Set RVP Load Off to OFF.
Query Syntax	:UTILity:RVP:LOAD:OFF?	
Return Parameter	<NR1>	Remote mode
	0	OFF
	1	ON
Query Example	:UTIL:RVP:LOAD:OFF? 0	RVP Load Off is set to OFF.

Current Subsystem

:CURRent:STATic:RECall

Channel Specific Command

Description	Sets or queries whether A Value or B Value is the currently active value in CC static mode.	
Syntax	:CURRent:STATic:RECall {A|0|B|1}	
Parameter	A/0	A
	B/1	B
Example	:CURR:STAT:REC 1	Makes B Value the active value.
Query Syntax	:CURRent:STATic:RECall?	
Return Parameter	<NR1>	Value
	0	A
	1	B

Query Example	:CURR:STAT:REC?	A Value is active.
	0	

:CURRent:STATic:L1/L2

Channel Specific Command

Description	Sets the A/B Value for constant current static mode, where L1 is A Value and L2 is B Value. The command is range dependent. If the current range is Low, then the command will only apply to the low range settings. When setting the A/B value, the device will be switched to CC mode by using this command.	
Syntax	:CURRent:STATic:L1|L2 <NRf+>[A]	
Parameter	<NRf+>[A]	
	L1 1	Sets A Value to 1 Amp.
	L2 2	Sets B Value to 2 Amps.
	L1 1A	Sets A Value to 1 Amp.
	L1 MIN	Sets A Value to the minimum level for the specific channel.
	L1 MAX	Sets A Value to the maximum Level for the specific channel.
Example	:CURR:STAT:L1 1	Sets A Value to 1 amp for the current range
Query Syntax	:CURRent:STATic:L1?/L2? [MAX|MIN]	
Return Parameter	<NR2> [MAX|MIN]	Current
	1 unit = 1 amp	Returns the current of the A Value (L1) or B Value (L2).
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:CURR:STAT:L2? MAX 10.2	Returns the maximum current allowed for the channel. (PEL-2020A(B))

Query Example	:CURR:STAT:L2? 2	Returns the current setting (2 A) for B Value.

:CURRent:STATic:RISE/FALL

Channel Specific Command

Description	Sets the slew rate for constant current static mode. The command is range dependent. If the current range is Low, then the command will only apply to the low range settings. When setting the A/B value, the device will be switched to CC mode by using this command.	
Syntax	:CURRent:STATic:RISE/FALL <NRf+>[A/uS]	
Parameter	<NRf+>[A/uS]	Slew Rate
	RISE/FALL 0.078A/uS	Sets the rising/ falling slew rate to 0.078A/uS
	RISE/FALL 1	Sets the rising/ falling slew rate to 1A/uS
	RISE/FALL MIN	Sets to the slowest rising/ falling slew rate.
	RISE/FALL MAX	Sets to the fastest rising/ falling slew rate.
Example	:CURR:STAT:RISE .01	Sets the rising slew rate to 0.01A/uS.
Query Syntax	: CURRent:STATic:RISE/FALL? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Slew rate
	1 Unit=1 amp/uS	Returns the slew rate.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:CURR:STAT:RISE? MIN 0.078	The Minimum value for the rising slew rate is 0.078 A/uS for the specific channel.

Query Example	:CURR:STAT:RISE? 0.16800	The rising slew rate is 0.168 A/uS for the specific channel.

:CURRent:STATic:LOW:AVALue/BVALue

Channel Specific Command

Description	Sets the low range A/B Value for constant current static mode.	
Syntax	:CURRent:STATic:LOW:AVALue/BVALue<NRf+>[A]	
Parameter	NRf+[A]	
	AVALue 1	Sets A Value to 1 Amp. (Low range only)
	BVALue 2	Sets B Value to 2 Amps. (Low Range only)
	AVALue 1A	Sets A Value to 1 Amp. (Low range only)
	AVALue MIN	Sets A Value to the minimum level for the specific channel.
	AVALue MAX	Sets A Value to the maximum Level for the specific channel.
Example	:CURR:STAT:LOW:AVAL 1	Sets low range CC static mode A Value to 1 amp.
Query Syntax	:CURRent:STATic:LOW:AVALue/BVALue? [MAX|MIN]	
Return Parameter	<NR2> [MAX|MIN]	Current
	1 unit = 1 amp	Returns the current of the A or B Value.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:CURR:STAT:LOW:BVAL? MAX 2	Returns the maximum current allowed for the channel. (PEL-2020A(B))

:CURRent:STATic:LOW:RISE/FALL

Channel Specific Command

Description	Sets the low range rising/falling slew rates.	
Syntax	:CURRent:STATic:LOW:RISE/FALL<NRf+>[A/uS]	
Parameter	<NRf+>[A/uS]	Slew Rate
	RISE/FALL 0.078A/uS	Sets the rising/falling slew rate to 0.078A/uS
	RISE/FALL 1	Sets the rising/falling slew rate to 1A/uS
	RISE/FALL MIN	Sets to the slowest rising/ falling slew rate.
	RISE/FALL MAX	Sets to the fastest rising/ falling slew rate.
Example	:CURR:STAT:LOW:RISE .001	Sets the rising slew rate to 0.001A/uS.
Query Syntax	: CURRent:STATic:LOW:RISE/FALL? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Slew rate
	1 Unit=1 amp/uS	Returns the slew rate.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:CURR:STAT:LOW:RISE? MIN 0.078	For low range CC mode, the Minimum value for the rising slew rate is 0.078 A/uS for the specific channel.

:CURRent:STATic:HIGH:AVALue/BVALue

Channel Specific Command

Description	Sets the high range A/B Value for constant current static mode.
Syntax	:CURRent:STATic:HIGH:AVALue/BVALue<NRf+>[A]
Parameter	NRf+[A]

	AVALue 10	Sets A Value to 10 Amps. (high range only)
	BVALue 20	Sets B Value to 20 Amps. (high range only)
	AVALue MIN	Sets A Value to the minimum level for the specific channel.
	A Value MAX	Sets A Value to the maximum Level for the specific channel.
Example	:CURRent:STATic:HIGH :AVALue 10	Sets high range CC static mode A Value to 10 amps.
Query Syntax	:CURRent:STATic:HIGH:AVALue/BVALue?[MAX|MIN]	
Return Parameter	<NR2> [MAX|MIN]	Auto load mode
	MAX/MIN	Returns the allowable maximum and minimum.
	1 unit= 1 amp	Returns the current of the A or B Value.
Query Example	:CURR:STAT:HIGH:BVALue? MAX 20.4000	Returns the maximum current allowed for the channel in high range mode. (PEL-2020A(B))

:CURRent:STATic:HIGH:RISE/FALL

Channel Specific Command

Description	Sets the high range rising/falling slew rate.	
Syntax	:CURRent:STATic:HIGH:RISE/FALL<NRf+>[A/uS]	
Parameter	<NRf+>[A/uS]	Slew Rate
	RISE/FALL 0.8A/uS	Sets the rising/ falling slew rate to 0.8A/uS
	RISE/FALL 1	Sets the rising/ falling slew rate to 1A/uS
	RISE/FALL MIN	Sets to the slowest rising/ falling slew rate.

	RISE/FALL MAX	Sets to the fastest rising/ falling slew rate.
Example	:CURR:STAT:HIGH:RISE 1.1	Sets the rising slew rate to 1.1A/uS.
Query Syntax	:CURRent:STATic:HIGH:RISE/FALL? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Slew rate
	1 Unit=1 amp/uS	Returns the slew rate.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:CURR:STAT:HIGH:RISE? MAX 0.8000	For high range CC mode, the maximum value for the rising slew rate is 0.8000 A/uS for the specific channel.

:CURRent:DYNamic:L1/L2

Channel Specific Command

Description	Sets the current levels (Level 1 & 2) for CC dynamic mode. The command is range dependent. If the current range is Low, then the settings will only apply to low range. When setting the A/B value, the device will be switched to CCD mode by using this command.	
Syntax	:CURRent:DYNamic:L1/L2<NRf+>[A]	
Parameter	NRf+[A]	Current
	L1 1	Sets L1 to 1 Amp.
	L2 2	Sets L2 to 2 Amps.
	L2 2A	Sets L2 to 2 Amps.
	L1/L2 MIN	Sets L1 or L2 to the minimum level for the specific channel.
	L1/L2 MAX	Sets L1 or L2 to the maximum Level for the specific channel.

Example	:CURR:DYN:L1 10	In CC dynamic mode, Set L1 (level 1) to 10 amps.
Query Syntax	:CURRent:DYNamic:L1/L2? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Current
	MAX/MIN	Returns the allowable maximum and minimum.
	1 unit= 1 amp	Returns the current of L1/L2, or the maximum or minimum current allowed.
Query Example	:CURR:DYN:L2? 2.0400	Returns current for the specific channel.

:CURRent:DYNamic:RISE/FALL

Channel Specific Command

Description	Sets the rising/falling slew rate for CC dynamic mode for the specific channel and range. When setting the A/B value, the device will be switched to CCD mode by using this command.	
Syntax	:CURRent:DYNamic:RISE/FALL<NRf+>[A/uS]	
Parameter	<NRf+>[A/uS]	Slew Rate
	RISE/FALL 0.8A/uS	Sets the rising/ falling slew rate to 0.8A/uS
	RISE/FALL 1	Sets the rising/ falling slew rate to 1A/uS
	RISE/FALL MIN	Sets to the slowest rising/ falling slew rate.
	RISE/FALL MAX	Sets to the fastest rising/ falling slew rate.
Example	:CURR:DYNA:RISE 1.1	Sets the rising slew rate to 1.1A/uS.
Query Syntax	:CURRent:DYNamic:RISE/FALL? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Slew rate

	1 Unit=1 amp/uS	Returns the slew rate.
	MAX/MIN	Returns the allowable maximum or minimum.
Query Example	:CURR:DYN:FALL? MIN 0.0003	Shows the minimum allowable value for the falling slew rate as 0.0003 A/uS for the specific channel and range.

:CURRent:DYNamic:T1/T2

Channel Specific Command

Description	Sets the timers T1 or T2 for CC dynamic mode for the specific channel and range. When setting the A/B value, the device will be switched to CCD mode by using this command.	
Syntax	:CURRent:DYNamic:T1/T2<NRf+>[S|ms]	
Parameter	<NRf+>[S]	Time
	T1/T2 0.1S	Sets the T1/T2 time to 0.1 seconds.
	T1/T2 1	Sets T1/T2 to 1 second.
	T1/T2 MIN	Sets the T1/T2 to the minimum value.
	T1/T2 MAX	Sets the T1/T2 time to the maximum time
Example	:CURR:DYNA:T1 .1S	Sets the T1 time to 100 milliseconds for the specific channel.
Query Syntax	: CURRent:DYNamic:T1/T2? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Time
	1 Unit=1 second	Returns T1/T2 time.
	MAX/MIN	Returns the allowable maximum and minimum.

Query Example	:CURR:DYN:L:T1? 2.5	Returns the T1 time of 2.5 seconds.
	:CURR:DYN:T1? MIN 0.000025	Returns the minimum T1 time allowable for the specific channel and range.

:CURRent:DYNamic:LOW:L1/L2

Channel Specific Command

Description	Sets the low range current levels (Level 1 & 2) for CC dynamic mode.	
Syntax	:CURRent:DYNamic:LOW:L1/L2 <NRf+>[A]	
Parameter	NRf+[A]	Current
	L1 1	Sets L1 to 1 Amp. (low range only)
	L2 2	Sets L2 to 2 Amps. (low Range only)
	L2 2A	Sets L2 to 2 Amps. (low Range only)
	L1/L2 MIN	Sets L1 or L2 to the minimum level for the specific channel.
	L1/L2 MAX	Sets L1 or L2 to the maximum Level for the specific channel.
Example	:CURR:DYN:LOW:L1 10	In low range CC dynamic, Set L1 (level 1) to 10 amps.
Query Syntax	:CURRent:DYNamic:LOW:L1/L2? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Current
	1 unit= 1 amp	Returns the current of L1/L2, or the maximum or minimum current allowed.
	MAX/MIN	Returns the allowable maximum and minimum.

Query Example	:CURR:DYN:LOW:L2? 2.0400	Returns current for the specific channel.

:CURRent:DYNamic:LOW:RISE/FALL

Channel Specific Command

Description	Sets the low range rising/falling slew rate for CC dynamic mode for the specific channel.	
Syntax	:CURRent:DYNamic:LOW:RISE/FALL<NRf+>[A/uS]	
Parameter	<NRf+>[A/uS]	Slew Rate
	RISE/FALL 0.8A/uS	Sets the rising/ falling slew rate to 0.8A/uS
	RISE/FALL 1	Sets the rising/ falling slew rate to 1A/uS
	RISE/FALL MIN	Sets to the slowest rising/ falling slew rate.
	RISE/FALL MAX	Sets to the fastest rising/ falling slew rate.
Example	:CURR:DYNA:LOW:RISE 1.1	Sets the rising slew rate to 1.1A/uS.
Query Syntax	: CURRent:DYNamic:LOW:RISE/FALL?[MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Slew rate
	1 Unit=1 amp/uS	Returns the slew rate.
	MAX/MIN	Returns the allowable maximum or minimum.
Query Example	:CURR:DYN:LOW:FALL? MIN 0.0003	For low range dynamic CC mode, the minimum allowable value for the falling slew rate is 0.0003 A/uS for the specific channel.

:CURRent:DYNamic:LOW:T1/T2

Channel Specific Command

Description	Sets the low range timers T1 or T2 for CC dynamic mode for the specific channel.	
Syntax	:CURRent:DYNamic:LOW:T1/T2<NRf+>[S/ms]	
Parameter	<NRf+>[S/ms]	Time
	T1/T2 0.1S	Sets the T1/T2 time to 0.1 seconds.
	T1/T2 1	Sets T1/T2 to 1 second.
	T1/T2 MIN	Sets the T1/T2 to the minimum value.
	T1/T2 MAX	Sets the T1/T2 time to the maximum time
Example	:CURR:DYNA:LOW:T1 .1S	Sets the T1 time to 100 milliseconds for the specific channel.
Query Syntax	: CURRent:DYNamic:LOW:T1/T2? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Time
	1 Unit=1 second	Returns T1/T2 time.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:CURR:DYN:LOW:T1? 2.5	Returns the T1 time of 2.5 seconds.
	:CURR:DYN:LOW:T1? MIN 0.000025	Returns the minimum T1 time allowable for the specific channel.

:CURRent:DYNamic:HIGH:L1/L2

Channel Specific Command

Description	Sets the high range current levels (Level 1 & 2) for CC dynamic mode.
Syntax	:CURRent:DYNamic:HIGH:L1/L2<NRf+>[A]

Parameter	NRf+[A]	
	L1 10	Sets L1 to 10 Amps. (High range only)
	L2 20	Sets L2 to 20 Amps. (High Range only)
	L1/L2 MIN	Sets L1 or L2 to the minimum level for the specific channel.
	L1/L2 MAX	Sets L1 or L2 to the maximum Level for the specific channel.
Example	:CURR:DYN:HIGH:L1 10	In high range CC dynamic mode, Set L1 (level 1) to 10 amps.
Query Syntax	:CURRent:DYNamic:HIGH:L1/L2? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Return value
	1 unit= 1 amp	Returns the current of Level 1/ 2 (L1/L2).
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:CURR:DYN:HIGH:L2? MAX 20.4000	Returns the maximum current allowed for the channel. (PEL-2020A(B))

:CURRent:DYNamic:HIGH:RISE/FALL

Channel Specific Command

Description	Sets the high range rising/falling slew rate for CC dynamic mode for the specific channel.	
Syntax	:CURRent:DYNamic:HIGH:RISE/FALL<NRf+>[A/uS]	
Parameter	<NRf+>[A/uS]	Slew Rate
	RISE/FALL 0.8A/uS	Sets the rising/ falling slew rate to 0.8A/uS
	RISE/FALL 1	Sets the rising/ falling slew rate to 1A/uS

	RISE/FALL MIN	Sets to the slowest rising/ falling slew rate.
	RISE/FALL MAX	Sets to the fastest rising/ falling slew rate.
Example	:CURR:DYNA:HIGH:RISE 1.1	Sets the rising slew rate to 1.1A/uS.
Query Syntax	: CURRent:DYNamic:HIGH:RISE/FALL? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Slew rate
	1 Unit = 1 amp/uS	Returns the slew rate.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:CURR:DYN:HIGH:FALL? MAX 0.8	For high range dynamic CC mode, the maximum value for the falling slew rate is 0.8 A/uS for the specific channel.

:CURRent:DYNamic:HIGH:T1/T2

Channel Specific Command

Description	Sets the timers T1 or T2 for CC dynamic mode for the specific channel in high range.	
Syntax	:CURRent:DYNamic:HIGH:T1/T2<NRf+>[S|ms]	
Parameter	<NRf+>[S]	Time
	T1/T2 0.1S	Sets the T1/T2 time to 0.1 seconds.
	T1/T2 1	Sets T1/T2 to 1 second.
	T1/T2 MIN	Sets the T1/T2 to the minimum value.
	T1/T2 MAX	Sets the T1/T2 time to the maximum time
Example	:CURR:DYNA:HIGH:T1 10S	Sets the high range T1 time to 10 seconds for the specific channel.

Query Syntax	:CURRent:DYNamic:HIGH:T1/T2? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Time
	1 Unit=1 second	Returns T1/T2 time.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:CURR:DYN:HIGH:T1? 2.5	Returns the T1 time of 2.5 seconds.
	:CURR:DYN:HIGH:T1? MIN 0.000025	Returns the minimum T1 time allowable for the specific channel.

FETCH Subsystem

:FETCh:VOLTage?

Channel Specific Status Command

Description	This query returns the real-time voltage of the load module input for the specific channel.	
Syntax	:FETCh:VOLTage? <NR2>	
Parameter	<NR2> 1 unit = 1 volt	Voltage
	8	8 volts
Query Example	:FETC:VOLT?	The specific channel has a voltage of 11.2 volts at the input.
	11.2	

:FETCh:CURRent?

Channel Specific Status Command

Description	This query returns the real-time current of the load module input for the specific channel.	
Syntax	:FETCh:CURRent? <NR2>	
Parameter	<NR2> 1 unit= 1 amp	
	1	1 amp
Query Example	:FETC:CURR?	The specific channel has a current of 1.2 amps at the load module input.
	1.2	

:FETCh:POWer?

Channel Specific Status Command

Description	This query returns the real-time power of the load module input for the specific channel.	
Syntax	:FETCh:CURRent? <NR2>	
Parameter	<NR2> 1 unit= 1 watt	
	1	1 amp
Query Example	:FETC:POW? 1.2	The specific channel is at 1.2 watts.

:FETCh:STATus?

Status Command

Description	This query returns the status of the load module. The returned value is the bit weight of the Channel Status Register. See page 202 for details.			
Syntax	:FETCh:STATus? <NR1>			
Parameter	<NR1>	Condition	<NR1>	Condition
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128-65535	Not Used
Query Example	:FETC:STAT? 2		Over voltage (OV) protection has been triggered for the specific channel.	

:FETCh:ALLVoltage?

All Channel Status Command

Description	This query returns the voltage values of all the load modules/channels in order from 1-8 (PEL-2004A)/1-4 (PEL2002A).
Syntax	:FETCh:ALLVoltage?

Parameter	<aard> CH1,CH2,CH3,CH4, CH5,CH6,CH7,CH8	Returns all the voltage values from all the channels, 1-8(PEL-2004A)/ 1-4(PEL-2002A).
Query Example	:FETC:ALLV? 2.5000, 3.0000, 0.0000, 0.0000, 0.0000, 0.0000, 5.500, 0.0000	Channel 1 and 2 have voltages of 2.5 and 3 volts respectively. Channels 3-6 and 8 have no voltage and channel 7 is 5.5 volts

:FETCh:ALLCurrent?

All Channel Status Command

Description	This query returns the current values of all the load modules/channels in order from 1-8 (PEL-2004A)/1-4 (PEL2002A).
Syntax	:FETCh:ALLCurrent? <aard>

Parameter	<aard> CH1,CH2,CH3,CH4, CH5,CH6,CH7,CH8	Returns all the current values from all the channels, 1-8 (PEL-2004A)/ 1-4 (PEL-2002A).
Query Example	:FETC:ALLC? 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 1.2000, 3.5600	Channels 1 to 6 have no current. Channels 7 & 8 have 1.2 and 3.56 amps, respectively.

:FETCh:ALLPower?

All Channel Status Command

Description	This query returns the power values of all the load modules/channels in order from 1-8 (PEL-2004A) /1-4 (PEL2002A).
Syntax	:FETCh:ALLPower? <aard>
Parameter	<aard>

	CH1,CH2,CH3,CH4, CH5,CH6,CH7,CH8	Returns all the power values from all the channels, 1-8(PEL-2004A)/ 1-4 (PEL-2002A).
Query Example	:FETC:ALLP? 0.0000, 0.0000, 10.200, 5.5000	Channels 1 to 2 have no power. Channels 3 & 4 have 10.2 and 5.5 watts, respectively.

LOAD Subsystem

:LOAD[:STATe]

Channel Specific Command

Description	This command turns the electronic load on/off for the specific channel.	
Syntax	:LOAD[:STATe] {ON|1|OFF|0}	
Parameter	ON/1	Load On
	OFF/0	Load Off
Example	:LOAD ON	Turns the specific channel load on.
Query Syntax	:LOAD[:STATe]?	
Return Parameter	<NR1>	Load module
	1	Load is On
	0	Load is Off
Query Example	:LOAD? 1	Turns the specific channel load on.

:LOAD:SHORt[:STATe]

Channel Specific Command

Description	This command shorts the electronic load on/off for the specific channel.
Syntax	:LOAD:SHORt[:STATe]{ON|1|OFF|0}

Parameter	ON/1	Shorting is On
	OFF/0	Shorting is Off
Example	:LOAD:SHOR ON	Short circuits the load module channel.
Query Syntax	:LOAD:SHORt[:STATe]?	
Return Parameter	<NR1>	Short Load module
	1	Shorting is activated
	0	Shorting is deactivated
Query Example	:LOAD:SHOR?	Shorting is deactivated on the specific channel.
	0	

:LOAD:SHORt:KEY

Channel Specific Command

Description	The SHORT key can be set to Toggle or Hold mode.	
Syntax	:LOAD:SHORt:KEY {TOGGLE|1|HOLD|0}	
Parameter	TOGGLE/1	Sets the SHORT key to toggle mode
	HOLD/0	Sets the SHORT key to hold mode
Example	:LOAD:SHOR:KEY 1	Set the SHORT key to toggle.
Query Syntax	:LOAD:SHORt:KEY?	
Return Parameter	<NR1>	Mode
	1	Toggle mode is active
	0	Hold mode is active
Query Example	:LOAD:SHOR:KEY?	Hold mode is active for the specific channel.
	0	

:LOAD:PROTection?

Channel Specific Command

Description	Returns the protection levels for electronic load
Query Syntax	:LOAD:PROTection?

Query Example	:LOAD:PROT? Clears the Channel Status Register.			
Return Parameter	<NR1>	Condition	<NR1>	Condition
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128-65535	Not Used
Query Example	:LOAD:PROT? 0	Returns the status of the Channel Status Register. Here 0 is returned indicating no protection settings have been tripped.		

:LOAD:PROTection:CLEar

Channel Specific Command

Description	This command clears the Channel Status Register for the specific channel. See page 202 for details.
Syntax	:LOAD:PROTection:CLEar
Example	:LOAD:PROT:CLE Clears the Channel Status Register.

:LOAD:TIME?

Channel Specific Command

Description	This command displays the total load on time. If the load is on, the load time when the command was issued is displayed.	
Query Syntax	:LOAD:TIME?	
Return Parameter	<NR1>1unit = 1 second	Load on time
	2.2	2.2 seconds
Query Example	:LOAD:TIME? 5.1	Returns the load on time as 5.1 seconds.

:LOAD:DELay

Channel Specific Command

Description	Sets or queries the load delay time for the specific channel.	
Syntax	:LOAD:DELay<NRf>[S]	
Parameter	<NRf>[S]	Time
	0.1S	Sets the delay time to 0.1 seconds.
Example	:LOAD:DEL 0.1s	Sets the delay time to 0.1s.
Query Syntax	:LOAD:DEL?	
Return Parameter	<NR2>	Delay time in seconds.
Query Example	:LOAD:DEL? 0.10000	Returns the delay time for the current channel.

:LOAD:TYPE

All Channels

Description	Sets or queries which load type is the active type.	
Syntax	:LOAD:TYPE {LOAD|0|PROGRAM|1|SEQUENCE|2}	
Parameter	LOAD/0	Normal load
	PROGRAM/1	Program
	SEQUENCE/2	Sequence
Example	:LOAD:TYPE: 1	Program is active.
Query Syntax	:LOAD:TYPE?	
Return Parameter	<NR1>	Type
	0	Normal load
	1	Program
	2	Sequence
Query Example	:LOAD:TYPE? 0	The normal load type is active

Measure Subsystem

:MEASure:VOLTage?

Channel Specific Command

Description	This query returns the measured voltage of the specific channel.	
Query Syntax	:MEASure:VOLTage? <NR2>	
Return Parameter	<NR2> 1 unit = 1 volt	Voltage at the load input
	0.5000	0.5000 volts
Query Example	:MEAS:VOLT?	A voltage of 8.56 volts is measured at the specific channel load input.
	8.5600	

:MEASure:CURRent?

Channel Specific Command

Description	This query returns the measured current of the specific channel.	
Query Syntax	:MEASure:CURRent? <NR2>	
Return Parameter	<NR2> 1 unit = 1 amp	Current at the load input
	1.0000	1.0000 amps
Query Example	:MEAS:CURR?	A current of 1.5 amps is measured at the specific channel load input.
	1.5	

:MEASure:POWer?

Channel Specific Command

Description	This query returns the measured power of the specific channel.	
Query Syntax	:MEASure:POWer? <NR2>	
Return Parameter	<NR2> 1 unit = 1 watt	Power at the load input
	1.0000	1.0000 watts
Query Example	:MEAS:POW? 1.5	1.5 watts is measured at the specific channel load input.

:MEASure:INPut

Channel Specific Command

Description	This command is for compatibility with other instruments only and has no action.	
Syntax	:MEASure:INPut {LOAD|0| UUT|1}	
Parameter	LOAD/0	Disabled
	UUT/1	Enabled
Example	:MEAS:INP 0	Disable voltage sense.
Query Syntax	:MEASure:INPut? <NR1>	
Return Parameter	<NR1>	Voltage Sense
	0	Disabled
	1	Enabled
Query Example	:MEAS:INP? 1	Returns the voltage input status. Voltage sense is enabled.

:MEASure:SCAN

Channel Specific Command

Description	This command allows the mainframe to scan all the load modules' voltage\current\power.
Syntax	:MEASure:SCAN {OFF|0|ON|1}

Parameter	OFF/0	Disabled
	ON/1	Enabled
Example	:MEAS:SCAN 0	Disable scanning.
Query Syntax	:MEASure:SCAN? <NR1>	
Return Parameter	<NR1>	Scan
	0	Disabled
	1	Enabled
Query Example	:MEAS:SCAN?	Returns the scanning status. Here scanning is enabled.
	1	

:MEASure:ALLVoltage?

All Channel Command

Description	This query measures the voltage values of all the load modules/channels in order from 1-8 (PEL-2004A)/1-4 (PEL2002A).	
Query Syntax	:MEASure:ALLVoltage? <aard>	
Query Parameter	<aard> 1 unit = 1 volt	
	CH1,CH2,CH3,CH4, CH5,CH6,CH7,CH8	Returns all the voltage values from all the channels, 1-8(PEL-2004A)/ 1-4(PEL-2002A).
Query Example	:MEAS:ALLV?	Channel 1 and 2 have voltages of 2.5 and 3 volts respectively. Channels 3-6 and 8 have no voltage and channel 7 is 5.5 volts
	2.5000, 3.0000, 0.0000, 0.0000, 0.0000, 0.0000, 5.500, 0.0000	

:MEASure:ALLCurrent?

All Channel Command

Description	This query returns the current measured of all the load modules/channels in order from 1-8 (PEL-2004A)/1-4 (PEL2002A).
Query Syntax	:MEASure:ALLCurrent? <aard>

Query Parameter	<aard> 1 unit = 1 amp CH1,CH2,CH3,CH4, CH5,CH6,CH7,CH8	Returns all the current values from all the channels, 1-8(PEL-2004A)/1-4(PEL-2002A).
Query Example	:MEAS:ALLC? 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 1.2000, 3.5600	Channels 1 to 6 have no current. Channels 7 & 8 have 1.2 and 3.56 amps, respectively.

:MEASure:ALLPower?

All Channel Command

Description	This query returns the power measured of all the load modules/channels in order from 1-8 (PEL-2004A)/1-4 (PEL2002A).
Query Syntax	:MEASure:ALLPower? <aard>

Query Parameter	<aard> 1 unit = 1 watt CH1,CH2,CH3,CH4, CH5,CH6,CH7,CH8	Returns all the power values from all the channels, 1-8(PEL-2004A)/ 1-4(PEL-2002A).
Query Example	:MEAS:ALLP? 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 1.5000, 3.2000	Channels 1 to 6 have no power. Channels 7 & 8 have 1.5 and 3.2 watts, respectively.

MODE Subsystem

:MODE		Channel Specific Command
Description	This command sets the operating mode of the specific channel. Some modes are load module dependent.	
Syntax	:MODE {CCL|CCH|CCDL|CCDH|CRL|CRH|CRDL|CRDH|CPL|CPH|CVL|CVH}	
Parameter	CCL	CC static mode, low range
	CCH	CC static mode, high range
	CCDL	CC dynamic mode, low range
	CCDH	CC dynamic mode, high range
	CRL	CR static mode, low range
	CRH	CR static mode, high range
	CRDL	CR dynamic mode, low range
	CRDH	CR dynamic mode, high range
	CPL	CP static mode, low range
	CPH	CP static mode, high range
	CVL	CV static mode, low range
	CVH	CV static mode, High range
Example	:MODE CCL	Set the specific channel to low range constant current static mode.
Query Syntax	:MODE?	
Return Parameter	CCL	CC static mode, low range
	CCH	CC static mode, high range
	CCDL	CC dynamic mode, low range
	CCDH	CC dynamic mode, high range
	CRL	CR static mode, low range

	CRH	CR static mode, high range
	CRDL	CR dynamic mode, low range
	CRDH	CR dynamic mode, high range
	CPL	CP static mode, low range
	CPH	CP static mode, high range
	CVL	CV static mode, low range
	CVH	CV static mode, High range
Query Example	:MODE? CCH	The specific channel is currently set to CC static mode, high range.

OCP Test Automation Commands

:OCP:EDIT:CHANnel?

Channel Specific Command

Description	Sets or queries which channel is used to apply the OCP Test Automation parameters. Also see page 118 for setting the active channel.	
Syntax	:OCP:EDIT:CHANnel <NR1>	
Parameter	<NR1> 1-8	
Example	:OCP:EDIT:CHAN 1	Sets channel 1 as the chosen channel.
Query Syntax	:OCP:EDIT:CHANnel?	
Return Parameter	<NR1> 1-8	
Query Example	:OCP:EDIT:CHAN? 1	Channel 1 is the chosen channel.

:OCP:CHANnel:RANGe

Channel Specific Command

Description	Sets or queries the channel range. High (CC Mode High) or Low(CC Mode Low)	
Syntax	:OCP:CHANnel:RANGe{LOW|0|HIGH|1}	
Parameter	LOW/0	CC Mode Low range
	HIGH/1	CC Mode High range
Example	:OCP:CHAN:RANG 0	Sets the range to LOW.
Query Syntax	:OCP:CHANnel:RANGe?	
Return Parameter	0	CC Mode Low range
	1	CC Mode High range
Query Example	:OCP:CHAN:RANG? 0	The range is CC Mode Low.

:OCP:CHANnel:STARt

Channel Specific Command

Description	Sets or queries the starting current value.	
Syntax	:OCP:CHANnel:STARt {<NRf>[A]|MIN|MAX}	
Parameter	<NRF>[A]	The current value in Amps.
	MAX	The maximum current value.
	MIN	The minimum current value.
Example	:OCP:CHAN:STAR MIN	Set the start current to the minimum.
Query Syntax	:OCP:CHANnel:STARt?[MIN|MAX]	
Return Parameter	<NR2>	Returns the starting current in Amps.
Query Example	:OCP:CHAN:STAR? MIN 1.5	Returns the minimum starting current.

:OCP:CHANnel:END

Channel Specific Command

Description	Sets the ending current value for the test. The value must be higher than the DUT OCP value.	
Syntax	:OCP:CHANnel:END{<NRf>[A]|MIN|MAX}	
Parameter	<NRF>[A]	The current value in Amps.
	MAX	The maximum current value.
	MIN	The minimum current value.
Example	:OCP:CHAN:END MIN	Set the ending current to the minimum.
Query Syntax	:OCP:CHANnel:END?	
Return Parameter	<NR2>	Returns the ending current in Amps.
Query Example	:OCP:CHAN:END? 10.0	Returns the ending current.

:OCP:CHANnel:STEP:CURRent

Channel Specific Command

Description	Sets the current step resolution for the OCP Test Automation.	
Syntax	:OCP:CHANnel:STEP:CURRent {<NRf>[A]|MIN|MAX}	
Parameter	<NRF>[A]	The current value in Amps.
	MAX	The maximum current value.
	MIN	The minimum current value.
Example	:OCP:CHAN:STEP :CURRent MIN	Set the step resolution to the minimum value.
Query Syntax	:OCP:CHANnel:STEP:CURRent?	
Return Parameter	<NR2>	Returns the current step resolution in Amps.
Query Example	:OCP:CHAN:STEP:CURR? 0.5	Returns the step resolution.

:OCP:CHANnel:LAST

Channel Specific Command

Description	Queries or sets the current value for after the DUT OCP protection has been activated.	
Syntax	:OCP:CHANnel:LAST {<NRf>[A]|MIN|MAX}	
Parameter	<NRF>[A]	The current value in Amps.
	MAX	The maximum current value.
	MIN	The minimum current value.
Example	:OCP:CHAN:LAST MAX	Set the current value to the maximum value.
Query Syntax	:OCP:CHANnel:LAST?	
Return Parameter	<NR2>	Returns the current value in Amps.
Query Example	:OCP:CHAN:LAST? 3.0	Returns the current value.

:OCP:CHANnel:STEP:TIME

Channel Specific Command

Description	Queries or sets how long the step time is for the OCP Test Automation.	
Syntax	:OCP:CHANnel:STEP:TIME {<NRf>[S]|MIN|MAX}	
Parameter	<NRF>[S]	The step time in seconds (50mS~1600S).
	MAX	The maximum step time.
	MIN	The minimum step time.
Example	:OCP:CHAN:STEP:TIME MIN	Set the step time to the maximum value.
Query Syntax	:OCP:CHANnel:STEP:TIME?	
Return Parameter	<NR2>	Returns the step time in seconds.
Query Example	:OCP:CHAN:STEP:TIME? 10.0	Returns the step time.

:OCP:CHANnel:DELay

Channel Specific Command

Description	Queries or sets the test delay time for the OCP Test Automation function.	
Syntax	:OCP:CHANnel:DELay {<NRf>[S]|MIN|MAX}	
Parameter	<NRF>[S]	The delay time in seconds (5mS~160S).
	MAX	The maximum delay time.
	MIN	The minimum delay time.
Example	:OCP:CHAN:DEL MAX	Set the delay time to the maximum value.
Query Syntax	:OCP:CHANnel:DELay?	
Return Parameter	<NR2>	Returns the delay time in seconds.
Query Example	:OCP:CHAN:DEL? 5.0	Returns the delay time.

:OCP:CHANnel:TRIGger

Channel Specific Command

Description	Queries or sets the voltage trigger for when the power supply OCP has been triggered.	
Syntax	:OCP:CHANnel:TRIGger {<NRf>[V]|MIN|MAX}	
Parameter	<NRF>[V]	The trigger voltage level.
	MAX	The maximum trigger voltage.
	MIN	The minimum trigger voltage.
Example	:OCP:CHAN:TRIG MAX	Set the trigger voltage level to the maximum value.
Query Syntax	:OCP:CHANnel:TRIGger?	
Return Parameter	<NR2>	Returns the trigger voltage level in volts.
Query Example	:OCP:CHAN:TRIG? 5.0	Returns the trigger level.

:OCP:CHANnel:ACTive

Channel Specific Command

Description	Queries or sets which bit(s) are the active channel for the OCP Test Automation function. More than one channel can be activated based on the bit weight of the parameter.
Syntax	:OCP:CHANnel:ACTive{<NR1>0~255}

Parameter

<NR1> (BIT WEIGHT)	Channel number	<NR1> (BIT WEIGHT)	Channel number
1	1	16	5
2	2	32	6
4	3	64	7
8	4	128	8

Example	:OCP:CHAN:ACT 3 Activates channel 1 and 2.
Query Syntax	:OCP:CHANnel:ACTive?

Return Parameter

<NR1> (BIT WEIGHT)	Channel number	<NR1> (BIT WEIGHT)	Channel number
1	1	16	5
2	2	32	6
4	3	64	7
8	4	128	8

Query Example	:OCP:CHAN:ACT? 8 Returns channel 4 as the active channel.

:OCP:STATus?

Query

Description	Queries the status of the OCP Test Automation function. Queries which bit(s) are the status of channel for the OCP Test Automation function. More than one channel can be query based on the bit weight of the parameter.

Query Syntax	:OCP:STATus?{<NR1>0~255}			
Return Parameter	<NR1> (BIT WEIGHT)	Channel number	<NR1> (BIT WEIGHT)	Channel number
	1	1	16	5
	2	2	32	6
	4	3	64	7
	8	4	128	8
Query Example	:OCP:STAT? 1	The test has ended		

:OCP:SAVE

Channel Specific Command

Description	Saves the current COP Test Automation parameters.
Syntax	:OCP:SAVE

:OCP:RESult?

Query

Description	Returns the OCP Test Automation results.	
Query Syntax	:OCP:RESult?	
Query Example	:OCP:RES? Ch1 OCP Voltage, Ch1 OCP Current, Ch2 OCP Voltage, Ch2 OCP Current, Ch3 OCP Voltage, Ch3 OCP Current, Ch4 OCP Voltage, Ch4 OCP Current, Ch5 OCP Voltage, Ch5 OCP Current, Ch6 OCP Voltage, Ch6 OCP Current, Ch7 OCP Voltage, Ch7 OCP Current, Ch8 OCP Voltage, Ch8 OCP Current	This is an example of the results that are returned for the PEL-2004A.

:OCP:RUN Command

Description	Turns the OCP Test Automation function on or off.	
Syntax	:OCP:RUN { 0 | OFF| 1 | ON }	
Parameter	0/OFF	Turn off.
	1/ON	Turn on.
Example	:OCP:RUN OFF	Turn the test off.

:OCP:KEEP Command

Description	Sets or queries how long the keep time is for the OCP Test Automation.	
Syntax	:OCP:CHANnel:KEEP{<NRF>[S]|MIN|MAX}	
Parameter	<NRF>[S]	The keep time in seconds (0S~160S).
	MaX	The maximum keep time.
	MIN	The minimum keep time.
Example	OCP:KEEP :MAX 160	Set the step time to the maximum value.
Query Syntax	:OCP:KEEP?	
Return Parameter	<NR2>	Keep the step time in seconds.
Query Example	OCP:KEEP? 5.0	Keep the step time.

Program Subsystem

:PROGram:STATe

Program Number Specific

Description	Sets or queries the state of the program function.	
Syntax	:PROGram:STATe {ON|OFF|PAUSE|CONTINUE|NEXT}	
Query Syntax	:PROGram:STATe? {ON,STOP|ON,PAUSE|ON, RUN|OFF}	
Parameter	ON	Turn program on. The command ":RUN" can be used to active the program. And, the command ":ABORt" can be used to abort the program.
	OFF	Turn program off. The system will return back to normal operation.

	PAUSE	Program pause. This command is available for any mode on sequence mode of program.
	NEXT	Next step in the program. This command is available only for the current sequence mode of program set to manual and the execution time of current sequence is out.
	CONTINUE	Program continue. This command is available for any mode of the program sequence under "PAUSE" event.
Return Parameter	ON, STOP	Program is on, stopped
	ON, PAUSE	Program is paused
	ON, RUN	Program is running
	OFF	Program is off
Example	:PROGram:STATe ON Turns "Program" on.	
Query example	:PROGram:STATe? >OFF "Program" is off.	

:PROGram:FILE

Program Number Specific

Description	Sets the program number.	
Syntax	:PROGram:FILE <NR1>	
Parameter	<NR1>	Program number
	1~12	Number 1~12
Example	:PROG:FILE 5	Sets the program number to 5.
Query Syntax	:PROGram:FILE?	
Return Parameter	<NR1>	Mainframe Scanning

	1-12	Returns the current program number
Query Example	:PROG:FILE? 5	The set program number is 5.

:PROGram:SEQuence

Program Number Specific

Description	Sets the Sequence number for the current program number.	
Syntax	:PROGram:SEQuence <NR1>	
Parameter	<NR1>	Sequence number
	1~10	Number 1~10
Example	:PROG:SEQ 1	Sets the sequence number to 1 for the current program number.
Query Syntax	:PROGram:SEQuence?	
Return Parameter	<NR1>	Mainframe Scanning
	1-10	Returns the current sequence number
Query Example	:PROG:SEQ? 1	The set sequence number is 1.

:PROGram:MEMory

Program Number Specific

Description	Sets the memory number used for the current program/sequence.	
Syntax	:PROGram:MEMory <NR1>	
Parameter	<NR1>	Memory number
	1~120	Number 1~120
Example	:PROG:MEM 1	Sets the memory number to 001.
Query Syntax	:PROGram:MEMory?	
Return Parameter	<NR1>	Mainframe Scanning
	1-120	Returns the current program number

Query Example	:PROG:MEM? 1	The memory number for the current program/sequence is 001.

:PROGram:SEQuence:SHORt:CHANnel

Program Number Specific

Description	Simulates short circuits for load channels for the current sequence number.			
Syntax	:PROGram:SEQuence:SHORt:CHANnel<NR1>			
Parameter	<NR1> (BIT WEIGHT)	Channel number	<NR1> (BIT WEIGHT)	Channel number
	1	1	16	5
	2	2	32	6
	4	3	64	7
	8	4	128	8
Example	:PROG:SEQ:SHOR:CHAN 12		Simulates a short circuit for channels 3 and 4.	
Query Syntax	:PROGram:SEQuence:SHORt:CHANnel?<NR1>			
Return Parameter	<NR1> (BIT WEIGHT)	Short Channel number	<NR1> (BIT WEIGHT)	Short Channel number
	1	1	16	5
	2	2	32	6
	4	3	64	7
	8	4	128	8
Query Example	:PROG:SEQ:SHOR:CHAN? 12		Returns channels 3 and 4 are set as shorted for the program sequence.	

:PROGram:SEQuence:SHORt:TIME

Program Number Specific

Description	Sets the short time (seconds) for the current program sequence.

Syntax	:PROGram:SEQuence:SHORt:TIME<NRf>[S]	
Parameter	<NRf>[S]	Short Time
	0.0	0 seconds = OFF
	0.1~60	0.1~60 seconds
	0.1~60S	0.1~60 seconds
⚠ Note	The short time value must equal to or small than on time setting value.	
Example	:PROG:SEQ:SHOR:TIME 0.5	The short time for the program sequence is set to .5 seconds
Query Syntax	:PROGram:SEQuence:SHORt:TIME? <NR2>	
Return Parameter	<NR2> 1 unit = 1 second	Short Time
	0.0~60	Returns the short time for the program sequence.
Query Example	:PROG:SEQ:SHOR:TIME?	The short time for the program sequence is 5 seconds.
	5	

:PROGram:SEQuence:MODE

Program Number Specific

Description	Sets the program sequence to Auto, Manual or Skip mode.	
Syntax	:PROGram:SEQuence:MODE{MANUAL|AUTO|SKIP}	
Parameter	MANUAL	Manual mode: program sequence is run manually
	AUTO	Auto mode: program sequence is run automatically
	SKIP	Skip mode: current program sequence is skipped.

Example	:PROG:SEQ:MODE AUTO	The current program sequence is set to Automatic mode.
Query Syntax	:PROGram:SEQuence:MODE?	
Return Parameter	MANUAL	Manual mode: program sequence is run manually under this mode. User may use the command ":PROG:STAT NET" to execute the next program sequence.
	AUTO	Auto mode
	SKIP	Skip mode
Query Example	:PROG:SEQ:MODE? AUTO	The current program sequence is set to AUTO.

:PROGram:ACTive

Program Number Specific

Description	Activates or selects the active load modules.			
Syntax	:PROGram:ACTive <NR1>			
Parameter	<NR1> (BIT WEIGHT)	Active Channel	<NR1> (BIT WEIGHT)	Active Channel
	1	1	16	5
	2	2	32	6
	4	3	64	7
	8	4	128	8
Example	:PROG:ACT 4		Activates channel three.	
Query Syntax	:PROGram:ACTive? <NR1>			
Return Parameter	<NR1> (BIT WEIGHT)	Active Channel	<NR1> (BIT WEIGHT)	Active Channel
	1	1	16	5
	2	2	32	6
	4	3	64	7

	8	4	128	8
Query Example	:PROG:ACT? 12	Channels 3 and 4 are active.		

:PROGram:CHAin

Program Number Specific

Description	Chains the current program number to a specified program number.	
Syntax	:PROGram:CHAin <NR1>	
Parameter	<NR1>	Program
	1-12	1-12
	0	No chain/End chain
Example	:PROG:CHA 6	Chains the current program number to program number 6
Query Syntax	:PROGram:CHAin? <NR1>	
Return Parameter	<NR1>	Program
	1-12	1-12
	0	No chain/End chain
Query Example	:PROG:CHA? 6	Returns the program number the current program is chained to.

:PROGram:ONTime

Program Number Specific

Description	Sets the on-time for the program number. 0.1~60 seconds.	
Syntax	:PROGram:ONTime <NRf>[S]	
Parameter	<NRf>[S]	Program On Time
	0.1-60	0.1~60 seconds
	0.1-60s	0.1~60 seconds
Example	:PROG:ONT 10S	Set the on-time for the current program number to 10 seconds.

Query Syntax	:PROGram:ONTime? <NR2>	
Return Parameter	<NR2>	Program On Time
	0.1-60	0.1~60 seconds
Query Example	:PROG:ONT?	Returns the on-time for the current program number in seconds.
	10	

:PROGram:OFFTime

Program Number Specific

Description	Sets the off-time for the program number. 0.1~60 seconds.	
Syntax	:PROGram:OFFTime <NRf>[S]	
Parameter	<NRf>[S]	Program Off Time
	0.0	0 seconds = OFF
	0.1~60	0.1~60 seconds
	0.1~60S	0.1~60 seconds
Example	:PROG:OFFT 10S	Set the off-time for the current program number to 10 seconds.
Query Syntax	:PROGram:OFFTime? <NR2>	
Return Parameter	<NR2> I unit = 1 second	Program Off Time
	0.0~60	0.0~60 seconds
Query Example	:PROG:OFFT?	Returns the off-time for the current program number in seconds.
	10	

:PROGram:RUN

All Channel Command

Description	Runs the current program number when set to on, and when set to off will allow all the program/ sequence data to be programmed.	
Syntax	:PROGram:RUN {OFF|0|ON|1}	
Parameter	OFF/0	OFF
	ON/1	ON

Example	:PROG:RUN 1	Runs the program.

:PROGram:SAVE

All Channel Command

Description	Saves the current program to memory.
Syntax	:PROGram:SAVE
Example	:PROG:SAVE Saves the program to memory.

:PROGram:PFTime

Program Number Specific

Description	Sets the P/F-Time (pass/fail time) for the current program sequence in seconds.	
Syntax	:PROGram:PFTime <NRf>[S]	
Parameter	<NRf>[S]	P/F Time
	0.0	0 seconds = OFF
	0.1~119.9	0.1~119.9 seconds
	0.1~119.9S	0.1~119.9 seconds
Example	:PROG:PFT 0.5	Sets the P/F-Time to .5 seconds
Query Syntax	:PROGram:PFTime? <NR2>	
Return Parameter	<NR2> 1 unit = 1 second	Short Time
	0.0~119.9	Returns the P/F-Time for the program sequence.
Query Example	:PROG:PFTime? 5	The P/F-Time is 5 seconds.

:PROGram:CHAin:STARt

Program Number Specific

Description	Sets or queries which program number is used as the "start" program in a program chain.	
Syntax	:PROGram:CHAin:STARt<NR1>	
Parameter	<NR1>	Program number

	1-12	1~12
Example	:PROG:CHA:STAR 1	Set program #1 to start the chain.
Query Syntax	:PROGram:CHAin:STARt?<NR1>	
Return Parameter	<NR1>	Program number
	1-12	1~12
Query Example	:PROG:CHA:STAR? 5	Program #5 starts the chain.

Resistance Subsystem

:RESistance[:STATic]:L1/L2

Channel Specific Command

Description	Sets A/B Value for constant resistance mode, where L1 is A Value and L2 is B Value. This command only applies to current mode (static). When setting the A/B value, the device will be switched to CR mode by using this command.	
Syntax	:RESistance[:STATic]:L1/L2<NRf+>[OHM]	
Parameter	NRf+[OHM]	Resistance
	L1 10	Sets A Value to 10 ohms

	L2 20	Sets B Value* to 20 ohms *Single Channel
	L1 MIN	Sets A Value to the minimum level for the specific channel.
	L1 MAX	Sets A Value to the maximum level for the specific channel.
Example	:RES:L1 10	Sets CR static mode A Value to 10 ohms, depending on the specific range
Query Syntax	:RESistance[:STATic]:L1/L2? [MAX|MIN]	
Return Parameter	<NR2> [MAX|MIN]	Resistance
	1 unit = 1 ohm	Returns the resistance of the A or B Value.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:RES:L1? MAX 300	Returns the maximum resistance allowed for the channel. (PEL-2020A(B))

:RESistance[:STATic]:RISE/FALL

Channel Specific Command

Description	Sets the rising/falling slew rate for CR mode. The command applies to the current mode (static/dynamic) and the current range (High/Low). When setting the A/B value, the device will be switched to CR mode by using this command.	
Syntax	:RESistance[:STATic]:RISE/FALL <NRf+>[A/uS]	
Parameter	<NRf+>[A/uS]	Slew rate
	RISE/FALL 0.8A/uS	Sets the rising/ falling slew rate to 0.8A/uS
	RISE/FALL .8	Sets the rising/ falling slew rate to 0.8A/uS

	RISE/FALL MIN	Sets to the slowest rising/ falling slew rate.
	RISE/FALL MAX	Sets to the fastest rising/ falling slew rate.
Example	:RES:RISE 0.1	Sets the rising slew rate to 0.1A/uS.
Query Syntax	:RESistance:RISE/FALL? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Slew rate
	1 Unit = 1 amp/uS	Returns the slew rate.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:RES:RISE? MAX 0.8000	Returns the maximum value for the rising slew rate (0.8 A/uS).

:RESistance:STATic:RECall

Channel Specific Command

Description	Sets or queries whether A Value or B Value is the currently active value in CR static mode.	
Syntax	:RESistance:STATic:RECall {A|0|B|1}	
Parameter	A/0	A
	B/1	B
Example	:RES:STAT:REC 1	Makes B Value the active value.
Query Syntax	:RES:STATic:RECall?	
Return Parameter	<NR1>	Value
	0	A
	1	B

:RESistance:STATic:LOW:AVALue/BVALue

Channel Specific Command

Description	Sets the low range A/B Value for constant resistance static mode.

Syntax	:RESistance:STATic:LOW:AVALue/BVALue <NRf+>[OHM]	
Parameter	NRf+[OHM]	Resistance
	AVALue 10	Sets A Value to 10 ohms. (Low range only)
	BVALue 20	Sets B Value to 20 ohms. (Low range only)
	AVALue MIN	Sets A Value to the minimum level for the specific channel.
	AVALue MAX	Sets A Value to the maximum level for the specific channel.
Example	:RES:STAT:LOW:BVAL 10	Sets low range CR static mode B Value to 10 ohms.
Query Syntax	:RESistance:STATic:LOW:AVALue/BVALue?	
Return Parameter	<NR2> [MAX|MIN]	Resistance
	1 unit = 1 ohm	Returns the resistance of the A or B Value.
Query Example	:RES:STAT:LOW:AVAL? MAX 300	Returns the maximum resistance allowed for the channel. (PEL-2020A(B))

:RESistance:STATic:LOW:RISE/FALL

Channel Specific Command

Description	Sets the low range rising/falling slew rate.	
Syntax	:RESistance:STATic:LOW:RISE/FALL<NRf+>[A/uS]	
Parameter	<NRf+>[A/uS]	Slew rate
	RISE/FALL 0.8A/uS	Sets the rising/ falling slew rate to 0.8A/uS
	RISE/FALL .8	Sets the rising/ falling slew rate to 0.8A/uS
	RISE/FALL MIN	Sets to the slowest rising/ falling slew rate.

	RISE/FALL MAX	Sets to the fastest rising/ falling slew rate.
Example	:RES:STAT:LOW:RISE 0.1	Sets the rising slew rate to 0.1A/uS.
Query Syntax	:RESistance:STATic:LOW:RISE/FALL?[MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Slew rate
	1 Unit =1 amp/uS	Returns the slew rate.
	MAX, MIN	Returns the allowable maximum and minimum.
Query Example	:RES:STAT:LOW:RISE? MAX 0.8000	For low range CR mode, the maximum value for the rising slew rate is 0.8 A/uS for the specific channel.

:RESistance:STATic:HIGH:AVALue/BVALue

Channel Specific Command

Description	Sets the high range A/B Value for constant resistance static mode.	
Syntax	:RESistance:STATic:HIGH:AVALue/BVALue <NRf+>[OHM]	
Parameter	NRf+[OHM]	
	AVALue 10	Sets A Value to 10 ohms. (high range only)
	BVALue 20OHM	Sets B Value to 20 ohms. (high range only)
	AVALue MIN	Sets A Value to the minimum level for the specific channel.
	AVALue MAX	Sets A Value to the maximum level for the specific channel.
Example	:RES:STAT:HIGH:BVAL 10	Sets high range CR static mode B Value to 10 ohms.

Query Syntax	:RESistance:STATic:HIGH:AVALue/BVALue? [MAX|MIN]	
Return Parameter	<NR2> [MAX|MIN]	Resistance
	1 unit= 1 ohm	Returns the resistance of the A or B Value.
Query Example	:RES:STAT:HIGH:BVAL? MAX 15000.0	Returns the maximum resistance allowed for the channel for B Value. (PEL-2020A(B))

:RESistance:STATic:HIGH:RISE/FALL

Channel Specific Command

Description	Sets the high range rising/falling slew rate.	
Syntax	:RESistance:STATic:HIGH:RISE/FALL<NRf+>[A/uS]	
Parameter	<NRf+>[A/uS]	Slew rate
	RISE/FALL 0.8A/uS	Sets the rising/ falling slew rate to 0.8A/uS
	RISE/FALL 0.5	Sets the rising/ falling slew rate to 0.5A/uS
	RISE/FALL MIN	Sets to the slowest rising/ falling slew rate.
	RISE/FALL MAX	Sets to the fastest rising/ falling slew rate.
Example	:RES:STAT:HIGH:RISE 1.1	Sets the rising slew rate to 1.1A/uS.
Query Syntax	:RESistance:STATic:HIGH:RISE/FALL?[MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Slew rate
	1 Unit=1 amp/uS	Returns the slew rate.
	MAX/MIN	Returns the allowable maximum and minimum.

Query Example	:RES:STAT:HIGH:RISE? MIN 0.8000	For high range CR mode, the minimum value for the rising slew rate is 0.8 A/uS for the specific channel.

:RESistance:DYNamic:L1/L2

Channel Specific Command

Description	Sets the current levels (Level 1 & 2) for CR dynamic mode. When setting the A/B value, the device will be switched to CRD mode by using this command.	
Syntax	:RESistance:DYNamic:L1/L2 <NRf+>[OHM]	
Parameter	NRf+[OHM]	Resistance
	L1 1	Sets L1 to 1 ohms.
	L2 2	Sets L2 to 2 ohms.
	L2 2A	Sets L2 to 2 ohms.
	L1/L2 MIN	Sets L1 or L2 to the minimum level for the specific channel.
	L1/L2 MAX	Sets L1 or L2 to the maximum level for the specific channel.
Example	:RES:DYN:L1 10	In CR dynamic mode, Set L1 (level 1) to 10 ohms.
Query Syntax	:RESistance:DYNamic:L1/L2?[MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Resistance
	MAX/MIN	Returns the allowable maximum and minimum
	1 unit = 1 ohm	Returns the current of L1/L2, or the maximum or minimum current allowed.
Query Example	:RES:DYN:L2? 2.0400	Returns current for the specific channel.

:RESistance:DYNamic:RISE/FALL

Channel Specific Command

Description	Sets the rising/falling slew rate for CR dynamic mode for the specific channel and range. When setting the A/B value, the device will be switched to CRD mode by using this command.	
Syntax	:RESistance:DYNamic:RISE/FALL<NRf+>[A/uS]	
Parameter	<NRf+>[A/uS]	Slew Rate
	RISE/FALL 0.8A/uS	Sets the rising/ falling slew rate to 0.8A/uS
	RISE/FALL 1	Sets the rising/ falling slew rate to 1A/uS
	RISE/FALL MIN	Sets to the slowest rising/ falling slew rate.
	RISE/FALL MAX	Sets to the fastest rising/ falling slew rate.
Example	:RES:DYNA:RISE 1.1	Sets the rising slew rate to 1.1A/uS.
Query Syntax	:RESistance:DYNamic:RISE/FALL? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Slew rate
	1 Unit =1 amp/uS	Returns the slew rate.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:RES:DYN:FALL? MIN 0.0003	Shows the minimum allowable value for the falling slew rate as 0.0003 A/uS for the specific channel.

:RESistance:DYNamic:T1/T2

Channel Specific Command

Description	Sets the timers T1 or T2 for CR dynamic mode for the specific channel and range. When setting the A/B value, the device will be switched to CRD mode by using this command.	
Syntax	:RESistance:DYNamic:T1/T2<NRf+>[S|ms]	
Parameter	<NRf+>[S]	Time
	T1/T2 0.1S	Sets the T1/T2 time to 0.1 seconds.
	T1/T2 1	Sets the T1/T2 time to 1 second.
	T1/T2 MIN	Sets the T1/T2 time to the minimum value.
	T1/T2 MAX	Sets the T1/T2 time to the maximum value.
Example	:RES:DYN:T1 .1S	Sets the T1 time to 100 milliseconds for the specific channel.
Query Syntax	:RESistance:DYNamic:T1/T2?[MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Time
	1 unit = 1 second	Returns the T1/T2 time.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:RES:DYN:T1? 2.5	Returns the T1 time of 2.5 seconds.
	:RES:DYN:T1? MIN 0.000025	Returns the minimum T1 time allowable for the specific channel and range.

:RESistance:DYNamic:LOW:L1/L2

Channel Specific Command

Description	Sets the low range resistance levels (Level 1 & 2) for CR dynamic mode.	
Syntax	:RESistance:DYNamic:LOW:L1/L2 <NRf+>[OHM]	
Parameter	NRf+[OHM]	Ohms
	L1 10	Sets L1 to 10 ohms. (low range only)
	L2 20OHM	Sets L2 to 20 ohms. (low range only)
	L1/L2 MIN	Sets L1 or L2 to the minimum level for the specific channel.
	L1/L2 MAX	Sets L1 or L2 to the maximum level for the specific channel.
Example	:RES:DYN:LOW:L1 10	In low range CR dynamic mode, Set L1 (level 1) to 10 ohms.
Query Syntax	:RESistance:DYNamic:LOW:L1/L2?[MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Resistance
	1 unit = 1 ohm	Returns the resistance of L1/L2.
Query Example	:RES:DYN:LOW:L2? MAX 300	Returns the maximum resistance allowed for the channel. (PEL-2020A(B))

:RESistance:DYNamic:LOW:RISE/FALL

Channel Specific Command

Description	Sets the low range rising/falling slew rate for CR dynamic mode for the specific channel.	
Syntax	:RESistance:DYNamic:LOW:RISE/FALL <NRf+>[A/uS]	
Parameter	<NRf+>[A/uS]	Slew Rate

	RISE/FALL 0.8A/uS	Sets the rising/falling slew rate to 0.8A/uS
	RISE/FALL .1	Sets the rising/falling slew rate to 0.1A/uS
	RISE/FALL MIN	Sets to the slowest rising/falling slew rate.
	RISE/FALL MAX	Sets to the fastest rising/falling slew rate.
Example	:RES:DYNA:LOW:RISE 0.1	Sets the rising slew rate to ~ 0.1A/uS.
Query Syntax	:RESistance:DYNamic:LOW:RISE/FALL? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Slew rate
	1 Unit =1 amp/uS	Returns the slew rate.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:RES:DYN:LOW:FALL? MIN 0.8000	For low range dynamic CR mode, the minimum value for the falling slew rate is 0.8 A/uS for the specific channel.

:RESistance:DYNamic:LOW:T1/T2

Channel Specific Command

Description	Sets the timers T1 or T2 for CR dynamic mode for the specific channel in low range.	
Syntax	:RESistance:DYNamic:LOW:T1/T2<NRf+>[S|ms]	
Parameter	<NRf+>[S]	Time T1/T2
	T1/T2 0.1S	Sets the T1/T2 time to 0.1 seconds.
	T1/T2 1	Sets the T1/T2 time to 1 second.
	T1/T2 MIN	Sets the T1/T2 time to the minimum value.

	T1/T2 MAX	Sets the T1/T2 time to the maximum value.
Example	:RES:DYNA:LOW:T1 10S	Sets the T1 time to 10 seconds for the specific channel.
Query Syntax	:RESistance:DYNamic:T1/T2? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Time T1/T2
	1 Unit =1 second	Returns T1/T2 time.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:RES:DYN:LOW:T1? 2.5	Returns the T1 time of 2.5 seconds.
	:CURR:DYN:LOW:T1? MIN 0.000025	Returns the minimum T1 time allowable for the specific channel.

:RESistance:DYNamic:HIGH:L1/L2

Channel Specific Command

Description	Sets the high range resistance levels (Level 1 & 2) for CR dynamic mode.	
Syntax	:RESistance:DYNamic:HIGH:L1/L2 <NRf+>[OHM]	
Parameter	NRf+[OHM]	Resistance
	L1 10	Sets L1 to 10 ohms. (high range only)
	L2 20OHM	Sets L2 to 20 ohms. (high range only)
	L1/L2 MIN	Sets L1 or L2 to the minimum level for the specific channel.
	L1/L2 MAX	Sets L1 or L2 to the maximum level for the specific channel.

Example	:RES:DYN:HIGH:L1 10	In high range CR dynamic mode, Set L1 (level 1) to 10 ohms.
Query Syntax	:RESistance:DYNamic:HIGH:L1/L2? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Resistance
	1 unit = 1 ohm	Returns the resistance of Level 1/ 2 (L1/L2).
Query Example	:RES:DYN:HIGH:L2? MAX 15000.0	Returns the maximum resistance allowed for the channel. (PEL-2020A(B))

:RESistance:DYNamic:HIGH:RISE/FALL

Channel Specific Command

Description	Sets the high range rising/falling slew rate for CR dynamic mode for the specific channel.	
Syntax	:RESistance:DYNamic:HIGH:RISE/FALL <NRf+>[A/uS]	
Parameter	<NRf+>[A/uS]	Slew Rate
	RISE/FALL 0.8A/uS	Sets the rising/falling slew rate to 0.8A/uS
	RISE/FALL 1	Sets the rising/falling slew rate to 1A/uS
	RISE/FALL MIN	Sets to the slowest rising/falling slew rate.
	RISE/FALL MAX	Sets to the fastest rising/falling slew rate.
Example	:RES:DYN:HIGH:RISE 1.1	Sets the rising slew rate to 1.1A/uS.
Query Syntax	:RESistance:DYNamic:HIGH:FALL? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	Slew rate
	1 Unit =1 amp/uS	Returns the slew rate.

	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:RES:DYN:HIGH:FALL? MAX 0.8000	For high range dynamic CR mode, the minimum value for the falling slew rate is 0.8 A/uS for the specific channel.

:RESistance:DYNamic:HIGH:T1/T2

Channel Specific Command

Description	Sets the timers T1 and T2 for high range dynamic CR mode.	
Syntax	:RESistance:DYNamic:HIGH:T1/T2 <NRf+>[S|ms]	
Parameter	<NRf+>[S]	Timer T1/T2
	T1/T2 0.1S	Sets the T1/T2 time to 0.1 seconds.
	T1/T2 1	Sets the T1/T2 time to 1 second.
	T1/T2 MIN	Sets the T1/T2 time to the minimum value.
	T1/T2 MAX	Sets the T1/T2 time to the maximum value.
Example	:RES:DYNA:HIGH:T1 10S	Sets the high range T1 time to 10 seconds for the specific channel.
Query Syntax	:RESistance:DYNamic:HIGH:T1/T2? [MIN|MAX]	
Return Parameter	<NR2> [MAX|MIN]	T1/T2 time.
	1 Unit =1 second	Returns T1/T2 time.
	MAX/MIN	Returns the allowable maximum and minimum.

Query Example	:RES:DYN:HIGH:T1? 2.5	Returns the T1 time of 2.5 seconds.
	:RES:DYN:LOW:T1? MIN 0.000025	Returns the minimum T1 time allowable for the specific channel.

RUN Subsystem

:RUN		All Channel Command
Description	Turns on all the electronic loads.	
Syntax	:RUN	
Example	:RUN	Turns on all electronic loads.

SHOW Subsystem

:SHOW[:DISPlay] dual channel

Channel Specific Command

(Dual channel module)

Description	Sets the display mode of the load module of the specific channel.	
Syntax	:SHOW:DISPlay {LVI|LVW|LIW|RVI|RVW|RIW|LRV|LRI|LRW|LRS|LIRV|LVRI}	
Parameter	LVI	Left channel, voltage/current
	LVW	Left channel, voltage/power
	LIW	Left channel, current/power
	RVI	Right channel, voltage/current
	RVW	Right channel, voltage/power
	RIW	Right channel, current/power
	LRV	Left and right channel voltage
	LRI	Left and right channel current
	LRW	Left and right channel power
	LRS	Left and right channel load on time
	LIRV	Left channel current, right channel voltage
	LVRI	Left channel voltage, right channel current
Example	:SHOW:DISP LVI	Show the left channel voltage and current on the load module display.

:SHOW[:DISPlay] single channel

Channel Specific Command

(Single channel module)

Description	Sets the display mode of the load module of the specific channel.	
Syntax	:SHOW:DISPlay {VI|VW|IW|S}	
Parameter	VI	Voltage/current
	VW	Voltage/power
	IW	Current/power
	S	Load on time
Example	:SHOW:DISP VI	Shows voltage and current on the load module display.

SPECIFICATION Subsystem

:SPECification:UNIT

Channel Specific Command

Description	Sets the Go/NoGo (specification) units as percentages or values.	
Syntax	:SPECification:UNIT {PERCENT|0|VALUE|1}	
Parameter	PERCENT/0	Percentages
	VALUE/1	Values
Example	:SPEC:UNIT PERCENT	Sets the Go/NoGo limits as percentages
Query Syntax	:SPECification:UNIT? <NR1>	
Return Parameter	<NR1>	Go/NoGo Unit
	0	Percent
	1	Value
Query Example	:SPEC:UNIT? 0	The Go/NoGo (specification) units are set as percent.

:SPECification[:PASS]?

Channel Specific Command

Description	Displays if the Go/NoGo (specification) limit has passed/failed for the current channel used.	
Query Syntax	:SPECification[:PASS]?	
Return Parameter	<NR1>	Go/NoGo Specification
	0	Fail
	1	Pass
Query Example	:SPEC:PASS? 0	Go/NoGo has failed
Query Example	:SPEC? 0	Go/NoGo has failed

:SPECification[:PASS]:CHANnel/ ALLChannel/VOLTage/CURRent?

Channel Specific Command

Description	Queries if the voltage, current, current channel or all channels have passed/failed the Go/NoGo (specification) limits. VOLTage→CC, CR mode, CURRent→CV, CP mode	
Query Syntax	:SPECification[:PASS]:CHANnel/ALLChannel/VOLTage/CURRent?	
Return Parameter	<NR1>	Go/NoGo Specification
	0	Fail
	1	Pass
Query Example	:SPEC:PASS:VOLT? 0	The test has exceeded the Go/NoGo voltage limits.
Query Example	:SPEC:VOLT? 0	The test has exceeded the Go/NoGo voltage limits.

:SPECification:VOLTage:H/L/C

Channel Specific Command

Description	Sets the high (H), low (L) and center (C) Go/NoGo voltage limit specifications. Applicable to CC and CR mode only. The high (H) setting value must be greater than or equal to center (C) and the center (C) setting value will be greater than or equal to low (L).	
Syntax	:SPECification:VOLTage:{H|L|C}<NRf+>[V]	
Parameter	<NRf+>[V] 1 unit = 1 volt	Go/NoGo voltage limit
	1	1 volt
	1V	1 volt
Example	:SPEC:VOLT:H 2V	Sets the Go/NoGo high voltage limit to 2 volts.
Query Syntax	:SPECification:VOLTage:{H|L|C}?	
Return Parameter	<NR2>	Go/NoGo voltage
	1 unit = 1 volt	Returns the limit voltage
Query Example	:SPEC:VOLT:H?	The voltage limit is 2 volts.
	2.000	

:SPECification:CURRent:H/L/C

Channel Specific Command

Description	Sets the high (H), low(L) and center (C) Go/NoGo current limit specifications. Applicable to CV and CP mode only. The high (H) setting value must be greater than or equal to center (C) and the center (C) setting value will be greater than or equal to low (L).	
Syntax	:SPECification:CURRent:{H|L|C}<NRf+>[A]	
Parameter	<NRf+>[A] 1 unit = 1 amp	Go/NoGo current limit
	1	1 amp
	1A	1 amp

Example	:SPEC:CURR:H 1A	Sets the Go/NoGo high current limit to 1 amp.
Query Syntax	:SPECification:CURRent:{H|L|C}?	
Return Parameter	<NR2>	Go/NoGo voltage
	1 unit = 1 amp	Returns the limit current
Query Example	:SPEC:CURR:H?	The current limit is 5.12 amps.
	5.120	

:SPECification:TEST:

Channel Specific Command

Description	Turns the Go/NoGo specification (SPEC) limits on/off.	
Syntax	:SPECification:TEST {OFF|0|ON|1}	
Parameter	OFF/0	OFF
	ON/1	ON
Example	:SPEC:TEST OFF	Turn Go/NoGo SPEC off for the specific channel.
Query Syntax	:SPECification:TEST?	
Return Parameter	<NR1>	Go/NoGo SPEC status
	0	Off
	1	On
Query Example	:SPEC:TEST?	Go/NoGo SPEC limits is on.
	1	

:SPECification:DELay

Channel Specific Command

Description	It is “Delay Time” setting and query commands.	
Syntax	:SPECification:DELay <NR2>[S]	
Parameter	<NR2>[S]	Time
	5	Set Delay time to 5 seconds.

Example	:SPECification:DELay 0.5	Set Delay time to 0.5 seconds.
Query Syntax	:SPECification:DELay?	
Return Parameter	<NR2>[S]	Time
	1unit =1 second	Set Delay time to 1 second.
Query Example	:SPECification:DELay? 1	Returns the delay time in seconds.

STATUS Subsystem

:STATus:CHANnel:CONDition?

Channel Specific Command

Description	Returns the status of the Channel Status Condition Register. The returned value is the bit weight of the Channel Status Condition Register. See page 205 for details.			
Query Syntax	:STATus:CHANnel:CONDition?<NR1>			
Return Parameter	<NR1>	Condition	<NR1>	Condition
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128~65535	Not Used
Query Example	:STAT:CHAN:COND? 3		Indicates OC and OV conditions are true.	

:STATus:CHANnel:ENABle

Channel Specific Command

Description	Sets which events are enabled in the Channel Status Enable register. The mask values are the bit weights of the Channel Status Enable Register. See page 205 for details.			
Syntax	:STATus:CHANnel:ENABle <NR1>			
Parameter	<NR1>	Event	<NR1>	Event
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128~65535	Not Used
Example	:STAT:CHAN:ENAB 12		Events OP (Bit 3) and RV (Bit 4) are enabled in the Channel Status Enable register.	
Query Syntax	:STATus:CHANnel:ENABle? <NR1>			
Return Parameter	<NR1>	Event	<NR1>	Event
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128~65535	Not Used
Query Example	:STAT:CHAN:ENAB? 4		The OP event is enabled.	

:STATus:CHANnel:EVENt?

Channel Specific Command

Description	Returns the status of the Channel Status Event register for the specific channel. The Channel Status Event register is cleared upon reading.
Query Syntax	:STATus:CHANnel:EVENt? <NR1>

Return Parameter	<NR1>	Event	<NR1>	Event
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128~65535	Not Used
Query Example	:STAT:CHAN:EVEN? 1		An over current (OC) event occurred since the last time the Channel Status Event register was read.	

:STATus:CHANnel:NTRansition/PTRansition

Channel Specific Command

Description	Determines whether a negative transition (NTR 1→0) or positive (PTR 0→1) transition in the Channel Status Condition register will set the corresponding event in the Channel Status Event register. The mask values are the bit weights of the Channel Status PTR/NTR filters. See page 205 for details.			
Syntax	:STATus:CHANnel:NTRansition/PTRansition<NR1>			
Parameter	<NR1>	Condition	<NR1>	Condition
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128~65535	Not Used
Example	:STAT:CHAN:NTR 12		OP (Bit 3) and RV (Bit 4) are set as negative transitions.	
	:STAT:CHAN:PTR 1		OC (Bit 1) is set as a positive transition.	

Query Syntax	:STATus:CHANnel:NTRansition/PTRansition?<NR1>			
Return Parameter	<NR1>	Event	<NR1>	Event
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128~65535	Not Used
Query Example	:STAT:CHAN:NTR? 4		OP is set as a negative transition.	

:STATus:CSUMmary:ENABle

Channel Specific Command

Description	Determines which channels in the Channel Summary Register group can set the CSUM bit of the Status Byte Register. The mask values are the bit weights of each corresponding channel in the Channel Summary Enable Register. See page 207 for details.			
Syntax	:STATus:CSUMmary:ENABle <NR1>			
Parameter	<NR1>	Event	<NR1>	Event
	1	CH1	16	CH5
	2	CH2	32	CH6
	4	CH3	64	CH7
	8	CH4	128	CH8
Example	:STAT:CSUM: 3		Events from channel 1 and 2 are enabled	
Query Syntax	:STATus:CSUMmary:ENABle? <NR1>			
Return Parameter	<NR1>	Event	<NR1>	Event
	1	CH1	16	CH5
	2	CH2	32	CH6
	4	CH3	64	CH7
	8	CH4	128	CH8

Query Example	:STAT:CSUM:ENAB? 4	Only the events from channel 3 can set the CSUM bit in the Status Byte Register.

:STATus:CSUMmary:EVENt?

Channel Specific Command

Description	Returns the status of the Channel Summary Event register. The Channel Summary Event register is cleared upon reading.			
Query Syntax	:STATus:CSUMmary:EVENt? <NR1>			
Return Parameter	<NR1>	Event	<NR1>	Event
	1	CH1	16	CH5
	2	CH2	32	CH6
	4	CH3	64	CH7
	8	CH4	128	CH8
Query Example	:STAT:CSUM:EVEN? 4		An event from channel 3 occurred since the last time the Channel Summary Event register was read.	

:STATus:QUEStionable:CONDition?

Channel Specific Command

Description	Returns the status of the Questionable Status Condition register for the specific channel. See page 207 for details.			
Query Syntax	:STATus:QUEStionable:CONDition? <NR1>			
Return Parameter	<NR1>	Condition	<NR1>	Condition
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128~65535	Not used

Query Example	:STAT:QUES:COND? 2	OV (overvoltage) error.

:STATus:QUEStionable:ENABle

Channel Specific Command

Description	Sets which events are enabled in the Questionable Status Enable register. The mask values are the bit weights of the events. See page 207 for details.
Syntax	:STATus:QUEStionable:ENABle <NR1>

Parameter	<NR1>	Event	<NR1>	Event
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128~65535	Not used

Example	:STAT:QUES:ENAB 12	Events OP (Bit 3) and RV (Bit 4) are enabled in the Questionable Status Enable register.
Query Syntax	:STATus:QUEStionable:ENABle? <NR1>	

Return Parameter	<NR1>	Event	<NR1>	Event
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128~65535	Not used

Query Example	:STAT:QUES:ENAB? 4	The OP event is enabled.

:STATus:QUEStionable[:EVENt]?

Channel Specific Command

Description	Returns the status of the Questionable Status Event register. The Questionable Status Event register is cleared upon reading.

Query Syntax	:STATus:QUEStionable[:EVENt]? <NR1>			
Return Parameter	<NR1>	Event	<NR1>	Event
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128~65535	Not used
Query Example	:STAT:QUES:EVEN? 1		An over current (OC) event occurred since the last time the Questionable Status Event register was read.	

:STATus:QUEStionable:NTRansition/PTRansition

Channel Specific Command

Description	Determines whether a negative transition (NTR 1→0) or positive (PTR 0→1) transition in the Questionable Status Condition register will set the corresponding event in the Questionable Status Event register. The mask values are the bit weights of the Questionable Status PTR/NTR filters. See page 207 for details.			
Syntax	:STATus:QUEStionable:NTRansition/PTRansition <NR1>			
Parameter	<NR1>	Condition	<NR1>	Condition
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128~65535	Not used
Example	:STAT:QUES:NTR 5		OC (Bit 1) and OP (Bit 3) are set as negative transitions.	

	:STAT:CHAN:PTR 2	OV (Bit 2) is set as a positive transition.

Query Syntax	:STATus:QUEStionable:NTRansition/PTRansition? <NR1>			
Return Parameter	<NR1>	Event	<NR1>	Event
	1	OC	16	OT
	2	OV	32	G/N
	4	OP	64	UVP
	8	RV	128~65535	Not used

Query Example	:STAT:QUES:NTR? 4	Returns which conditions (OP) have negative transitions.

:STATus:PREset

Channel Specific Command

Description	The status preset command resets the Enable registers and NTR/PTR registers from the Channel Status and Questionable Status Register groups.	
Preset	Register	Preset
	Channel Status Enable	All bits set to 1
	Channel Status PTR	All bits set to 1
	Channel Status NTR	All bits set to 0
	Questionable Status Enable	All bits set to 0
	Questionable Status PTR	All bits set to 1
	Questionable Status NTR	All bits set to 0
Syntax	:STATus:PREset	
Example	:STAT:PRE	

Voltage Subsystem

:VOLTage:L1/L2

Channel Specific Command

Description	Sets the voltage of A Value or B Value in CV mode, where L1 is A Value and L2 is B Value. When setting the A/B value, the device will be switched to CV mode by using this command.	
Syntax	:VOLTage:L1/L2<NRf+>[V]	
Parameter	<NRf+>[V]	Voltage
	10	10 volts
	10V	10 volts
	MIN	Sets the voltage to the minimum value for the channel
	MAX	Sets the voltage to the maximum value for the channel
Example	:VOLT:L1 10V	Sets A Value to 10 volts for the specific channel
	:VOLT:L2 MAX	Sets B Value to the maximum allowed voltage for the specific channel.
Query Syntax	:VOLTage:L1/L2? [MAX|MIN]	

Return Parameter	<NR2> 1 unit = 1 volt	Voltage
	10	Returns the voltage of the specific channel.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:VOLT:L1? 5	A Value is set to 5 volts.
	:VOLT:L1? MAX 81.6000	Returns the maximum settable voltage.

:VOLTage:RECall

Channel Specific Command

Description	Sets or queries whether A Value or B Value is the currently active value in CV mode.	
Syntax	:VOLTage:RECall {A|0|B|1}	
Parameter	A/0	A
	B/1	B
Example	:VOLT:REC 1	Makes B Value the active value.
Query Syntax	:VOLTage:RECall?	
Return Parameter	<NR1>	Value
	0	A
	1	B

:VOLTage:AVALue/BVALue

Channel Specific Command

Description	Sets the voltage of A Value or B Value in CV mode. When setting the A/B value, the device will be switched to CV mode by using this command.	
Syntax	:VOLTage:AVALue/BVALue<NRf+>[V]	
Parameter	<NRf+>[V]	Voltage
	10	10 volts

	10V	10 volts
	MIN	Sets the voltage to the minimum value for the channel
	MAX	Sets the voltage to the maximum value for the channel
Example	:VOLT:AVAL 10V	Sets A Value to 10 volts for the specific channel
	:VOLT:BVAL MAX	Sets B Value to the maximum allowed voltage for the specific channel. (single channel only)
Query Syntax	:VOLTage:AVALue/BVALue? [MAX|MIN]	
Return Parameter	<NR2> 1 unit = 1 volt	Voltage
	10	Returns the voltage of the specific channel.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:VOLT:AVAL? 5	A Value is set to 5 volts.
	:VOLT:AVAL? MAX 81.6000	Returns the maximum settable voltage.

:VOLTage:LOW:CURRent

Channel Specific Command

Description	Sets the current limit in CV mode. When setting the A/B value, the device will be switched to CV mode by using this command.	
Syntax	:VOLTage:LOW:CURRent<NRf+>[A]	
Parameter	<NRf+>[A]	Current limit
	1	1 Amp
	1A	1 Amp
	MIN	Sets the current limit to the minimum value for the channel

	MAX	Sets the current limit to the maximum value for the channel
Example	:VOLT:LOW:CURR 1A	Sets the current limit to 1 Amp for the specific channel.
	:VOLT:LOW:CURR MAX	Sets the current limit to the maximum limit for the specific channel.
Query Syntax	:VOLTage:LOW:CURRent? [MAX|MIN]	
Return Parameter	<NR2> 1 unit = 1 amp	Current limit
	1	Returns the current limit of the specific channel.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:VOLT:LOW:CURR? 5	The current limit is 5 amps for the specific channel.

:VOLTage:HIGH:CURRent

Channel Specific Command

Description	Sets the current limit in CV mode. When setting the A/B value, the device will be switched to CV mode by using this command.	
Syntax	:VOLTage:HIGH:CURRent<NRf+>[A]	
Parameter	<NRf+>[A]	Current limit
	1	1 Amp
	1A	1 Amp
	MIN	Sets the current limit to the minimum value for the channel
	MAX	Sets the current limit to the maximum value for the channel
Example	:VOLT:HIGH:CURR 1A	Sets the current limit to 1 Amp for the specific channel.

	:VOLT:HIGH:CURR MAX	Sets the current limit to the maximum limit for the specific channel.
Query Syntax	:VOLTage:HIGH:CURRent? [MAX|MIN]	
Return Parameter	<NR2> 1 unit = 1 amp	Current limit
	1	Returns the current limit of the specific channel.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:VOLT:HIGH:CURR? 5	The current limit is 5 amps for the specific channel.

:VOLTage:MODE

Channel Specific Command

Description	Set the constant voltage response time for the specific channel.	
Syntax	:VOLTage:MODE {SLOW|0|FAST|1}	
Parameter	SLOW/0	Slow response time for PEL-2000A of module
	FAST/1	Fast response time for PEL-2000A/B of module
	SLOW2	Slow1 response time for PEL-2000B of module
	SLOW3	Slow2 response time for PEL-2000B of module
	SLOW4	Slow3 response time for PEL-2000B of module
Example	:VOLT:MODE SLOW	Sets the response time to SLOW for the specific channel.
	:VOLT:MODE 1	Sets the response time to FAST for the specific channel.
Query Syntax	:VOLTage:MODE? <NR1>	

Return Parameter	<NR1>	Response Time
	0	Slow
	1	Fast
Query Example	:VOLT:MODE? 0	The specific channel is set to SLOW response time.

:VOLTage:LOW:AVALue/BVALue

Channel Specific Command

Description	Sets the low voltage A/B value for constant voltage mode.	
Syntax	:VOLTage:LOW:AVALue/BVALue<NRf+>[V]	
Parameter	<NRf+>[V]	
	AVALue 1	Sets A Value to 1 volt.
	BVALue 1V	Sets B Value to 1 volt.
	AVALue MIN	Sets A Value to the minimum level for the specific channel.
	AVALue MAX	Sets A Value to the maximum level for the specific channel.
Example	:VOLTage:LOW:AVAL 1	Sets A Value to 1 volts for the specific channel
Query Syntax	:VOLTage:LOW:AVALue/BVALue? [MAX|MIN]	
Return Parameter	<NR2> [MAX/MIN]	Current
	1 unit = 1 volt	Returns the voltage of the A or B Value.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:VOLTage:LOW:BVAL? MAX 5	Returns the maximum voltage allowed for the channel/range.

:VOLTage:HIGH:AVALue/BVALue

Channel Specific Command

Description	Sets the high voltage A/B value for constant voltage mode.	
Syntax	:VOLTage:HIGH:AVALue/BVALue<NRf+>[V]	
Parameter	<NRf+>[V]	
	AVALue 1	Sets A Value to 1 volt.
	BVALue 1V	Sets B Value to 1 volt.
	AVALue MIN	Sets A Value to the minimum level for the specific channel.
	AVALue MAX	Sets A Value to the maximum level for the specific channel.
Example	:VOLTage:HIGH:AVAL 1	Sets A Value to 1 volts for the specific channel
Query Syntax	:VOLTage:HIGH:AVALue/BVALue?[MAX|MIN]	
Return Parameter	<NR2> [MAX/MIN]	Current
	1 unit = 1 volt	Returns the voltage of the A or B Value.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:VOLTage:HIGH:BVAL? MAX 2	Returns the maximum voltage allowed for the channel/range.

:VOLTage:IMEasure

Channel Specific Command

Description	Sets the current measurement range of constant voltage mode for the specific channel.	
Syntax	:VOLTage:IMEasure{L|0|H|1}	
Parameter	L/0	Low range of current measurement.

	H/1	High range of current measurement.
Example	:VOLTage:IME L	Sets the current measurement range to Low for the specific channel.
	:VOLTage:IME 1	Sets the current measurement range to High for the specific channel.
Query Syntax	:VOLTage:IMEasure?<NR1>	
Return Parameter	<NR1>	The current measurement range of constant voltage mode for the specific channel.
	0	Low
	1	High
Query Example	:VOLT:IME? 0	The specific channel is set to low range for current measurement.

Power Subsystem

:POWer:L1/L2

Channel Specific Command

Description	Sets the A/B Value for constant power mode, where L1 is A Value and L2 is B Value. The command is range dependent. If the current range is Low, then the command will only apply to the low range settings. When setting the A/B value, the device will be switched to CP mode by using this command.	
Syntax	:POWer:L1|L2 <NRf+>[W]	
Parameter	<NRf+>[W]	
	L1 1	Sets A Value to 1 Watt.
	L2 2	Sets B Value to 2 Watts.
	L1 1W	Sets A Value to 1 Watt.
	L1 MIN	Sets A Value to the minimum level for the specific channel.
	L1 MAX	Sets A Value to the maximum Level for the specific channel.
Example	:POW:L1 1	Sets A Value to 1 watt
Query Syntax	:POW:L1?/L2? [MAX|MIN]	
Return Parameter	<NR2> [MAX|MIN]	Current

	1 unit = 1 watt	Returns the power of the A Value (L1) or B Value (L2).
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:POW:L2? MAX 357.000	Returns the maximum power allowed for the channel. (PEL-2040A(B))

:POWer:CURRent

Channel Specific Command

Description	Sets the current limit for constant power mode. The command is range dependent. If the current range is Low, then the command will only apply to the low range settings. When setting the A/B value, the device will be switched to CP mode by using this command.	
Syntax	:POWer:CURRent<NRf+>[A]	
Parameter	<NRf+>[A]	
	1	Sets the current limit to 1A.
	1A	Sets the current limit to 1A.
	MIN	Sets the current limit to the minimum level for the specific channel.
	MAX	Sets the current limit to the maximum level for the specific channel.
Example	:POW:CURR 1 Sets the current limit to 1A.	
Query Syntax	:POW:CURRent? [MAX|MIN]	
Return Parameter	<NR2> [MAX|MIN]	Current
	1 unit = 1 amp	Returns the current limit.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:POW:CURR? 7.0	Returns the current limit for the specific channel.

:POWer:RECall

Channel Specific Command

Description	Sets or queries whether A Value or B Value is the currently active value in CP mode.	
Syntax	:POWer:RECall {A|0|B|1}	
Parameter	A/0, B/1	Value
	A/0	A
	B/1	B
Example	:POW:REC 1	Makes B Value the active value.
Query Syntax	:POWer:RECall?	
Return Parameter	<NR1>	Value
	0	A
	1	B
Query Example	:POW:REC?	A Value is active.
	0	

:POWer:LOW:AVALue/BVALue

Channel Specific Command

Description	Sets the low range A/B Value for constant power mode.	
Syntax	:POWer:LOW:AVALue/BVALue<NRf+>[W]	
Parameter	NRf+[W]	
	AVALue 1	Sets A Value to 1 watt.
	BVALue 1W	Sets B Value to 1 watt.
	AVALue MIN	Sets A Value to the minimum level for the specific channel.
	AVALue MAX	Sets A Value to the maximum Level for the specific channel.
Example	:POWer:LOW:AVAL 1	Sets A Value to 1 watt for the low range.

Query Syntax	:POWer:LOW:AVALue/BVALue? [MAX|MIN]	
Return Parameter	<NR2> [MAX|MIN]	Current
	1 unit = 1 watt	Returns the power of the A or B Value.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:POWer:LOW:BVAL? MAX 2	Returns the maximum power allowed for the channel/range.

:POWer:LOW:CURRent

Channel Specific Command

Description	Sets the current limit for constant power mode for the low range only.	
Syntax	:POWer:LOW:CURRent <NRf+>[A]	
Parameter	<NRf+>[A]	
	1	Sets the current limit to 1A.
	1A	Sets the current limit to 1A.
	MIN	Sets the current limit to the minimum level for the specific channel.
	MAX	Sets the current limit to the maximum level for the specific channel.
Example	:POW:CURR 1	Sets the current limit to 1A.
Query Syntax	:POW:LOW:CURRent? [MAX|MIN]	
Return Parameter	<NR2> [MAX|MIN]	Current
	1 unit = 1 amp	Returns the current limit.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:POW:LOW:CURR? 7.0	Returns the current limit for the specific channel.

:POWer:HIGH:AVALue/BVALue

Channel Specific Command

Description	Sets the high range A/B Value for constant power mode.	
Syntax	:POWer:HIGH:AVALue/BVALue<NRf+>[W]	
Parameter	NRf+[W]	
	AVALue 1	Sets A Value to 1 watt.
	BVALue 1W	Sets B Value to 1 watt.
	AVALue MIN	Sets A Value to the minimum level for the specific channel.
	AVALue MAX	Sets A Value to the maximum Level for the specific channel.
Example	:POWer:HIGH:AVAL 1	Sets A Value to 1 watt for the high range.
Query Syntax	:POWer:LOW:AVALue/BVALue? [MAX|MIN]	
Return Parameter	<NR2> [MAX|MIN]	Current
	1 unit = 1 watt	Returns the power of the A or B Value.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:POWer:HIGH:BVAL? MAX 2	Returns the maximum power allowed for the channel/range.

:POWer:HIGH:CURRent

Channel Specific Command

Description	Sets the current limit for constant power mode for the high range only.	
Syntax	:POWer:HIGH:CURRent<NRf+>[A]	
Parameter	<NRf+>[A]	
	1	Sets the current limit to 1A.

	1A	Sets the current limit to 1A.
	MIN	Sets the current limit to the minimum level for the specific channel.
	MAX	Sets the current limit to the maximum level for the specific channel.
Example	:POW:HIGH:CURR 1	Sets the current limit to 1A.
Query Syntax	:POW:HIGH:CURRent? [MAX|MIN]	
Return Parameter	<NR2> [MAX|MIN]	Current
	1 unit = 1 amp	Returns the current limit.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:POW:HIGH:CURR? 7.0	Returns the current limit for the specific channel.

SYSTEM Subsystem

:SYSTem:ERRor? System Command

Description	The System Error command returns all the system errors. Please see the Error codes section for a full description. (page 177)	
Query Syntax	:SYSTem:ERRor?	
Return Parameter	<character string> -102, "Syntax error" 1 2	Error 1 Error code number 2 Error code description
Query Example	:SYST:ERR? -102, "Syntax error"	Returns the next error in the Error Queue.

:SYSTem:VERSion? System Command

Description	The system version command returns the SCPI version: year and SCPI version of that year.	
Query Syntax	:SYSTem:VERSion?	
Return Parameter	<NRf>	
	2008.0	Year/ version

:SYSTem:SETup System Command

Description	Sets or returns the system setup for the current settings using block data. See the command syntax on page 33 for more details.	
Syntax	:SYSTem:SETup <block data>	
Parameter	<block data>	System setup data
Example	:SYST:SET <block data>	Loads the system setup using block data.
Query Syntax	:SYSTem:SETup?	
Return Parameter	<block data>	Returns the system setup as block data.
Query Example	:SYST:SET?	Returns the system settings as block data.
	#<digits><byte count><data><NL>	

:SYSTem:KLOCk? System Command

Description	Enables or disables the front panel key lock.	
Syntax	:SYSTem:KLOCk{OFF|ON|0|1}	
Query Syntax	:SYSTem:KLOCk?	
Parameter	0/OFF	Panel keys are unlocked.
	1/ON	Panel keys are locked.

Return Parameter	0	<Boolean> Panel keys are unlocked.
	1	<Boolean> Panel keys are locked.

:SYSTem:KEYLock:MODE? System Command

Description	Set or queries the key lock mode.	
Syntax	:SYSTem:KEYLock:MODE{0|1}	
Query Syntax	:SYSTem:KEYLock:MODE?	
Parameter/Return Parameter	0	Panel lock: allow load off.
	1	Panel lock: allow load on/off.

:SYSTem:COMMunicate:LAN:IPADdress System Command

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/Return	<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.	

:SYSTem:COMMunicate:LAN:GATeway System Command

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 <string>
Query Syntax	:SYSTem:COMMunicate:LAN:GATeway?

Parameter/Return	<string>	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.	

:SYSTem:COMMunicate:LAN:SMASk System Command

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/Return	<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.	

:SYSTem:COMMunicate:LAN:MAC? System Command

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.	

:SYSTem:COMMunicate:LAN:DHCP System Command

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.

:SYSTem:COMMunicate:LAN:DNS System Command

Description	Sets or queries the DNS address.	
⚠ Note	The setting will only be valid after the power has been cycled.	
Syntax	:SYSTem:COMMunicate:LAN:DNS <string>	
Query Syntax	:SYSTem:COMMunicate:LAN:DNS?	
Parameter/Return	<string>	DNS in string format ("mask")
		Applicable ASCII characters: 20H to 7EH
Example	SYST:COMM:LAN:DNS "172.16.1.252"	
	Sets the DNS to 172.16.1.252.	

:SYSTem:COMMunicate:LAN:WEB:PACTive System Command

Description	Sets or queries whether the web password is on or off. This setting is applied only after the unit is reset.
Syntax	:SYSTem:COMMunicate:LAN:WEB:PACTive{0|1}

Parameter	0	Web password off.
	1	Web password on.

:SYSTem:COMMunicate:LAN:WEB:PASSword

System Command

Description	Sets or queries the web password. This setting is applies only after the unit is reset.	
Syntax	:SYSTem:COMMunicate:LAN:WEB:PASSword<NR1>	
Query Syntax	:SYSTem:COMMunicate:LAN:WEB:PASSword?<NR1>	
Parameter/Return	<NR1>	0~9999
Example	SYST:COMM:LAN:WEB:PASS 1234 Set the web password as 1234.	
Query Example	:SYSTem:COMMunicate:LAN:WEB:PASSword?<NR1> 1234 Web password as 1234.	

:SYSTem:COMMunicate:LAN:VERSion?

System Command

Description	Returns the LanCard version.	
Query Syntax	:SYSTem:COMMunicate:LAN:VERSion?	
Return Parameter	<sting>	1.22. Returns the LanCard version: 1.22

Memory Subsystem

:MEMory:SAVE:PREset

Channel Specific Command

Description	Saves preset data for the specific channel to internal memory slots P0~P9.	
Syntax	:MEMory:SAVE:PREset: <NR1>	
Parameter	<NR1>	Preset no.
	0~9	P0~P9
Example	:MEM:SAVE:PRE 0 Saves the preset settings to (P0).	

:MEMory:SAVE:PROGram

Channel Specific Command

Description	Saves the specific channel into memory.	
Syntax	:MEMory:SAVE:PROGram<NR1>	
Parameter	<NR1>	Memory number
	001~120	M001~M120

Example	:MEM:SAVE:PROG 100	Saves the channel to Memory M100.

:MEMory:SAVE:ALLPreset — All Channels

Description	Saves preset data to internal memory for all channels.	
Syntax	:MEMory:SAVE:ALLPreset: <NR1>	
Parameter	<NR1>	Preset no.
	0~9	P0~P9
Example	:MEM:SAVE:ALLP 0	Saves the preset settings to (P0) for all channels.

:MEMory:SAVE:SETup — All Channels

Description	Saves setup data for all channels to internal memory slots S1~S4.	
Syntax	:MEMory:SAVE:SETup: <NR1>	
Parameter	<NR1>	Setup data
	1~4	S1~S4
Example	:MEM:SAVE:SET 1	Saves the setup data to S1 (applicable to all channels).

:MEMory:RECall:PREset — Channel Specific Command

Description	Recalls preset data for the specific channel from internal memory slots P0~P9.	
Syntax	:MEMory:RECall:PREset: <NR1>	
Parameter	<NR1>	Preset no.
	0~9	P0~P9

Example	:MEM:REC:PRE 0	Recalls the preset settings from (P0).

:MEMory:RECall:PROGram

Channel Specific Command

Description	Recalls memory data to the current channel.	
Syntax	:MEMory:RECall:PROGram <NR1>	
Parameter	<NR1>	Memory number
	001~120	M001~M120
Example	:MEM:REC:PROG 100	Recalls the memory M100 for the current channel.

:MEMory:RECall:ALLPreset

All Channels

Description	Recalls preset data from internal memory for all channels.	
Syntax	:MEMory:RECall:ALLPreset: <NR1>	
Parameter	<NR1>	Preset no.
	0~9	P0~P9
Example	:MEM:REC:ALLP 0	Recalls the preset settings from (P0) for all channels.

:MEMory:RECall:SETup

All Channels

Description	Recalls setup data for all channels from internal memory slots S1~S4.	
Syntax	:MEMory:RECall:SETup: <NR1>	
Parameter	<NR1>	Setup data
	1~4	S1~S4
Example	:MEM:REC:SET 1	Recalls the setup data from S1 (applicable to all channels).

Example	:MEM:REC:1	Recalls memory data S1 to the current channel.

:MEMory:FILE:PRESet System Command

Description	Sets or returns the preset settings using block data. See the command syntax on page 33 for more details on block data.	
Syntax	:MEMory:FILE:PREset <block data>	
Parameter	<block data>	Preset data
Example	:MEM:FILE:PRE <block data>	Loads the preset settings block data.
Query Syntax	:MEMory:FILE:PREset?	
Return Parameter	<block data>	Returns the preset settings as block data.
Query Example	:MEM:FILE:PRE? #<digits><byte count><data><NL>	Returns the preset settings as block data.

:MEMory:FILE:PROGram System Command

Description	Sets or returns the program data using block data. See the command syntax on page 33 for more details on block data.	
Syntax	:MEMory:FILE:PROGram <block data>	
Parameter	<block data>	Program data
Example	:MEM:FILE:PROG <block data>	Loads the program data using block data.
Query Syntax	:MEMory:FILE:PROGram?	
Return Parameter	<block data>	Returns the program data as block data.

Query Example	:MEM:FILE:PROG? #<digits><byte count><data><NL>	Returns the program data as block data.

:MEMory:FILE:SETup System Command

Description	Sets or returns the setup data using block data. See the command syntax on page 33 for more details on block data.	
Syntax	:MEMory:FILE:SETup <block data>	
Parameter	<block data>	Setup data
Example	:MEM:FILE:SET <block data>	Loads the setup data using block data.
Query Syntax	:MEMory:FILE:SETup?	
Return Parameter	<block data>	Returns the setup data as block data.
Query Example	:MEM:FILE:SET? #<digits><byte count><data><NL>	Returns the setup data as block data.

:MEMory:FILE:SEQuence System Command

Description	Sets or returns the sequence data using block data. See the command syntax on page 33 for more details on block data.	
Syntax	:MEMory:FILE:SEQuence <block data>	
Parameter	<block data>	Sequence data
Example	:MEM:FILE:SEQ <block data>	Loads the sequence data using block data.
Query Syntax	:MEMory:FILE:SEQuence?	
Return Parameter	<block data>	Returns the sequence data as block data.

Query Example	:MEM:FILE:SEQuence? #<digits><byte count><data><NL>	Returns the sequence data as block data.

SEQuence Subsystem

:SEQuence:STATe

Channel Specific Command

Description	Turns on/off the Sequence Function mode.	
Syntax	:SEQuence:STATe {OFF|0|ON|1}	
Parameter	ON/1	Turn sequence mode on
	OFF/0	Turn sequence mode off
Example	:SEQuence:STATe 1	Turn sequence on
Query Syntax	:SEQuence:STATe?	
Return Parameter	ON,STOP	Sequence is on, stopped
	ON,RUN	Sequence is on, running
	OFF	Sequence is off

Query Example	:SEQuence:STATe? ON,STOP	Sequence is on, stopped.

:SEQuence:EDIT:POINt

Channel Specific Command

Description	Sets the current point in the sequence. The SEQuence:END command should first be used to set the number of points.	
Syntax	:SEQuence:EDIT:POINt <NR1>	
Parameter	<NR1>	Points
	1~last point	1~ last point.
Example	:SEQ:EDIT:POIN 3	Sets the point to number 3.
Query Syntax	:SEQuence:EDIT:POINt?	
Return Parameter	<NR1>	Points
	1~last point	Returns the current point.
Query Example	:SEQ:EDIT:POIN? 3	The current point is 3.

:SEQuence:END

Channel Specific Command

Description	Sets the number of points in the sequence.	
Syntax	:SEQuence:END <NR1>	
Parameter	<NR1>	Points
	1~120	1~120
Example	:SEQ:END 5	Sets the max number of points to 5.
Query Syntax	:SEQuence:END?	
Return Parameter	<NR1>	Points
	1~120	1~120
Query Example	:SEQ:END? 5	There are 5 points in the sequence.

:SEQuence:END:LOAD

Channel Specific Command

Description	Sets or queries the value of On End Load.	
Syntax	:SEQuence:END:LOAD <NRf+>[MAX|MIN]	
Parameter	<NRf+>	current value(CC), resistance value(CR).
	0	On End Load = Off.
	MIN/MAX	Maximum or minimum value.
Example	:SEQuence:END:LOAD 1.000	Sets the value of On End Load to 1.000
Query Syntax	:SEQuence:END:LOAD?	
Return Parameter	0	On End Load is Off
	<NRf>	On End Load value
Query Example	:SEQuence:END:LOAD? 1,000	On End Load value is 1.000.

:SEQuence:POINt:RESistance

Channel Specific Command

Description	Sets the resistance value for the current point. CR mode only.	
Syntax	:SEQuence:POINt:RESistance <NRf>[OHM]|MIN|MAX	
Parameter	<NRf>[OHM], MIN, MAX	Resistance value
	100	100Ω
	100 OHM	100Ω
	MAX/MIN	Maximum or minimum value.
Example	:SEQ:POIN:RES 100	Sets the resistance to 100.
Query Syntax	:SEQuence:POINt:RESistance? [MAX|MIN]	
Return Parameter	<NR1>	Resistance Value

	1 unit = 1 ohm	Returns the resistance value.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:SEQ:POIN:RES? 100	The resistance value is 100 ohm.

:SEQuence:POINt:CURRent

Channel Specific Command

Description	Sets the current value for the current point. CC mode only.	
Syntax	:SEQuence:POINt:CURRent <NRf>[A]|MIN|MAX	
Parameter	<NRf>[A], MIN, MAX	Current value
	10	10A
	100 A	100A
	MAX/MIN	Maximum or minimum value.
Example	:SEQ:POIN:CURR 1	Sets the current to 1.
Query Syntax	:SEQuence:POINt::CURRent? [MAX|MIN]	
Return Parameter	<NR1>	Current Value
	1 unit = 1 A	Returns the current value.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:SEQ:POIN:CURR? 1	The current value is 1 amp.

:SEQuence:POINt:RISE/FALL

Channel Specific Command

Description	Sets the rising and falling slew rates for the current point.	
Syntax	:SEQuence:POINt:RISE/FALL<NRf>[A/us]|MIN|MAX	
Parameter	<NRf>[A/us], MIN, MAX	Slew rate
	1.2	1.2A/us

	1.2 A/us	1.2A/us
	MAX/MIN	Maximum or minimum value.
Example	:SEQ:POIN:RISE .3 A	Sets the rising slew rate to 0.3 A/us
	:SEQ:POIN:FALL .4 A	Sets the falling slew rate to 0.4 A/us
Query Syntax	:SEQuence:POINt:RISE/FALL? [MAX|MIN]	
Return Parameter	<NR1>	Slew Rate
	1 unit = 1 A/us	Returns the slew rate.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:SEQ:POIN:RISE? 0.30000	Returns the rising slew rate (0.3 A/us).
	:SEQ:POIN:FALL? 0.40000	Returns the falling slew rate (0.4 A/us).

:SEQuence:POINt:TIME

Channel Specific Command

Description	Sets the duration time of the current point in seconds (for CC mode and CR mode only).	
Syntax	:SEQuence:POINt:TIME<NRf>[S]|MIN|MAX	
Parameter	<NRf>	Duration Time
	0.000025~60000	0.000025~60000 seconds
	0.000025~60000S	0.000025~60000 seconds
	MIN	0.0001seconds
	MAX	60,000 seconds
Example	:SEQ:POIN:TIME 10	Sets the point duration time to 10 seconds.
Query Syntax	:SEQuence:POIN:TIME? [MAX|MIN]	

Return Parameter	<NR2>	Point
	0.0001~60000	Returns the point duration time.
	MAX/MIN	Returns the allowable maximum and minimum.
Query Example	:SEQ:POIN:TIME? 0.00100	The point duration time is 0.001 seconds.

:SEQuence:REPeat

Channel Specific Command

Description	Sets the number of times the sequence can be repeated (looped).	
Syntax	:SEQuence:REPeat <NR1>	
Parameter	<NR1>	Repeat setting
	1~9999	1~9999
	0	Infinite repeats
Example	:SEQ:REP 10	Repeat 10 times
	:SEQ:REP 0	Repeat infinitely
Query Syntax	:SEQuence:REPeat?	
Return Parameter	<NR1>	Repeat setting
	1~9999	1~9999
	0	Infinite
Query Example	:SEQ:REP? 10	Repeats the sequence 10 times

:SEQuence:VOLTage:RANGe

Channel Specific Command

Description	Sets the sequence CC voltage range.	
Syntax	:SEQuence:VOLTage:RANGe {<NRf>[V]|L|H}	
Parameter	<NRf>[V] , L, H	Range
	16	Low range*

	80V	High range*
	L	Low range
	H	High range
	*Load module dependent, PEL-2020A(B) shown.	
Example	:SEQ:VOLT:RANG L	Sets the range to Low for the channel.
Query Syntax	:SEQuence:VOLTage:RANGe?	
Return Parameter	<NR2>	Range
	16	Low PEL-2020A(B), 2030A(B), 2040A(B)
	125	Low PEL-2041A(B)
	80	High PEL-2020A(B), 2030A(B), 2040A(B)
	500	High PEL-2041A(B)
Query Example	:SEQ:VOLT:RANG? 500	Returns the voltage range. In this case high for the PEL-2041A(B).

:SEQuence:LOOP:STARt

Channel Specific Command

Description	Determines from which point to start repeating (looping) the sequence from when using the SEQuence:REPeat command.	
Syntax	:SEQuence:LOOP:STARt <NR1>	
Parameter	<NR1>	Start loop from
	1~last point	1st~ last point.
Example	:SEQ:LOOP:STAR 2	Loop from point 2.
Query Syntax	:SEQuence:LOOP:STARt?	
Return Parameter	<NR1>	Point
	1~last point	Returns the point that the loop will start from.
Query Example	:SEQ:LOOP:STAR? 2	The loop starts at point 2.

:SEQuence:CHANnel:TIME

Channel Specific Command

Description	Sets which channel duration time the specific channel will use.	
Syntax	:SEQuence:CHANnel:TIME <NR1>	
Parameter	<NR1>1~ max channels	Duration Time Settings
	0	OFF
	1	Use channel 1
	2	Use channel 2
Example	:SEQ:CHAN:TIME 3	Set the specific channel to use the channel duration time of channel 3.
Query Syntax	:SEQuence:CHANnel:TIME?	
Return Parameter	<NR1>	Point
	1~ max channels	Returns the channel duration time that the specific channel is using.
Query Example	:SEQ:CHAN:TIME? 2	The specific channel is using the channel duration setting of channel 2.

:SEQuence:RUN

Channel Specific Command

Description	Turns the sequence On/Off.	
Syntax	:SEQuence:RUN {OFF|0|ON|1}	
Parameter	OFF/0	Off
	ON/1	On
Example	:SEQ:RUN ON	Run the sequence.

:SEQuence:SAVE

Channel Specific Command

Description	Saves the sequence for the specific channel.	
Syntax	:SEQuence:SAVE	
Example	:SEQ:SAVE	Saves the sequence.

:SEQuence:TRIGger:IN

Channel Specific Command

Description	Turns the trigger input on/off for sequences. See the :SEQuence:TRIGger:IN:CHANnel command to set which channels this command applies to.	
Syntax	:SEQuence:TRIGger:IN {OFF|0|ON|1}	
Parameter	OFF/0	Off
	ON/1	On
Example	:SEQ:TRIG:IN 0	Trigger IN is on.
Query Syntax	:SEQuence:TRIGger:IN?	
Return Parameter	<NR1>	Trigger IN
	0	Off
	1	On
Query Example	:SEQ:TRIG:IN? 1	Trigger IN is on.

:SEQuence:TRIGger:OUT

Channel Specific Command

Description	Turns the trigger output on for the selected channel for sequences.	
⚠ Note	One channel must be set for trigger out.	
Syntax	:SEQuence:TRIGger:OUT <NR1>|MIN|MAX	
Parameter	<NR1>	Channel number
	MAX	Sets TRIG OUT to the last channel

	MIN	Sets TRIG OUT to the first channel
Example	:SEQ:TRIG:OUT 1 Sets TRIG OUT to CH1.	
Query Syntax	:SEQuence:TRIGger:OUT?	
Return Parameter	<NR1>	Channel number
	MAX/MIN	Last or first channel.
Query Example	:SEQ:TRIG:OUT? CH1 is set to TRIG OUT. 1	

:SEQuence:TRIGger:IN:CHANnel

Channel Specific Command

Description	Selects which channels are turned on/off with the :SEQuence:TRIGger:IN command. The bit weight of the <NR1> value determines which channels are used.			
Syntax	:SEQuence:TRIGger:IN:CHANnel<NR1>			
Parameter	<NR1>	Channel	<NR1>	Channel
	1	CH1	32	CH 6
	2	CH2	64	CH 7
	4	CH3	128	CH 8
	8	CH 4	256~65535	Not used
	16	CH 5		
Example	:SEQ:TRIG:IN:CHAN 9		Sets TRIG IN to CH1 and CH4.	
Query Syntax	:SEQuence:TRIGger:IN:CHANnel?			
Return Parameter	<NR1>	Channel	<NR1>	Channel
	1	CH1	32	CH 6
	2	CH2	64	CH 7
	4	CH3	128	CH 8
	8	CH 4	256~65535	Not used
	16	CH 5		
Query Example	:SEQ:TRIG:IN:CHAN? 24		Sets TRIG IN to CH4 and CH5.	

GLOBal Subsystem

:GLOBal:CONFigure:VOLTage:RANGe Global Command

Description	Sets the CC Voltage range high or low. This command applies to all channels.	
Syntax	:GLOBal:CONFigure:VOLTage:RANGe{L|H}	
Parameter	L	Low range
	H	High range
Example	:GLOB:CONF:VOLT:RANG L	Sets the range to low.

:GLOBal:LOAD:SHORt Global Command

Description	Shorts all the input terminals.	
Syntax	:GLOBal:LOAD:SHORt{OFF|0|ON|1}	
Parameter	{OFF|0|ON|1}	SHORT
	OFF/0	Off
	ON/1	On
Example	:GLOB:LOAD:SHOR 1	Short on.
Note	This command is valid only when the "LOAD ON". Otherwise, it will get "-200, Execution error". All channels must be LOAD ON to be set to 1.	

:GLOBal:MODE Global Command

Description	Sets the mode for all the load modules in the mainframe.	
Syntax	:GLOBal:MODE {CCL|CCH|CCDL|CCDH|CRL|CRH|CRDL|CRDH|CVL|CVH|CPL|CPH}	
Parameter	CCL	CC static mode, low range
	CCH	CC static mode, high range
	CCDL	CC dynamic mode, low range
	CCDH	CC dynamic mode, high range
	CRL	CR static mode, low range
	CRH	CR static mode, high range
	CRDL	CR dynamic mode, low range
	CRDH	CR dynamic mode, high range
	CVL	CV static mode, low range
	CVH	CV static mode, high range
	CPL	CP static mode, low range
	CPH	CP static mode, high range
Example	:GLOBal:MODE CCL	Set the specific channel to low range constant current static mode.

:GLOBal:LOAD:[STATe] Global Command

Description	This command turns the electronic load on/off for all channels.	
Syntax	:GLOBal:LOAD:[STATe]{OFF|0|ON|1}	
Parameter	OFF/0	Turns the electronic load OFF for all channels.
	ON/1	Turns the electronic load ON for all channels.
Example	:GLOB:LOAD 0	Turns the electronic load OFF for all channels.

Command Error Codes

Description

The PEL-2000A series has a number of specific error codes. Use the SYSTem:ERRor command to recall the error codes.

-102	Syntax error. An unrecognized command or data type was encountered.
-109	Missing parameter The command header requires more parameters than was received.
-122	Data out of range The data is outside the allowed range.
-128	Numeric data not allowed The command does not accept numerical data/parameters
-200	Execution error Generic execution error.
-144	Character Data too long The character data contains more than twelve characters
-151	Invalid String The string data received is invalid
-148	Character data not allowed The command does not accept character data
-138	Suffix not allowed A command does not accept suffixes/the suffix type.
-222	Data out of range

STATUS REGISTERS

To program the PEL-2000A series effectively, the Status Register structure needs to be understood. This chapter explains in detail the structure of the status registers.

Status Register Overview

Description

The status registers are used to determine the status of the electronic load. The status registers maintain the status of the protection conditions, load conditions and channel conditions of the load modules.

The PEL-2000A series have a number of register groups:

Channel Status Registers (one for each channel)

Channel Summary Registers

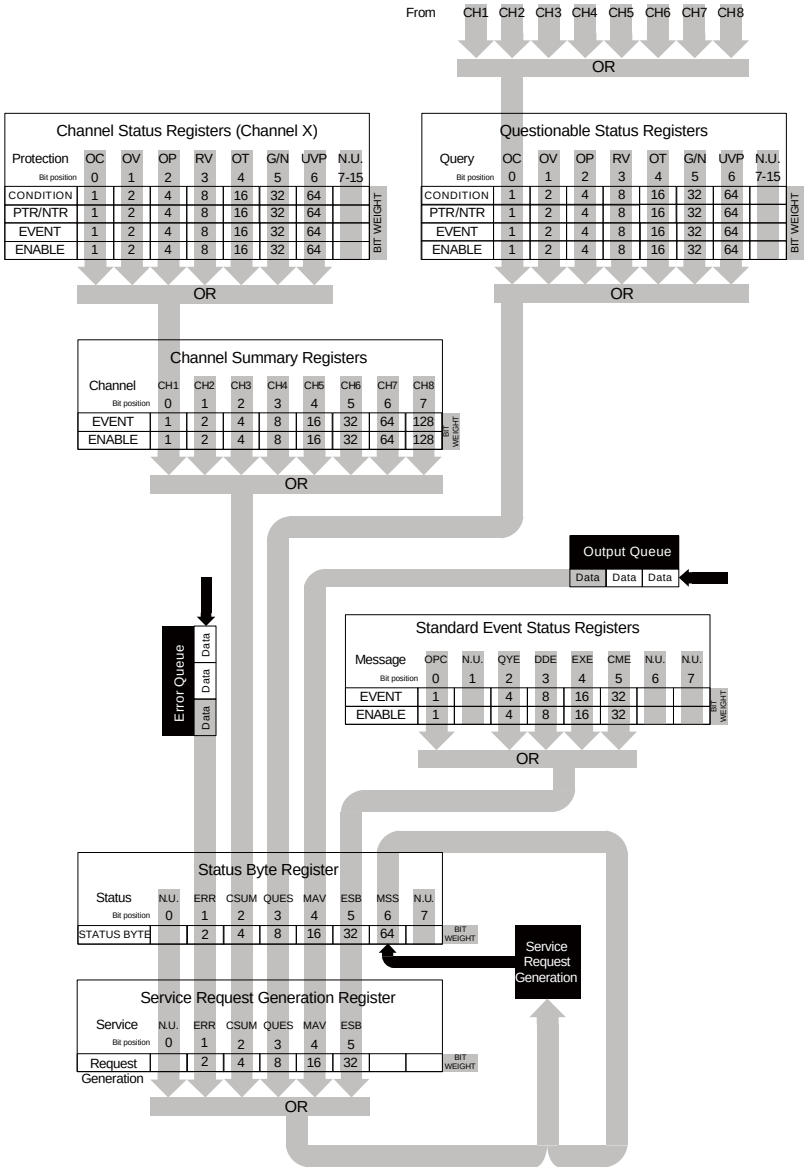
Questionable Status Registers

Standard Event Status Registers

Status Byte Register

Service Request Generation Register

The structure of the status registers is shown on the next page.


From CH1 CH2 CH3 CH4 CH5 CH6 CH7 CH8
OR
Channel Status Registers (Channel X)
Protection OC OV OP RV OT G/N UVP N.U.
Bit position 0 1 2 3 4 5 6 7-15
CONDITION 1 2 4 8 16 32 64
PTR/NTR 1 2 4 8 16 32 64
EVENT 1 2 4 8 16 32 64
ENABLE 1 2 4 8 16 32 64
BIT WEIGHT
OR
Questionable Status Registers
Query OC OV OP RV OT G/N UVP N.U.
Bit position 0 1 2 3 4 5 6 7-15
CONDITION 1 2 4 8 16 32 64
PTR/NTR 1 2 4 8 16 32 64
EVENT 1 2 4 8 16 32 64
ENABLE 1 2 4 8 16 32 64
BIT WEIGHT
OR
Channel Summary Registers
Channel CH1 CH2 CH3 CH4 CH5 CH6 CH7 CH8
Bit position 0 1 2 3 4 5 6 7
EVENT 1 2 4 8 16 32 64 128
ENABLE 1 2 4 8 16 32 64 128
BIT WEIGHT
OR
Output Queue
Data Data Data
Error Queue
Data
Data
Data
Standard Event Status Registers
Message OPC N.U. QYE DDE EXE CME N.U. N.U.
Bit position 0 1 2 3 4 5 6 7
EVENT 1 4 8 16 32
ENABLE 1 4 8 16 32
BIT WEIGHT
OR
Status Byte Register
Status N.U. ERR CSUM QUES MAV ESB MSS N.U.
Bit position 0 1 2 3 4 5 6 7
STATUS BYTE 2 4 8 16 32 64
BIT WEIGHT
Service Request Generation
Service Request Generation Register
Service N.U. ERR CSUM QUES MAV ESB
Bit position 0 1 2 3 4 5
Request Generation 2 4 8 16 32
BIT WEIGHT
OR

Channel Status

Description

Each channel has a dedicated Channel Status Register group. These registers show if any errors or faults have occurred to a specific channel.

The Channel Status Register group consists of: the Condition, EVENT and ENABLE registers as well as PTR/NTR (positive and negative transition) filters.

Channel Status Registers								
Bit Position	7-15	6	5	4	3	2	1	0
Condition	0	UVP	G/N	OT	RV	OP	OV	OC
PTR/NTR	0	UVP	G/N	OT	RV	OP	OV	OC
EVENT	0	UVP	G/N	OT	RV	OP	OV	OC
ENABLE	0	UVP	G/N	OT	RV	OP	OV	OC
Bit weight		64	32	16	8	4	2	1

Protection Bits

OC

If an over current condition occurs the OC bit (bit 0) is set.

The OC bit can be cleared only with the :LOAD:PROTection:CLEar command if the over current condition is invalid.

OV

If an over voltage condition occurs, the OV bit (bit 1) will be set.

The OV bit can be cleared only with the :LOAD:PROTection:CLEar command if the over voltage condition is invalid.

OP

If an over power condition occurs, the OP bit (bit 2) is set.

The OP bit can be cleared only with the :LOAD:PROTection:CLEar command if the over power condition is invalid.

	RV	If a reverse voltage condition occurs the RV bit (bit 3) is set. The RV bit is automatically cleared after the reverse voltage is removed.
	OT	When the internal temperature exceeds 85˚C the OT bit will be set. The OT bit is automatically cleared after the temperature goes below 85˚C.
	G/N	The Go/NoGo bit is set when Go/NoGo limits have been exceeded, when Go/NoGo SPEC has been enabled.
	UVP	If the under voltage condition occurs the UVP bit is set.
Condition Register	The condition register indicates the status of the electronic load. The condition register can only be changed by a change in the condition of the electronic load. Reading the condition register does not change the state of the condition register.	
PTR/NTR Register	The PTR/NTR (Positive/Negative transition) register determines the type of transition conditions that will trigger an event. Only the Channel Status Register and Questionable Status Register can be transition programmed.	
	Positive Transition	0→1
	Negative Transition	1→0
Event Register	The Event Register indicates if an event has been triggered according to the transition settings from the PTR/NTR Register.	
Enable Register	The Enable register determines which status event(s) are enabled. Any status events (OC, OV, OP, RV, OT, G/N, UVP) that are enabled will set the corresponding channel bit in the Channel Summary Event Register.	

Channel Summary

Description

The Channel Summary Registers consolidate the channel status of all 4/8 channels, depending on the electronic load.

Channel Summary Registers								
Bit Position	7	6	5	4	3	2	1	0
EVENT	CH8	CH7	CH6	CH5	CH4	CH3	CH2	CH1
ENABLE	CH8	CH7	CH6	CH5	CH4	CH3	CH2	CH1
Bit weight	128	64	32	16	8	4	2	1

Event Register

If an event has been enabled and set in the Channel Status Registers, then the corresponding channel bit will be set in the Channel Summary Event Register. If the Event Register is read, it will be cleared to 0.

Enable Register

The Enable Register is used to determine which channel events will be used to set the CSUM bit of the Status Byte Register.

Questionable Status

Description

The Questionable Status Registers will show if any faults or errors have occurred. The Questionable Status Registers have the same events as the Channel Status Registers.

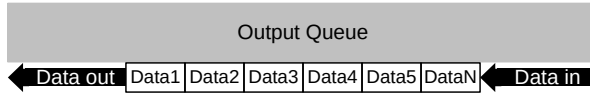
Questionable Status Register								
Bit Position	7-15	6	5	4	3	2	1	0
Condition	0	UVP	G/N	OT	RV	OP	OV	OC
PTR/NTR	0	UVP	G/N	OT	RV	OP	OV	OC
EVENT	0	UVP	G/N	OT	RV	OP	OV	OC
ENABLE	0	UVP	G/N	OT	RV	OP	OV	OC
Bit weight		64	32	16	8	4	2	1

Bit Summary	OC	Over Current
	OV	Over voltage
	OP	Over Power
	RV	Reverse Voltage
	OT	Over Temperature
	G/N	Go/NoGo
	UVP	Under Voltage Protection
Condition Register	The Questionable Status Condition Register indicates the status of the electronic load. If a bit is set in the Condition register (OC, OV, OP, RV) indicates that the event is true. Reading the condition register does not change the state of the condition register.	
PTR/NTR Register	The PTR/NTR (Positive/Negative transition) register determines the type of transition conditions will set the corresponding bit in the Event Registers. Only the Channel Status Register and Questionable Status Register can be transition programmed.	
	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 is used to determine which channel events will be used to set the QUES bit of the Status Byte Register.	

Output Queue

Description

The Output queue stores output messages in a FIFO buffer until read. If the Output Queue has data, the MAV bit in the Status Byte Register is set.



Standard Event Status

Description

The Standard Event Status Registers indicate any programming errors that occur. The Standard Event Status Register group comprises of the Event and Enable registers.

Standard Event Status Registers

Bit Position	7	6	5	4	3	2	1	0
EVENT	0	0	CME	EXE	DDE	QUE	0	OPC
ENABLE	0	0	CME	EXE	DDE	QUE	0	OPC
Bit weight	128	64	32	16	8	4	2	1

Error Bits

OPC	The operation complete bit is set when all selected pending operations are complete. This bit is set in response to the *OPC command.
QUE	The query error bit is set when there is an error reading the output queue. This can be caused by trying to read the output queue when there is no data in it.
DDE	The Device Dependent Error indicates a memory error/lost memory or failure of the self-test.
EXE	The Execution bit indicates an execution error due to one of the following

		• Illegal command parameter • Parameter out of range • Invalid parameter Command didn't execute due to an overriding operation condition.
	CME	The Command Error 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. (Group Execute Trigger) as defined in IEEE 488.1.
Event Register	The Event Register will be set to 0 when read.	
Enable Register	The Enable Register determines which events will set the ESB Bit (bit 5) in the Status Byte Register.	

Status Byte Register

Description

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

Status Byte Register

Bit Position	7	6	5	4	3	2	1	0
Condition	0	MSS	ESB	MAV	QUES	CSUM	ERR	0
Bit weight	128	64	32	16	8	4	2	1

Status Bits	CSUM	The CSUM bit is set when an Enabled event has occurred on a channel. The Channel Condition, Channel Event and Channel Summary Event Registers all determine if the CSUM bit is set.
	QUES	The Questionable bit is set when a questionable event has occurred.

ESB	The Event Status bit is set if an enabled event in the Standard Event Status Event Register has occurred.
ERR	The ERR bit is set when there is a message in the error queue.
MSS & RQS	The Master Summary Status is used with the *STB? query. When the *STB? query is read the MSS bit is not cleared. The Request Service bit is cleared when it is polled during a serial poll.

Service Request Register

Description

The Service Request Generation Register determines which events in the Status Byte Register will generate Service Requests. It is essentially the Status Byte Enable Register. The bit events are the same as the Status Byte Register, minus the MSS/RQS bit.

Service Request Generation Register(Status Byte Enable)

Bit Position	7	6	5	4	3	2	1	0
Condition	0	0	ESB	MAV	QUES	CSUM	ERR	0
Bit weight	128	64	32	16	8	4	2	1

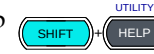
APPENDIX

Adjusting QueryModeName

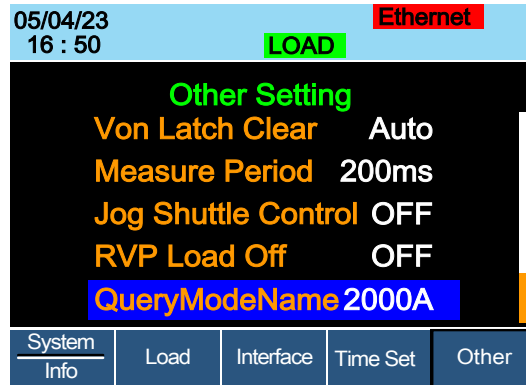
Background	Users can adjust the model name to PEL-2000A or PEL-2000B.	
Parameter	Query Mode Name	2000A/2000B

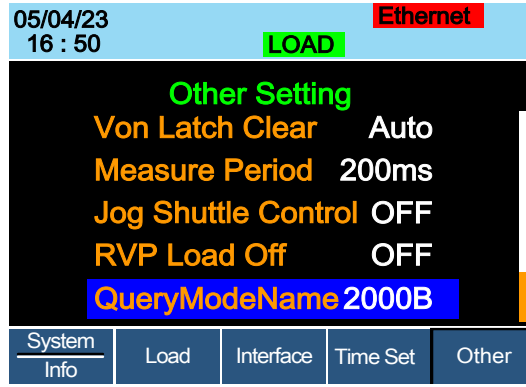
Panel operation

1. Press the Shift Key then the Help key to access the Utility menu.

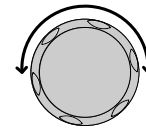


2. Press F5 (Other Menu).

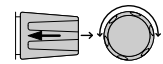




3. Use the Selector knob to highlight QueryModeName.



4. Press the Selector knob to edit QueryModeName, then turn to change from 2000A to 2000B and vice versa.



5. Press the Selector Knob or Enter to confirm selection.