OWH80Q Series Programmable Power Supply

Programming Manual

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Note: All commands require an \n ending, such as OUTP? \ n OUTP OFF\ n

1. System commands

SYSTem:VERSion?

Syntax:

SYSTem:VERSion?

Function Description:

Query SCPI command version number.

Parameters:

None.

Examples:

(1) SYST:VERS?

Return:
V1.0.0

SYSTem:LOCal

Syntax:

SYSTem:LOCal

Function Description:

Disconnect the power through the communication interface (USB, RS485, LAN) to the remote control mode. At this time, the panel button resumes operation.

Parameters:

None.

Examples:

(1) **SYST:LOC?**

SYST: LOC?
Return:

None.

SYSTem:REMote

Syntax:

SYSTem:REMote

Function Description:

Set the power to remote control mode through the communication interface (USB, RS485, LAN). At this time, the panel keys are locked and inoperable, and all control commands need to be operated normally after this command.

Parameters:

None.

Examples:

(1) **SYST:REM?**
SYST: REM?
Return:

None.

2. Output command

OUTPut

Syntax:

OUTPut[:STATe] <channel>,<value>
OUTPut[:STATe]?

Function Description:

Controls the output state of the specified channel.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>: output state
- ON: 1 or ON
- OFF: 0 or OFF

Examples:

(1) Turn on the output of channel 1.

OUTP 1,ON

(2) Query the output status of the channel, return 1 if the channel has output, or 0 otherwise.

OUTP? 1

Return:ON.

3. Control command

VOLTage

Syntax:

[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude] <channel>,<value>
[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]? <channel>

Function Description:

Set and query the output voltage value of the specified channel.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>: |MIN|MAX|NRf|, output voltage value to be set, number of float characters.

Examples:

(1) Set the output voltage of channel 1 to 10V.

VOLT 1,10

(2) Query the output voltage setting for the channel.

VOLT? 1

Return:10.000

VOLTage: SLOPe

Syntax:

[SOURce:]VOLTage:SLOPe[:LEVel][:IMMediate][:AMPLitude] <channel>,<value>

[SOURce:]VOLTage:SLOPe[:LEVel][:IMMediate][:AMPLitude]? <channel>

Function Description:

Set and query the voltage output rise and fall slopes for a specified channel.

Parameters:

- <channel>:channel number (1, 2, 3, 4)
- <value>: |MIN|MAX|NRf|, output slope to set, number of float characters.

Examples:

(1) Set the output rise and fall slope of the channel 1 supply voltage to 0.1 V.

VOLT: SLOP 1,0.1

(2) Query the output rise and fall slopes of the supply voltage.

VOLT:SLOP? 1

Return:0.1.

CURRent

Syntax:

[SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude] <channel>,<value>

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

Function Description:

Set and query the output current value of the specified channel power supply.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>: |MIN|MAX|NRf|, output current value to be set, number of float characters.

Examples:

(1) Set the output current of channel 1 to 1A.

CURR 1,1

(2) Query the output current setting of the channel.

CURR? 1

Return:1.000.

CURRent:SLOPe

Syntax:

[SOURce:]CURRent:SLOPe[:LEVel][:IMMediate][:AMPLitude] <channel>,<value>
[SOURce:]CURRent:SLOPe[:LEVel][:IMMediate][:AMPLitude]? <channel>

Function Description:

Set and query the ascending and descending slopes of the power output of the specified channel.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>: |MIN|MAX|NRf|, outputs the values of rising and falling slopes

Examples:

(1) Set the output rise and fall slope of the channel 1 power supply to 0.1 A.

CURR:SLOP 1,0.1

(2) Query the output rise and fall slopes of the power supply.

CURR:SLOP? 1

Return:0.1.

4. Measurement command

MEASure:VOLTage

Syntax:

MEASure[:SCALar]:VOLTage[:DC]? <channel>

Function Description:

Queries the output voltage value of the specified channel power supply.

Parameters:

- <channel>: channel number (1, 2, 3, 4).

Examples:

(1) Query the output voltage value of the channel 1 power supply.

MEAS:VOLT? 1

Return:10.000.

MEASure:CURRent

Syntax:

MEASure[:SCALar]:CURRent[:DC]? <channel>

Function Description:

Queries the output current value of the specified channel power supply.

Parameters:

- <channel>: channel number (1, 2, 3, 4).

Examples:

(1) Query the output current value of the channel 1 power supply.

MEAS:CURR? 1

Return:1.000.

MEASure:POWer

Syntax:

MEASure[:SCALar]:POWer[:DC]? <channel>

Function Description:

Query the output power value of the specified channel power supply.

Parameters:

- <channel>: channel number (1, 2, 3, 4).

Examples:

(1) Query the output power value of the channel 1 power supply.

MEAS:POW?

Return:100.0.

MEASure:ALL

Syntax:

MEASure[:SCALar]:ALL[:DC]? <channel>

MEASure[:SCALar]:ALL[:DC]:INFO? <channel>

Function Description:

- MEASure[:SCALar]:ALL[:DC]? Query the output voltage and current of the power supply of the specified channel.
- MEASure[:SCALar]:ALL[:DC]:INFO? Query the output voltage, power, current, output fault status, and CCCV status of the specified channel power supply.

Parameters:

- <channel>: channel number (1, 2, 3, 4).

Examples:

(1) Query the output voltage and current of the channel 1 power supply.

MEAS:ALL? 1

Return:10.000,2.000.

(2) Query the output voltage, current, power, output fault status (OCP, OVP, OPP), CCCV status (CV = 1, CC = 2) of power supply 1.

MEAS:ALL:INFO? 1

Return:10.000,2.000,20.0,OFF,OFF,OFF,1.

5. System Configuration Commands

CONFigure:CHannel:SELect

Syntax:

CONFigure:CHannel:SELect{1|2|CH1|CH2}
CONFigure:CHannel:SELect?

Function Description:

Set and query power specifies the effective channel for subsequent operations.

Parameters:

- Value 1|2CH1|CH2

Examples:

(1) Set the power to operate at CH1.

CONF:CH:SEL CH1

(2) Query the effective channel of the subsequent operation of the power supply.

CONF:CH:SEL?

Return:CH1.

CONFigure:OUTPut:MODE

Syntax:

CONFigure:OUTPut:MODE{CCCV|LIST|PV}
CONFigure:OUTPut:MODE?

Function Description:

Set and query the output mode of the power supply.

Parameters:

- Value CCCV|LIST|PV|

Examples:

(1) Set the power supply to work in LIST.

CONF:OUTP:MODE LIST

(2) Query about the working mode of the power supply.

CONF:OUTP:MODE?

Return:LIST.

FUNCtion:PRIority

Syntax:

FUNCtion:PRIority<channel>,<value>
FUNCtion:PRIority?<channel>

Function Description:

Set and query the output priority mode of the specified channel power supply.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>: CV|CC|VOLTAGE|CURRENT

Examples:

(1) Set the output of the power supply to CC first.

FUNC:PRI 1,CC

(2) Query the output priority mode of the power supply.

FUNC:PRI? 1

Return:0.

6. Protection command

OVP,OCP,OPP

Syntax:

[SOURce:]VOLTage:PROTection[:LEVel] <channel>,<value>

[SOURce:]VOLTage:PROTection[:LEVel]? <channel>

[SOURce:]CURRent:PROTection[:LEVel] <channel>,<value>

[SOURce:]CURRent:PROTection[:LEVel]? <channel>

[SOURce:]POWer:PROTection[:LEVel] <channel>,<value>

[SOURce:]POWer:PROTection[:LEVel]? <channel>

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>: |NRf|

Function Description:

- VOLT:PROT sets the OVP protection value.
- CURR:PROT sets the OCP protection value.
- POW:PROT sets the OPP protection value.

Examples:

(1) Set the protection value of channel 1

1. **VOLT:PROT 1, 85.0**
2. **CURR:PROT 1, 25.0**
3. **POW:PROT 1, 500.0**

7. LIST Waveform Command

[SOURce:]LIST:MODE

Syntax:

[SOURce:]LIST:MODE <channel>,<value>
[SOURce:] LIST:MODE? <channel>

Function Description:

Set and query the operating mode of the specified channel LIST.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:{AUTO|MANUAL}

Examples:

(1) Set the operating mode of channel 1LIST to automatic mode.

LIST:MODE 1,AUTO

(2) Query the running mode of channel 1LIST.

LIST:MODE? 1

Return:AUTO.

[SOURce:]LIST:STEP

Syntax:

[SOURce:]LIST:STEP <channel>,<value>
[SOURce:]LIST:STEP? <channel>

Function Description:

Set and query the total number of steps for the specified channel LIST run.

Parameters:

- <channel>: channel number (1, 2, 3, 4)

- <value>:(1--100)

Examples:

(1) Set the number of running steps of Channel 1 LIST to 5.

LIST:STEP 1,5

(2) Number of running steps for query channel 1 LIST.

LIST:STEP? 1

Return:5.

[SOURce:]LIST:INDex

Syntax:

[SOURce:]LIST:INDex <channel>,<value>
[SOURce:]LIST:INDex? <channel>

Function Description:

Set and query the current step count of the specified channel LIST.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:(1--100)

Examples:

(1) Set the current number of steps for channel 1 LIST to 2 steps.

LIST:IND 1,2

(2) Query the current number of steps for channel 1LIST.

LIST:IND? 1

Return:2.

[SOURce:]LIST:VOLTage

Syntax:

[SOURce:]LIST:VOLTage <channel>,<value>
[SOURce:]LIST:VOLTage? <channel>

Function Description:

Set and query the voltage value corresponding to the current number of steps of the specified channel LIST.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:|NRf|

Examples:

(1) Set the voltage value of the current number of steps of channel 1 LIST to 5V.

LIST:VOLT 1,5.0

(2) Query the voltage value for the current step count of channel 1 LIST.

LIST:VOLT? 1

Return:5.00.

[SOURce:]LIST:CURRent

Syntax:

[SOURce:]LIST:CURRent <channel>,<value>
[SOURce:]LIST:CURRent? <channel>

Function Description:

Set and query the current value corresponding to the current number of steps of the specified channel LIST.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:|NRf|

Examples:

(1) The current value of the current number of steps of channel 1 LIST is set to 5A.

LIST:CURR 1,5.0

(2) Query the current value for the current number of steps of channel 1LIST.

LIST:CURR? 1

Return:5.000.

[SOURce:]LIST:TIMEr

Syntax:

[SOURce:]LIST:TIMEr <channel>,<value>
[SOURce:]LIST:TIMEr? <channel>

Function Description:

Set and query the execution duration corresponding to the current number of steps of the specified channel LIST, in s.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:|NRf|

Examples:

(1) Set the execution duration 1s of the current number of steps of channel 1 LIST.

LIST:TIME 1,1.00

(2) Execution duration of the current number of steps of the query channel 1 LIST.

LIST:TIME? 1

Return:1.00.

[SOURce:]LIST:CYCle

Syntax:

[SOURce:]LIST:CYCle <channel>,<value>
[SOURce:]LIST:CYCle? <channel>

Function Description:

Set and query the total number of cycles that specify the channel LIST runs.

Parameters:

- <channel>:channel number (1, 2, 3, 4)
- <value>:(0--9999),0:INF(infinite loop)

Examples:

(1) Set the total number of running cycles of channel 1LIST to 9.

LIST:CYC 1,9

(2) Number of running steps for query channel 1LIST.

LIST:CYC? 1

Return:9.

[SOURce:]LIST:TIMEr

Syntax:

[SOURce:]LIST:TIMEr <channel>,<value>
[SOURce:]LIST:TIMEr? <channel>

Function Description:

Set and query the execution duration corresponding to the current number of steps of the specified channel LIST, in s.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:|NRf|

Examples:

(1) Set the execution duration 1s of the current number of steps of channel 1LIST.

LIST:TIME 1,1.00

(2) Execution duration of the current number of steps of the query channel 1LIST.

LIST:TIME? 1

Return:1.00.

[SOURce:]LIST:LOAD

Syntax:

[SOURce:]LIST:LOAD <channel>
[SOURce:]LIST:LOAD? <channel>

Function Description:

Set and query the LIST table load for the specified channel.

Parameters:

- <channel>:channel number (1, 2, 3, 4)

Examples:

(1) Load the channel 1LIST table.

LIST:LOAD 1

(2) Query whether the channel 1LIST table has been loaded, ON when loading is completed, OFF when loading is not completed.

LIST:LOAD? 1

Return:ON.

[SOURce:]LIST:TRIG

Syntax:

[SOURce:]LIST:TRIG <channel>

Function Description:

Set and query the LIST step for the specified channel in manual mode.

Parameters:

- <channel>: channel number (1, 2, 3, 4)

Examples:

(1) In manual mode, channel 1 is stepped, and the number of steps currently executed is 5-> 6.

LIST:TRIG 1

Overall Function Description:

LIST:MODE This command is used to select the LIST MODE state.
LIST:STEP this command is used to set the number of steps to execute LIST.
LIST:INDex this command sets the storage location INDex (1-100).
LIST:VOLT sets the voltage under the current index.
LIST:CURR sets the current under the current index.
LIST:TIME sets the execution TIME under the current index (the minimum execution TIME is 1S = 1).
LIST: CYCl Sets the number of loop executions of the total LIST LIST.
LIST:LOAD Loads the LIST table to the DSP.
LIST:TRIG triggers the DSP to run the LIST LIST output.

Example running step channel 1:

1. CONF:OUTP:MODE 1,LIST
2. LIST:MODE 1,AUTO
3. LIST:STEP 1,10
4. LIST: CYCl 1,0
5. LIST:INDex 1,1
    1) LIST:VOLT 1,12.0
    2) LIST:CURR 1,1.0
    3) LIST:TIME 1,1

    Reuse the number of times set from step 5 to step 3 according to different indexes.
6. LIST:LOAD 1
7. OUTP 1,ON (performs the start LIST function)
8. LIST:TRIG 1 (used in MANUAL mode setting)

8. PV simulation commands

SAS:CURve:TYPE

Syntax:

SAS:CURve:TYPE <channel>,<value>
SAS:CURve:TYPE?

Function Description:

This command sets the PV simulation type for the specified channel.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:{EN50530|SANDIA}

Examples:

(1) Set the channel 1 PV simulation type to EN50530.

SAS:CUR:TYPE 1,EN50530

(2) Query channel 1 photovoltaic simulation type.

SAS:CUR:TYPE? 1

Return:EN50530.

SAS:TECH

Syntax:

SAS:TECH <channel>,<value>
SAS:TECH? <channel>

Function Description:

This command is used to set the material type under the specified channel PV simulation type to EN50530.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:{csi|tf}

Examples:

(1) Set channel 1 PV simulation type to material type under EN50530.

SAS:TECH 1,CSI

(2) Query channel 1 PV simulation type is material type under EN50530.

SAS:TECH? 1

Return:CSI.

SAS:VMPp

Syntax:

SAS:VMPp<channel>,<value>
SAS:VMPp? <channel>

Function Description:

Set and query the voltage when the PV simulation type is the maximum power of the specified channel under EN50530.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:|NRf|

Examples:

(1) Set the photovoltaic simulation type to EN50530 lower channel 1 high power time voltage.

SAS:VMP 1,35

(2) Query the voltage when the photovoltaic simulation type is EN50530 under channel 1 high power.

SAS:VMP? 1

Return:35.00.

SAS:PMPp

Syntax:

SAS:PMPp <channel>,<value>
SAS:PMPp? <channel>

Function Description:

Set and query the maximum power of the specified channel under the PV simulation type EN50530.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:|NRf|

Examples:

(1) Set the photovoltaic simulation type to EN50530 lower channel 1 maximum power.

SAS:PMP 1,500

(2) The query photovoltaic simulation type is EN50530 lower channel 1 maximum power.

SAS:PMP? 1

Return:500.0.

SAS:TMP

Syntax:

SAS:TMP <channel>,<value>
SAS:TMP? <channel>

Function Description:

Set and query the ambient temperature of the specified channel under the PV simulation type EN50530.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:|NRf| (0—100.0)

Examples:

(1) Set the PV simulation type to EN50530 lower channel 1 ambient temperature.

SAS:TMP 1,25

(2) Query photovoltaic simulation type is EN50530 lower channel 1 ambient temperature.

SAS:TMP? 1

Return:25.0.

SAS:IRR

Syntax:

SAS:IRR <channel>,<value>
SAS:IRR? <channel>

Function Description:

Set and query the light intensity of the specified channel under the PV simulation type EN50530.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:(0-1000)

Examples:

(1) Set the photovoltaic simulation type to EN50530 lower channel 1 light intensity.

SAS:IRR 1,800

(2) Query photovoltaic simulation type is EN50530 lower channel 1 light intensity.

SAS:IRR? 1

Return:800.

SAS:SANDIA:TECH

Syntax:

SAS:SANDIA:TECH <channel>,<value> {smc|hc|tf}
SAS:SANDIA:TECH? <channel>

Function Description:

This command is used to set the material type under the specified channel PV simulation type to SANDIA.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:{smc|hc|tf}

Examples:

(1) Set the channel 1 PV simulation type to the material type under SANDIA.

SAS:SANDIA:TECH 1,TF

(2) Query channel 1 photovoltaic simulation type is material type under SANDIA.

SAS:SANDIA:TECH? 1

Return:TF.

SAS:SANDIA:IRR

Syntax:

SAS:SANDIA:IRR <channel>,<value>

SAS:SANDIA:IRR? <channel>

Function Description:

Set and query the light intensity of the specified channel under the PV simulation type SANDIA.

Parameters:

- <channel>: channel number (1, 2, 3, 4)

- <value>:(0-1000)

Examples:

(1) Set the photovoltaic simulation type to SANDIA lower channel 1 light intensity.

SAS:SANDIA:IRR 1,800

(2) Query the photovoltaic simulation type as the light intensity of channel 1 under SANDIA.

SAS:SANDIA:IRR? 1

Return:800.

SAS:SANDIA:TMP

Syntax:

SAS:SANDIA:TMP <channel>,<value>
SAS:SANDIA:TMP? <channel>

Function Description:

Set and query the ambient temperature of the specified channel under the PV simulation type SANDIA.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:|NRf| (0—100.0)

Examples:

(1) Set the photovoltaic simulation type to SANDIA under channel 1 ambient temperature.

SAS:SANDIA:TMP 1,50

(2) query photovoltaic simulation type is the ambient temperature of channel 1 under SANDIA.

SAS:SANDIA:TMP? 1

Return:50.0.

SAS:SANDIA:PMPp

Syntax:

SAS:SANDIA:PMPp <channel>,<value>
SAS:SANDIA:PMPp? <channel>

Function Description:

Set and query the maximum power of the specified channel under the PV simulation type SANDIA.

Parameters:

- <channel>: channel number (1, 2, 3, 4)
- <value>:|NRf|

Examples:

(1) Set the photovoltaic simulation type to SANDIA lower channel 1 maximum power.

SAS:SANDIA:PMP 1,500

(2) Query the photovoltaic simulation type as the maximum power of channel 1 under SANDIA.

SAS:SANDIA:PMP? 1

Return:500.0.

SAS:SANDIA:VMPp

Syntax:

SAS:SANDIA:VMPp<channel>,<value>
SAS:SANDIA:VMPp? <channel>

Function Description:

Set and query the voltage when the PV simulation type is the maximum power of the specified channel under SANDIA.

Parameters:

- <channel>: channel number (1, 2, 3, 4)

- <value>:|NRf|

Examples:

(1) Set the photovoltaic simulation type to the high power voltage of channel 1 under SANDIA.

SAS:SANDIA:VMP 1,35

(2) Query the voltage when the photovoltaic simulation type is SANDIA under channel 1 high power.

SAS:SANDIA:VMP? 1

Return:35.00.

TRIG

Syntax:

TRIG<channel>

Function Description:

Triggers the emulation to take effect.

Parameters:

- <channel>: channel number (1, 2, 3, 4)

Examples:

(1) Set the photovoltaic simulation type to the high-power voltage of channel 1 under EN50530, and it will take effect directly.

SAS:SANDIA:VMP 1,35

TRIG

SAS:AVErage:VMPp?

Syntax:

SAS:AVErage:VMPp? <channel>

Function Description:

Query the average voltage at maximum power when the simulation is running.

Parameters:

- <channel>: channel number (1, 2, 3, 4)

Examples:

(1) Query the average voltage at the maximum power of channel 1 when the simulation is running.

SAS:AVErage:VMPp? 1

Return:5.00.

SAS:AVErage:IMPp?

Syntax:

SAS:AVErage:IMPp? <channel>

Function Description:

Query the average current at maximum power when the simulation is running.

Parameters:

- <channel>: channel number (1, 2, 3, 4)

Examples:

(1) Query the average current at the maximum power of channel 1 when the simulation is running.

SAS:AVErage:IMPp? 1

Return:5.00.

SAS:AVErage:PMPp?

Syntax:

SAS:AVErage:PMPp? <channel>

Function Description:

Average power when querying the maximum power when the simulation is running.

Parameters:

- <channel>: channel number (1, 2, 3, 4)

Examples:

(1) The average power when querying the maximum power of channel 1 when the simulation is running.

SAS:AVErage:PMPp? 1

Return:500.00.

Overall functional description of PV system:

SAS:CURve:TYPE This command is used to set the PV simulation TYPE {EN50530 | SANDIA}

The following is a description of the simulation instruction of type EN50530

SAS:VMPp Set the voltage at maximum power.
SAS:TMP sets ambient temperature.
SAS:PMPp sets the maximum power.
SAS:TECH sets the material type.
SAS:IRR Setting Light Intensity
TRIG triggers the simulation to take effect.

The following is a description of the SANDIA type emulation instruction

SAS:SANDIA:TECH sets the material type.
SAS:SANDIA:IRR Light Intensity.
SAS:SANDIA:TMP Ambient Temp.
SAS:SANDIA:PMPp Max.
SAS:SANDIA:VMPp Voltage at maximum power.
TRIG triggers the simulation to take effect.

SAS:AVErage:VMPp? Query the average voltage at maximum power when the simulation is running.
SAS:AVErage:IMPp? Query the average current at maximum power when the simulation is running.
SAS:AVErage:PMPp? Query the average power when the simulation is running.

Example running steps:

1. CONF:OUTP:MODE PV
2. SAS:CURve:TYPE 1,EN50530

3. SAS:VMPp 1,20.0
4. SAS:TMP1, 25
5. SAS:PMPp 1,60.0
6. SAS:TECH 1,csi
7. SAS:IRR 1,800
8. TRIG
9. OUTP 1,ON (perform start function)