OWH65 Series Single-Channel High Power Programmable DC Power Supply

Programming Manual

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⚠ Command to remember: :SYSTem:REMote
Function: Enable remote control mode for the device to accept SCPI commands.
Why it must be sent first: The device responds to front panel keys by default. Any configuration commands will be ignored (no error, no response, which can easily be mistaken for device failure) before entering remote mode.

Note: All commands must end with \n, e.g. **OUTP? \n OUTP OFF\n**

1. System Commands

SYSTem:VERSion?

Syntax	:SYSTem:VERSion?	
Function Description	Query the SCPI protocol version supported by the device.	
Parameters	None.	
Note	None.	
Return Format	String, example: 1999.0.	
Example	**Query**	SYST:VERS?
	Return	V1.0.0

SYSTem:LOCal

Syntax	SYSTem:LOCal	
Function Description	Switch the power supply to local control mode via communication interfaces (USB, RS485, LAN). The front panel keys become operable at this point.	
Parameters	None.	
Note	None.	
Return Format	None.	
Example	**Set**	SYST:LOC

SYSTem:REMote

Syntax	SYSTem:REMote	
Function Description	Set the power supply to remote control mode via communication interfaces (USB, RS485, LAN). The front panel keys are locked and unavailable. All control commands can work properly only after this command.	
Parameters	None.	
Note	None.	
Return Format	None.	
Example	**Set**	SYST:REM

2. Output Commands

⚠ Prerequisite Reminder for This Chapter
:SYSTem:REMote — Enables remote control, which is the prerequisite for all commands to take effect.
When remote mode is not activated, all commands such as OUTPut[:STATe], and :MEASure will not work.
This command must be resent every time the device powers up or after :SYSTem:LOCal is executed to exit remote mode.

OUTPut[:STATe]

Syntax	OUTPut[:STATe] {0|1|ON|OFF} OUTPut[:STATe]?	
Function Description	Control the output state of the currently selected channel.	
Parameters	Enable: 1 or ON; Disable: 0 or OFF.	
Note	None.	
Return Format	ON or OFF.	
Example1	**Set**	OUTP ON //Turn on the channel output
	Query	OUTP? //Query the channel output status
	Return	ON
Example2	**Set**	OUTPut:MODE CCCV //Set output mode to CCCV
	Query	OUTPut:MODE? //Query output mode
	Return	CCCV

3. Control Commands

⚠ Prerequisite Reminder for This Chapter
:SYSTem:REMote — Enables remote control, which is the prerequisite for all commands to take effect.
When remote mode is not activated, all commands such as OUTPut[:STATe], and :MEASure will not work.
This command must be resent every time the device powers up or after :SYSTem:LOCal is executed to exit remote mode.

VOLTage

Syntax	[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]<value> [SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]?	
Function Description	Set or query output voltage of power supply.	
Parameters	value: Output voltage value to be set, floating-point numeric string.	
Note	None.	
Return Format	Float value.	
Example	**Set**	VOLT 10 //Set channel output voltage to 10V
	Query	VOLT? //Query channel output voltage
	Return	10.000

VOLTage: SLOPe

Syntax	[SOURce:]VOLTage:SLOPe[:LEVel][:IMMediate][:AMPLitude]<value> [SOURce:]VOLTage:SLOPe[:LEVel][:IMMediate][:AMPLitude]?	
Function Description	Set or query the rising and falling slope of power supply voltage output.	
Parameters	value: |MIN|MAX|NRf	
Note	None.	
Return Format	Float value.	
Example	**Set**	VOLT: SLOP 0.1 //Set the rising and falling slope of the power supply voltage output to 0.1V

	Query	VOLT:SLOP? //Query the rising and falling slope of the power supply voltage output
	Return	0.1

CURRent

Syntax	[SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude]<value> [SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude]?	
Function Description	Set or query output current of power supply.	
Parameters	value: Output current value to be set, floating-point numeric string.	
Note	None.	
Return Format	Float value.	
Example	**Set**	CURR 1 //Set channel output current to 1A
	Query	CURR? //Query channel output current
	Return	1.000

CURRent:SLOPe

Syntax	[SOURce:]CURRent:SLOPe[:LEVel][:IMMediate][:AMPLitude]<value> [SOURce:]CURRent:SLOPe[:LEVel][:IMMediate][:AMPLitude]?	
Function Description	Set or query the rising and falling slope of power supply current output.	
Parameters	value: |MIN|MAX|NRf	
Note	None.	
Return Format	Float value.	
Example	**Set**	CURR: SLOP 0.1 //Set the rising and falling slope of the power supply current output to 0.1A
	Query	CURR:SLOP? //Query the rising and falling slope of the power supply current output
	Return	0.1

4. Measurement Commands

⚠ Prerequisite Reminder for This Chapter
:SYSTem:REMote — Enables remote control, which is the prerequisite for all commands to take effect.
When remote mode is not activated, all commands such as OUTPut[:STATe], and :MEASure will not work.

This command must be resent every time the device powers up or after :SYSTem:LOCal is executed to exit remote mode.

MEASure:VOLTage

Syntax	MEASure[:SCALar]:VOLTage[:DC]?	
Function Description	Query the output voltage of power supply.	
Parameters	None.	
Note	None.	
Return Format	String, example: 1999.0.	
Example	**Send**	MEAS:VOLT? //Query the output voltage of power supply
	Return	10.000

MEASure:CURRent

Syntax	MEASure[:SCALar]:CURRent[:DC]?	
Function Description	Query the output current of power supply.	
Parameters	None.	
Note	None.	
Return Format	String, example: 1.000.	
Example	**Send**	MEAS:CURR? //Query the output current of power supply
	Return	1.000

MEASure:POWer

Syntax	MEASure[:SCALar]:POWer[:DC]?	
Function Description	Query the output power of power supply.	
Parameters	None.	
Note	None.	
Return Format	String, example: 100.0.	
Example	**Send**	MEAS:POW? //Query the output power of power supply
	Return	100.0

MEASure:ALL

Syntax	MEASure[:SCALar]:ALL[:DC]? MEASure[:SCALar]:ALL[:DC]:INFO?	
Function Description	Query the output voltage, current and power of the power supply.	
Parameters	None.	
Note	None.	
Return Format	String, example: 100.0.	
Example1	**Send**	MEAS:ALL? //Query the output voltage and current of the power supply
	Return	10.000,2.000
Example2	**Send**	MEAS:ALL:INFO? //Query the output voltage, current and power of the power supply
	Return	10.000,2.000,20.0

5. System Configuration Commands

⚠ Prerequisite Reminder for This Chapter
:SYSTem:REMote — Enables remote control, which is the prerequisite for all commands to take effect.
When remote mode is not activated, all commands such as OUTPut[:STATe], and :MEASure will not work.
This command must be resent every time the device powers up or after :SYSTem:LOCal is executed to exit remote mode.

CONFigure:OUTPut:MODE

Syntax	CONFigure:OUTPut:MODE{CCCV|LIST|PV} CONFigure:OUTPut:MODE?	
Function Description	Set or query the output mode of power supply.	
Parameters	value: CCCV|LIST|PV	
Note	None.	
Return Format	CCCV, LIST, PV	
Example	**Set**	CONF:OUTP:MODE LIST //Set the work mode of power supply to LIST
	Query	CONF:OUTP:MODE? //Query the work mode of power supply
	Return	LIST

FUNCtion:PRIority

Syntax	FUNCtion:PRIority{CV|CC|VOLTAGE|CURRENT} FUNCtion:PRIority?
Function Description	Set or query the output priority mode of the power supply.
Parameters	value: CV|CC|VOLTAGE|CURRENT
Note	None.
Return Format	CV, CC, VOLTAGE, CURRENT

Example	**Set**	FUNC:PRI CC //Set the power supply output to CC priority
	Query	FUNC:PRI? //Query the output priority mode of the power supply
	Return	0

6. Protection Commands

⚠ Prerequisite Reminder for This Chapter
:SYSTem:REMote — Enables remote control, which is the prerequisite for all commands to take effect.
When remote mode is not activated, all commands such as OUTPut[:STATe], and :MEASure will not work.
This command must be resent every time the device powers up or after :SYSTem:LOCal is executed to exit remote mode.

[SOURce:]VOLTage:PROTection

Syntax	[SOURce:]VOLTage:PROTection[:LEVel]<value_f> [SOURce:]VOLTage:PROTection[:LEVel]?	
Function Description	Set or query the overvoltage protection (OVP) setting value (protection is triggered when the voltage exceeds this value).	
Parameters	value_f: Float Parameters, unit is V.	
Note	Applicable to all output modes. The output will be turned off after triggering.	
Return Format	Float value.	
Example	**Set**	VOLT:PROT 85.0 //Set OVP to 85V
	Query	VOLT:PROT? //Query OVP value
	Return	85.0

[SOURce:]CURRent:PROTection

Syntax	[SOURce:]CURRent:PROTection[:LEVel]<value_f> [SOURce:]CURRent:PROTection[:LEVel]?
Function Description	Set or query the overcurrent protection (OCP) setting value (protection is triggered when the current exceeds this value).
Parameters	value_f: Float Parameters, unit is A.
Note	Applicable to all output modes. The output will be turned off after triggering.
Return Format	Float value.

Example	**Set**	CURR:PROT 25.0　//Set OCP to 25A
	Query	CURR:PROT?　　//Query OCP value
	Return	25.0

[SOURce:]POWer:PROTection

Syntax	[SOURce:]POWer:PROTection[:LEVel]<value_f> [SOURce:]POWer:PROTection[:LEVel]?	
Function Description	Set or query the overpower protection (OPP) setting value (protection is triggered when the power exceeds this value).	
Parameters	value_f: Float Parameters, unit is W.	
Note	Applicable to all output modes. The output will be turned off after triggering.	
Return Format	Float value.	
Example	**Set**	POW:PROT 500.0　//Set OPP to 500W
	Query	POW:PROT?　　//Query OPP value
	Return	500.0

7. LIST Waveform Commands

⚠ Prerequisite Reminder for This Chapter
:SYSTem:REMote — Enables remote control, which is the prerequisite for all commands to take effect.
When remote mode is not activated, all commands such as OUTPut[:STATe], and :MEASure will not work.
This command must be resent every time the device powers up or after :SYSTem:LOCal is executed to exit remote mode.

[SOURce:]LIST:MODE

Syntax	[SOURce:]LIST:MODE {AUTO|MANUAL} [SOURce:] LIST:MODE?	
Function Description	Set/Query LIST the operation mode of LIST mode (Auto / Manual).	
Parameters	AUTO: Automatic operation. MANUAL: Manual operation.	
Note	Abbreviation: LIST:MODE.	
Return Format	AUTO, MANUAL	
Example	**Set**	LIST:MODE AUTO
	Query	LIST:MODE?
	Return	AUTO

[SOURce:]LIST:STEP

Syntax	[SOURce:]LIST:STEP<value_i (1--100)> [SOURce:]LIST:STEP?
Function Description	Set/Query the total step count of LIST mode (number of list entries).
Parameters	value: 1~100.
Note	Abbreviation: LIST:STEP.
Return Format	Integer.

Example	**Set**	LIST:STEP 2
	Query	LIST:STEP?
	Return	2

[SOURce:]LIST:INDex

Syntax	[SOURce:]LIST:INDex<value_i (1--100)> [SOURce:]LIST:INDex?	
Function Description	Set/Query the current edit index of LIST mode (the step number for specified operation).	
Parameters	value: 1~100.	
Note	Abbreviation: LIST:IND.	
Return Format	Integer.	
Example	**Set**	LIST:IND 2
	Query	LIST:IND?
	Return	2

[SOURce:]LIST:VOLTage

Syntax	[SOURce:]LIST:VOLTage<value_f> [SOURce:]LIST:VOLTage?	
Function Description	Set/Query the voltage value of the current index step in LIST.	
Parameters	value_f: Float value, unit is V.	
Note	Abbreviation: LIST:VOLT.	
Return Format	Integer.	
Example	**Set**	LIST:VOLT 24
	Query	LIST:VOLT?
	Return	24.000

[SOURce:]LIST:CURRent

Syntax	[SOURce:]LIST:CURRent<value _f> [SOURce:]LIST:CURRent?	
Function Description	Set/Query the current value of the current index step in LIST.	
Parameters	value_f: Float value, unit is A.	
Note	Abbreviation: LIST:CURR.	
Return Format	Integer.	
Example	**Set**	LIST:CURR 4
	Query	LIST:CURR?
	Return	4.000

[SOURce:]LIST:TIMEr

Syntax	[SOURce:]LIST:TIMEr<value _f> [SOURce:]LIST:TIMEr?	
Function Description	Set/Query the duration of the current index step in LIST.	
Parameters	value_f: Float value, unit is s.	
Note	Abbreviation: LIST:TIME.	
Return Format	Integer.	
Example	**Set**	LIST:TIME 2
	Query	LIST:TIME?
	Return	2.0

[SOURce:]LIST:CYCle

Syntax	[SOURce:]LIST:CYCle<value_i (0--9999) > [SOURce:]LIST:CYCle?
Function	Set/Query the cycle count of LIST mode.

Description		
Parameters	value: 0~9999; 0=Infinity.	
Note	Abbreviation: LIST:CYC.	
Return Format	Integer.	
Example	**Set**	LIST:CYC 2
	Query	LIST:CYC?
	Return	2

[SOURce:]LIST:LOAD

Syntax	[SOURce:]LIST:LOAD	
Function Description	Load the LIST table data (to make the set step count, voltage, current and duration take effect).	
Parameters	None.	
Note	Must be executed after all LIST parameters are set.	
Return Format	None.	
Example	**Set**	LIST:LOAD //List data loading is complete, ready to run.

[SOURce:]LIST:TRIG

Syntax	[SOURce:]LIST:TRIG	
Function Description	In manual mode, trigger LIST to execute the current indexed step (valid when LIST:MODE is set to MANUAL).	
Parameters	None.	
Note	Each send executes one step.	
Return Format	None.	
Example	**Set**	LIST:TRIG //Execute the current indexed step (e.g., index 1).

8. PV Stimulate Commands

⚠ Prerequisite Reminder for This Chapter
:SYSTem:REMote — Enables remote control, which is the prerequisite for all commands to take effect.
When remote mode is not activated, all commands such as OUTPut[:STATe], and :MEASure will not work.
This command must be resent every time the device powers up or after :SYSTem:LOCal is executed to exit remote mode.

SAS:CURve:TYPE

Syntax	SAS:CURve:TYPE {EN50530|SANDIA} SAS:CURve:TYPE?	
Function Description	Set / query photovoltaic simulation model type under PV Mode.	
Parameters	EN50530|SANDIA|CUSTOM	
Note	Select the core simulation algorithm for PV Mode.	
Return Format	Return EN50530, SANDIA or CUSTOM	
Example	**Set**	SAS:CURve:TYPE EN50530
	Query	SAS:CURve:TYP?
	Return	EN50530

SAS:VMPp

Syntax	SAS:VMPp<value_f> SAS:VMPp?	
Function Description	Set / query MPP voltage under EN50530 model.	
Parameters	<value_f>: Float Parameters, unit is V.	
Note	Valid only when CURve:TYPE=EN50530	
Return Format	<value_f> (float value, unit is V)	
Example	**Set**	SAS:VMPp 35.0

	Query	SAS:VMPp?
	Return	35.0

SAS:TMP

Syntax	SAS:TMP<value_f> SAS:TMP?	
Function Description	Set / query ambient temperature under EN50530 model.	
Parameters	<value_f>: numeric value, unit is: ℃	
Note	Valid only when CURve:TYPE=EN50530	
Return Format	<value_f> (float value, unit is ℃)	
Example	**Set**	SAS:TMP 35.0
	Query	SAS:TMP?
	Return	35.0

SAS:PMPp

Syntax	SAS:PMPp<value_f> SAS:PMPp?	
Function Description	Set / query MPP power under EN50530 model.	
Parameters	<value_f>: numeric value, unit is: W.	
Note	Valid only when CURve:TYPE=EN50530	
Return Format	<value_f> (float value, unit is W)	
Example	**Set**	SAS:PMP 1000.0
	Query	SAS:PMP?
	Return	1000.0

SAS:TECH

Syntax	SAS:TECH{csi|tf} SAS:TECH?	
Function Description	Set / query photovoltaic material type under EN50530 model.	
Parameters	CSI: Crystalline Silicon TF: Thin Film	
Note	Valid only when CURve:TYPE=EN50530	
Return Format	csi|tf	
Example	**Set**	SAS:TECH csi
	Query	SAS:TECH?
	Return	csi

SAS:IRR

Syntax	SAS:IRR <value_i (0--1000)> SAS:IRR?	
Function Description	Set / query irradiance under EN50530 model.	
Parameters	<value_i>: numeric value, unit is: W/m²	
Note	Valid only when CURve:TYPE=EN50530	
Return Format	Integer.	
Example	**Set**	SAS:IRR 5
	Query	SAS:IRR?
	Return	5

SAS:SANDIA:TECH

Syntax	SAS:SANDIA:TECH{smc|hc|tf} SAS:SANDIA:TECH?

Function Description	Set / query photovoltaic material type under SANDIA model.	
Parameters	TF: Thin Film SMC: Standard HC: High-efficiency Crystalline	
Note	Valid only when CURve:TYPE=SANDIA)	
Return Format	TF|SMC|HC	
Example	**Set**	SAS:SANDIA:TECH SMC
	Query	SAS:SANDIA:TECH?
	Return	SMC

SAS:SANDIA:IRR

Syntax	SAS:SANDIA:IRR<value_i (0--1000)> SAS:SANDIA:IRR?	
Function Description	Set / query irradiance under SANDIA model.	
Parameters	<value_i>: numeric value, unit is: W/m²	
Note	Valid only when CURve:TYPE=SANDIA).	
Return Format	Integer.	
Example	**Set**	SAS:SANDIA:IRR 20
	Query	SAS:SANDIA:IRR?
	Return	20

SAS:SANDIA:TMP

Syntax	SAS:SANDIA:TMP<value_f (0—100.0)> SAS:SANDIA:TMP?
Function Description	Set / query ambient temperature under SANDIA model.
Parameters	<value_f>: numeric value, unit is: ℃.

Note	Valid only when CURve:TYPE=SANDIA).	
Return Format	<value_f> (float value, unit is ℃)	
Example	**Set**	SAS:SANDIA:TMP 35.0
	Query	SAS:SANDIA:TMP?
	Return	35.0

SAS:SANDIA:PMPp

Syntax	SAS:SANDIA:PMPp<value_f> SAS:SANDIA:PMPp?	
Function Description	Set / query MPP power under SANDIA model.	
Parameters	<value_f>: numeric value, unit is: W.	
Note	Valid only when CURve:TYPE=SANDIA).	
Return Format	<value_f> (float value, unit is W)	
Example	**Set**	SAS:SANDIA:PMP 1000.0
	Query	SAS:SANDIA:PMP?
	Return	1000.0

SAS:SANDIA:VMPp

Syntax	SAS:SANDIA:VMPp<value_f> SAS:SANDIA:VMPp?	
Function Description	Set / query MPP voltage under SANDIA model.	
Parameters	<value_f>: Float Parameters, unit is V.	
Note	Valid only when CURve:TYPE=SANDIA).	
Return Format	<value_f> (float value, unit is V)	
Example	**Set**	SAS:SANDIA:VMP 20.0
	Query	SAS:SANDIA:VMP?

	Return	20.0

TRIG

Syntax	TRIG	
Function Description	Apply the above PV mode settings (submit parameters to output).	
Parameters	None.	
Note	Set CURve:TYPE, VMPp, PMPp and other parameters first, then send this command to take effect.	
Return Format	None.	
Example	**Set**	TRIG

SAS:AVErage:VMPp?

Syntax	SAS:AVErage:VMPp?	
Function Description	Query average MPP voltage under PV Mode.	
Parameters	None.	
Note	VMPp Valid only in PV Mode. Returns average VMPp over long-term operation.	
Return Format	<value_f> (float value, unit is V).	
Example	**Query**	SAS:AVErage:VMPp?
	Return	35.20

SAS:AVErage:IMPp?

Syntax	SAS:AVErage:IMPp?
Function Description	Query average MPP current under PV Mode.
Parameters	None
Note	Valid only in PV Mode. Returns average IMPp over long-term

	operation.	
Return Format	<val> (numeric value, unit is: A)	
Example	**Query**	SAS:AVErage:IMPp?
	Return	28.6

SAS:AVErage:PMPp?

Syntax	SAS:AVErage:PMPp?	
Function Description	Query average MPP power under PV Mode.	
Parameters	None	
Note	Valid only in PV Mode. Returns average PMPp over long-term operation.	
Return Format	<val> (numeric value, unit is: W)	
Example	**Query**	SAS:AVErage:PMPp?
	Return	1000.0

9. Example

Typical Programming Flow Example for LIST Mode

① SYSTem:REMote //Enable SCPI remote control
② CONF:OUTP:MODE LIST
③ LIST:MODE AUTO
④ LIST:STEP 10
⑤ LIST: CYCl 0
⑥ LIST:INDex 1
⑦ LIST:VOLT 12.0
⑧ LIST:CURR 1.0
⑨ LIST:TIME 1
Repeat step 5 according to different indexes, set to the count of step 3.
⑩ LIST:LOAD
⑪ OUTP ON (Execute to start the LIST function.)
⑫ LIST:TRIG (Used under MANUAL mode setting.)

Typical Programming Flow Example for PV Mode

Application: Simulate EN50530 curve operation.

① SYSTem:REMote //Enable SCPI remote control
② CONF:OUTP:MODE PV
③ SAS:CURve:TYPE EN50530
④ SAS:VOC 25.0
⑤ SAS:ISC 5.0
⑥ SAS:VMPp 20.0
⑦ SAS:IMPp 3.0
⑧ SAS:TMP 25
⑨ SAS:PMPp 60.0
⑩ SAS:TECH csi
⑪ SAS:IRR 800
⑫ TRIG
⑬ OUTP ON (Execute the start function.)