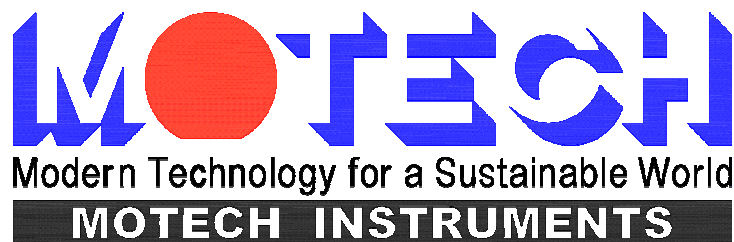
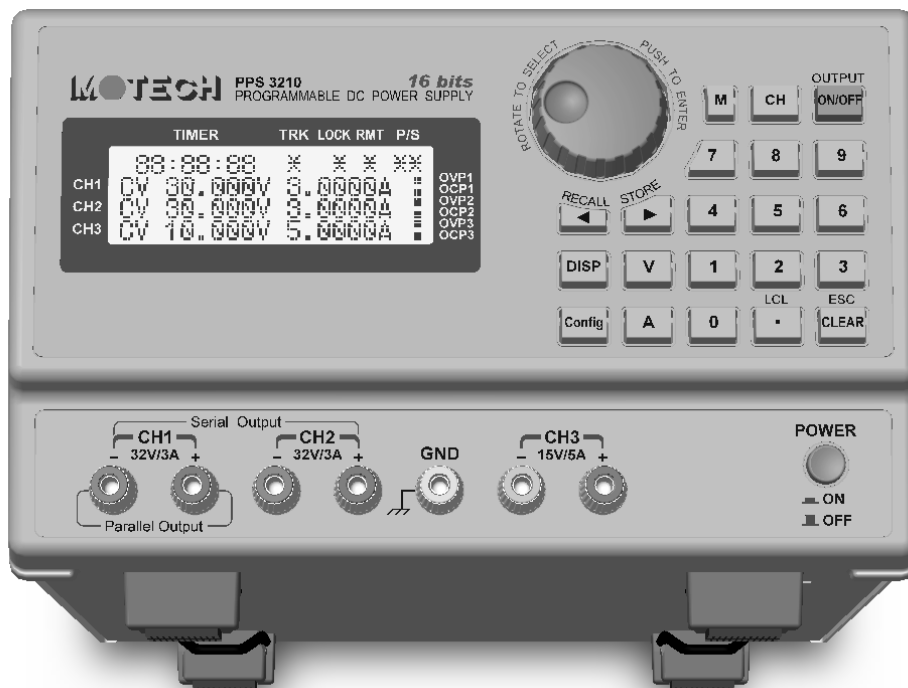


PPS3210

Programmable DC Power Supply User's Manual



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MOTECH INDUSTRIES INC.

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※※※ Storage. Freight. Maintenance. Disposal ※※※

Storage

When don't use the device, please pack it properly and store under a good environment.

(The packing is no needed when the device under appropriate environment.)

Freight

Please use the original packing material when move the device. If the packing material is missing, please use the equivalent buffer material to pack and mark it fragile and waterproof to avoid the device damage during movement. The device is precision equipment, please use qualified transportation as possible. And, please avoid heavy hitting to damage the device.

Maintenance

There is no maintenance operation for the general user (except for the note in the manual). Please contact our company or agent when abnormal occurred to the device. Don't maintain by yourself to avoid occurred unnecessary danger and serious damage to the device.

Disposal

When the device in badly condition and can't be used or repaired, please discard it according to your company disposal procedures or local legal procedures. Don't discard arbitrary to avoid polluting environment.

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1. Introduction

1.1 An Overview of the Product

Motech PPS 3210 is a programmable DC power supply with three (3) outputs that channel 1 and channel 2 are linear power supply and channel 3 is a switching mode power supply. PPS 3210 comes with 16 bits resolution. The maximum total output power is 222 watts with both channel 1 and channel 2 providing 96 watts each (0 ~ 32V/3A) and channel 3 providing 30 watts (0 ~ 15V/5A). For the channel 3, the maximum output power is 30 watts. When the output voltage is set to 6 volts or less, the output current can be up to 5A. If the output voltage is set above 6 volts then the maximum output current depends on the output voltage setting and the maximum output power of 30 watts. This is a unique feature and it differs from other traditional power supplies. For the channel 1 and channel 2, they can be put in parallel mode if the output current is required to drive more than 3A. Also, they can be put in serial mode if the output voltage is required to provide more than 32V. Tracking function is a convenient feature that is also provided to meet general applications. The PPS 3210 has a rotary and numeric keypads for user to manipulate this electronic instrument easily. The PPS 3210 provides a memory space enough to store 100 configurations that can be recalled later after saving. This feature offers an easy way to restore the application setting. There is a build-in timer (1 sec ~ 100 hrs) that can be used to control when to switch off the output power. This feature provides an extra safety for burning room and electroplating applications. The PPS 3210 also provides over voltage protection (OVP) and over current protection (OCP) features used to keep the output voltage and current within the safety level preventing the target from the damage caused by the over current. The key lock feature is added to avoid accidentally wrong setting to the PPS 3210. When the input power and the load change, the PPS 3210 provides a stable output with the load and line regulation within 0.01% and the transient time less than 50 us. When in remote mode, the PPS 3210 may output a new setting in 50 ms after receive a command. This quick response time may increase the throughput on the mass production lines.

1.2 Features

1. Triple output:

Voltage Ranges : 0 ~ 32V (CH1&CH2) / 0 ~ 15V (CH3)

Current Ranges : 0 ~ 3A (CH1&CH2) / 0 ~ 5A (CH3)

Power Ranges : 0 ~ 96W (CH1&CH2) / 0 ~ 30W (CH3)

The maximum output current of channel 3 basically depends on the output

voltage setting and the maximum output power of 30 watts. However, it is limited to 5A maximum. For example, if the output voltage of the channel 3 is set to 15V, then the maximum output current is 2A. If the output voltage is set to 6V, then the output current could be up to 5A. However, if the output voltage is set to 3V, the output current will still keep within 5A because of the maximum output current limit.

2. Digital rotary, number key, function key setting:

The rotary can be used to change the output voltage rapidly. Simulate the surge of the voltage output. It provides the solution for the trigger circuit testing. User can set up output voltage by numeric keypads too. It differs from original VR adjusting. Function keys provide users operation more friendly and easily.

3. Precious measurement on voltage & current:

In addition to the precise outputs, PPS 3210 provides voltage and current measurements (read back). Users can reduce the measurement equipment budget and space.

4. Memory and timer function:

PPS 3210 provides a memory space to store 100 settings that can be easily recalled. This feature makes the restoration of the previous settings quickly and friendly. The PPS 3210 has two (2) timers with resolution of 1 second and 1 millisecond respectively. The timers are used to time the outputs. When the timer counts down to zero the PPS 3210 will automatically turn the output off. This feature is useful when the PPS 3210 is providing the power to the targets in the burning room. Also it can be used to precisely control the output current down to millisecond duties for electroplate applications.

5. OVP, OCP & lock protection function:

The over voltage protection (OVP) and over current protection (OCP) features limit the maximum output current and voltage to avoid damages to the target when doing experimentations in a laboratory. The key lock feature disables all keys except the CLR key. It prevents the PPS 3210 from the accidentally wrong setting and then avoids the damages to the target.

6. Series, parallel mode:

In serial mode, CH1/CH2 can output maximum 64V with positive/negative output. It can be used for OP circuit design. In parallel mode, CH1/CH2 can output 6A maximum.

7. Dual tracking:

Users only needs to setup CH1 output voltage and current, PPS 3210 will output the same voltage/current at CH2. This is convenient to test two samples at the same time.

2. Specification

Model	PPS 3210	
Channel NO.	CH1 & CH2	CH3
Output Voltage	0~32V	0~15V
Output Current	0~3A	0~5A
Output Power (CH3 Auto Ranging)	96W	30W
Line Regulation ±(% of output + offset)		
Voltage	0.01% + 2mV	
Current	0.01% + 300uA	
Load Regulation ±(% of output + offset)		
Voltage	≤3mV	≤5mV
Current	0.01% + 300uA	
Ripple and Noise (20Hz ~ 20MHz)		
Normal Mode Voltage	700uVrms / 7mVpp	1mVrms / 20mVpp
Normal Mode Current	<1mA	<5mA
Resolution		
Programming	1mV / 100uA	
Read back	1mV / 100uA	
Programming Accuracy ±(% of output + offset)		
Voltage	0.01% + 5mV	
Current	0.01% + 1mA	0.01% + 2mA
Read back Accuracy ±(% of output + offset)		
Voltage	0.01% + 5mV	
Current	0.01% + 1mA	0.01% + 2mA
Temperature Coefficient per°C ±(% of output + offset)		
Voltage	<0.01% + 3mV	
Current	<0.02% + 2mA	
Tracking Accuracy ±(% of output + offset)		
Voltage	0.02% + 10mV	
Transient Response Time	<50uS	
Stability, constant output & temperature ±(% of output + offset), 8hrs		
Voltage	<0.02% + 2mV	
Current	<0.01% + 1mA	

Voltage Programming Speed	
Rising Time at Full Load	3mSec
Rising Time at No Load	3mSec
Falling Time at Full Load	8mSec
Falling Time at No Load	250mSec
General	
AC Line Input Voltage Ranges	115 / 220 VAC 10%(50 / 60Hz)
Temperature Ratings	Operating(0°C ~ 40°C) , Storage (-10°C ~ 70°C)
Common-Mode Voltage	±240Vdc
Dimensions (W×H×D)mm	(216 x 135 x 432)
Weight	6.5 kg

PPS 3210 Features :

- LCD display, three independent outputs and display on LCD
- CH3 auto-ranging output
- Low Ripple, Low Noise
- Numeric and function keypads
- Store and recall settings (up to 100 sets)
- Timer (1 sec ~ 100 hours; 4 ~ 65535 ms)
- Precise voltage and current measurement
- OVP, OCP and Key Lock function
- Serial and Parallel mode
- Dual Tracking Mode
- Average measurement time 50m sec
- Standard RS232, USB interface
- Optional Interface: GPIB, LAN, I/O Port

3. Notices before Using

3.1 Confirm Attachment before Using

Please follow the below items to protect your rights as you receive this instrument.

1. If there is ruin or scratch bad condition on product overlook.
 2. The standard attachment as table 7-1, please confirm if there is any missing.
- ※ If above conditions, please inform us for prompt service.

3.2 The Description of Using

The tester is a precise instrument. Please read through this manual to prevent improper operation and arbitrary using from causing this instrument damage. Please calibrate once a year for keeping accuracy.

3.3 Ambient Environment

1. Do not use this instrument in an environment with dusty, vibrating, and corrosive gas and do not expose this machine directly to the sunlight. Please use this instrument in an environment that the ambient temperature is in 0 ~ 40°C and the relative humidity is in 20% ~ 80%. If the temperature is over 40°C, please don't use temporarily until the temperature is back to normal to avoid the unit damage caused by the over temperature.
2. The PPS 3210 is equipped with a cooling fan on the rear panel to keep the internal temperature down, so adequate ventilation should be ensured. The tester should be located at least 10cm from any object or wall behind it. Do not block the ventilation holes to keep the tester in good precision.
3. The PPS 3210 has been carefully designed to prevent the noise from the AC power source. However, it should be used in the environment with noise as low as possible. If noise is inevitable, please install a power filter.

3.4 Storage

The PPS 3210 should be stored in an environment with the temperature in the range of -10°C ~ 70°C, and the relative humidity below 80% RH. If the unit is not to be in use for a long period of time, please store it in the original or similar package and keep it from direct sunlight and humidity.

3.5 Power-Line Voltage

The tester is an instrument which uses AC power 115V/220V 50Hz/60Hz. Before plugging in the power cord, make sure the power switch is in the off position and the voltage of the rear panel is the same as the required voltage.

3.6 Fuse

There is one fuse installed in the rear panel. When replacing the fuse, please notice the following:

1. Please turn off the power and disconnect the AC power cord and remove all the other connections from the power supply.
2. The checking of fuse can't sure with the eyes, the testing value under 15Ω is normal.
3. When replacing the fuse, the cap jut out the rear panel on fuse stand using flat type screwdriver or pressing softly by hand.

Mark	Center Voltage	Range	Fuse
115	115V	100V~125V	Slow
220	220V	200V~250V	Slow

Warning :

For continues protection against fire hazard, replace only with the same type and rating of fuse as specified.

3.7 Warming Up

This tester activates at power on. However, in order to meet the accuracy in the specification, please warm it up for 30 minutes or longer.

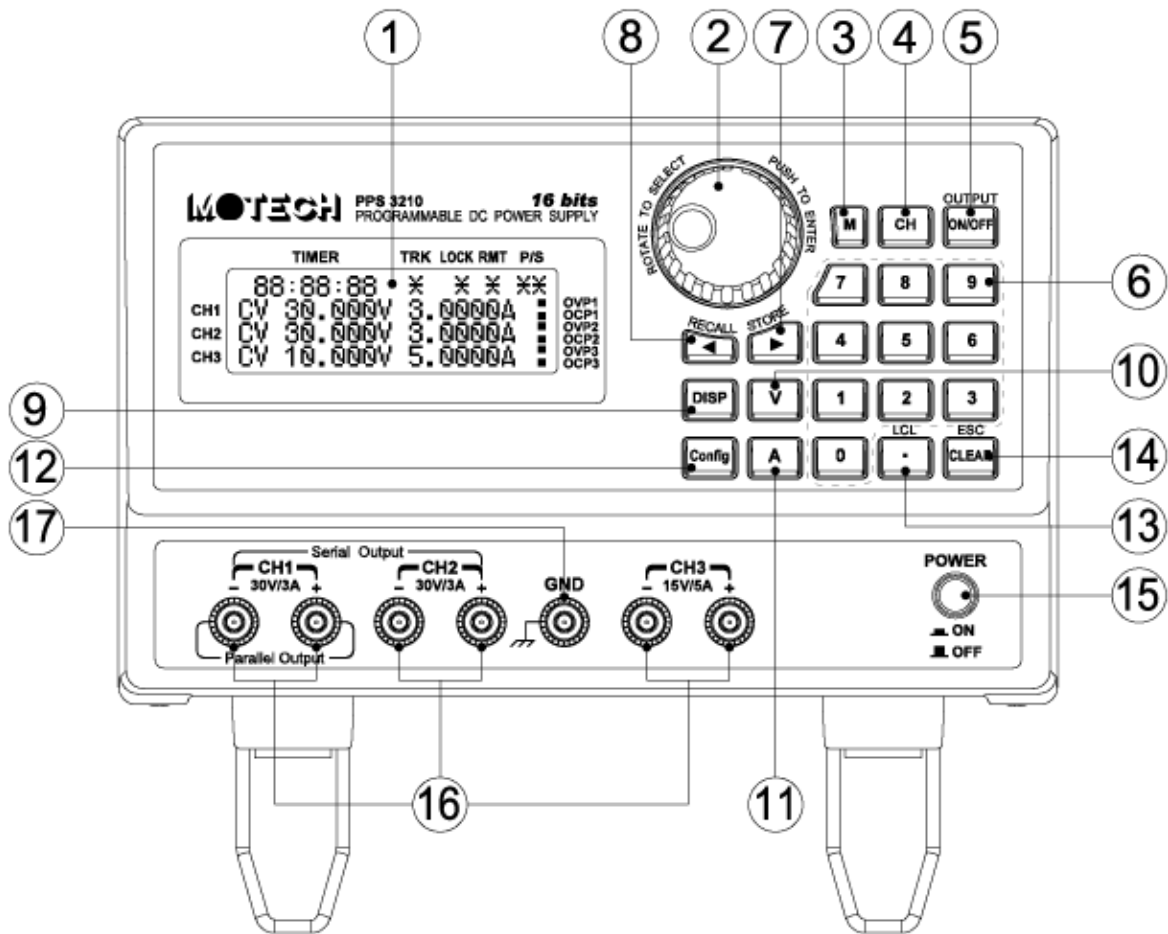
3.8 End Test

When tests are done and the tester is not in use or need to leave for a while during usage, make sure to turn off the power switch.

4. Panel Description

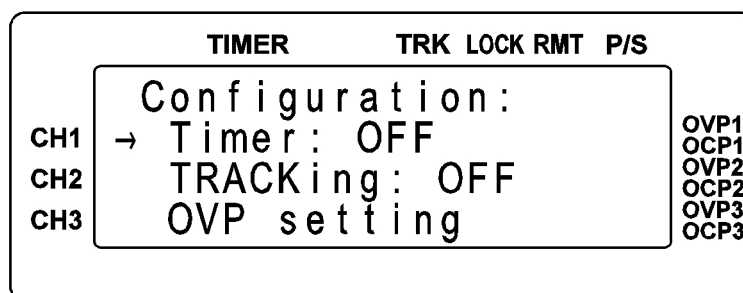
4.1 PPS 3210 Panel Description

4.1.1 Front Panel Description



- (1) Display:
Display is a 20x4 blue backlight LCD
- (2) Rotary(ENTER):
Rotary can adjust voltage and current. Users can press it as ENTER function.
- (3) M:
Press M key to enter the memory function. Users can then select one (1) from the 100 memories to store or recall the configuration by pressing the STORE or RECALL key.
- (4) CH:
Selecting CH1/CH2/CH3

- (5) **ON/OFF:**
This keypad is used to turn the output power on or off.
- (6) **Number Key:**
Input number by number key. To set the voltage or current, press the "V" or "A" key after the number input.
- (7) **►(STORE):**
This keypad has two (2) functions. When the output is on, this key is used to move the cursor to select the digit to be adjusted. Users then adjust the digit by turning the rotary. When in memory function, this keypad is used to store the current configuration into the memory simply by pressing it.
- (8) **◄(RECALL):**
This keypad has two (2) functions also. When the output is on, press this key to move the cursor to the selected digit and then turning the rotary to adjust the value of the digit. When in memory function, by pressing this key to recall a stored configuration from the memory.
- (9) **DISP:**
Press this key to select the display to show the voltage/current or power/resistance readout.
- (10) **V(Voltage):**
Press this key to set voltage after number input.
- (11) **A(Current):**
Press this key to set current after number input.
- (12) **Config:**
Press this key to enter the configuration setting. There are 16 items to be set in this mode.
1. **Timer:** The initial value is OFF. Press the rotary to enter the timer configuration.



	TIMER	TRK	LOCK	RMT	P/S
	<div> <div>TIMER: 00:00:00</div> <div> <div>CH1 OFF←</div> <div>ON/OFF key</div> </div> <div>CH2 OFF</div> <div>To start Timer</div> <div>CH3 OFF</div> </div>				
					OVP1 OCP1 OVP2 OCP2 OVP3 OCP3

- A. Using rotary or ◀▶ keypads to move the cursor onto the digit and set up the timer with the format of 00:00:00 (HH:MM:SS).
 - B. Select CH1, CH2, or CH3 by press the CH keypad. Then press the rotary to turn the timer ON or OFF.
 - C. Start Timer when press the ON/OFF key
 - D. Press knob + CLEAR to pause the timer. Restart by repeating the same step
2. TRACKING: The initial value is OFF, switch to ON by pressing the rotary. The CH2 will have the same voltage and current setting as the CH1.

	TIMER	TRK	LOCK	RMT	P/S
	<div> <div>Configuration:</div> <div> <div>CH1 Timer: OFF</div> <div>CH2 → TRACKing: ON</div> <div>CH3 OVP setting</div> </div> </div>				
					OVP1 OCP1 OVP2 OCP2 OVP3 OCP3

3. OVP setting: Over voltage protection. Press the rotary to enter OVP Configuration. Press “CH” to select CH1/CH2/CH3. Users can press ON/OFF to enable or disable OVP and input the voltage value via the number keys. Please remember to press rotary (Enter) to save the settings.

	TIMER	TRK	LOCK	RMT	P/S
	<div> <div>Configuration:</div> <div> <div>CH1 Timer: OFF</div> <div>CH2 TRACKing: OFF</div> <div>CH3 → OVP setting</div> </div> </div>				
					OVP1 OCP1 OVP2 OCP2 OVP3 OCP3

	TIMER	TRK	LOCK	RMT	P/S	
	OVP setting:					
CH1	OFF→30.00V			3.000A		OVP1
CH2	OFF 30.00V			3.000A		OC1
CH3	OFF 10.00V			5.000A		OVP2
						OC2
						OVP3
						OC3

4. OCP setting: Over current protection. Press rotary to enter OCP Configuration. Press “CH” to select CH1/CH2/CH3. Users can press ON/OFF to enable or disable OCP and input current value via the number keys. Please remember to press rotary to save the settings.

	TIMER	TRK	LOCK	RMT	P/S	
	Configuration:					
CH1	→ OCP setting					OVP1
CH2	Baud rate:38400					OC1
CH3	Interface:RS-232					OVP2
						OC2
						OVP3
						OC3

	TIMER	TRK	LOCK	RMT	P/S	
	OCP setting:					
CH1	OFF→30.00V			3.000A		OVP1
CH2	OFF 30.00V			3.000A		OC1
CH3	OFF 10.00V			5.000A		OVP2
						OC2
						OVP3
						OC3

5. Baud rate: Transmission speed. Users can select baud rate for 1200, 2400, 4800, 9600, 19200, 38400 by rotary.

	TIMER	TRK	LOCK	RMT	P/S	
	Configuration:					
CH1	OCP setting					OVP1
CH2	→ Baud rate:38400					OC1
CH3	Interface:RS-232					OVP2
						OC2
						OVP3
						OC3

6. Interface: Transmission interface. Users can select RS232, USB, GPIB (optional), LAN Port (optional) by using rotary.

TIMER		TRK LOCK RMT P/S		
CH1	Configuration:			OVP1 OCP1 OVP2 OCP2 OVP3 OCP3
CH2	OCP setting			
CH3	Baud rate: 38400			
	→ Interface: RS-232			

7. DHCP: This parameter is for LAN port setting. The default value is Off mode. Users may change the mode by press the rotary. At DHCP "On" mode, a dynamic IP address can be obtained from the server.

TIMER		TRK LOCK RMT P/S		
CH1	Configuration:			OVP1 OCP1 OVP2 OCP2 OVP3 OCP3
CH2	→ DHCP: ON			
CH3	IP: 170. 85.170. 81			
	BEEP: ON			

8. IP***.***.***.***: When the DHCP is off, it needs to set an IP address for the PPS3210 if LAN is selected. Users may use the ◀▶keypads to locate the cursor and then use the number keypads to key-in the right IP address.

TIMER		TRK LOCK RMT P/S		
CH1	Configuration:			OVP1 OCP1 OVP2 OCP2 OVP3 OCP3
CH2	DHCP: ON			
CH3	→ IP: 170. 85.170. 81			
	BEEP: ON			

9. BEEP: Buzzer. Press rotary to switch the buzzer on or off.

	TIMER	TRK	LOCK	RMT	P/S
CH1	Configuration: DHCP: ON IP: 170. 85. 170. 81 → BEEP: ON				
CH2					
CH3					
					OVP1 OCP1 OVP2 OCP2 OVP3 OCP3

10. Key lock: Key lock function. The initial value is OFF. Press rotary to turn on key lock function. All keys are disabled except Rotary + CLEAR can disable the key lock.

	TIMER	TRK	LOCK	RMT	P/S
CH1	Configuration: → Key lock: OFF Parallel out: OFF Serial out: OFF				
CH2					
CH3					
					OVP1 OCP1 OVP2 OCP2 OVP3 OCP3

11. Parallel out: Parallel output. The initial value is OFF. Press rotary to turn on parallel output. The total output current is 6A because the CH1 and CH2 are connected parallelized.

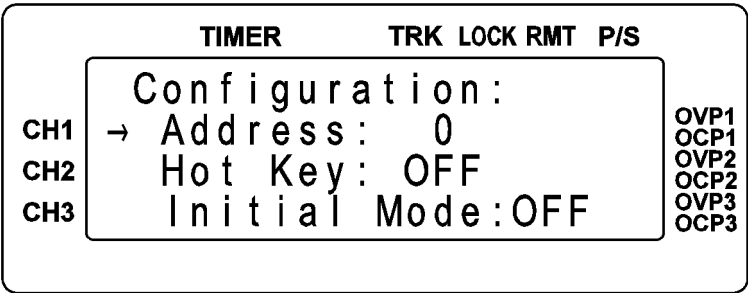
	TIMER	TRK	LOCK	RMT	P/S
CH1	Configuration: Key lock: OFF → Parallel out: OFF Serial out: OFF				
CH2					
CH3					
					OVP1 OCP1 OVP2 OCP2 OVP3 OCP3

12. Serial out: Serial output. The initial value is OFF. Press rotary to turn on serial output. The total output voltage is 64V because the CH1 and CH2 are connected serialized.

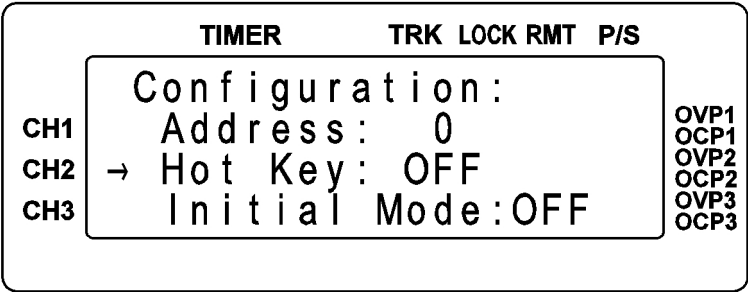
	TIMER	TRK	LOCK	RMT	P/S
CH1	Configuration: Key lock: OFF Parallel out: OFF → Serial out: OFF				
CH2					
CH3					
					OVP1 OCP1 OVP2 OCP2 OVP3 OCP3

13. Address: GPIB address setting. Acceptable range is 00~31. Users

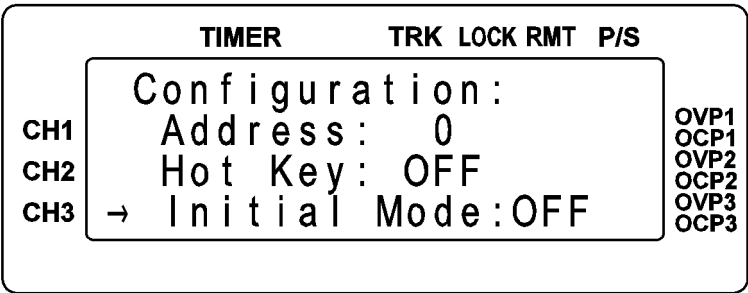
can input the number and press rotary to save the settings.



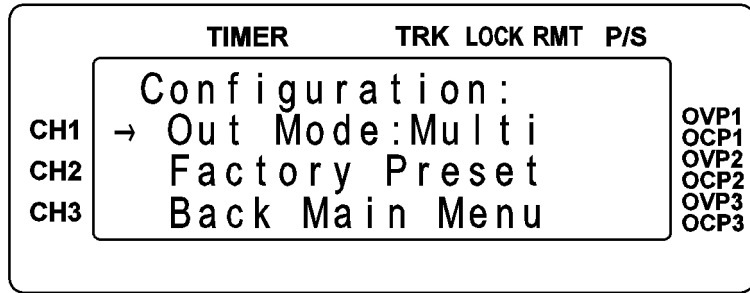
14. Hot Key: Express function key. The initial value is OFF. Press rotary to turn on hot key. The users can recall the correspondent settings from the memory via input 0~9.



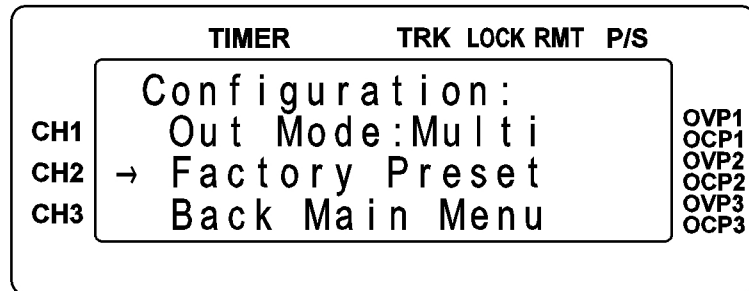
15. Initial Mode: Memorize the settings before the instrument shutdown. The initial value is OFF. Press rotary to turn on the function. When the function is enable, all setting will be saved before the instrument shutdown and recalled after the instrument power on.



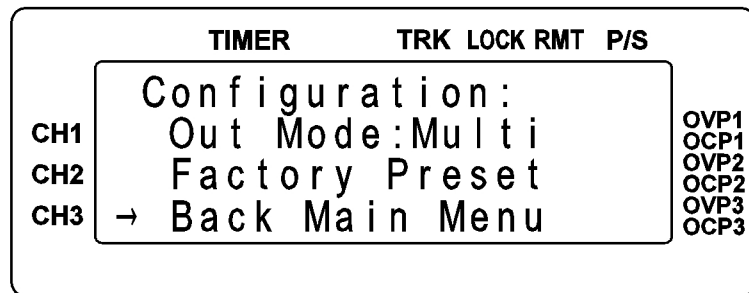
16. Out Mode: Output mode. The initial value is single. Press rotary to switch to multi mode. In the multi mode, CH1/CH2/CH3 output on or off will synchronize by press the ON/OFF key.



17. Factory Preset: Reset to default settings



18. Back Main Menu: Quit configuration and save the settings



(13) . (LCL):

Use as a decimal point. Or, users can press the key to reset to LOCAL mode when in REMOTE connection.

(14) CLEAR(ESC):

Clear the number input. Or, back to the previous display.

(15) Power Switch (POWER ON/OFF)

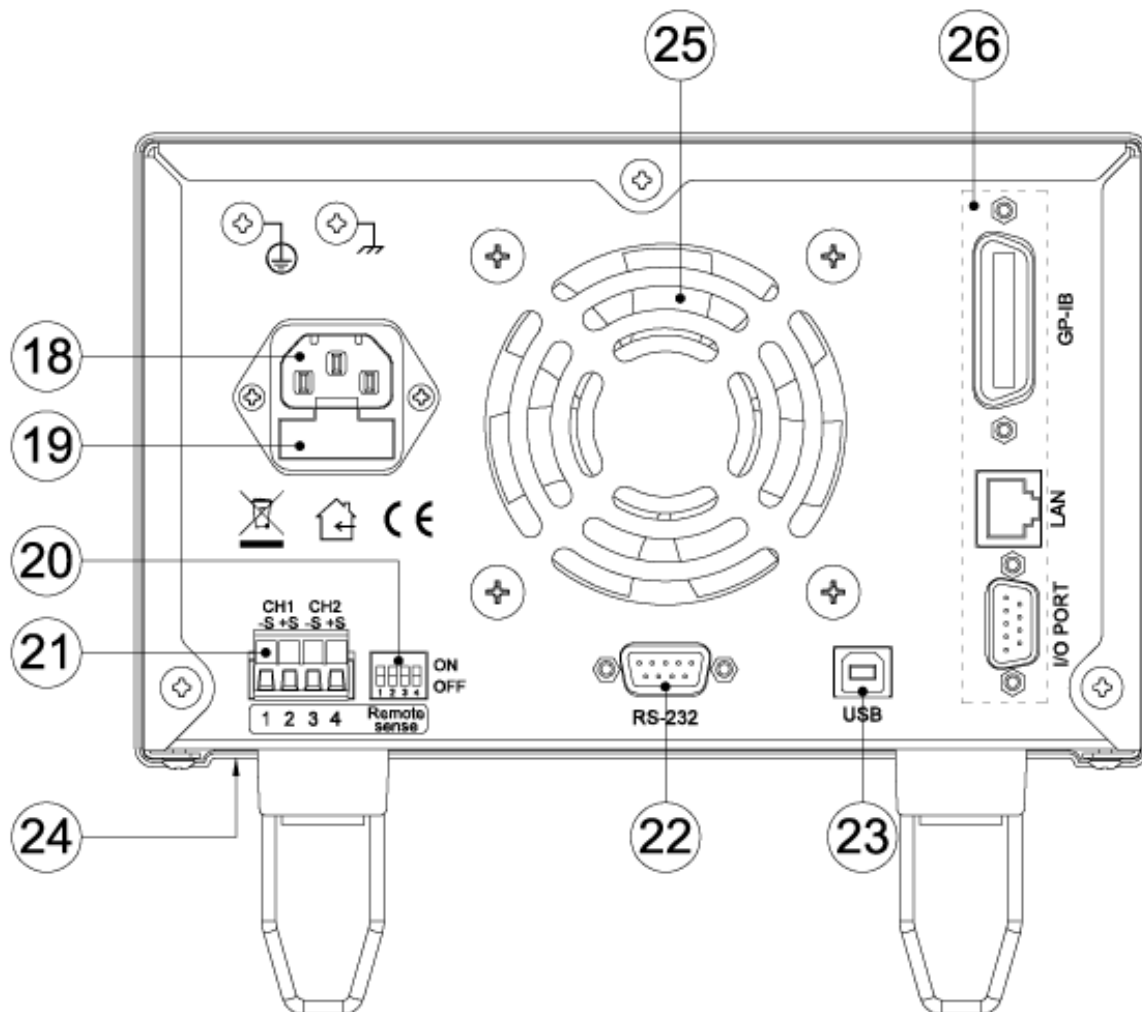
(16) CH1/CH2/CH3 Output terminals

Please recognize the mark on front panel and notice the positive and negative pole.

(17) GND:

It is connected to the earth ground through the power core. Please note that the power core shall have the third pin, or it will not work.

4.1.2 Rear Panel Description



(18) AC Power Input:

The plug connected to the AC source. It uses for 115V/220V.

(19) Fuse:

The fuse used for power source. When the switch set to 115V, using 5A slow fuse; set to 220V, using 2.5A slow fuse.

(20) Remote Sense/Local Sense dip switch:

When the switch set to ON, it becomes to local sense mode, which means positive pole connect to +Sense, negative pole connect to -Sense. When the switch set to OFF, it becomes to remote sense mode. It has voltage compensation when it collaborates with \pm Sense.

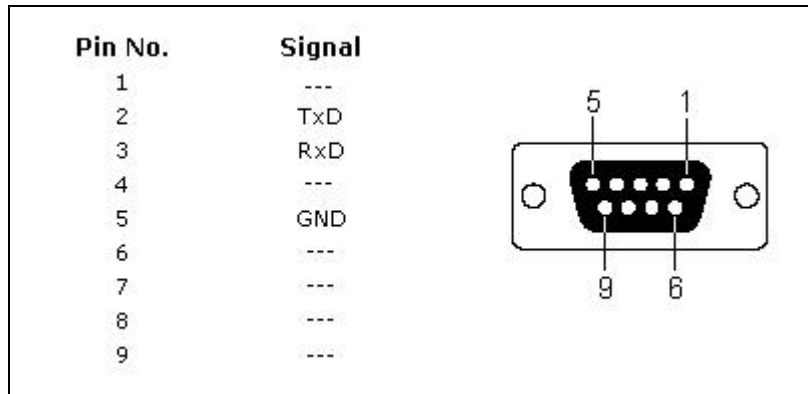
(21) CH1 \pm S / CH2 \pm S:

When the switch set to OFF, it becomes to local sense mode. It has

voltage compensation when it collaborates with \pm Sense. CH1 +Sense and positive pole connect to DUT positive pole. CH1 -Sense and negative pole connect to DUT negative pole.

(22) RS232 Interface

Using pin-to-pin cable to connect with PC, the pin definition as follow:



(23) USB Interface

(24) 115V/220V Power switch (At the bottom of the instrument near the front panel)

(25) Cooling Fan:

Depends on the current of the load, it will adjust the rotation speed of the fan. It is a fuzzy fan.

(26) Optional Interface:

There are GPIB, LAN, and I/O port.

5. Operation Setting

5.1 Voltage Setting

Press “CH” to select channel, there are CH1/CH2/CH3 to choose. (Please follow the * sign in the left side of the LCD) Use the number key to input the voltage. And, press “V” to finish the setting. The voltage will be set immediately.

	TIMER	TRK	LOCK	RMT	P/S	
	30V					
CH1	OFF*	30.00V		3.000A		OVP1 OCP1
CH2	OFF	10.01V		3.000A		OVP2 OCP2
CH3	OFF	5.00V		3.000A		OVP3 OCP3

5.2 Current Setting

Press “CH” to select Channel, there are CH1/CH2/CH3 to choose. (Please follow the * sign in the left side of the LCD) Use the number key to input the current. And, press “A” to finish the setting. The current will be set immediately.

	TIMER	TRK	LOCK	RMT	P/S	
	3A					
CH1	OFF*	30.00V		3.000A		OVP1 OCP1
CH2	OFF	10.01V		3.000A		OVP2 OCP2
CH3	OFF	5.00V		3.000A		OVP3 OCP3

5.3 OVP

Press the “Config” keypad to enter the Configuration screen, and then turn the knob or press the ◀▶ keypads to move the cursor to OVP setting. Press the knob to enter OVP setting screen. Users can press “CH” to select the channel that the OVP to be set. Press the ON/OFF keypad to choose enable or disable. Use the number key to input the voltage. Please remember to press rotary to finish the setting.

5.4 OCP

Press the “Config” keypad to enter the Configuration screen, and then turn the knob

or press the ◀▶ keypads to move the cursor to OCP setting. Press the knob to enter OCP setting. Users can press “CH” to select the channel that the OCP to be set. Press the ON/OFF keypad to choose enable or disable and then use the numeric keypads to enter the OCP value. Please remember to press the knob (Enter) to complete the OCP setting.

5.5 Knob Controller (output on)

When output is on, users can adjust the voltage by turning the knob. Press ◀ or ▶ key to move the cursor and then adjust the voltage by turning the knob. If users want to change channel, just press the “CH” keypad. This provides a convenient testing tool when users are observing the variation of the voltage.

	TIMER	TRK	LOCK	RMT	P/S	
CH1	CV *	1.99V	0.000A			OVP1 OCP1
CH2	OFF	10.01V	3.000A			OVP2 OCP2
CH3	OFF	5.00V	3.000A			OVP3 OCP3

6. Remote Interface Protocol and Package Mode

Communication protocol includes MOTECH and SCPI instructions and low-error Protocol.

6.1 Preface

SCPI interface provides users to operate the power supply by connecting to PC via IEEE-488.2 or RS-232 interface. It also allows users to control and monitor the instrument remotely. SCPI IEEE-488 supports multiple power supply to control. (Max. 31 set)

6.2 Definition of Parameters

Type	Valid arguments
=====	
<boolean>	ON or 1 / OFF or 0
<NR1>	The data format <NR1> is defined in IEEE-488.2 for integers. Zero, positive and negative integer numeric values are valid data.
<NRf>	The data format <NRf> is defined in IEEE-488.2 for flexible numeric representation. Zero, positive and negative floating point numeric values are valid data.
<string>	Characters are enclosed by single or double quotes.
<NL>	New line, hex code is 0x0Ah
<Rtn>	Return, hex code is 0x0Dh
<END>	end or identify

Note: All commands shall be ended with the <NL> and <Rtn>. And there shall be a space between the command and the parameter.

For example, to set the GPIB address of 10 to a PPS 3210. The command line is as follows:

ADDR 10<NL><Rtn>

Note: The <NL> and <Rtn> are not presented in the following examples and command descriptions. However, users shall add them to the end of each command when doing the coding.

6.3 Error Message List

The SCPI maintains an Error/Event Queue as defined by SCPI. The queue holds up to 10 errors and events. It is queried by using the command of **status:error?** which reads in a First In/First Out (FIFO) manner. The read operation removes the entry from the queue. The ***CLS** command will clear all entries from the queue.

Error	Description
=====	
-000	No error
-002	GET not allowed
-003	Parameter not allowed
-005	Command Header Error
-010	Numeric data error
-011	Invalid character in number
-013	Too many digits
-014	Numeric data not allowed
-016	Invalid suffix
-020	Invalid character data
-030	Invalid expression
-035	Macro parameter error
-056	Timer currently running
-058	Timer syntax error
-059	Cannot create timer
-060	Password error
-088	Media protected
-089	Expression Error
-100	Program error
-101	Cannot create program
-104	Program currently running
-105	Program syntax error
-106	Program runtime error
-108	Syntax error
-109	Data type error
-110	Input voltage overwrite error
-111	Input current overwrite error

6.4 Compatible MOTECH LPS and PPS Protocol

Command	Description
=====	
ADDRess	set the address of the machine
ADDRess?	return the address current setting
BEEP	set beep on(1) or off(0)
CALi?	calibration procedure
CURR[1]	channel 1 current setting
CURR[1]?	return channel 1 current setting
CURR2	channel 2 current setting
CURR2?	return channel 2 current setting
CURR3	channel 3 current setting
CURR3?	return channel 3 current setting
CURRENT[1]	channel 1 current setting
CURRENT[1]?	return channel 1 current setting
CURRENT2	channel 2 current setting
CURRENT2?	return channel 2 current setting
CURRENT3	channel 3 current setting
CURRENT3?	return channel 3 current setting
HOTKey	set hot key function, on(1) or off(0)
IOUT[1][?]	channel 1 current read back
IOUT2[?]	channel 2 current read back
IOUT3[?]	channel 3 current read back
ISSET[1]	channel 1 current setting
ISSET[1][?]	return channel 1 current setting
ISSET2	channel 2 current setting
ISSET2?	return channel 2 current setting
ISSET3	channel 3 current setting
ISSET3?	return channel 3 current setting
LOCK	set rotary and keypad lock on(1) or off(0)
MODEL?	display model NO
OCP[1]	set channel 1 current protect to off(0) or on(1)
OCP2	set channel 2 current protect to off(0) or on(1)
OCP3	set channel 3 current protect to off(0) or on(1)
OISSET[1]	set channel 1 overcurrent protect
OISSET[1]?	return channel 1 overcurrent value
OISSET2	set channel 2 overcurrent protect
OISSET2?	return channel 2 overcurrent value
OISSET3	set channel 3 overcurrent protect
OISSET3?	return channel 3 overcurrent value

OUT[1]	set channel 1 output on(1) or off(0)
OUT2	set channel 2 output on(1) or off(0)
OUT3	set channel 3 output on(1) or off(0)
OVP[1]	set channel 1 voltage protect to off(0) or on(1)
OVP2	set channel 2 voltage protect to off(0) or on(1)
OVP3	set channel 3 voltage protect to off(0) or on(1)
OVSET[1]	set channel 1 overvoltage protect
OVSET[1]?	return channel 1 overvoltage value
OVSET2	set channel 2 overcurrent protect
OVSET2?	return channel 2 overcurrent value
OVSET3	set channel 3 overcurrent protect
OVSET3?	return channel 3 overcurrent value
PARAllel	set parallel output on(1) or off(0)
SERial	set seial output on(1) or off(0)
STATUS?	current NLPS working status
TRACK	set CH2=CH1
VERSION?	display version NO.
VOLT[1]	channel 1 voltage setting
VOLT[1]?	return channel 1 voltage setting
VOLT2	channel 2 voltage setting
VOLT2?	return channel 2 voltage setting
VOLT3	channel 3 voltage setting
VOLT3?	return channel 3 voltage setting
VOLTAGE[1]	channel 1 voltage setting
VOLTAGE[1]?	return channel 1 voltage setting
VOLTAGE2	channel 2 voltage setting
VOLTAGE2?	return channel 2 voltage setting
VOLTAGE3	channel 3 voltage setting
VOLTAGE3?	return channel 3 voltage setting
VOUT[1][?]	channel 1 voltage read back
VOUT2[?]	channel 2 voltage read back
VOUT3[?]	channel 3 voltage read back
VSET[1]	channel 1 voltage setting
VSET[1]?	return channel 1 voltage setting
VSET2	channel 2 voltage setting
VSET2?	return channel 2 voltage setting
VSET3	channel 3 voltage setting
VSET3?	return channel 3 voltage setting

example:

Q1. How to set the GPIB address?

ADDR 10 ==> address is 10

ADDRESS 5	==> address is 5
ADDR 70	==> address is out of maximum value, refer to error code

Q2. How to set beep?

BEEP 1	==> set beep to on
BEEP off	==> set beep to off

Q3. How to set voltage?

VSET 10	==> set channel 1 voltage to 10V
VSET2 5.123	==> set channel 2 voltage to 5.123V
VOLT3 3.3V	==> set channel 3 voltage to 3.3V
VOLTAGE1 35	==> set channel 1 voltage to 35V is fail, because out of range

Q4. How to read the voltage setting value?

VSET?	==> return channel 1 voltage setting
VSET2?	==> return channel 2 voltage setting

Q5. How to set current?

ISSET 1.1	==> set channel 1 current to 1.1A
ISSET2 2.1A	==> set channel 2 current to 2.1A
CURR3 4.3022	==> set channel 3 current to 4.3022A
CURRENT1 0.250	==> set channel 1 current to 250mA

Q6. How to read the current setting value?

ISSET?	==> return channel 1 current setting
ISSET2?	==> return channel 2 current setting

Q7. How to read the voltage output value?

VOLT3?	==> return channel 3 voltage output
VOLTAGE1?	==> return channel 1 voltage output
VOUT2?	==> return channel 2 voltage output
VOUT?	==> return channel 1 voltage output

Q8. How to read the current output value?

CURR3?	==> return channel 3 current output
CURRENT1?	==> return channel 1 current output
IOUT2?	==> return channel 2 current output
IOUT?	==> return channel 1 current output

Q9. How to set the tracking mode?

TRACK 1	==> CH2 = CH1
TRACK ON	==> CH2 = CH1
TRACK 0	==> tracking off
TRACK OFF	==> tracking off

Q10. How to set the parallel output mode?

PARA 1	==> parallel on
PARALLEL ON	==> parallel on
PARA 0	==> parallel off
PARALLEL OFF	==> parallel off

Q11. How to set the serial output mode?

SER 1	==> serial on
SERIAL ON	==> serial on
SER 0	==> serial off
SERIAL OFF	==> serial off

Q12. How to read back calibration parameter?

CAL?	==> return the calibration data
CALi?	==> return the calibration data

Q13. How to lock keypad and knob?

LOCK 1	==> lock the keypad and knob
LOCK ON	==> lock the keypad and knob

Q14. How to read back address number?

ADDR?	
ADDRESS?	

6.5 SCPI Compatible Information

The SCPI conforms to all specifications for devices as defined in IEEE-488.2 and complies with SCPI command syntax version 1995.0. Confirmed Commands are those commands which are approved commands in the SCPI 1995 Specification, Volume 2: Command Reference.

6.5.1 SCPI Common Command

Command Description

=====

*CLS	Clear status (include error code)
*CAL?	As same as CALi? command, return calibration parameter

*IDN?	Response:<Manufacturer>, <model>, <serial number>, <firmware type & version>
*RCL	Recalls settings from memory. Memory numbers from 0 to 99 are valid.
*RST	Resets the power supply to its power on state.
*SAV	1. Saves defined parameters 2. Saves current settings to memory. Memory numbers from 0 to 99 are valid.
*WAI	Sets the device to wait until all previous commands and queries are complete before executing commands following the *WAI command.

example:

Q15. How to save V/I to memory?

*SAV 15	==> Saves current settings to memory number 15
SAV 0	==> Saves current settings to memory number 0

Q16. How to recall memory V/I variable to output?

*RCL 3	==> recall setting from memory location 3
RCL 120	==> the data value is invalid

Q17. How to save configuration parameters?

SAV
*SAV

Q18. How to do the software reset procedure?

*RST
RST

Q19. How to return the device identification?

*IDN?
IDN?

6.5.2 SCPI Command for Subsystem

OUT[n]	on/off subsystem for channel n: 1 - 3
[state/bool]	ON/1 (enable) or OFF/0 (disable) output action
:ALL[state/bool]	ON/1 (enable) or OFF/0 (disable) output action for all channels
:TRACK	enable track mode
:PARAllel	enable parallel mode

:SERial	enable serial mode
:NORMal	resume normal mode
STATus	status subsystem
[?]	read back machine status
:ERRor[?]	read back machine error code
:CCP[?]	read back Iset DAC value
:CVP[?]	read back Vset DAC value
:MONV[?]	read back Vout DAC value
:MONI[?]	read back Iout DAC value
PROGram	program subsystem
[state/bool]	ON/1 (enable) or OFF/0 (disable) program action
[n]	select [n] as the program number, n range from 0 ~ 99
:VSET[n]	volt setting for channel n: 1 - 3
[level]	voltage level: 0 – 32V for ch1 and ch2, 0 – 15V for ch3
:ISet[n]	current setting for channel n: 1 - 3
[level]	current level: 0 – 3A for ch1 and ch2, 0 – 5A for ch3
:TIMER	return or set up timer
[?/ hh:mm:ss]	
:FASTimer	set up timer for fast action
[level]	unit is millisecond, range from 4~65535ms
:NEXT	next step
[?]	return the next program number
:END	end current program
:NEXT	next program number = current program number + 1
:JUMP[n]	jump to program number n: 0 ~ 99
:SAVe	save programmable 0 ~ programmable 99 value
TIMer	timer subsystem
[?]	return timer setting
[ON/OFF]	enable/disable timer
[hh:mm:ss]	set up timer
:TIMER?	Response current timer parameter
:PAUSE	stop running the timer
MEMory	memory subsystem

[n]	select [n] page memory number, n range from 0 ~ 99
[?]	read back memory page[n] parameters
:VSET[n] [level]	volt setting for channel n: 1 - 3 voltage level: 0 – 32V for ch1 and ch2, 0 – 15V for ch3
:ISET[n] [level]	current setting for channel n current level: 0 – 3A for ch1 and ch2, 0 – 5A for ch3
:SERial?	read back serial number
:PWD	set up password
:PASSword [string]	the string must be less than 15 characters
:PWD?	return password
:PASSword?	
:SAVE	store memory subsystem parameters
CONTRol	control subsystem
:LCD [state/bool]	turn ON (1) or OFF (0) the LCD backlight
:FASTREQ [state/bool]	ON/1 (enable) or OFF/0 (disable) fast output mode
:HOTKey [state/bool]	enable/disable hotkey mode
:LOCK [state/bool]	enable/disable keypad and rotary lock
:MONitor [state/bool]	enable/disable monitor to send "status" & V/I message(GPIB & LAN not support)
:DHCP [state/bool]	select DHCP command enables/disables DHCP mode
:IP [?/ xxx.xxx.xxx.xxx]	select IP command return IP address or set IP address
:CHannel [n]	select channel channel number n: 1 - 3
:ADDRess [?/ n]	set up GPIB address for PPS3210 return or set GPIB address n: 1 - 31
:DEFault	resume factory preset(password protected)
:PWD	enter password to verify
:PASSword [string]	the string must be less than 15 characters

:LOCAL ON disable remote mode and back to local mode

:GPIO this command is valid when optional card exists

 [?/ level] read or set up level of GPIO pins, level: 0 - 255

 :DIRection n set GPIO pins as input or output (0-input, 1-output), n: 0 – 255

GPIO	Pin 9	Pin 8	Pin 7	Pin 6	Pin 5	Pin 4	Pin 3	Pin 2	Pin 1
Bit	Bit 7	Bit 6	Bit 5	Bit 4	GND	Bit 3	Bit 2	Bit1	Bit 0
Value	128	64	32	16	X	8	4	2	1

MEASure measure subsystem for channel n: 1 - 3

 :CURRent[n]? Return the floating point value of the DC output current in amps for channel n: 1 - 3.

 :VOLTag[n]? Return the floating point value of the DC output voltage in volts for channel n: 1 - 3.

 :POWer[n]? Return DC output power in watts.

 :RESistance[n]? Return DC output impedance in ohms.

SOURce source subsystem

 :CURRent[n] Set the floating point value of the DC output current in amps for channel n: 1 - 3.

 [level] current level: 0 – 3A for ch1 and ch2, 0 – 5A for ch3

 :PROTection over current protection (OCP)

 [?/ level] return or set the over current in amps

 :TRIGger trigger current protection

 [state/bool] ON/1 (enable) or OFF/0 (disable) OCP

 :VOLTag[n] Sets the floating point value of the DC output voltage in volts for channel n: 1 - 3.

 [level] voltage level: 0 – 32V for ch1 and ch2, 0 – 15V for ch3

 :PROTection over voltage protection (OVP)

 [?/ level] return or set the over voltage in volts

 :TRIGger trigger voltage protection

 [state/bool] ON/1 (enable) or OFF/0 (disable) OVP

example:

Q20. How to set tracking mode?

OUT:TRACK

Q21. How to set serial output mode?

OUT:SER

OUT:SERIAL

Q22. How to set parallel output mode?

OUT:PARA

OUT:PARALLEL

Q23. How to resume normal output mode?

OUT:NORM

OUT:NORMAL

Q24. How to read back machine status?

STATUS?

Q25. How to read back machine error code?

STAT:ERR?

STATUS:ERR?

STATUS:ERROR?

STAT:ERROR?

Q26. How to read voltage setting DAC value?

STATUS:CVP? ==> read CVP DAC value

Q27. How to read current setting DAC value?

STATUS:CCP? ==> read CCP DAC value

Q28. How to read voltage DAC value?

STATUS:MONV? ==> read MONV DAC value

Q29. How to read current DAC value?

STATUS:MONI? ==> read MONI DAC value

Q30. How to set all channels to synchronously output?

OUT:ALL 1 ==> tri-channel output is ON

OUT:ALL OFF ==> tri-channel output is OFF

Q31. How to set up timer?

TIMER 00:10:00 ==> set up the timer to run for 10 minutes

TIM 99:59:59

==> set up timer to run 99 hours 59 minutes
59 seconds and then stop

Q32. How to start the timer?

TIMER ON

TIM ON

Q33. How to stop the timer?

TIMER OFF

TIM OFF

Q34. How to read timer parameter?

TIMER?

TIM?

Q35. How to set up a program (example)?

step 1: PROG 10

==> select program number 10,
program number shall be in 0 ~ 99.

step 2: PROG:VSET1 16V

==> set output voltage to 16v for ch1

step 3: PROG:VSET2 25V

==> set output voltage to 25v for ch2

step 4: PROG:VSET3 3.3V

==> set output voltage to 3.3v for ch3

step 5: PROG:ISET1 1A

==> set output current up to 1A for ch1

step 6: PROG:ISET2 2A

==> set output current up to 2A for ch2

step 7: PROG:ISET3 3.3A

==> set output current up to 3.3A for ch3

step 8: PROG:TIMER:00:05:00

==> set up the run-time to 5 minutes

step 9: PROG:NEXT:NEXT

==> next step is the next program, program
number 11 in this example

:
:

Q36. How to save program?

PROGRAM:SAV

PROG:SAVE

Q37. How to start program?

PROG n

==> select the program number n: 0 - 99

PROGRAM ON

==> start running the program selected in the
above command

Q38. How to stop program?

PROG OFF

Q39. How to read program parameter?

PROGRAM? ==> Return program parameter
 PROGRAM:TIMER? ==> Return timer parameter

Q40. How to set memory?

step 1: MEM:1 ==> select memory number which is 1 in this example
 step 2: MEM:VSET 1.5 ==> set channel 1 output voltage to 1.5 V.
 step 3: MEM:ISSET 3 5 ==> set channel 3 output current up to 5 A.

Q41. How to read memory parameter?

step 1: MEM 2 ==> select memory number is 2
 step 2: MEM? ==> read back memory NO.2 parameter

Q42. How to set up GPIO direction?

GPIO	Pin 9	Pin 8	Pin 7	Pin 6	Pin 5	Pin 4	Pin 3	Pin 2	Pin 1
Bit	Bit 7	Bit 6	Bit 5	Bit 4	GND	Bit 3	Bit 2	Bit 1	Bit 0
Value	128	64	32	16	X	8	4	2	1

Direction: 0 – input; 1 – output

CONT:GPIO:DIRECTION 15 ==> set GPIO pin 1 ~ pin 4 as the outputs and the pin 6 ~ pin 9 as the inputs
 CONT:GPIO:DIR 16 ==> set GPIO pin 6 as the output and other pins as the inputs

Q43. How to read back and set up GPIO levels?

CONT:GPIO 3 ==> set GPIO pin 1 and pin 2 to output a high level
 CONT:GPIO? ==> if return a value of 96, it means the input pin 7 and pin 8 are high and other input pins are low

Q44. How to read back serial number?

MEM:SERIAL?
 MEMORY:SER?

Q45. How to modify machine ID (address)?

CONTROL:ADDR 23 ==> modify id to 23
 CONT:ADDRESS 09 ==> modify id to 9

Q46. How to check password?

CONT:PASSWORD 12345 ==> enter password to verify

Q47. How to enter or leave the monitor mode? (GPIB & LAN not support)

CONT:MONITOR ON ==> enter the monitor mode

CONTROL:MONI OFF ==> exit the monitor mode

Q48. How to change channel?

CONT:CHANNEL 1 ==> change to channel 1

CONT:CH 1 ==> change to channel 1

CONTROL:CH 2 ==> change to channel 2

Q49. How to enter or leave lock status?

CONT:LOCK ON ==> enter lock mode

CONTROL:LOCK OFF ==> exit lock mode

Q50. How to enter or leave hotkey status?

CONT:HOTK ON ==> enter hotkey mode

CONTROL:HOTKEY OFF ==> exit hotkey mode

Q51. How to measure current?

MEASURE:CURRE1? ==> read back current 1 result

MEAS:CURRENT3? ==> read back current 3 result

MEAS:CURRE3? ==> read back current 3 result

CURRE1? ==> read back current 1 result

CURRENT2? ==> read back current 2 result

IOUT1? ==> read back current 1 result

IOUT2? ==> read back current 2 result

Q52. How to measure voltage?

MEASURE:VOLT1? ==> read back voltage 1 result

MEAS:VOLTAGE3? ==> read back voltage 3 result

MEAS:VOLT3? ==> read back voltage 3 result

VOLT1? ==> read back voltage 1 result

VOLTAGE2? ==> read back voltage 2 result

VOUT1? ==> read back voltage 1 result

VOUT2? ==> read back voltage 2 result

Q53. How to measure power?

MEASURE:POW1? ==> read back power for ch1

MEAS:POWER3? ==> read back power for ch3

MEAS:POW3? ==> read back power for ch3

Q54. How to measure resistance?

MEASURE:RES1?	==>	read back resistance for ch1t
MEAS:RESISTANCE3?	==>	read back resistance for ch3
MEAS:RES3?	==>	read back resistance for ch3

Q55. How to set output voltage?

SOUR:VOLTAGE2 12	==>	set output voltage to 12V for channel 2.
SOURCE:VOLT1 30	==>	set voltage to 30V for channel 1.
VOLT3 10	==>	set voltage to 10V for channel 3.
VOLTAGE3 5	==>	set voltage to 5V for channel 3.
VSET2 15	==>	set voltage to 15V for channel 2.

Q56. How to set output current?

SOUR:CURRENT2 1	==>	set current to 1A for channel 2.
SOURCE:CURR1 3	==>	set current to 3A for channel 1.
CURR3 1.2	==>	set current to 1.2A for channel 3.
CURRENT3 5	==>	set current to 5A for channel 3.
ISSET2 1.5	==>	set current to 1.5A for channel 2.

Q57. How to define over voltage protection?

SOUR:VOLTAGE3:PROT 12	==>	set over voltage to 12V for channel 3.
SOURCE:VOLT1:PROT 30	==>	set over voltage to 30V for channel 1.
SOUR:VOLT2:PROTECTION 10	==>	set over voltage to 10V for channel 2.
VOLTAGE3:PROT 7	==>	set over voltage to 7V for channel 3.
VOLT2:PROT 18	==>	set over voltage to 18V for channel 2.
VOLT1:PROTECTION 27	==>	set over voltage to 27V for channel 1.
VOLT:PROTECTION 25	==>	set over voltage to 25V for channel 1.
OVSET2 19	==>	set over voltage to 19V for channel 2.

Q58. How to define over current protection?

SOUR:CURRENT3:PROT 1.2	==>	set over current to 1.2A for channel 3
SOURCE:CURR1:PROT 3	==>	set over current to 3A for channel 1
SOUR:CURR2:PROTECTION 2	==>	set over current to 2A for channel 2
CURRENT3:PROT 2.7	==>	set over current to 2.7A for channel 3
CURR2:PROT 1.8 <NL>	==>	set over current to 1.8A for channel 2
CURR1:PROTECTION 2.7	==>	ses over current to 2.7A for channel 1
CURR:PROTECTION 2.5	==>	set over current to 2.5A for channel 1
OISSET2 1.9	==>	set over current to 1.9A for channel 2.

Q59. How to read back over voltage parameter?

SOUR:VOLTAGE3:PROT?	==>	return over voltage for channel 3
---------------------	-----	-----------------------------------

SOURCE:VOLT1:PROT?	==> return over voltage for channel 1
SOUR:VOLT2:PROTECTION?	==> return over voltage for channel 2
VOLTAGE3:PROT?	==> return over voltage for channel 3
VOLT2:PROT?	==> return over voltage for channel 2
VOLT1:PROTECTION?	==> return over voltage for channel 1
VOLT:PROTECTION?	==> return over voltage for channel 1
OVSET2?	==> return over voltage for channel 2

Q60. How to read back over current parameter?

SOUR:CURRENT3:PROT?	==> return over current for channel 3
SOURCE:CURRE1:PROT?	==> return over current for channel 1
SOUR:CURRE2:PROTECTION?	==> return over current for channel 2
CURRENT3:PROT?	==> return over current for channel 3
CURRE2:PROT?	==> return over current for channel 2
CURRE1:PROTECTION?	==> return over current for channel 1
CURRE:PROTECTION?	==> return over current for channel 1
OISET2?	==> return over current for channel 2

Q61. How to enable or disable over voltage protection (OVP)?

SOUR:VOLTAGE3:PROT:TRIG ON	==> enable OVP for channel 3.
SOURCE:VOLT1:PROT:TRIG OFF	==> disable OVP for channel 1.
SOUR:VOLT2:PROTECTION:TRIG OFF	==> disable OVP for channel 2.
VOLTAGE3:PROT:TRIG ON	==> enable OVP for channel 3.
VOLT2:PROT:TRIGGER ON	==> enable OVP for channel 2.
VOLT1:PROTECTION:TRIG OFF	==> disable OVP for channel 1.
VOLT:PROTECTION:TRIG OFF	==> disable OVP for channel 1.
OVP2 ON	==> enable OVP for channel 2.
OVP3 OFF	==> disable OVP for channel 3.

Q62. How to enable or disable over current protection (OCP)?

SOUR:CURRENT3:PROT:TRIG ON	==> enable OCP for channel 3.
SOURCE:CURRE1:PROT:TRIG OFF	==> disable OCP for channel 1.
SOUR:CURRE2:PROTECTION:TRIG OFF	==> disable OCP for channel 2.
CURRENT3:PROT:TRIG ON	==> enable OCP for channel 3.
CURRE2:PROT:TRIGGER ON	==> enable OCP for channel 2.
CURRE1:PROTECTION:TRIG OFF	==> disable OCP for channel 1.
CURRE:PROTECTION:TRIG OFF	==> disable OCP for channel 1.
OCP2 ON	==> enable OCP for channel 2.
OCP3 OFF	==> disable OCP for channel 3.

Q63. How to set up a program (example)?

PROG 10	==> define program 10
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PROG:ISSET1 1	==> set max. output current of 1A for ch1
PROG:ISSET2 1	==> set max. output current of 1A for ch2
PROG:ISSET3 1	==> set max. output current of 1A for ch3
PROG:VSET1 1	==> set output voltage of 1V for ch1
PROG:VSET2 1	==> set output voltage of 1V for ch2
PROG:VSET3 1	==> set output voltage of 1V for ch3
PROG:FAST 4	==> output above setting for 4 ms
PROG:NEXT:NEXT	==> go on to program 11
PROG?	==> read back the setting of program 10 for verification
PROG 11	==> define program 11
PROG:ISSET1 1	==> ch1 output up to 1 A
PROG:ISSET2 1	==> ch2 output up to 1 A
PROG:ISSET3 1	==> ch3 output up to 1 A
PROG:VSET1 3	==> ch1 output 3V
PROG:VSET2 3	==> ch2 output 3V
PROG:VSET3 3	==> ch3 output 3V
PROG:FAST 100	==> output above setting for 100 ms
PROG:NEXT:JUMP 13	==> jump to program 13
PROG 12	==> define program 12
PROG:ISSET1 1	==> ch1 output up to 1 A
PROG:ISSET2 1	==> ch2 output up to 1 A
PROG:ISSET3 1	==> ch3 output up to 1 A
PROG:VSET1 5	==> ch1 output 5V
PROG:VSET2 5	==> ch2 output 5V
PROG:VSET3 5	==> ch3 output 5V
PROG:FAST 500	==> output above setting for 500 ms
PROG:NEXT:END	==> end the program
PROG 13	==> define program 13
PROG:ISSET1 1	==> ch1 output up to 1 A
PROG:ISSET2 1	==> ch2 output up to 1 A
PROG:ISSET3 1	==> ch3 output up to 1 A
PROG:VSET1 7	==> ch1 output 7V
PROG:VSET2 7	==> ch2 output 7V
PROG:VSET3 7	==> ch3 output 7V
PROG:FAST 1000	==> output the setting of program 13 for 1 second
PROG:NEXT:JUMP 12	==> jump to program 12

Q64. How to enable or disable DHCP?

CONT:DHCP ON	==> enable DHCP
CONTROL:DHCP 1	==> enable DHCP
CONT:DHCP 0	==> disable DHCP
CONTROL:DHCP OFF	==> disable DHCP

Q65. How to get the IP address?

CONT:IP?	==> return the IP address
CONTROL:IP?	==> return the IP address

Q66. How to set the IP address?

CONT:IP 192.168.10.1	==> set up the IP address for PPS3210
CONTROL:IP 192.168.10.1	==> set up the IP address

6.6 Rules of Status Definition

byte 0:	bit 7	channel 3 on/off status
	bit 6	channel 2 on/off status
	bit 5	channel 1 on/off status
	bit 4	channel 3 OVP setting flag
	bit 3	channel 2 OVP setting flag
	bit 2	channel 1 OVP setting flag
	bit 1	channel 3 OCP setting flag
	bit 0	channel 2 OCP setting flag
byte 1:	bit 7	channel 1 OCP setting flag
	bit 6	output mode status; 0: single output 1: multi-output
	bit 5	power on status, 0:output off, 1: remember pre-setting status
	bit 4	hot-key flag
	bit 3	serial output mode
	bit 2	parallel output mode
	bit 1	track output mode
	bit 0	beep trigger flag
byte 2:	bit 7	disable remote mode, inhibit communication
	bit 6	programmable flag
	bit 5	remote flag
	bit 4	keypad between push and pop status
	bit 3	machine running at time mode
	bit 2	machine running at sub-menu mode
	bit 1	machine running at configuration sub-menu mode
	bit 0	machine running at memory item mode

byte 3:	bit 7	machine running at power on status
	bit 6	keypad & Rotary lock flag
	bit 5	machine running at EPROM write or read mode
	bit 4	machine running at synchronized mode
	bit 3	display I/V or W/ohm flag
	bit 2	machine running at LCD process mode
	bit 1	detect double- key flag
	bit 0	machine running at key-pad process mode
byte 4:	bit 7	reserved
	bit 6	reserved
	bit 5	reserved
	bit 4	channel 3 OVP is occur flag
	bit 3	channel 2 OVP is occur flag
	bit 2	channel 1 OVP is occur flag
	bit 1	channel 3 OCP is occur flag
	bit 0	channel 2 OCP is occur flag
byte 5:	bit 7	channel 1 OCP is occur flag
	bit 6	relay switch flag
	bit 5	in line system program flag
	bit 4	password is correct flag
	bit 3	machine running at DAC read-back mode
	bit 2	timer paused flag
	bit 1	machine running at calibration mode
	bit 0	reserved
byte 6:	bit 7	display lock message flag
	bit 6	continue to send "V/I, status" message flag
	bit 5	reserved
	bit 4	reserved
	bit 3	DHCP on or off flag
	bit 2	when the bit is on, LCD to display minus ('-') signal
	bit 1	fast-output flag
	bit 0	when the machine is OEM version, the flag must on
byte 7:	fan PWM value.	

7. Accessories

Model: PPS 3210

Serial number:

Accessories

Date:

No	Description	P/N	Q'ty	Selection
1.	Power cord	ZPO-640MI	1	<input type="checkbox"/> Yes <input type="checkbox"/> No
2.	Black & Red Test Lead	ZTP-LPSMI-1	3	<input type="checkbox"/> Yes <input type="checkbox"/> No
3.	User's manual	ZOMG-3210E-1	1	<input type="checkbox"/> Yes <input type="checkbox"/> No

Version: 1.1



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