

# MPS-3600LP/H SERIES PROGRAMMABLE DC POWER SUPPLY USER MANUAL

MATRIX TECHNOLOGY INC.

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MODEL: MPS-3603LP, MPS-3605LP, MPS-3610LP,  
MPS-6003LP, MPS-6005LP, MPS-8002LP, MPS-3603H,  
MPS-3605H, MPS-3610H, MPS-6003H, MPS-6005H,  
MPS-8002H

Version No.: V1.1

## PREFACE

Dear User

Hello! Thank you for purchasing the products of MATRIX TECHNOLOGY. In order to use this instrument correctly, please read the full text of this manual carefully before using this instrument, especially the part about "safety precautions".

If you have read the full text of this manual, it is recommended that you keep this manual properly and place it with the instrument or at a place where you can read it at any time for future use.

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## Calibration and Calibration Statement

We specifically declare that the instruments and equipment listed in this manual are in full compliance with the specifications and characteristics stated in our technical specifications. This instrument has been factory calibrated by our company before leaving the factory, and the calibration procedures and procedures are in accordance with the specifications and standards of the Electronics Inspection Center.

## Product quality assurance

Our company guarantees that all new instruments manufactured by us have undergone strict quality confirmation and that we will be responsible for repairing any construction defects or parts failures within one year of delivery. However, if the user has changed the circuit, function, or repair the instrument and parts or damage to the outer case, the company will not provide free warranty service. If the machine is not connected to all ground wires or operated in accordance with safety regulations, the company will not provide free warranty service.

This warranty does not cover accessories that are not manufactured by our company, such as accessories for this instrument.

During the one-year warranty period, please return the defective unit to our service center or our designated dealer, and we will repair it properly.

If the unit fails under abnormal use, human negligence, or non-human control, such as earthquake, flood, riot, fire, or other factors beyond human control, our company will not provide free warranty service.

**(The company follows a sustainable development strategy and reserves the right to make improvements to the content of this manual without prior notice)**

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## Chapter 1 Product Description

MPS-3600 series is a new generation of high quality programmable DC power supply. This series is equipped with RS232 communication interface and voltage remote compensation function. MPS-3600 series power supply has the characteristics of both desktop and system type, and can be matched with other instruments at will to integrate into a test system with special functions to complete the measurement requirements in different occasions, and the program can be edited by the panel keyboard, which brings great convenience to the users' use, and is a replacement product of common programmable power supply with high cost-performance advantage.

This series power supply has the following features.

- Infinitely servo, intelligent fan system
- Multi-group data storage
- Standard instrument rack design
- Support RS232,communication
- Optional analog control interface
- With machine temperature monitoring function
- Serial programming output function
- Remote voltage compensation function
- External trigger function
- Test result signal output function

## Chapter 2 Technical Specifications

### 2.1 Main Technical Specifications

MPS-3600 series power supply technical specifications table

Model		MPS-3603LP	MPS-3605LP	MPS-3610LP
Rated input voltage		AC220V/110V±5%		
Rated output voltage		0-36V	0-36V	0-36V
Rated output current		0-3A	0-5A	0-10A
Voltage changing mode		Linear power supply		
Load regulation rate	Voltage	<0.05%+5mV	<0.05%+8mV	<0.05%+10mV
	Current	<0.1%+5mA	<0.1%+5mA	<0.1%+8mA
Power supply regulation rate	Voltage	<0.05%+5mV	<0.05%+8mV	<0.05%+10mV
	Current	<0.1%+5mA	<0.1%+5mA	<0.1%+8mA
Resolution of setting value	Voltage	10mV		
	Current	1mA		
Accuracy of setting value	Voltage	≤0.1%+2 byte		
	Current	≤0.2%+3 byte	≤0.2%+3 byte	≤0.2%+6 byte
Resolution of readback value	Voltage	10mV		
	Current	1mA		
Readback accuracy	Voltage	≤0.1%+2 byte		
	Current	≤0.2%+3 byte	≤0.2%+3 byte	≤0.2%+6 byte
Temperature	Operating environment	0 to 40 °C ≤ 80 R.H.		
	Storage environment	-15 to 70 °C ≤ 80 R.H.		
Packing Size (W*H*D(mm))		300*195*420		300*195*480
Packing weight (net weight)		5.4Kg	6.3Kg	10.2Kg

Model		MPS-6003LP	MPS-6005LP	MPS-8002LP
Rated input voltage		AC220V/110V±10%		
Rated full load power (input voltage 220v)		300W	480W	240W
Standby power (input voltage 220v)		6W	8W	6W
Fuse specification		110V/8A,220V/5A	110V/10A,220V/8A,	110V/8A,220V/5A
Rated output voltage		0-60V		0-80V
Rated output current		0-3A	0-5A	0-2A
Variable voltage mode		Linear Power Supplies		
Load Regulation Rate Voltage	Voltage	≤0.02%+5mV		
	Current	≤0.02%+3mA		
Power regulation rate	Voltage	≤0.02%+5mV		
	Current	≤0.02%+3mA		
Set value resolution	Voltage	10mV		10mV
	Current	1mA		1mA
Set value accuracy (25°C ±5°C)	Voltage	≤0.05%+2Bytes		≤0.05%+2Bytes
	Current	≤0.05%+2Bytes		≤0.05%+2Bytes
Readback Resolution	Voltage	10mV		10mV
	Current	1mA		1mA
Readback accuracy(25°C ± 5°C)	Voltage	≤0.05%+2bit		≤0.05%+2bit
	Current	≤0.05%+2bit		≤0.05%+2bit
Voltage rise time (0V - full scale)		100mS	100mS	100mS
Ripple	Voltage	5mVrms	5mVrms	8mVrms
	Current	3mArms	5mArms	3mArms
Temperature	Operating Environment		0 to 40 °C ≤ 80 R.H.	
	Storage environment		-15 to 70 °C ≤ 80 R.H	
Dimension (W*H*D(mm))		214*108*305	214*108*365	214*108*365
Package weight (net weight)		6.2Kg	8.2Kg	7.2Kg

Model		MPS-3603H	MPS-3605H	MPS-3610H
Rated Input Voltage		AC220V/110V±10%		
Rated full load power (input voltage 220v)		185W	300W	600W
Standby power (input voltage 220v)		6W	7W	8W
Fuse specification		110V/5A,220V/3.15A	110V/8A,220V/5A	110V/10A,220V/8A,
Rated output voltage		0-36V		0-36V
Rated output current		0-3A	0-5A	0-10A
Variable pressure mode		Linear Power Supplies		Linear Power Supplies
Load Regulation Rate	Voltage	≤0.02%+5mV		≤0.02%+8mV
	Current	≤0.02%+2mA		≤0.02%+3mA
Power regulation rate	Voltage	≤0.02%+5mV		≤0.02%+8mV
	Current	≤0.02%+2mA		≤0.02%+3mA
Set value resolution	Voltage	1mV		1mV
	Current	0.1mA		0.1mA
Set value accuracy(25 °C ±5°C)	Voltage	≤0.05%+5mV		≤0.05%+5mV
	Current	≤0.05%+2mA		≤0.05%+3mA
Readback Resolution	Voltage	1mV		1mV
	Current	0.1mA		0.1mA
Return Reading Accuracy	Voltage	≤0.05%+5mV		≤0.05%+5mV
	Current	≤0.05%+2mA		≤0.05%+3mA
Voltage rise time (0V - full scale)		30mS	30mS	30mS
Ripple	Voltage	3mVrms	5mVrms	8mVrms
	Current	3mA <sub>rms</sub>	5mA <sub>rms</sub>	8mA <sub>rms</sub>
Temperature	Operating Environment	0 to 40 °C ≤ 80 R.H.		
	Storage environment	-15 to 70 °C ≤ 80 R.H		
Dimension (W*H*D(mm))		214*108*305		214*108*365
Package weight (net weight)		5.5Kg	5.9Kg	8.2Kg

Model		MPS-6003H	MPS-6005H	MPS-8002H
Rated Input Voltage		AC220V/110V±10%		
Rated full load power (input voltage 220v)		300W	480W	240W
Standby power (input voltage 220v)		6W	8W	6W
Fuse specification		110V/8A,220V/5A	110V/10A,220V/8A	110V/8A,220V/5A
Rated output voltage		0-60V		0-80V
Rated output current		0-3A	0-5A	0-2A
Variable voltage mode		Linear type		
Load Regulation Rate	Voltage	≤0.02%+5mV		
	Current	≤0.02%+3mA		
Power regulation rate	Voltage	≤0.02%+5mV		
	Current	≤0.02%+3mA		
Set value resolution	Voltage	1mV		1mV
	Current	0.1mA		0.1mA
Set value accuracy(25 °C ±5°C)	Voltage	≤0.05%+5mV		≤0.05%+5mV
	Current	≤0.05%+2mA		≤0.05%+2mA
Readback Resolution	Voltage	1mV		1mV
	Current	0.1mA		0.1mA
Return Reading Accuracy	Voltage	≤0.05%+5mV		≤0.05%+5mV
	Current	≤0.05%+2mA		≤0.05%+2mA
Voltage rise time (0V - full scale)		30mS	30mS	30mS
Ripple	Voltage	5mVrms	5mVrms	8mVrms
	Current	3mA <sub>rms</sub>	5mA <sub>rms</sub>	3mA <sub>rms</sub>
Temperature	Operating Environment	0 to 40 °C ≤ 80 R.H.		
	Storage environment	-15 to 70 °C ≤ 80 R.H		
Dimension (W*H*D(mm))		214*108*305	214*108*365	214*108*365
Package weight (net weight)		6.2Kg	8.2Kg	7.2Kg

## 2.2 Additional features

Status memory capacity: 9 sets of operating states

Recommended calibration frequency: 1 year / 1 time

Heat dissipation mode: Intelligent air cooling

Operating ambient temperature: 0 to 40 °C

Storage ambient temperature: -20 to 70 °C

Operating environment: Indoor use design, pollution level 2, maximum humidity 90%

## Chapter 3 Quick Start

This chapter will briefly introduce the appearance and basic functions of the MPS-3600 series power supply to give you a quick introduction to the MPS-3600 series power supply. It will also tell you the basic checks to be done after you get this power supply to ensure the normal operation of this product.

### 3.1 Introduction to the front and rear panels

The front panel of MPS3600 series power supply is shown in the figure below.



Figure 3.1 (MPS-3600LP series power supply front panel)



Figure 3.2 (MPS-3600H series power supply front panel)

The MPS3600 series rear panel layout, as shown in the figure below.

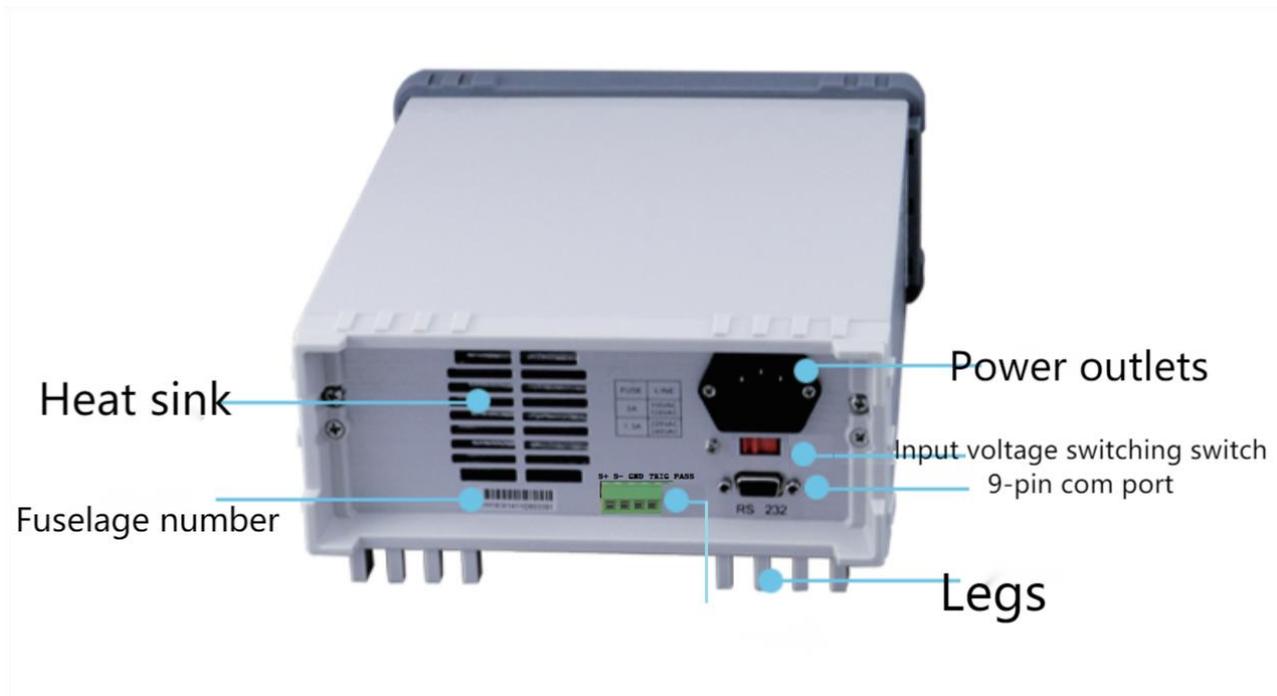


Figure 3.3 Rear panel of the MPS-3600 series power supply

## 3.2 Pre-check

Please follow the steps below to check the power supply to make sure that it can be used properly.

### 3.2.1 Inspection of the goods

Please check if you receive the power supply with the following accessories, if there is any missing, please contact your nearest distributor.

- One main unit of the power supply
- A power cord (in accordance with the voltage standard used in the region)
- An operation manual (standard)
- A certificate of conformity (standard)
- One communication cable (standard)
- A pair of output test cables (standard)

### 3.2.2 Connect the power cord and turn on the power

Check whether the input voltage toggle switch matches the grid input voltage before powering on. After powering on, the power supply first conducts a system self-test test and then enters the standby.state.

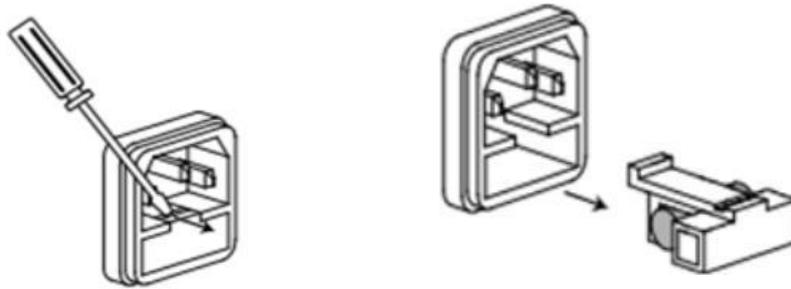
**Warning:** The power supply is shipped with a three-pronged power cord, and your power supply should be connected to a three-pronged connector. Before operating this power supply, you should first make sure that the power supply is well grounded.

## 3.3 If the power does not start

Use the following methods to solve the problems you may encounter when turning on the power.

1. Check whether the power cord is connected
2. Fuse replacement method

Use a screwdriver to open the small plastic cover under the power input socket on the rear panel of the power supply, you can see the fuse, please use the fuse with the same specifications (fuse specifications please refer to the power supply technical specifications table).



## Chapter 4 Panel Operation

This chapter will detail the operation of the front panel of the power supply, divided into the following sections.

Keyboard Arrangement

Introduction to Front Panel Operation

Voltage/current setting operation

OVP/OCP setting operation

Output on/off operation

Storage operation

Menu Setting

List Setting

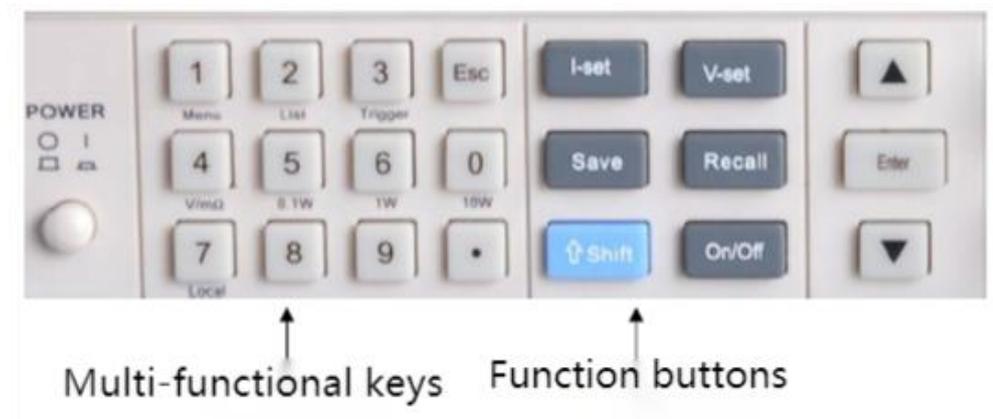
Trigger setting

Local function

Battery setting

Key lock function

## 4.1 Keyboard Arrangement



### Keyboard Description

Key Position	Key Function Description
0-9.	Numeric keys
Menu (numeric key "1"):	Menu setting (valid when pressed in combination with shift, used to set power on memory status, buzzer sound, voltage remote compensation, communication and other functions)
List (numeric key "2"):	List function setting key, (valid when pressed in combination with shift, to set the power supply List function.)
Trigger (numeric key "3"):	Trigger function setting key, (valid when pressed in combination with shift, sets the power supply Trigger function.)
Local (key "7"):	Local operation, (valid when pressed in combination with shift, disconnects from computer)
Battery (numeric key "8"):	Battery charge warning function, voltage, current upper and lower limit setting (valid when combined with shift pressed)
CRL (function key "Save"):	Not open
CRL Time (key "6"):	Not open
I-Set	Set the maximum output current of power supply
V-Set	Set power supply output voltage
Save	Store the power supply current related parameters to the specified storage location
Recall	Recall the power supply related setting parameters from the specified memory location
Shift	Composite key, combined with multi-function key
On/off	Control the power supply output status (lock the key when combined with shift)
▲	Flip up key (select menu item in menu operation, increase output voltage in working interface)
▼	Flip down key (select menu item in menu operation, reduce the

	output voltage in the working interface)
Enter	Confirmation key
Knob	Used to change the power supply voltage and current setting

## 4.2 Introduction to Front Panel Operation

"Before using this power supply, please understand the following basic introduction about the front panel button operation.

- After the power supply is powered on, the power supply is automatically in panel operation mode. In the panel operation mode, all keys can be used.
- When the power supply is in remote operation mode, the panel keys do not function. Panel operation mode and remote operation mode can be switched only through the P
- The front display panel shows the current operation information of the power supply. When the power supply is turned on, the LED display has two data, the first one shows the voltage value and the second one shows the current value. When the instrument is in the output state, the window displays the actual output value; when the instrument is in the closed state, the window displays the set value.

-  Constant current status indicator, when the output current is greater than the set value, the CC lamp lights up and the power supply automatically switches to the steady current working state.

-  Constant voltage status indicator, When the output current is less than the set value, the CV lamp lights up and the power supply automatically switches to the steady state.

-  Output status indicator, when the "ON/OFF" button is pressed when the power supply is on, the output light is on and the power supply output is turned on, and when the "ON/OFF" button is pressed again, the output light is off and the power supply output is turned off.

## 4.3 Voltage Setting Operation

The voltage setting range is from 0V to the maximum rated voltage setting value, you can use the following three methods to set the output voltage value through the front panel.

Method 1: Press the V-Set key Set the voltage value via the numeric keys from 0 to 9, then press Enter.

Method 2: Press V-Set to change the voltage setting value by rotating the knob left and right (the screen flashes to set the voltage left and right, press the knob to move the setting cursor position, press Enter to confirm and exit the setting mode).

Method 3: Change the voltage setting value by rotating the knob left and right, (press the knob in standby mode, the screen flashes to rotate the setting voltage and current left and right, press the knob to move the setting cursor position, press the "Enter" key to confirm and exit the setting mode).

## 4.4 Current setting operation

The current setting range is from 0A to the maximum rated current, you can use the following two methods to set the output current value through the front panel.

Method 1: Press the I-Set key to set the current value via the numeric keys 0 to 9, then press Enter.

Method 2: Press I-Set to change the current setting value by rotating the knob left and right (the screen flashes to rotate the setting current left and right, press the knob to move the setting cursor position, press "Enter" to confirm and exit the setting mode).

### 4.5 OVP setting operation

Press the "shift" key and then press the "V-set" key to enter OVP setting, and switch between setting value and status setting by ▲ and ▼ keys.

1.OVP parameter setting, the set value can be changed by numeric keys and knob, the method is the same as voltage setting.



2. OVP status setting, OFF is function off, ON is function on, switch by knob.



### 4.6 OCP Setting Operation

Press the "shift" key and then press the "I-set" key to enter OCP setting, and switch between set value and status setting by ▲ and ▼ keys.

1.OCP parameter setting, the set value can be changed by numeric keys and knob, the method is the same as current setting.

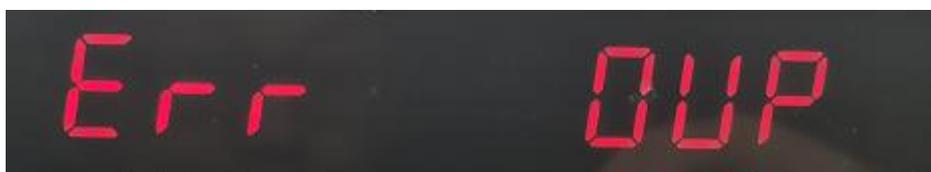


2. OCP status setting, OFF is function off, ON is function on, switch by knob.

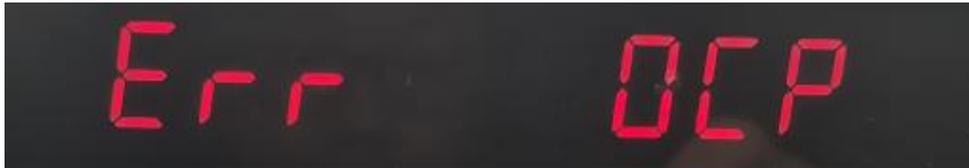


**Note:** 1. After setting, press "ESC" to exit.

3. When the power supply enters OVP, OCP protection state, the output will be automatically shut down, the display will show the relevant information, the buzzer alarm, at this time we can clear the error and press "Esc" key to clear the screen information.



### OVP protection tips



### OCP protection prompt

## 4.7 Output on/off operation

When the "ON/OFF" button is pressed when the power supply is on, the Output light is on and the power output is turned on. Output light goes off and the power output is turned off.

## 4.8 Storage Operation

The power supply can save some common parameters in 0~9 groups of non-volatile memory for users to quickly call out.

1. Press the "Save" button on the front panel to realize (0~9) group storage operation.

Storage contents include: ①. Voltage setting value ②. OVP setting value ④.OCP setting value ⑤. Voltage and current upper and lower limits

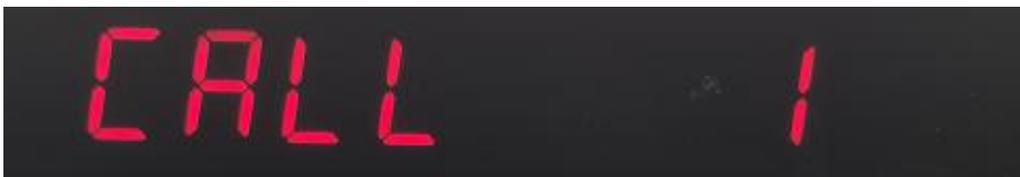
After pressing the "Save" key, select the storage location by using the 0 to 9 numeric keys or pressing the ▲ and ▼ keys, and confirm by pressing the Enter key.



2. Press the "Recall" key on the front panel to realize the call operation of (0~9) group of stored parameters.

The call contents include: ①. Voltage setting value ②. OVP setting value ④.OCP setting value ⑤. Voltage and current upper and lower limits

When "Recall" is pressed, use 0 to 9 numeric keys or press ▲ and ▼ keys to select the parameter storage location, and press Enter to confirm.



## 4.9 Menu Setting

In standby mode, press the shift key and then press the number key "1" to enter the menu setting function, press the ▲ and ▼ keys to switch the menu options, use the knob to modify the parameter settings, press the "Enter" key to confirm, the menu content is as follows:

1. Power on default parameter setting: there are two states of "ON" and "OFF", use the knob to modify the parameter setting, "ON" to keep the parameters of the last power off, "OFF" to restore the system. "OFF" to restore the default system parameters



2. Power on the output state settings: "ON" and "OFF" two settings, use the knob to modify the parameter settings, "ON" for power on to keep the output for the open state, "OFF" is to keep the output off when the power is on.



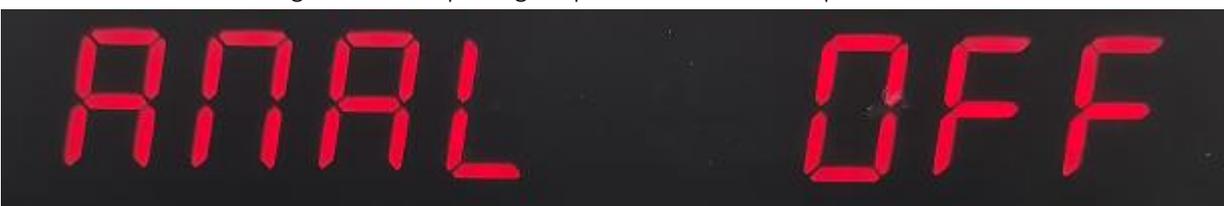
3. Power buzzer sound enable setting: there are "ON" and "OFF" two states, use the knob to modify the parameter settings, "ON" for the power buzzer sound on, "OFF" for the power buzzer sound off. "OFF" for the power buzzer sound off.



4. Voltage remote compensation function setting: there are "ON" and "OFF" two states, use the knob to modify the parameter settings, "ON" for the power supply remote compensation function to open, "OFF" for the power supply remote compensation function to close. "OFF" for the power supply remote compensation function off.



5. Analog function setting: analog interface is optional, when your power supply option has this interface, this function can take effect, use the knob to modify the parameter settings, there are "ON" and "OFF" two states, "ON" "ON" for the power analog interface to open, "OFF" for the power analog interface off, analog interface set to "ON" must be analog interface input signal power to normal output.



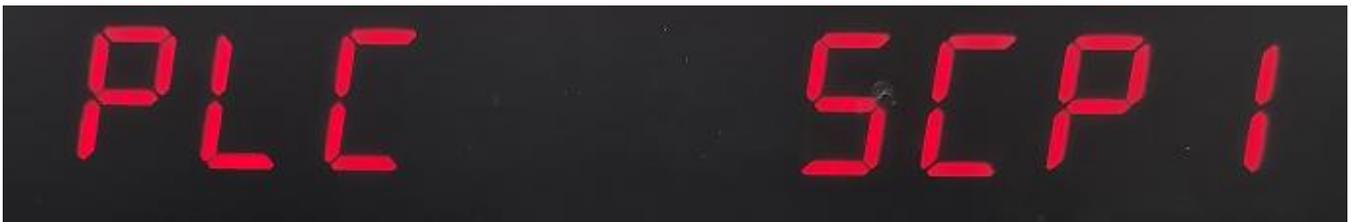
6. Power communication address setting: use the knob to modify the parameter setting or input directly with the key, the address is arbitrarily selected between 1-254.



7. Power communication baud rate setting: Only use the knob to modify the parameter settings, baud rate: 4800, 9600, 19200, 38400, 57600, 115200 to choose.



8. Communication protocol type selection: communication protocol has two kinds of SCPI and MODBUS can be selected, use the knob to modify the parameter settings.



9. Communication protocol end character selection: communication protocol end character has CR, LF, CRLF, LFCR can be selected, use the knob to modify the parameter settings.



10. Lower limit value setting of voltage setting: After this lower limit value is set, the output voltage setting of the power supply cannot be lower than this voltage value, when it is lower than this voltage value, the system will automatically modify your setting for this voltage lower limit value, use the knob to modify the parameter setting or input directly with the key, the method is the same as the voltage setting operation.



11. The upper limit value of voltage setting: this upper limit value is set after the power supply output voltage setting can not be higher than this voltage value, when higher than this voltage value, the system will automatically modify your settings for this voltage upper limit value, use the knob to modify the parameter settings or directly input with the key, the same method as the voltage setting operation.



12. Lower limit value setting of current setting: After this lower limit value is set, the output current setting of the power supply cannot be lower than this current value, when it is lower than this current value, the system will automatically modify your setting for this current lower limit value, use the knob to modify the parameter setting or input directly with the key, the method is the same as the current setting operation.



13. Current setting upper limit value setting: this upper limit value is set after the power supply output current setting can not be higher than this current value, when higher than this current value, the system will automatically modify your settings for this current upper limit value, use the knob to modify the parameter settings or directly input with the key, the same method as the current setting operation.



14. Power initialization setting: There are two settings: "NO" and "YES", use the knob to modify the parameter settings, "Enter" key to confirm. "NO" is not initialized, "YES" is initialized. Initialization content includes.



The initialization is as follows.

Menu function initialization parameters.

- ①. Power on default parameter setting: P-ST ON, the default is "ON".
  - ②. Power-on output status setting: P-UP OFF, default is "OFF".
  - ③. Power buzzer sound enable setting: BEEP ON, default is "ON".
  - ④. Voltage remote compensation function setting: SENSE OFF, default is "OFF".
  - ⑤. Analog function setting: ANAL OFF, default is "OFF".
  - ⑥. Power communication address setting: Addr 001, default is "001".
  - ⑦. Power communication baud rate setting: BAUD 9600, the default is "9600".
  - ⑧. Communication protocol type selection: PLC SCPI, the default is "SCPI".
  - ⑨. Communication protocol terminator: CEND LF, the default is "LF".
  - ⑩. Set the lower limit value of voltage setting: UO-L 00.00, the default value is "00.00".
- ... The upper limit value of voltage setting: UO-H 32.00 The default value is "Max".

- . Lower limit setting for current setting: CU-LO 0.000 Default value is "0.000".
- . Upper limit setting of current setting: CU-H 3.100 default value is "Max".

OVP function initialization parameters.

OVP parameter setting: OUP 32.00, the default value is "maximum".

OVP status setting: OUP OFF, the default value is "OFF".

OCP function initialization parameters.

①CP parameter setting: OCP 3.200, the default value is "Max".

② OCP status setting: OCP OFF, default is "OFF".

Trigger function initialization parameters.

①Trigger function parameter setting: trig off, the default is "OFF".

Battery function initialization parameters

① Output voltage lower limit parameter setting: U--L 00.00, the default value is "00.00".

② Output voltage upper limit parameter setting: U--H 32.00, the default value is "Max".

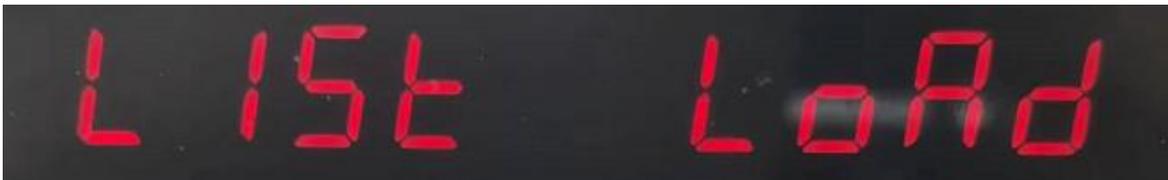
③ Output current lower limit parameter setting: C--L 0.000 default value is "0.000".

④ Output current upper limit parameter setting: C--H 3.100 default value is "Max".

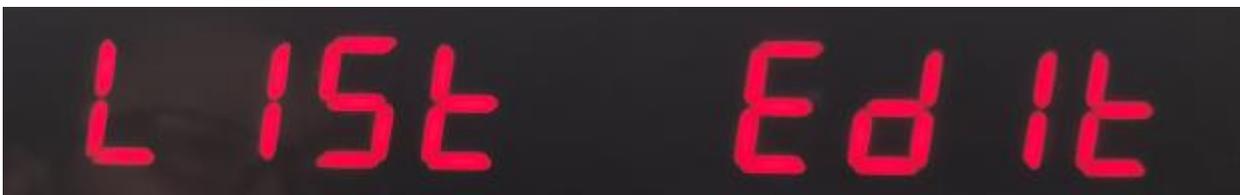
## 4.10 List Setting

In standby mode, press the shift key and then press the number key "2" to enter the List function setting, press ▲ and ▼ to switch the menu option, press "Enter" to select the item to be edited, the content is as follows.

1. Load List file: Press "Enter" in this interface, the system will automatically load the edited List file and switch to the List test interface, press ON/OFF key or execute List through external trigger port.



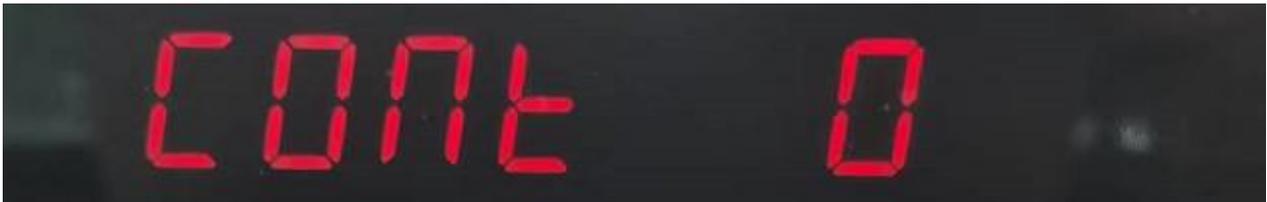
2. Edit the List file: Press "Enter" in this interface, the system will enter the List file editing.



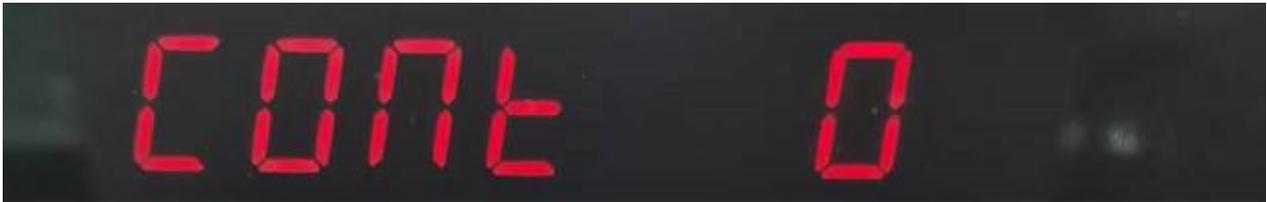
3. List Total step setting: Enter parameters with the number key, press "Enter" to confirm, selection between 1 and 10



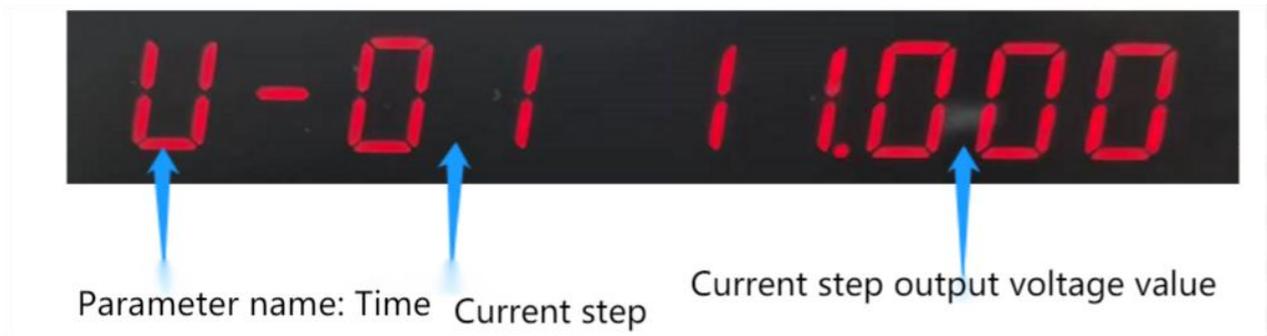
4. List continuous loop number setting: use the number key to input parameters, press "Enter" key to confirm, the total number between 0-9999, after the execution, automatically exit Lis mode, 0 is infinite loop, List can press the trigger key to stop or continue during the execution.



5. List trigger mode setting: press ▲ and ▼ to switch parameters, there are "AUTO" and "STEP". "AUTO" is automatically executed after List triggering, and "STEP" must be triggered manually once for every step.



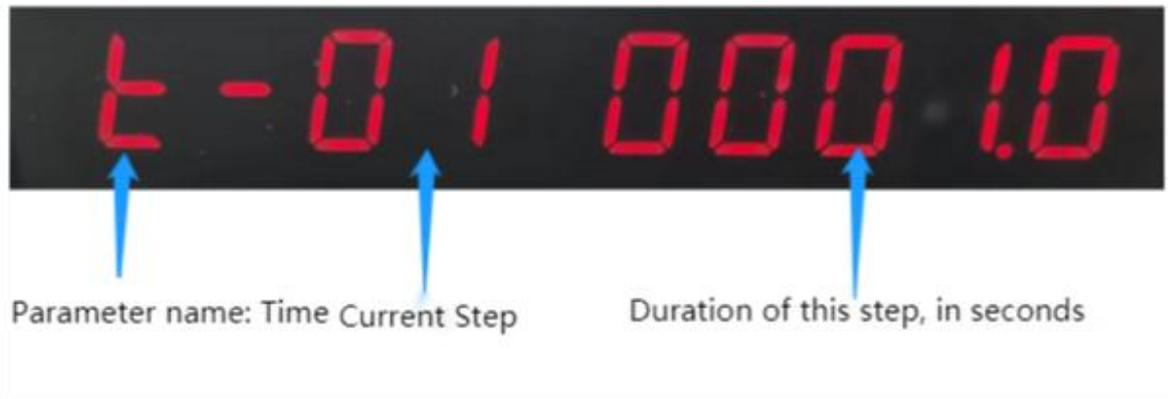
6. List voltage parameter setting:



7. List current parameter settings:

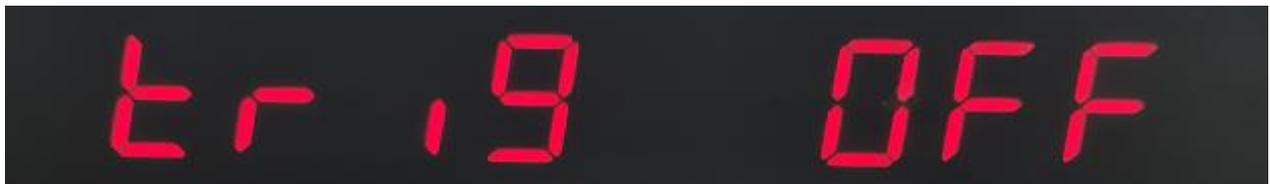


8. List time parameter setting :



ng:

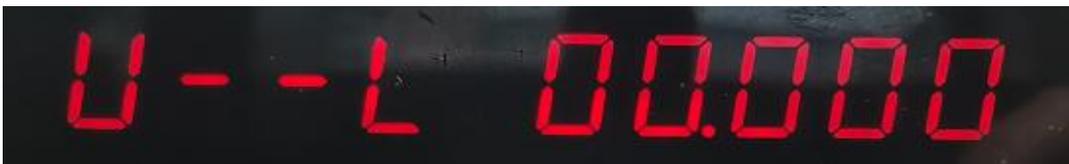
4.11 Trigger Settings: (This feature is used to turn on and off external triggers.) In standby state, press the shift key and then press the number key "3" to enter the "Trigger" function setting, modify the parameter setting and press "Enter" to confirm that "ON" opens external trigger; "OFF" closes external trigger; the content is as follows:



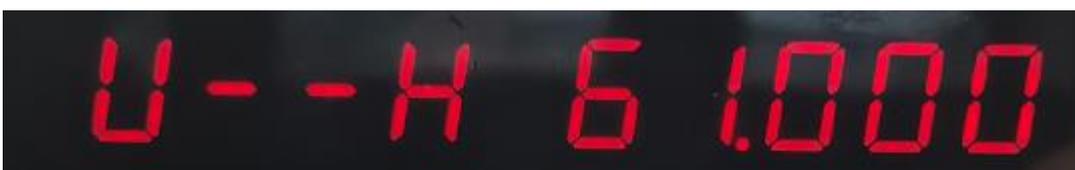
4.12 Local function: When the power supply is connected to the PC, the front panel button control will fail. At this time, you can disconnect the power supply and the PC by pressing the number key "7", and return to the front panel operation.

4.13 Battery setting (battery charging warning function, voltage / current upper and lower limit warning setting). In the standby state, press the shift key and then press the number key "8" to enter the Battery setting as follows:

4.13.1. Lower voltage limit warning setting, can change the setting value through the digital key and knob, the method is consistent with the voltage setting.



4.13.2 Voltage upper limit warning setting, the setting value can be changed by digital key and knob, the method is the same as voltage setting.



4.13.3 Current lower limit warning setting, the setting value can be changed by digital key and knob, the method is the same as current setting.



4.13.4 Current upper limit warning setting, the setting value can be changed by digital key and knob, the method is the same as current setting.



4.14 Key-button lock function setting:

Press the power supply in the boot state, press the "ON / OFF" key, and the front panel key will be locked, only the shift key and "ON / OFF" key will be valid. If you want to unlock the lock, press the shift key again and press the "ON / OFF" key.

## Chapter 5 Remote operation mode

5.1 Communication between power supply and host machine

The power supply can be connected to the host interface through the DB9 plug through the level conversion circuit on the rear panel. The following content can help you understand how to control the output of the power supply through the host.

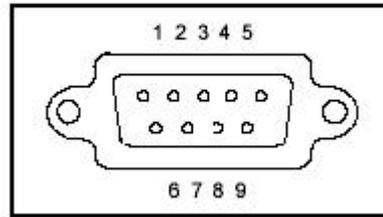
1. Communication Settings

Before proceeding with the communication operation, you should first match the power supply to the following parameters of the control host.

1. (1) Baud rate: 4800,9600,19200,38400,57600,115200 for selection.
- (2) verification:NONE
- (3) Data bit: 8, stop bit: 1 (fixed value)

2. DB9

Serial interface



The DB9 connector on the rear panel of the power supply can be connected to the connector of the host computer.

### 3. Interface Pin Definitions

1	NC
2	RXD(Received)
3	TXD(Send)
4	NC
5	GND(Land)
6	NC
7	NC
8	NC
9	NC

## Chapter 6 Communication Protocols

### 6.1 Overview

MPS-3600 series programmable DC power supply supports two communication protocols, SCPI and Modbus.

#### 6.1.1 Programming Manual of SCPI Protocol for MPS-3600 Series Programmable DC Power Supply Case Sensitivity

SCPI commands are not case sensitive: you can use upper or lower case or any combination of case.

For example: \*RST = \*rst

\*IDN? = \*idn?

\*RCL = \*rcl

#### Long and Short Form

The SCPI command word can be sent in long form, short form, or a combination of long and short form, which is provided in this document. And the short form is represented by uppercase characters.

For example.

SYSTem:LOCal long-form

SYST:LOC short

SYSTem:LOC long-short combination

SYST:LOCal long-short combination

Note:Each command word must be in long or short form, not in the middle form of long or short form.

For example::SYSTe:LOCa is illegal and the command will not be executed.

### Command Format

According to the command syntax, most commands (and some parameters) are represented by a mixture of upper and lower case letters. Capital letters indicate the abbreviation of a command. For shorter program lines, abbreviated format commands can be sent. For better program readability, long format commands can be sent. For example, VOLT and VOLTAGE are both acceptable formats. You can use upper or lower case letters. Therefore, VOLTAGE, volt and Volt are acceptable formats. Other formats (such as VOL and VOLTAG) are invalid and will not be enforced.

1. The curly brackets ({} ) contain the parameter options for a given command string. The curly brackets are not sent with the command string.
  2. A vertical bar (|) separates multiple parameter choices for a given command string. For example, in the above command, {0|1|OFF|ON} means you can specify "0", "1", "OFF", "ON ". The vertical bar is not sent along with the command string.
  3. The pointed brackets (<>) indicate that you must specify a value for the parameter inside the brackets. For example, VOLTage {<voltage value>}, the pointed brackets are not sent with the command string. You must specify a value for the parameter. For example: VOLT 1.23
  4. The colon (:) is used to separate the command keyword from the keyword at the next level. For example: SYSTem:LOCal
  5. Question mark(?) By adding a question mark (?) to the command you can query the current value of the parameter. For example: MEASure:VOLTage?
- You must use a blank character, [TAB] or [space] to separate the parameter from the command keyword. The command string sent to the instrument must end with a \r\n(0X0D,0X0A) character. Command string termination always resets the current SCPI command path to the root level.

### Remote Interface Connection

The power supply can be connected to the RS-232 interface via the DB9 plug on the rear panel via a level

conversion circuit. The following will help you understand how to control the output of the power supply via a PC.

## Communication Settings

Before proceeding with the communication operation, you should first match the power supply with the following parameters of the PC.

Baud rate: 9600

Data bits: 8

Stop bit: 1

Checksum: None

### IEEE 488.2 General Commands

\*IDN?

This query command reads the identification string of the power supply.

Return parameters: manufacturer name, product model, hardware version number, software version number.

\*RST

This command resets the power supply to the factory setting state.

\*SAV {<Address >}

This command saves the current parameter to the specified address (0~9).

Example: \*SAV 1

\*RCL {<Address >}

This command calls the parameter of the specified address (0~9).

Example: \*RCL 1

## SYSTEM Commands

**The SYSTEM command is used to set and query the system-related status**

SYSTem:LOCal

This command sets the power supply to the local operation mode.

SYSTem:REMOte

This command sets the power supply to remote operation mode.

SYSTem: BEEPer {0 | 1 | OFF | ON}

This command enables or disables the beeper of the power supply.

Example: SYST:BEEP OFF "Disable the beep of power supply"

SYST:BEEP 1 "Enable the power tone"

### SYSTEM :BEEPer?

This command queries the beep status of the power supply.

Example: SYST:BEEP?

Return parameter: 0(Disable beep) | 1(Enable beep)

**SYSTem: SENSE {0 | 1 | OFF | ON}**

This command enables or disables the power remote compensation.

Example: SYST:SENSE OFF "Disable remote compensation"

SYST:SENSE 1 "Enable remote compensation".

**SYSTem: SENS?**

This command queries the status of power supply remote compensation.

Example: SYST:SENSE:

Return parameter: 0(Disable remote compensation) | 1(Enable remote compensation)

**SYSTem :ERRor?**

This command queries the power supply error information and clears the error flag.

Example: SYST:ERR?

Return parameter: Error message

Return parameter: Error message

**SYSTem :TEMP?**

This command queries the internal temperature of the power supply.

Example: SYST:TEMP?

Return parameter: Temperature

## **APPLy command**

The APPLy command is used to set and query the set voltage and current values simultaneously

APPL y {<voltage>,<current>}

This command simultaneously sets the actual output voltage and current values of the power supply.

Example: APPL 12.345,1.234

The set voltage is 12.345V and the set current is 1.234A.

### **APPLy?**

This command queries the set voltage and current value of power supply at the same time.

Example: APPLy?

Return parameters: Set voltage value(XX.XXX),Set current value(X.XXX)

### **MEASure Commands**

The MEASure command is used to query the actual output voltage and current values of the power supply

#### **MEASure: VOLTage?**

This command queries the actual output voltage value of the power supply.

Example: MEAS:VOLT?

Return parameter: actual voltage value (X.XXX)

### **MEASure: CURRent?**

This command queries the actual output current value of the power supply.

Example: MEAS:CURR?

Return parameter: Actual current value (X.XXX)

### **MEASure: VCM?**

This command queries the actual output voltage and current value of the power supply.

Example: MEAS:VCM?

Return parameter: actual voltage, current value (XX.XXX,X.XXXX)

### **OUTPut Command**

The **OUTPut** command is used to set and query the output of the power supply and the output time.

### **OUTPut {<0 | 1 | OFF | ON>}**

This command enables or disables the power output state

Example: OUTP OFF "Disable power output"

OUTP 1 "Enable power output"

### **OUTPut?**

This command queries the power output status

Example: OUTP?

### **VOLTage command**

The **VOLTage** command is used to set and query the set voltage value and overvoltage protection value

### **VOLTage {<voltage>}**

This command is used to set the output voltage value of the power supply.

Example: VOLT 12.345

Set the voltage to 12.345V

### **VOLTage?**

This command is used to query the set voltage value of power supply

Example: VOLT?

Return parameter: Voltage set value (X.XXX)

### **VOLTage:MINimum {<voltage>}**

This command is used to set the minimum value of power supply output voltage

Example: CURR:MIN 3

Set the voltage to the minimum value of 3A

### **VOLTage:MINimum?**

This command is used to query the minimum value of power supply output voltage.

Example: VOLT:MIN?

Return parameter: The minimum value of power supply voltage (XX.XXX)

### **VOLTage: MAXimum {<voltage>}**

This command is used to set the maximum value of power supply output voltage

Example: VOLT:MAX 32

Set the voltage to the maximum value of 32V

**VOLTage: MAXimum?**

This command is used to query the maximum value of power output voltage.

Example: VOLT:MAX?

Return parameter: The maximum value of power supply voltage (XX.XXX)

**VOLTage: LOW {<voltage>}**

This command is used to set the lower limit value of power supply alarm

Example: VOLT:LOW 5

Set the lower limit of voltage alarm value 5V

**VOLTage: LOW?**

This command is used to query the lower limit value of power supply voltage alarm.

Example: VOLT:LOW?

Return parameter: The lower limit value of the power supply voltage alarm (XX.XXX)

**VOLTage: HIGH {<voltage>}**

This command is used to set the upper limit value of power supply voltage alarm.

Example: VOLT:HIGH 32

Set the upper limit of voltage alarm value 32V

**VOLTage: HIGH?**

This command is used to query the upper limit value of power supply voltage alarm.

Example: VOLT:HIGH?

Return parameter: The upper limit value of power supply voltage alarm (XX.XXX)

**VOLTage: PROTection {<ovp>}**

This command is used to set the power supply over-voltage protection value

Example: VOLT:PROT 12.3

Set the power supply overvoltage value to 12.3V

**VOLTage: PROTection?**

This command is used to query the over-voltage protection value of the power supply.

Example: VOLT:PROT?

Return parameter: Power supply overvoltage protection value (X.XXX)

**VOLTage: PROTection:STATe {<0|1|ON|OFF>}**

This command is used to set the state of power supply overvoltage protection

Example: VOLT:PROT:STAT OFF

Set the power supply overvoltage protection state to OFF

**VOLTage: PROTection:STATe?**

This command is used to query the over-voltage protection status of power supply.

Example: VOLT:PROT:STAT?

Return parameter: 0(disable output) | 1(enable output)

**CURRent Command**

The CURRent command is used to set and query the set current value and overcurrent protection status.

CURRent {<current>}

This command is used to set the output current value of power supply.

Example: CURR 2.345

Set the power supply output current value to 2.345A

**CURRent?**

This command is used to query the set current value of power supply.例: CURR?  
Return parameter: Power supply current setting value (X.XXXX)

#### **CURRent:MINImun**

This command is used to set the minimum value of power supply output current  
Example: CURR:MIN 3  
Set the current to the minimum value of 3A

#### **CURRent:MINImun?**

This command is used to query the minimum value of power supply output current.  
Example: CURR:MIN?  
Return parameter: The minimum value of power supply current (X.XXXX)

#### **CURRent: MAXImun**

This command is used to set the maximum value of power supply output current  
Example: CURR:MAX 5  
Set the current to the maximum value of 5A

#### **CURRent: MAXImun?**

This command queries the maximum value of power supply output current.  
Example: CURR:MAX?  
Return parameter: The maximum value of power supply current (X.XXXX)

#### **CURRent: LOW {< current >}**

This command is used to set the lower limit value of power supply current alarm.  
Example: CURR:LOW 1  
Set the lower limit of current alarm value 1A

#### **CURRent: LOW?**

This command queries the lower limit value of power supply current alarm.  
Example: CURR:LOW?  
Return parameter: The lower limit value of power supply current alarm (X.XXXX)

#### **CURRent: HIGH {< current >}**

This command is used to set the upper limit value of power supply current alarm.  
Example: CURR:HIG 5  
Set the upper limit of current alarm value 5A

#### **CURRent: HIGH?**

This command queries the upper limit value of power supply current alarm.  
Example: CURR:HIG?  
Return parameter: The upper limit value of power supply current alarm (X.XXXX)

#### **CURRent: PROTection {<ocp>}**

This command is used to set the over-current protection value of power supply.例: CURR:PROT 3  
Set power supply overcurrent value to 3A

### CURRent: PROTection?

This command is used to query the power supply when the overcurrent protection value

Example: CURR:PROT?

Return parameter: Power supply overcurrent protection value (X.XXXX)

### CURRent: PROTection:STATe {<0|1|ON|OFF>}

This command is used to set the power overcurrent protection status

Example: CURR:PROT:STAT ON

Set the power overcurrent protection ON

### CURRent: PROTection:STATe?

This command is used to query the overcurrent protection status of power supply.

Example: CURR:PROT:STAT?

Return parameter: 0(disable output) | 1(enable output)

## 6.1.2 MPS-3600 Series Programmable DC Power Supply Modbus Protocol Communication Protocol Register definition.

Register Address	NAME	03 Function Code	06 Function Code	10 Function Code	Description
0X0000	Remote Mode	Y	Y	Y	Remote control status 0:Local mode 1:Remote mode
0X0001	V_SET	Y	N	Y	Voltage setting register float type
0X0003	A_SET	Y	N	Y	Current setting register float type
0X0005	V_MIN	Y	N	Y	Min. voltage setting register float type
0X0007	V_MAX	Y	N	Y	Max. voltage setting register float type
0X0009	A_MIN	Y	N	Y	Minimum current setting register float type
0X000B	A_MAX	Y	N	Y	Maximum current setting register float type
0X000D	V_LOW	Y	N	Y	Lower voltage setting register float type
0X000F	V_HIGH	Y	N	Y	Upper voltage setting register float type
0X0011	A_LOW	Y	N	Y	Current lower limit setting register float type
0X0013	A_HIGH	Y	N	Y	Current upper limit setting register float type
0X0015	OVP_SET	Y	N	Y	Over-voltage parameter setting register float type
0X0017	OCP_SET	Y	N	Y	Over-current parameter setting register float type
0X0019	OVP_STATE	Y	Y	Y	Over-voltage status setting register 0:Close protection 1:Open protection
0X001A	OCP_STATE	Y	Y	Y	Overcurrent status setting register 0:Close protection 1:Open protection
0X001B	OUTPUT	Y	Y	Y	Output status setting register 0:Close output 1:Open output
0X001C	STATE	Y	Y	Y	Status read clear register u16 type, refer to the status register bit definition table
0X001D	V_OUT	Y	N	N	Output actual voltage register float type
0X001F	A_OUT	Y	N	N	Output actual current register float type
0X0021	CV/CC	Y	N	N	Output operating status register 0:CV status 1:CC

					status
--	--	--	--	--	--------

**Status register bit definition table.**

Bit	Name	Attributes	Description
6	VL_FLAG	R	1 is the voltage value over the lower limit mark
5	VH_FLAG	R	1 is the voltage value exceeds the upper limit mark
4	AL_FLAG	R	1 is the current value over lower limit mark
3	AH_FLAG	R	1 is the current value over the upper limit mark
2	OTP_FLAG	W/R	1 is the over-temperature protection mark, write 1 to clear the over-temperature mark (when the temperature returns to the safe value)
1	OCP_FLAG	W/R	1 is overcurrent protection mark, write 1 to clear overcurrent mark
0	OVP_FLAG	W/R	1 is overvoltage protection mark, write 1 to clear overvoltage mark

**Note: All float type parameters occupy two register addresses**

**The function code table and the interval are as follows.**

Function Code	Corresponding function	Time between two operations
0X03	Read one or more registers in a row command	N * 5ms
0X06	Write a single register command	10ms
0X10	Write one or more registers in a row command	N * 5ms

**Note: N is the number of registers**

The communication protocol format is as follows.

Function code 0X03

Address	Function Code	Start address high byte	Start address low byte	Number of registers high byte	Number of registers low byte	CRC16 check digit low byte	CRC16 check digit high byte
0X01	0X03						

**Power Return: 5+N\*2 Byte**

Address	Function Code	Data length bytes	Return Data High Byte	Return Data Low Byte	Return data N+1 High Byte	Return data N+1 Low Byte	CRC16 check digit low byte	CRC16 check digit high byte
0X01	0X03							

**Example 1: Reading the output voltage value (0X001D)**

PC send: 01 03 00 1D 00 02 54 0D

(Start address is 0X001D, length is 2 registers,

CRC 16 check result is 0X0D54)

Power return: 01 03 04 40 A0 00 00 EF D1 (0X40A00000) is 5.000V, 0 XD 1 EF is CRC 16 check result

**Example 2: Read the output voltage and current value (0X001D~0X001F)**

PC sent: 01 03 00 1D 00 04 D4 0F  
check result is 0 X 0 FD 4)

(Start address is 0X001D, length is 4 registers, CRC 16

Power return: 01 03 08 40 A0 00 00 40 00 00 00 24 2D (0X40A00000 is 5.00V, 0X40000000 is 2.0000A, 0X2D24 is CRC 16 check result)

Function code: 0X06

PC send: 8 Byte

Address	Function Code	Write to address high byte	Write to address low byte	Write data high byte	Write data low byte	CRC16 check digit low byte	CRC16 check digit high byte
0X01	0X06						

### Power return: 8Byte

Address	Function Code	Write to address high byte	Write to address low bytes	Write to the data with high bytes	Write the data to low bytes	CRC 16 check code for low bytes	CRC 16 check code high bytes
0X01	0X06						

**Note: All float type parameter registers do not support 06 code, 06 code only support a single register operation**

Example 1: Open the power output (0X001B) PC Send: 01 06 00 1B 00 01 38 0D (write address is 0X001B, write data is 0X0001, CRC 16 check result is 0X0D38) Power return: 01 06 00 1B 00 01 38 0D (write address is 0X001B, write data is 0X0001, CRC 16 check result is 0X0A48)

**Function code: 0X10**

PC send: 9+N\*2 Byte

address	function code	Starting address is high byte	Starting address Low Bytes	Register number of high bytes	Register number is low in bytes	DL byte	read-in data high byte	read-in data lower byte	Write to the data, N + 1 high byte	Write to the data, N + 1 lower byte	CRC 16 check code for low bytes	CRC 16 check code high bytes
0X01	0X10											

### Power supply is returned: 8 Byte

address	function code	Starting address is high byte	Starting address Low Bytes	DL high byte	DL lower byte	CRC 16 check code for low bytes	CRC 16 check code high bytes
0X01	0X10						

Example 1: Set the voltage and current value simultaneously (0X0001~0X0003)

PC send: 01 10 00 01 00 04 08 40 A0 00 00 40 00 00 00 FA 43 (start address is 0X0001, length is 4 registers, 0X40A00000 is 5.00V/40 00 00 00 is 1.0000A,



```

0x22, 0xE2, 0xE3, 0x23, 0xE1, 0x21, 0x20, 0xE0, 0xA0, 0x60, 0x61, 0xA1,
0x63, 0xA3, 0xA2, 0x62, 0x66, 0xA6, 0xA7, 0x67, 0xA5, 0x65, 0x64, 0xA4,
0x6C, 0xAC, 0xAD, 0x6D, 0xAF, 0x6F, 0x6E, 0xAE, 0xAA, 0x6A, 0x6B, 0xAB,
0x69, 0xA9, 0xA8, 0x68, 0x78, 0xB8, 0xB9, 0x79, 0xBB, 0x7B, 0x7A, 0xBA,
0xBE, 0x7E, 0x7F, 0xBF, 0x7D, 0xBD, 0xBC, 0x7C, 0xB4, 0x74, 0x75, 0xB5,
0x77, 0xB7, 0xB6, 0x76, 0x72, 0xB2, 0xB3, 0x73, 0xB1, 0x71, 0x70, 0xB0,
0x50, 0x90, 0x91, 0x51, 0x93, 0x53, 0x52, 0x92, 0x96, 0x56, 0x57, 0x97,
0x55, 0x95, 0x94, 0x54, 0x9C, 0x5C, 0x5D, 0x9D, 0x5F, 0x9F, 0x9E, 0x5E,
0x5A, 0x9A, 0x9B, 0x5B, 0x99, 0x59, 0x58, 0x98, 0x88, 0x48, 0x49, 0x89,
0x4B, 0x8B, 0x8A, 0x4A, 0x4E, 0x8E, 0x8F, 0x4F, 0x8D, 0x4D, 0x4C, 0x8C,
0x44, 0x84, 0x85, 0x45, 0x87, 0x47, 0x46, 0x86, 0x82, 0x42, 0x43, 0x83,
0x41, 0x81, 0x80, 0x40
};

```

```

unsigned int crc16(unsigned char *DData,unsigned char len)
{
    unsigned char CRCHi = 0XFF;
    unsigned char CRCLo = 0XFF;
    unsigned int wIndex;
    unsigned int CRC_DData;
    while(len--)
    {
        wIndex = CRCLo ^ *DData++;
        CRCLo = CRCHi ^ CRCHTalbe[wIndex];
        CRCHi = CRCLTalbe[wIndex];
    }
    CRC_DData = CRCHi;
    CRC_DData<<= 8;
    CRC_DData |=CRCLo;
    return CRC_DData;
}

```

### Safety

Do not install replacement parts on the instrument yourself or perform any unauthorized modifications. Please take the instrument to our service department for repair to ensure that it can be used safely.

Refer to specific warnings or cautionary information in this manual to avoid causing personal injury or damage to the instrument.

### Safety signs

#### Warning

It reminds users of certain operating procedures, practices, conditions, and other matters that may lead to personal injury.

Caution

It reminds the user of the operation procedures, practices, conditions, etc. that may cause damage to the instrument or permanent loss of data.

Access point

High voltage hazard. (Non-specialists should not open the machine)

Refer to the warnings in the related documents and pay attention to the tips. (High voltage, please wear gloves when operating to prevent electric shock do not use the machine in occasions related to safety)

Certification and quality assurance The MPS3600 series of programmable DC power supply fully meets the nominal technical indicators in the manual. quality assurance

Our company gives a one-year warranty on the materials and manufacture of this product from the date of shipment.

Repair Service

If this product needs to be repaired, please send the product back to the repair unit designated by our company. The customer shall bear the one-way shipping cost of sending the repaired product to our repair department, and our company will be responsible for paying the return shipping cost. If the product is returned to the factory for repair from another country, all shipping costs, duties and other taxes shall be borne by the customer.

### **Limitation of Quality Warranty**

The above warranty does not apply to damage caused by  
Incorrect or improper repair of the product by the customer.

Use of other software or interfaces by the customer.

Unauthorized modification or misuse.

Operation of the product outside of the specified environment or configuration and repair at a non-specified service location.

Damage caused by the customer's own installation of the circuit.

NOTICE

The contents of this manual are subject to change without notice and are subject to interpretation by the Company.

## Warranty Card

### What the warranty covered:

If the machine break down due to its defectiveness, MATRIX will provide free maintenance during warranty period. If the machine break down due to wrong operation or carelessness, then Matrix provide paid service within warranty period.

### How long does this warranty last:

This warranty lasts for 3 years from the date of original purchase of all MATRIX branded products.

### Who is covered:

This warranty covers only the original purchaser of this product. This warranty is not transferable to subsequent owners or purchasers of this product.

### What do customers need to do to get repairs/service under the warranty policy?

If the machine get problem, please contact our local distributor. If you cannot find the local distributor, you can contact us directly, our email is [service@szmatrix.com](mailto:service@szmatrix.com), our telephone No. is 0086 755 2836 4276.

### What information do customers need to supply?

Model No.	
Serial No.	
Problem description	
Picture	
Video if necessary	