MPS-4A Series Four-channel Programmable DC Power Supply

MATRIX TECHNOLOGY INC.

Introduction

Dear users:

Thank you for choosing a brand new MATRIX electronic instrument. In order to use the instrument correctly, please read the full text of the instruction manual carefully before using the instrument, especially about the "safety precautions" part.
If you have read the full text of this manual, it is recommended that you keep it properly together with the instrument or where you can read it for future use.

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Check and correction statement

In particular, the company declares that the equipment listed in this manual fully complies with the nominal specifications and characteristics of the company. The instrument has passed the factory calibration of the company before leaving the factory, and the verification procedures and steps are in line with the specifications and standards of the electronic inspection center.

(The Company follows the sustainable development strategy and reserves the right not to improve the contents of this specification.)

CATALOGUE

Chapter 1 Product Profile

MPS-4A series programmable DC power supply is a new generation of high quality programmable DC power supply, four channels can independently adjust the voltage and current, this series of products equipped with RS232 communication interface, both the characteristics of the table and system type, can any match other instruments, become special function test system, to complete the measurement requirements of different occasions, can edit through the communication protocol, bring great convenience to the use of the user, is the replacement of ordinary programmable power supply products, has high cost performance advantage.

This series of power supplies has the following features:

- Intelligent fan system
- Multiple sets of data stores
- Standard 19-inch 2U instrument architecture design
- Supports RS232, communication
- The high resolution of the 1mV, 0.1mA
- OCP, OVP, OTP and other protection functions
- All four ways can independently adjust the voltage and current

Chapter 2 Technical Specifications

2.1 Main technical specifications

MPS-4A Series Programmable DC Power Supply Technical Specification Table:

Model		**MPS-3034A**				**MPS-3054A**				**MPS-6034A**			
Rated input voltage		AC 110 / 220V ± 10% (optable)											
channel		CH1	CH2	CH3	CH4	CH1	CH2	CH3	CH4	CH1	CH2	CH3	CH4
Rated output voltage		0-30V				0-30V				0-60V			
Rated output current		0-3A				0-5A				0-3A			
Power		360W				600W				720W			
Load regulation rate	voltage	≤0.02%+5mV											
	current	≤0.02%+5mA											
Line regulation rate	voltage	≤0.02%+5mV											
	current	≤0.02%+5mA											
Set value resolution	voltage	1mV											
	current	0.1mA											
Ripple and noise	voltage	≤2mVrms											
	current	≤5mArms											
Set accuracy (25℃± 5℃)	voltage	≤0.05%+5mV											
	current	≤0.0.05%+2mA											
Readback resolution	voltage	1mV											
	current	0.1mA											
Readback accuracy (25℃±5℃)	voltage	≤0.05%+5mV											
	current	≤0.0.05%+2mA											
Temperature Coefficient	operational environment	0 to 40 ℃ ≤ 80% R.H.											
	Storage environment	-15 to 70 ℃ ≤ 80% R.H											
Size (W * H * D (mm))		440*90*340											
Net weight (KG)		20.2											

2.2 Supplementary Features

Status memory capacity: 9 sets of operation states
Recommended calibration frequency: 1 year / 1 time
Heat dissipation mode: forced air cooling
Operating ambient temperature: 0 to 40℃
Storage ambient temperature: -20 to 70℃
Use environment: indoor use design, pollution level 2, maximum humidity 80%

Chapter 3 Quick Start

This chapter briefly introduces the appearance and basic functions of the MPS-4A series programmable DC power supply, and let you quickly understand the four-way programmable DC power supply. At the same time, you will be told about the basic inspection after getting the power supply to ensure the normal operation of the product.

3.1 Introduction of the front and rear panel

The front panel of the MPS-4A series programmable DC power supply is shown below.

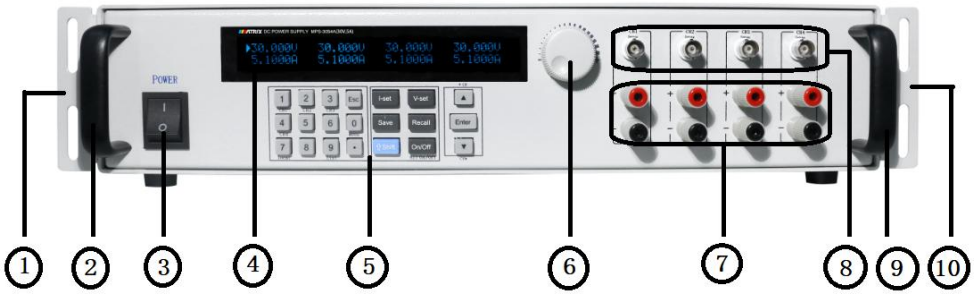


Figure 3.1

① , ⑩ Standard 19-inch cabinet with a fixed ear
② , ⑨ Four-way programmable DC power supply
③ mains switch
④ LCD display screen,
⑤ From left to right, 0-9 number keys and ESC exit, function keys, move up and down and Enter,
⑥ Adjust the knob,
⑦ leading-out terminal,
⑧ Voltage compensation interface,

MPS-4A series programmable DC power supply rear panel layout, as shown in the figure below.

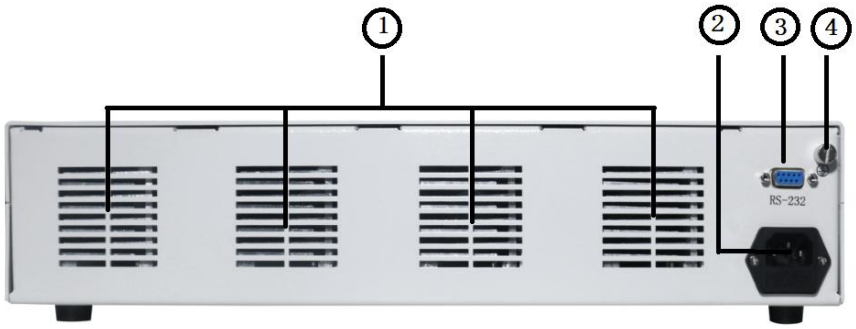


Figure 3.2 MPS-4A series programmable DC power supply rear panel

① heat emission hole
② Power supply input socket
③ RS232 communication interface
④ earth terminal

3.2 Pre-check

Follow the following below to check the power supply to ensure the power supply is properly.

1. Inspection of goods

Please check for the following accessories while receiving the power supply. If there is any missing thing, please contact your nearest dealer.

☑ One power cord (meet the voltage standard used in the region)
☑ One operation manual (standard equipment)
☑ A communication line (standard equipment)
☑ One warranty card (standard standard)

2. Connect the power cord and turn the power on

After the power on, the power supply first conducts the system self-test, and then enters the standby state.

Warning: The power supply provides a three-core power cable, and your power supply should be connected to the three-core junction box. Before operating this power supply, you should first determine that the power supply is well grounded.

3.3 If the power supply cannot be started

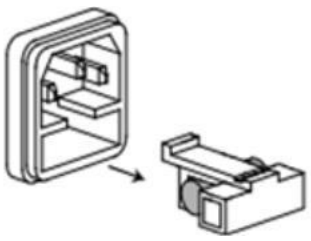
Solve the problems you may have when you turn the power on.

1. Check whether the power cord is well connected

model	Fuse specifications
	230V
MPS-4A	10A
MFP-4001	10A
MFP-4002	10A

2. Fuse replacement method

Use the screwdriver to open the small plastic cover under the power input socket on the back panel of the power supply to see the fuse. Please use the fuse with the same specification.

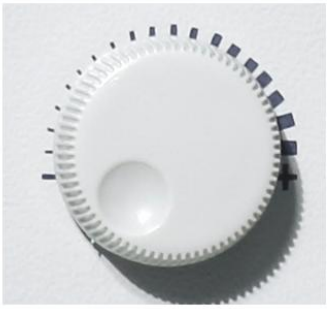


Chapter 4 Panel Operation

This chapter details the operation of the front power supply panel and is divided into the following sections:

- Enacious keyboard arrangement
- Introduction of the front panel operation
- Voltage-setting operation
- Current-setting operation
- Store operation
- Vacation Menu Operation
- Output the on / off operation

4.1 Introduction to Keyboard

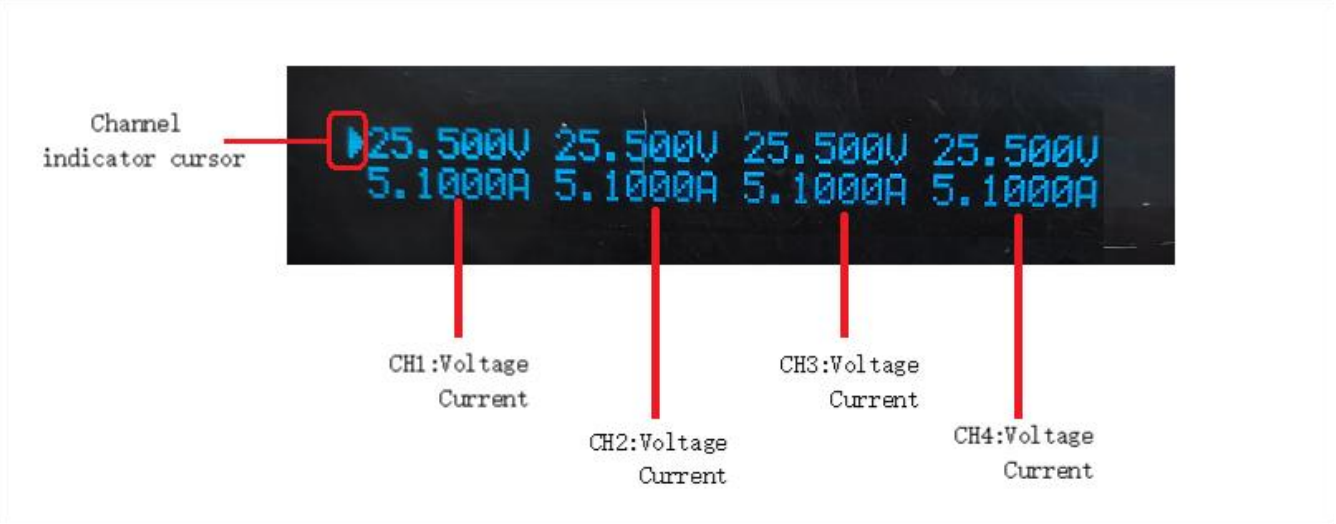


Key instructions

Key position	Key function description
0-9：	**Number keys (where 0,1,2,3,4,7,9 are combination keys, see later.)**
Esc:	**eject key**
I-Set	**Set the maximum output current of the power supply**
V-Set	**Set the power supply output voltage**
Save	Storage power supply current relevant parameters to the specified storage location
Recall	Call power related setting parameters from the specified storage location
Shift	Composite keys, and multifunction keys
On/off	Control the power output status (control all channels ON / OFF when combined with shift)
▲	Turn key (select menu item in menu operation to switch channels in non-menu state)
▼	Down key (select menu item in menu operation to switch channels in non-menu state)
Enter	Confirm the key
knob	Used to change the power supply voltage, the current setting

4.2 Basic operation of the front panel

Turn on the power supply, the LCD displays the voltage and current data of the four channels, from left to right: CH 1, CH2, CH3, CH4, the voltage value, the first line displays the current value, when the current channel is in the output state, the decimal point of the voltage window flashes, the current window displays the actual output current value, when the instrument is closed, the current window displays as the set current value. Press ▲ and ▼ to switch the parameter settings from CH 1 to CH4, ▶ and the cursor indicates that the current channel parameters can be set.



4.3 Voltage setting operation

The voltage setting ranges between 0V and the maximum voltage setting value. You can set the output voltage value through the front panel below, and the set voltage is the value of the channel indicated by the current cursor.
Method 1: Press V-Set key, then press 0 to 9 number keys to input the voltage value, and then press Enter key to determine the voltage value.

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

4.4 Current setting operation

The current is set between 0A and full rated output current. You can set the output current value through the front panel in the following two methods. The set current is the value of the channel indicated by the current cursor.

Method 1: Press I-Set key, then press 0 to 9 number keys to input the current value, and then press Enter key to determine the current value.

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

4.5 Output ON / OFF operation

You can control the power output and the off output through the front panel in the following two methods.
Method 1: When the instrument is in standby state, pressing ON / OFF F can control the output and closing of the channel where the light meter is located, and the decimal point of the voltage display window flashes when the power supply is in the output state.

Method 2: When the instrument is in standby state, press the "shift" and "ON / OFF" combination keys to control the output and closing of all channels, and the decimal point of the voltage display window will blink when the power supply is in the output state.

4.6 Access operation

The power supply can save some commonly used parameters in 9 sets of non-volatile memory, for users to use quickly. You can use the front panel Save and Recall keys to access the (0~9) group storage area.
Storage contents include: 1. Voltage setting value 2. Current setting value 3. OVP 4. OCP
You can press Save again, press 1 to 9 numbers, and press Enter to store the power supply parameters in the specified storage area.
You can press Recall, 1 to 9, and Enter to remove the parameters from the specified storage area.

4.7 OVP / OCP / V SENSE function setting

Press shift and then press the number key "1 to 4" to enter the OVP / OCP / V SENSE parameter setting of CH 1 to CH4 respectively, press the ▲ and ▼ keys to move the cursor to the parameter position to be modified,
OVP ON / OFF (over voltage protection enable switch, ON open, OFF off, the default value is "OFF", change the setting through the knob, press "Enter" key to save the setting,)
OVP value (overvoltage protection value set by the number key or knob)
OCP ON / OFF (Overcurrent protection enable switch, ON open, OFF off, default value is "OFF", change setting through the knob, press "Enter" key to save settings,)
SENSE ON / OFF (distal compensation enable switch, ON open, OFF off, default value is "OFF", change the setting through the knob, press "Enter" key to save the setting,)
As shown in the figure: (CH 1-CH4 setup method is the same)

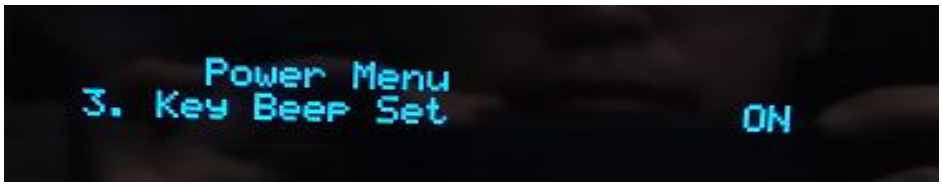
Note: Press "ESC" to exit or wait about 10 seconds to exit automatically.

4.8 Menu settings

Press shift and then press the number key "0", enter the menu setting function, press ▲ and ▼ keys to switch options, the screen appears as follows:
1. Power Out State Set ON / OFF (boot state enable switch, ON open, OFF off, default value is "OFF", change the setting through the knob, press "Enter" key to save, set to ON, power on after automatically output, set to OFF, power supply will not automatically output,)

2. Power Out Param Set REST / KEEP (startup parameter memory switch, the default value is "KEEP", through the knob to change the setting, press "Enter" key to save, set to KEEP, maintain the output parameter of the last power off, set to REST, call the default output parameters of the system after the power on.

3. Key Beep Set ON / OFF (buzzer enabling switch, ON open, OFF off, default value is "ON", change the setting through the knob, press "Enter" key to save, sound when setting to ON button, no sound when set to OFF button,)



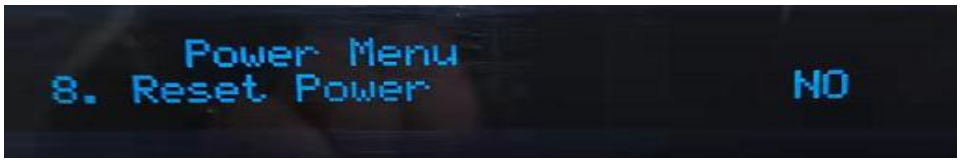
4. Baud Rate Select 9600 (Communication port rate set, the default value is "9600", change the setting through the knob, press "Enter" key to save, port rate is: 4800,9600,19200,38400 for selection,)

5. Modbus Machine Address 1 (Address setting, optional between 1-250, the default value is "1", changed through the rotation of the knob, press "Enter" key to save,)

6. Commad Version Select SCPI (Command / communication protocol version selection, the default value is "SCPI", change the setting through the left and right rotation of the knob, press "Enter" key to save, the command has SCPI and MODBUS two choice)

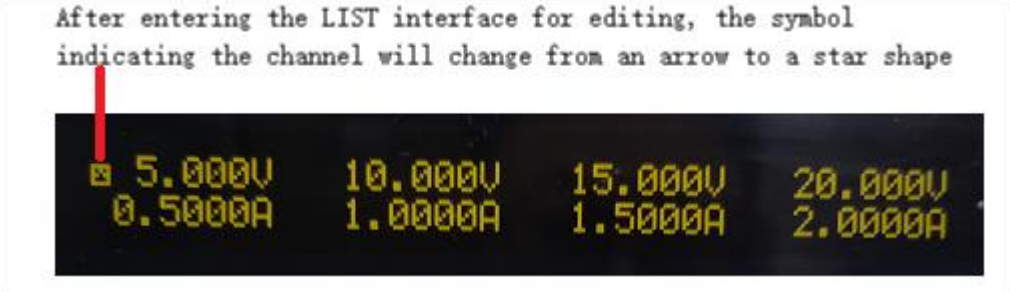
7. SCPI End Char Set LF (0A) (Selection of end character during SCPI communication, the default value is "LF (0A)", change the setting value by changing the left and right rotation of the knob, press "Enter" key to save,)

8. Reset Power NO (Factory initialization setting, change the knob, press "Enter" to confirm, NO is not initialization, YES is initialization, after initialization, all parameters will be set to the factory default value.)



4.9 List settings

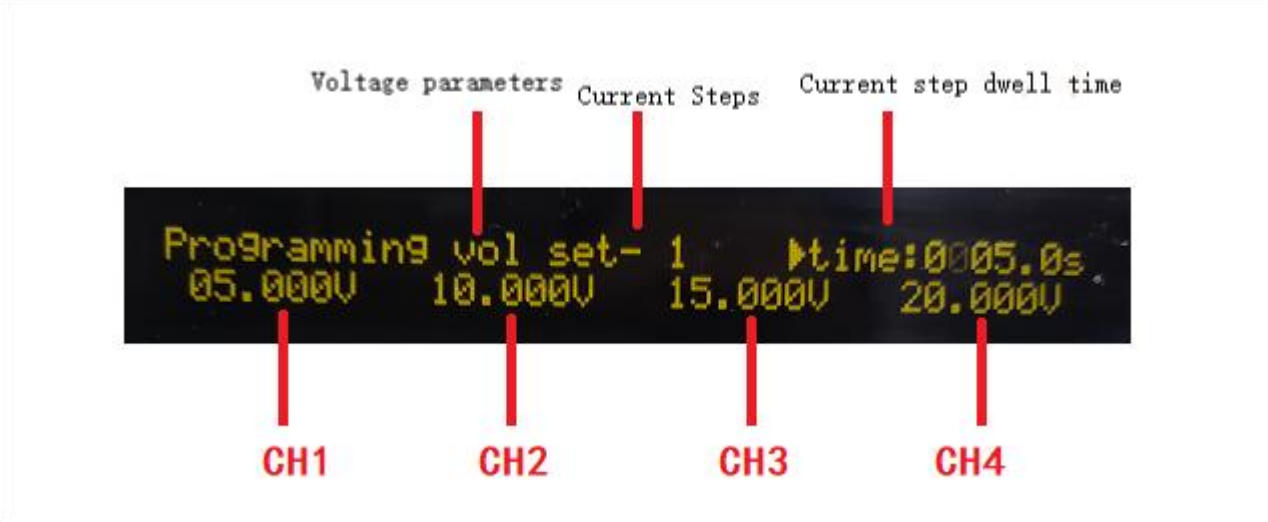
Press shift and then press the number key "9" to enter the List function main screen. The screen displays as follows:



When the List function is turned on, press shift and then press the number key "0" to enter the setting of List. After entering the setting of List, you can switch to the parameters to be modified by pressing ▲ and ▼, and modify the parameters by turning the knob left and right. The screen shows as follows:

Note: Up to 30 steps can be set, and up to 99,999 cycles can occur. After editing, press "Enter" to confirm and exit.

"After pressing the ▼ key, you can set the voltage, current and time of List (in the List main interface, you can enter the parameter setting by pressing" Shift "and" I-set "or" Shift "and" V-set "). The screen displays as follows:



Note: Use the number keys to modify the parameter content. Confirm with the "Enter" key. The "I-set" and "V-SET" keys can switch between voltage and current. Press the ▲ and ▼ keys to switch to the next or previous step. After editing the parameters, press "Esc" to exit the List main interface. At this time, press "On/Off" to execute the List test (all channels of "Shift" and "On/Off" can execute the List simultaneously, and press "On/Off" to only execute the channel where the cursor is located).

Chapter 5 Remote Operation Mode

5.1 Communication between power supply and host machine

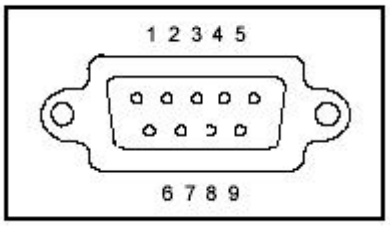
The power supply can be connected to the PC host interface through the DB9 plug on the rear panel.
The following content can help you understand how to control the output of the power supply through the host.

1. Communication setting

Before performing communication, you should first match the power supply to the following parameters of the control host:

(1) Baud rate: 9,600
(2) Check: NONE
(3) Data bit: 8, stop bit: 1 (fixed value)

2. DB9 Serial interface



The DB9 interface of the rear power supply panel can be connected to the interface of the host machine.

3. Interface pin definition

1	NC
2	RXD(receive)
3	TXD(transmit by radio)
4	NC
5	GND(the earth)
6	NC
7	NC
8	NC
9	NC

Chapter 6 SCPI communication protocol

Command format

Follow the SCPI command syntax, support short mnemonic capital format.

1. The parameter options for a given command string are included in the braces ({}). Brackets are not sent with the command string.

2. Vertical bar (|) separates multiple parameter selections 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 with the command string.

3. Sharp brackets (<>) indicate that a value must be specified for the parameters in the parentheses. For example, VOLTage {<Voltage Value>}, the sharp brackets are not sent with the command string. You must specify a value for the parameter. Such as: VOLT 1.23

4. The colon (:) is used to separate the command keyword from the keyword at the next level. For example: the SYST: The LOC

5. Question marks (?) By adding a question mark to the command (?) You can query for the current value of the parameter. For example: MEAS: VOLT?

6. Space You must use a blank character, [TAB], or [space].

7. The command string of the end character sent to the instrument must end with a \ r \ n (0X0D, 0X0A) character. The 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 through the DB9 plug on the rear panel. The following content helps you understand how to control the output of the power supply through the PC.

Communication Settings

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

Porter rate: 4800 / 9600 / 19200 /

Data bit: 8

Stop position: 1

verification:None

IEEE 488.2 General command

***IDN?**

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

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

SYSTem Command

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

SYSTem:LOCal

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

Example: SYST: LOC

SYSTem:REMote

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

Example: SYST: REM

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

This command enables or disables power prompts.

Example: SYST: BEEP OFF "Disabled power prompt tone"

SYST: BEEP 1 "Power-enabled prompt tone"

SYSTem :BEEPer?

This command queries the prompt status of the power supply.

Example: SYST: BEEP?

Return parameter: 0 (disabled) | 1 (enabled)

APPly order

The APPly command is used to simultaneously set or read the voltage values, current values, output states, and SENSE states of the five channels.

APP ly :V OLTage {<CH1 Voltage >, <CH2 Voltage >,<CH3 Voltage, <CH 4 Voltage >,<CH 5 Voltage >}

This command also sets the voltage value of the five channels

Example: APP: VOLT 12,5,3,20.1,30.5

The output voltage is set to be 12V, 5V, 3V, 20.1V,30.5V respectively

APP l y :V OLTage ?

This command simultaneously queries the set voltage value of the five channels

Example: APP: VOLT?

Return parameter: CH 1 set voltage (X. XXX), CH2 set voltage (X. XXX), CH3 set voltage (X. XXX) CH 4 set voltage (X. XXX), CH 5 set voltage (X.XXX)

APP ly:CURR ent {<CH1 C urrent >, <CH2 C urrent >,<CH2 C urrent >, <CH 4 C urrent >,<CH 5 C urrent >}

This command also sets the current value for the five channels

Example: APP: CURR 3,1,3,2.123,5,

The output current is set to 3A, 1A, 3A, 2.123A, 5A respectively

APP l y :CURRnet ?

This command simultaneously queries the set current value of the five channels

Example: APP: CURR?

Return parameter: CH 1 set current (X. XXX), CH2 setting current (X. XXX), CH3 setting current (X. XXX), CH 4 setting current (X. XXX), CH 5 setting current (X.XXX)

APP ly:OUT put {<0 |1 |ON|OFF>, <0 |1 |ON |OFF >,<0 |1 |ON|OFF >}

This command also sets the output state of the five channels

Example: APP: OUT OFF, 0,1, ON, 0

Set the five-channel output status as OFF, OFF, ON, ON, and OFF respectively

APP l y :OUT put?

This command simultaneously queries the output status of the five channels

Example: APP: OUT?

Return parameters: CH 1 output state (0 | 1), CH2 output state (0 | 1), CH3 output state (0 | 1), CH 4 output state (0 | 1), and CH 5 output state (0 | 1)

APP ly:SENSEput {<0 |1 |ON|OFF>, <0 |1 |ON |OFF >,<0 |1 |ON|OFF >}

This command also sets the SENSE state of the five channels

Example: APP: OUT OFF, 0,1, ON, 0

Set five-channel SENSE, the status are OFF, OFF, ON, ON and OFF

APP l y :SENSe?

This command simultaneously queries the SENSE status of the five channels

Example: APP: SENS?

Return parameters: CH1SENSE state (0 | 1), CH2SENSE state (0 | 1), CH3SENSE state (0 | 1), CH4SENSE state (0 | 1), CH5SENSE state (0 | 1)

MEASure Command

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 current channel of the power supply
Example: MEAS: VOLT?
Return parameter: Actual voltage value (X.XXX)

MEASure:VOLTage:ALL?
This command also queries the actual output voltage value of the power supply in five channels
Example: MEAS: VOLT: ALL?
Return parameter: CH 1 Actual voltage value (X. XXX), CH 2 actual voltage value (X. XXX), CH 3 actual voltage value (X. XXX), CH 4 actual voltage value (X. XXX), CH 5 actual voltage value (X.XXX)

MEASure : CURRent?
This command queries the actual output current value of the current channel of the power supply
Example: MEAS: CURR?
Return parameter: Actual current value (X.XXX)

MEASure: CURRent :ALL?
This command also queries the actual output current value of the power supply three channels
Example: MEAS: CURR: ALL?
Return parameter: CH 1 actual current value (X. XXX), CH 2 actual current value (X. XXX), CH 3 actual current value (X. XXX), CH 4 actual current value (X. XXX), CH 5 actual current value (X.XXX)

OUTPut Command
The OUTPut command is used to set up and query the output of the power supply
OUTPut {<0 | 1 | OFF | ON>}
This command enables or disables the output status of the power supply current channel
Example: OUTP OFF Disable power output"
OUTP 1 Enable Power Output

OUTPut ?
This command queries the output status of the current channel of the power supply
example:OUTP?
Return parameter: 0 (disabled output) | 1 (enable output)

VOLTage Command
VOLTage Command is used to set and query the set voltage value
VOLTage {<voltage>}
This command is used to set the output voltage value of the current channel
Example: VOLT 12.345
Set the voltage to be at 12.345V

VOLTage?
This command is used to query the set voltage value of the current channel of the power supply
example:VOLT?
Return parameter: Voltage SetPoint (X.XXX)

CURRent Command
CURRent The command is used to set and query the set current value
CURRent {<current >}
This command is used to set the output current value for the current channel
Example: CURR 2.345
Set the output current value of the current channel of the power supply to 2.345A

CURRent?

This command is used to query the set current value of the current channel

example:CURR?

Return parameter: current channel (X.XXX)

INSTrument Command

INSTrument The command switches the current channel for the power supply

INSTrument {<1|2|3|4|5|>}

This command switches the current channel for the power supply

Example: INST 1

Set the power supply CH 1 channel as the current channel

INSTrument ?

This command is used to query which channel the power supply currently is

Example: I NST?

Return parameter: Power supply current channel (1 | 2 | 3 | 4 | 5)

Safe

Do not install substitute parts on the instrument or perform any unauthorized modifications. Please send the instrument to the company's maintenance department for repair to ensure its safe use.
Please refer to the specific warning or precautions information in this manual to avoid causing personal injury or instrument damage.

Safety signs

Warn

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

Pay attention to

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

 Ground point

 High pressure danger.(Non-professional personnel shall not turn on the machine)

 Refer to the warnings in the relevant documents.(The voltage is high, please wear gloves during operation, beware of electric shock and do not use the machine in the relevant safety occasions).

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, 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	