MTP-200/ MFP-2005 Series
Programmable DC Power Supply
User Manual

MATRIX TECHNOLOGY INC.

Applicable models: MTP-200, MTP-201, MTP-202, MTP-203, MTP-204, MTP-205, MTP-206, MFP-2005, MTP-2006, MTP-2007, MTP-2008, MTP-2009, MTP-2010, MTP-2011

Preface

Dear users:

Hello! Thank you for purchasing a new MATRIX instrument. In order to use the instrument correctly, please read this manual carefully before using the instrument, especially the part about "Safety Precautions".

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

Copyright information

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- MATRIX The products are protected by patents in China or other countries, including those that have been obtained or are being applied for.
- MATRIX TECHNOLOGY INC. reserves the right to change product specifications and prices.
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Verification and correction statement

Our company hereby declares that the instruments and equipment listed in this manual fully comply with the specifications and characteristics stated in our company's technical specifications. This instrument has been calibrated in our company's factory before leaving the factory, and the calibration procedures and steps comply with the specifications and standards of the Electronic Inspection Center.

Product quality assurance

Our company guarantees that all newly manufactured instruments have undergone rigorous quality verification. We also ensure that within one year of leaving the factory, if any construction defects or part failures are discovered, we will provide free repairs. However, if users make their own modifications to the circuitry, functions, or repair the instruments and parts, or if the outer casing is damaged, we do not offer free warranty services. If abnormal conditions occur due to failure to properly connect all ground wires or operate the machine according to safety standards, we also do not provide free warranty services.

This warranty does not include the accessories of this instrument and other accessories not produced by our company.

During the three-year warranty period, please send the faulty unit to our maintenance center or our designated dealer for proper repair.

If the unit fails due to abnormal use, human negligence, or uncontrollable factors such as earthquake, flood, riot or fire, the company will not provide free warranty service.

Safety precautions

General safety precautions must be followed at all stages of operation of this instrument. If these are not followed specific warnings that are described in the preventive measures or other parts of this manual will violate the design, manufacture and safety standards for use. The Company assumes no responsibility for users who do not comply with these precautions.

Caution

- Do not use damaged equipment, check the equipment is intact before using the equipment. Please do not operate the equipment in an environment containing explosive gas, steam or dust.
- The power supply comes with a three-core power cord at the factory, and your power supply should be connected to the three-core connection
- On the line box. Before operating the power supply, you should first ensure that the power supply is well grounded to avoid accidental injury!
- Before connecting the device, check all the labels on the device.
- Please always use the cable provided with the instrument at the time of manufacture to avoid accidental injury.
- Use wires with appropriate rated loads, and the capacity of all load wires must be able to withstand the power supplys maximum
- A large short circuit output current without overheating. If there are multiple loads, each pair of load wires must
- It can safely carry the full rated short-circuit output current of the power supply.
- To reduce the risk of fire and electric shock, ensure that the voltage fluctuation of the municipal power supply does not exceed 10% of the working voltage range.
- If you use the power supply to charge the battery, you must confirm the positive and negative polarity of the battery when wiring, otherwise it will burn the power supply!
- Do not use this equipment when the cover is removed or loose.
- Do not install replacement parts on the instrument yourself or perform any unauthorized modifications.
- We shall not be liable for any direct or indirect financial loss that may occur when using this product.
- It is strictly prohibited to use this equipment on life support systems or any other equipment with safety requirements.
- Failure to use the device in accordance with the manufacturers specified method may compromise the protection provided by the device.
- Always clean the equipment housing with a dry cloth. Do not clean the interior of the instrument.

(The Company follows the sustainable development strategy and reserves the right to make improvements to the contents of this manual without prior notice)

CATALOGUE

Chapter 1 Product Introduction

The MTP series and MFP 2005 series programmable DC power supplies represent a new generation of high-quality programmable multi-channel DC power supplies. Each channel is isolated from one another and can independently adjust voltage and current. This series comes equipped with an RS232 communication interface (with optional USB, RS485, LAN, etc.) interfaces, combining the characteristics of both desktop and system models. It can be paired with other instruments to form specialized testing systems for various measurement requirements in different settings. Users can edit programs on the host computer through communication protocols, greatly enhancing user convenience. This is a replacement product for ordinary programmable power supplies, offering excellent cost-performance advantages.

This series of power supply has the following features:

- Intelligent fan system
- Multiple data storage groups
- Standard 19-inch 2U instrument architecture design
- Support RS232 and other communications
- High resolution of 1mV, 1mA
- OCP, OVP, OTP and other protection functions
- Isolation between channels
- Each channel independently regulates voltage and current
- Remote voltage compensation function

Chapter 2 Technical Specifications

2.1 Main technical specifications

MTP-200 series programmable DC power supply technical specification table:

Model		MTP-200	MTP-201	MTP-202	MTP-203	MTP-204	MTP-205	MTP-206
Rated input voltage		AC220V±10%						
Rated output voltage		0-30V*2CH	0-30V*2CH	0-60V*2CH	0-60V*2CH	0- 80V*2CH	0-150V*2CH	0-15V*2CH
Rated output current		0-20A*2CH	0-30A*2CH	0-10A*2CH	0-15 A*2CH	0-11 A*2CH	0-6 A*2CH	0-60A*2CH
Load regulation rate	Voltage	<0.1%+20mV		<0.1%+10mV	<0.1%+15mV	<0. 1%+ 10mV		<0.1%+25mV
	Current	<0. 1%+ 5mA		<0.1%+5mA	<0. 1%+5mA	<0. 1%+ 5mA		<0.1%+8mA
Line regulation rate	Voltage	<0. 1%+ 20mV		<0.1%+10mV	<0. 1%+15mV	<0. 1%+ 10mV		<0. 1%+25mV
	Current	<0. 1%+ 5mA		<0. 1%+5mA	<0. 1%+5mA	<0. 1%+ 5mA		<0.1%+8mA
Setting resolution	Voltage	1mV						
	Current	1mA						
Setting accuracy (25 ℃ ± 5℃)	Voltage	≤0. 1%+ 10mV						
	Current	≤0. 3%+ 5mA						
Readback resolution	Voltage	1mV						
	Current	1mA						
Readback accuracy (25 ℃ ± 5℃)	Voltage	≤0. 1%+ 10mV						
	Current	≤0. 3%+ 5 mA						
Temperature	Operational environment	0 to 40 ℃ ≤ 85 R.H.						
	Storage environment	-15 to 70 ℃ ≤ 85 R.H						
Size (W*H*D(mm))		372 (including handle 32mm) *482 (including ears on both sides 42mm) *100 (including footpad 10 mm)						
Net weight		9.5kg (bare machine)						

MFP-2005 series programmable DC power supply technical specification table:

Model		MFP-2005	MF-2006	MFP-2007	MFP-2008	MFP-2009	MFP-2010	MFP-2011
Rated input voltage		AC220V±10%						
Rated output voltage		0-30V*4CH	0-30V*4CH	0-60V*4CH	0-60V*4CH	0-80V*4CH	0-150V*4CH	0-15V*4CH
rated output current		0-20A*4CH	0-30A*4CH	0-10A*4CH	0-15A*4CH	0-11A*4CH	0-6A*4CH	0-60A*4CH
Load regulation rate	Voltage	<0.1%+20mV		<0.1%+10mV	<0.1%+15mV	<0.1%+10mV		<0.1%+25mV
	Current	<0.1%+5mA		<0.1%+5mA	<0.1%+5mA	<0.1%+5mA		<0.1%+8mA
Line regulation rate	Voltage	<0.1%+20mV		<0.1%+10mV	<0.1%+15mV	<0.1%+10mV		<0.1%+25mV
	Current	<0.1%+5mA		<0.1%+5mA	<0.1%+5mA	<0.1%+5mA		<0.1%+8mA
Setting resolution	Voltage	1mV						
	Current	1mA						
Setting accuracy (25℃±5℃)	Voltage	≤0.1%+10mV						
	Current	≤0.3%+5mA						
Readback resolution	Voltage	1mV						
	Current	1mA						
Readback accuracy (25℃±5℃)	Voltage	≤0.1%+10mV						
	Current	≤0.3%+5mA						
Temperature	Operational environment	0 to 40℃≤85 R.H.						
	Storage environment	-15 to 70℃≤85R.H						
Size (W*H*D(mm))		372 (including handle 32mm) * 482 (including ears 4 2mm) * 100 (including footpad 1 0 mm)						
Net weight		--						

2.2 Supplementary features

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

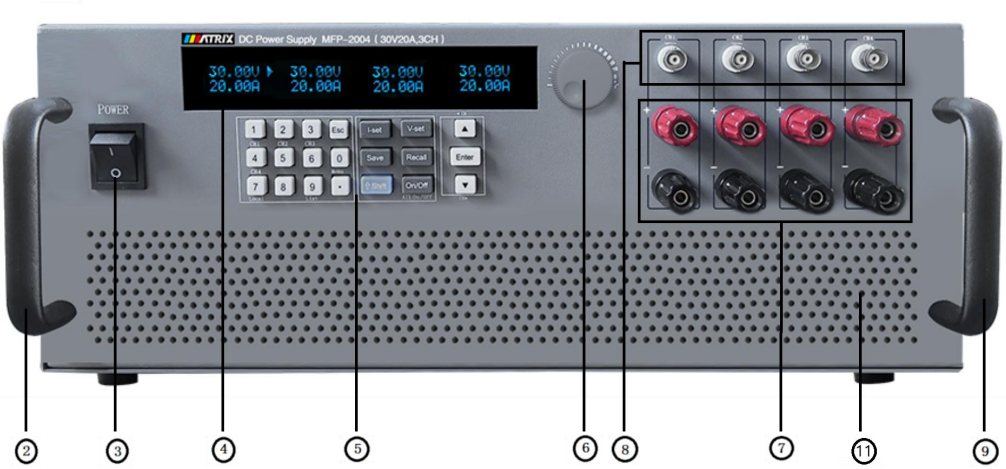
Chapter 3 Quick Start

This chapter will briefly introduce the appearance and basic functions of the MTP series programmable DC power supply, so that you can quickly understand the MTP series programmable DC power supply. At the same time, it will tell you what basic checks to do after receiving this power supply to ensure the normal operation of this product.

3.1 Introduction to front and rear panels

The front panel of the MTP-200 series programmable DC power supply is shown in the following figure.

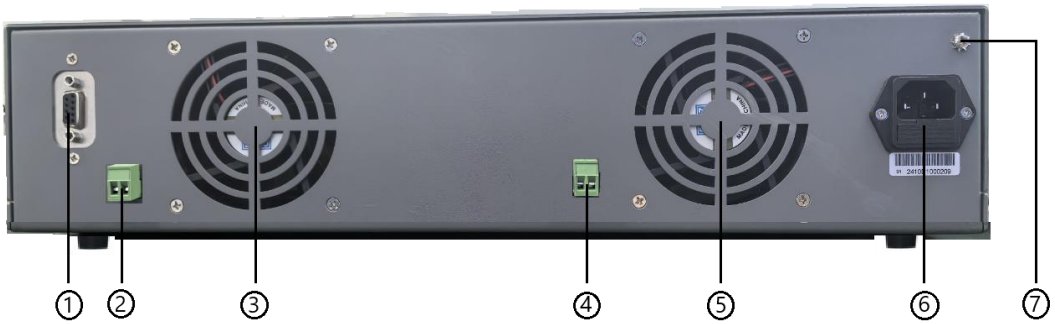
The front panel of MFP-2005 series programmable DC power supply is shown in the following figure.



①, ⑩ standard 19-inch cabinet fixed ears
②, ⑨ programmable DC power supply handle

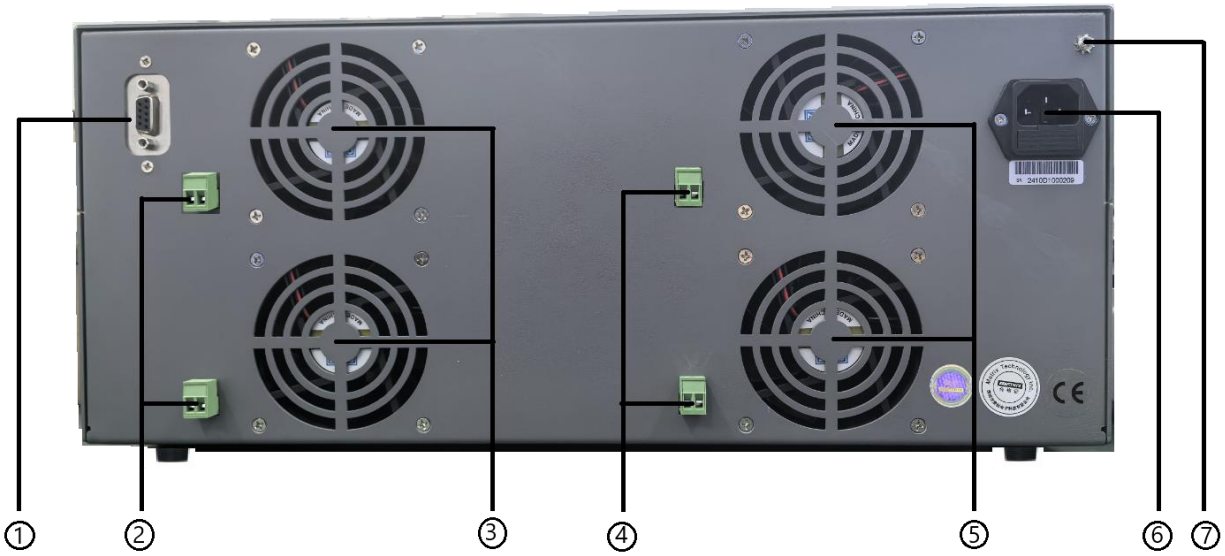
③ Mains switch
④ LCD display screen,
⑤ From left to right are the 0-9 numeric keys and the ESC exit key, the function keys, the up and down keys and the Enter key,
⑥ Adjust the knob
⑦ Output terminal
⑧ Remote voltage compensation interface,
⑪ Cooling and ventilation holes,

The back panel layout of MTP-200 series programmable DC power supply is shown in the following figure.



MTP-200 series programmable DC power supply back panel

The MTP-2005 series programmable DC power supply rear panel is shown in the following figure.



① RS232 communication interface
② ④ Sense port
③ ⑤ Heat emission hole
⑥ Power input socket
⑦ Grounding

3.2 Pre-check

Please check the power supply according to the following steps to ensure that the power supply can be used normally.

1. Inspection of goods

Please check for the following attachments when you receive the power supply. If any are missing, contact your nearest dealer.

☐ One power cable (in accordance with the voltage standard used in this region)

☐ A manual (standard configuration)

☐ One communication line (standard)

2. Connect the power cord and turn on the power

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

Warning: The power supply comes with a three core power cord, and your power supply should be connected to the three core junction box. Before operating this power supply, you should first ensure that the power supply is well grounded.

3.3 If the power supply cannot start

1. Check if the power cable is connected properly

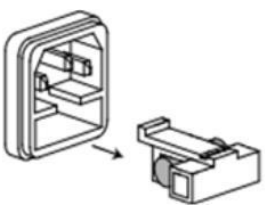
Use the following methods to solve the problems you may encounter when turning on the power.

Model	MTP-200	MTP-201	MTP-202	MTP-203	MTP-204	MTP-205	MTP-206
Fuses specifications	250V/10A	250V/12A	250V/10A	250V/12A			

Model	MTP-2005	MTP-2006	MTP-2007	MTP-2008	MTP-2009	MTP-2010	MTP-2011
Fuses specifications	No external fuse						

2. How to replace the fuse

Use a screwdriver to open the small plastic cover below the power input socket on the back panel of the power supply, and you will see the fuse. Please use a fuse with the same specification.

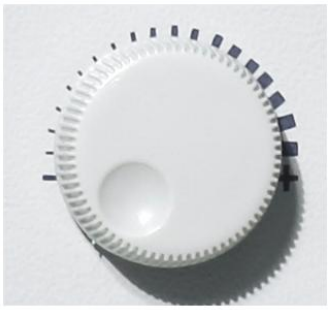


Chapter 4 Panel Operation

This chapter provides a detailed description of the operation of the power panel, which is divided into the following sections:

- Keyboard arrangement
- Introduction to front panel operations
- Voltage setting operation
- Current setting operation
- store operation
- Menu operations
- Output on/off operation

4.1 Keyboard arrangement



Key instructions

Key position	Key function description
0-9：	**Number keys (0,1,2,3,4,7,9 are combination keys, see the following explanation.)**
Esc:	**eject key**
I-Set	**Set the maximum output current of the power supply**
V-Set	**Set the power output voltage**
Save	Store the current related parameters of the power supply to the specified storage location
Recall	Call out the power related setting parameters from the designated storage location
Shift	Composite keys, used in combination with multi-function keys
On/off	Control the power output state (and control all channels ON/OFF when used with shift)
▲	Up button (selects menu items in menu operation and switches channels when not in menu state)
▼	Down flip key (selects menu items in menu operation and switches channels in non-menu state)
Enter	Confirm key
knob	Used to change the set value of the power supply voltage and current

4.2 Basic operations of the front panel

Turn on the power, and the LCD displays voltage and current data for each channel from left to right: CH1, CH2, CH3, CH4. The first row shows the voltage value, and the second row shows the current value. When the instrument is in output mode for a specific channel, the corresponding channels current window will display "**V**" or "**C**" before the current value. A "**V**" indicates that the current channel is in constant voltage mode, while a "**C**" indicates that it is in constant current mode. The digital display in the current window shows the actual output current value. When the instrument is off, the current window displays the set current value, and both "**V**" and "**C**" will also be turned off. Press the ▲ and ▼ keys to switch channels, and the cursor indicates that parameters for the current channel can be set.

4.3 Voltage setting operation

The voltage setting range is between 0V and the maximum voltage setting value. You can set the output voltage value through the front panel in the following two ways, and the set voltage is the value indicated by the current cursor channel.
Method 1: Press the V-Set key, press the 0 to 9 numeric key to input the voltage value, and press Enter to confirm the voltage value.

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

4.4 Current setting operation

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

Method 1: Press the I-Set key, press the number keys from 0 to 9 to input the current value, and press Enter key to confirm 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, you can rotate the knob left and right to set the current value; you can move 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 power output and turn off output through the front panel in either of the following two ways.

Method 1: When the instrument is in standby state, pressing "ON/OFF" can control the output and shutdown of the channel where the photometer is located. When the power supply is in output state, the decimal point of the voltage display window will flash.
Method 2: When the instrument is in standby mode, pressing the "shift" and "ON/OFF" combination key can control the output and shutdown of all channels. When the power is in output mode, the decimal point in the voltage display window will flash.

4.6 Access operations

The power supply can save some commonly used parameters in 9 sets of non-volatile memory for users to quickly retrieve and use. You can use the Save and Recall keys on the front panel to achieve access operations of (0~9) sets of storage areas.
The stored content includes: 1. voltage set value 2. current set value 3.OVP 4.0CP
You can press the Save key and press the number keys from 1 to 9, and press Enter to store the power parameters in the specified storage area.
You can press the Recall key and then press the number keys from 1 to 9, and press the Enter key to retrieve the parameters from the specified storage area for use.

4.7 OVP/OCP/V SENSE function Settings

Press shift and press the number keys "1 to 4" to enter the OVP/OCP/V SENSE parameter Settings for CH1 to CH4 respectively. Press the ▲ and ▼ keys to move the cursor to the parameter position that needs to be modified,
OVP ON/OFF (overvoltage protection enable switch, ON open, OFF closed, default value is "OFF", set by knob change, press Enter to save Settings)
OVP value (overvoltage protection value set by digital key or knob)
OCP ON/OFF (Overcurrent protection enable switch, ON to open, OFF to close, default value is "OFF", set by knob, save Settings by pressing Enter key)
SENSE ON/OFF (Remote compensation enable switch, ON to open, OFF to close, default value is "OFF", set by knob, save Settings by pressing Enter key)
As shown in the figure:(CH1-CH4 Settings are the same)

4.8 Menu Settings

Press shift and press the number key "1" to enter the menu Settings function, press the ▲ and ▼ keys to switch menu options, press the "Enter" key to select this function option, the menu content is as follows:

<table>
<tr><td colspan="5">Power Menu</td></tr>
<tr><td rowspan="20">System
System Settings</td><td rowspan="3">Out State
Output state Settings</td><td colspan="3">Off (keep Off)</td></tr>
<tr><td colspan="3">On (keep On)</td></tr>
<tr><td colspan="3">Keep (keep the last shutdown state)</td></tr>
<tr><td rowspan="2">Out Param
Output parameter Settings</td><td colspan="3">Reset (factory default value, default value is 5.000V/1.000A)</td></tr>
<tr><td colspan="3">Keep (keep last shutdown parameters)</td></tr>
<tr><td rowspan="2">Buzzer
Beeper sound Settings</td><td colspan="3">Off</td></tr>
<tr><td colspan="3">On</td></tr>
<tr><td rowspan="7">Communication
Communication connection Settings</td><td>Addres
postal address</td><td colspan="2">Addres=1(0-255)</td></tr>
<tr><td rowspan="6">Baud Rate
Communications baud rate</td><td colspan="2">4800</td></tr>
<tr><td colspan="2">9600</td></tr>
<tr><td colspan="2">19200</td></tr>
<tr><td colspan="2">38400</td></tr>
<tr><td colspan="2">57600</td></tr>
<tr><td colspan="2">115200</td></tr>
<tr><td rowspan="5">Command
Command category Settings</td><td colspan="3">Modbus</td></tr>
<tr><td rowspan="4">SCPI</td><td>CR</td><td rowspan="4">End symbol selection</td></tr>
<tr><td>LF</td></tr>
<tr><td>CR+LF</td></tr>
<tr><td>LF+CR</td></tr>
<tr><td rowspan="2">Reset
Reset to default value</td><td colspan="3">No</td></tr>
<tr><td colspan="3">Yes</td></tr>
<tr><td colspan="4">Exit</td></tr>
<tr><td rowspan="4">Config
configure</td><td>Min Volt
Adjust the voltage limit</td><td colspan="3">Min Voltage=0.000V</td></tr>
<tr><td>Max Volt
Adjust the upper voltage limit</td><td colspan="3">Max Voltage=31.000V (maximum)</td></tr>
<tr><td>Min Curr
Adjust the current limit</td><td colspan="3">Min Current=0.000A</td></tr>
<tr><td>Max Curr
Adjust the upper limit of the current</td><td colspan="3">Max Current=20.100A</td></tr>
<tr><td rowspan="3">List
List test function</td><td>Transferd</td><td colspan="3"></td></tr>
<tr><td>Started</td><td colspan="3">begin</td></tr>
<tr><td>Stopped</td><td colspan="3">cease</td></tr>
</table>

	Edit	Edit content
	Cleared	clear contents
	Store	memory
	Recall	transfer temporarily for a specific task
Exit		

4.9 Factory default value

1. Out State (Output state): Off (keep Off state)
2. Out Param (Output parameter): Keep (keep last shutdown parameter)
3. Buzzer (beep sound): ON
4. Addres (address for communication): 1
5. Baud Rate: 9600
6. Command (command category)SCPI
7. Communication end symbol: LF

Chapter 5 Remote operation mode

5.1 Communication between power supply and host

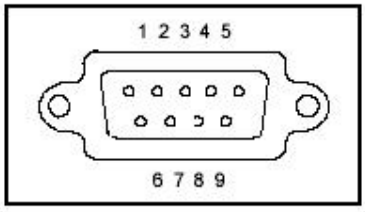
The power supply can be connected to the PC host interface through the DB9 plug on the back panel, and optional USB, RS485, LAN and other interfaces can be selected. It supports SCPI and MODBUS communication protocols. The following content can help you understand how to control the power supply through the host.

1. Communication Settings

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

(1) Porter rate: 9600
(2) Verification: NONE
(3) Data bit: 8, stop bit: 1 (fixed value)

2. DB9 serial interface



The DB9 interface diagram of the power supply back panel

3. Interface 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

5.2 safe

Do not install replacement parts on the instrument yourself or perform any unauthorized modifications. Please send the instrument to our maintenance department for repair to ensure its safe use.
Please refer to the specific warning or precaution information in this manual to avoid personal injury or instrument damage.

Safety sign

Warning

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

Caution

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

 Grounding point today

 High voltage hazard. (Do not open the machine for non-expert personnel)

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

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	