N39200 Series High-accuracy Dual-channel Programmable DC Power Supply

User Manual

Version: V20200731

Contents

1 Preface

Dear Customers,

First of all, we greatly appreciate your choice of N39200 series DC power supply (N39200 for short). We are also honored to introduce our company, Hunan Next Generation Instrumental T&C Tech. Co., Ltd. (NGI for short).

About Company

NGI is a professional manufacturer of intelligent equipment and test & control instruments, mainly engaged in design, production, sales, installations and maintenance of instruments and meters, electronic products, mechanical equipment, automatic test systems, computer software, automatic control equipment, automatic monitoring and alarm systems.

NGI maintains close cooperation with many universities and scientific research institutions, and maintains close ties with many industry leaders. We strive to develop high-quality, technology-leading products, provide high-end technologies, and continue to explore new industry measurement and control solutions.

About User Manual

This manual is applied to N39200 series DC power supply, including installation, operation, specifications and other detailed information. The copyright of the manual is owned by NGI. Due to the upgrade of instrument, this manual may be revised without notice in future versions.

This manual has been reviewed carefully by NGI for the technical accuracy. The manufacturer declines all responsibility for possible errors in this operation manual, if due to misprints or errors in copying. The manufacturer is not liable for malfunctioning if the product has not correctly been operated.

To ensure the safety and correct use of N39200, please read this manual carefully, especially the safety instructions.

Please keep this manual for future use.

Thanks for your trust and support.

2 Safety Instructions

In the operation and maintenance of the instrument, please strictly comply with the following safety instructions. Any performance regardless of attentions or specific warnings in other chapters of the manual may impair the protective functions provided by the instrument.

NGI shall not be liable for the results caused by the neglect of those instructions.

2.1 Safety Notes

➢ **Confirm the AC input voltage before supplying power**.
➢ **Reliable grounding**: Before operation, the instrument must be reliably grounded to avoid the electric shock.
➢ **Confirm the fuse**: Ensure to have installed the fuse correctly.
➢ **Do not open the chassis**: The operator cannot open the instrument chassis. Non-professional operators are not allowed to maintain or adjust it.
➢ **Do not operate under hazardous conditions**: Do not operate the instrument under flammable or explosive conditions.
➢ **Confirm the working range**: Make sure the DUT is within N39200's rated range.

2.2 Safety Symbols

Please refer to the following table for definitions of international symbols used on the instrument or in the user manual.

Table 1

Symbol	Definition	Symbol	Definition
⎓	DC (direct current)	N	Null line or neutral line
∼	AC (alternating current)	L	Live line
≈	AC and DC	I	Power-on
3∼	Three-phase current	O	Power-off
⏚	Ground	⏻	Back-up power
⏚	Protective ground	▭	Power-on state
⏚	Chassis ground	▯	Power-off state
⏚	Signal ground	⚡	Risk of electric shock
WARNING	Hazardous sign	⚠	High temperature warning
Caution	Be careful	⚠	Warning

3 Product

3.1 Brief Introduction

N39200 series is a high-accuracy & dual-channel programmable DC power supply, available for benchtop use. N39200 standalone supports 2 channels output, with each channel isolated. Both local operation on front panel and remote control on a computer are supported. N39200 can be widely used in lab test, system integration test, production aging line, etc.

3.1.1 Features

■ Automatic switch between CV and CC mode

■ High definition touch screen

■ Remote sense for accurate measurement

■ Single device with 2 channels, each channel isolated

■ Low ripple and low noise

■ Intelligent fan control

■ User-friendly interface

■ Lock function to avoid misoperation

■ LAN port and RS232 interface

■ Compact size, light weight

■ CC&CV priority function

■ Dual LAN ports design

■ Multiple protections: OVP, OCP, OTP and short circuit

3.2 N39200 Series Lineup

Table 2

Model	Channels	Voltage	Current	Power
N39220-60-10	2	60V	10A	200W
N39240-60-20	2	60V	20A	400W
N39260-60-20	2	60V	20A	600W
N39220-150-04	2	150V	4A	200W
N39240-150-08	2	150V	8A	400W
N39260-150-08	2	150V	8A	600W

3.3 Appearance & Dimension
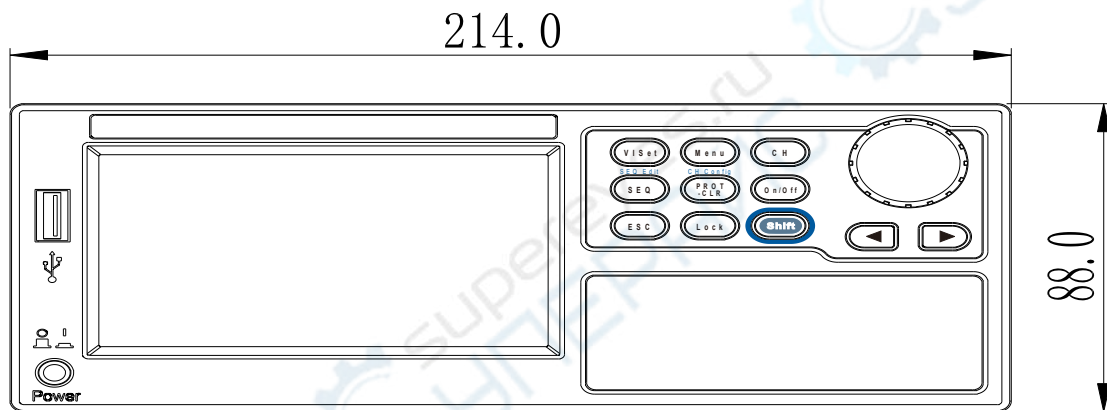
Figure 1   Front Panel Dimension(mm)
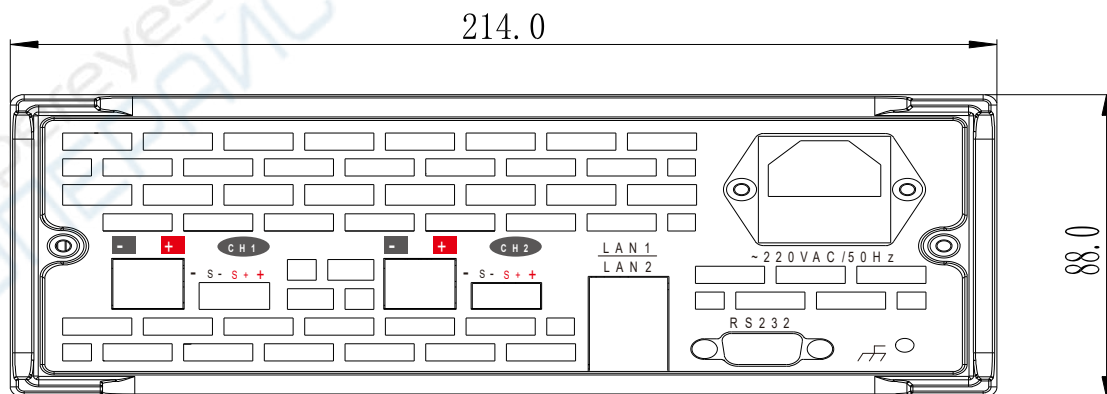
Figure 2   Rear Panel Dimension(mm)

546.0
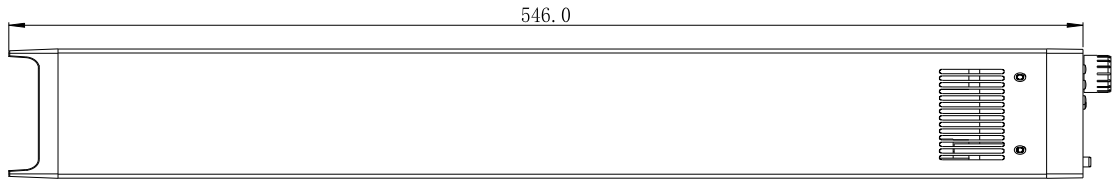
Figure 3   Side Dimension(mm)

3.4 Package Contents and Accessories

After receiving N39200, please check the instrument according to the following steps:

1. Check whether the instrument is damaged during transportation. If any severe damage to the package, please contact our authorized distributor or NGI.

2. Check accessories.

3. Make sure the the following accessories are attached.

Table 3

N39200 Accessories	Instructions
Power cord and fuse	For AC power connection
2 pins green connector	For output connection
4 pins green connector	For local and remote sense
RS232 cable	For RS232 communication
Ethernet cable	For Ethernet connection
USB flash drive	User manual, software & technical information

If any loss or damage, please contact our authorized distributor or NGI.

4. Check the whole instrument. If N39200 chassis is damaged or has abnormal operation, please contact our authorized distributor or NGI.

3.5 Default Communication Parameter

Table 4

Parameter	N39200 Series Default Value
Default IP Address	192.168.0.123
Baud Rate	115200

4 Panel Introduction

4.1 Front Panel Introduction
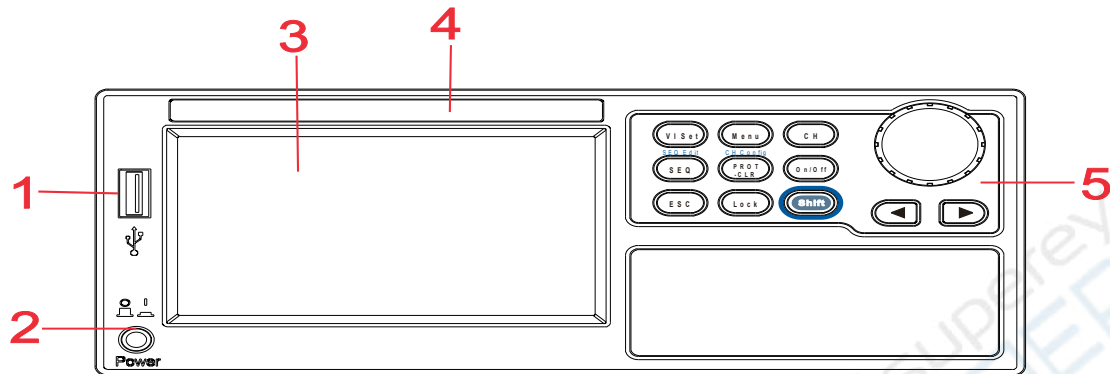
Figure 5   Front Panel

Table 5

Number	Name	Function
1	USB port	USB cable connection
2	Power switch	Power control
3	Screen	Displaying data with touch function
4	Device name	Displaying model
5	Buttons & knob	Operation mode & parameter setting

4.1.1 Screen

N39200 is equipped with a 4.3 inch touch screen. The contents displayed on the screen are as follows.

Table 6

Number	Item	Function
1	Menu	Function selection
2	V/I	Voltage or current setting
3	SEQ	For sequence test
4	SEQ Edit	For sequence test editing
5	Channel	Setting protection parameters for each channel
6	System	Setting system parameters
7	About Us	NGI information
8	Remote	For remote control
9	Virtual keypad	Parameters setting

4.1.2 Button

N39200 front panel mainly includes a screen and buttons. Users can control the device via buttons.
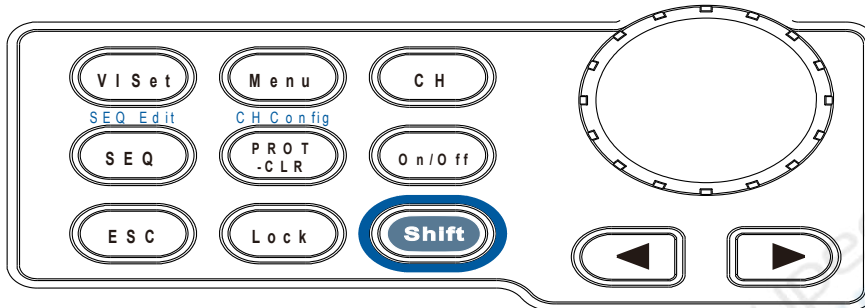
Figure 6   Buttons

Table 7

Button	Function
VISet	To set voltage and current
Menu	To enter the main menu
CH	Channel switch for V/I, SEQ, CH Config,etc.
SEQ	To enter SEQ mode
PROT-CLR	To clear the alarm
On/Off	To power on/off the output
ESC	To exit from setting or the present page
Lock	To lock/unlock
Shift	Compound button
◀ ▶	1. To shift or select the desired item in menu 2. To control the cursor scrolling when setting parameter
◯	By rotating: to select the desired item, adjust the parameter By pressing: to enter the edit interface, confirm the input

4.1.3 Virtual Keyboard

N93200 is equipped with a virtual keypad on the screen for numeric input.
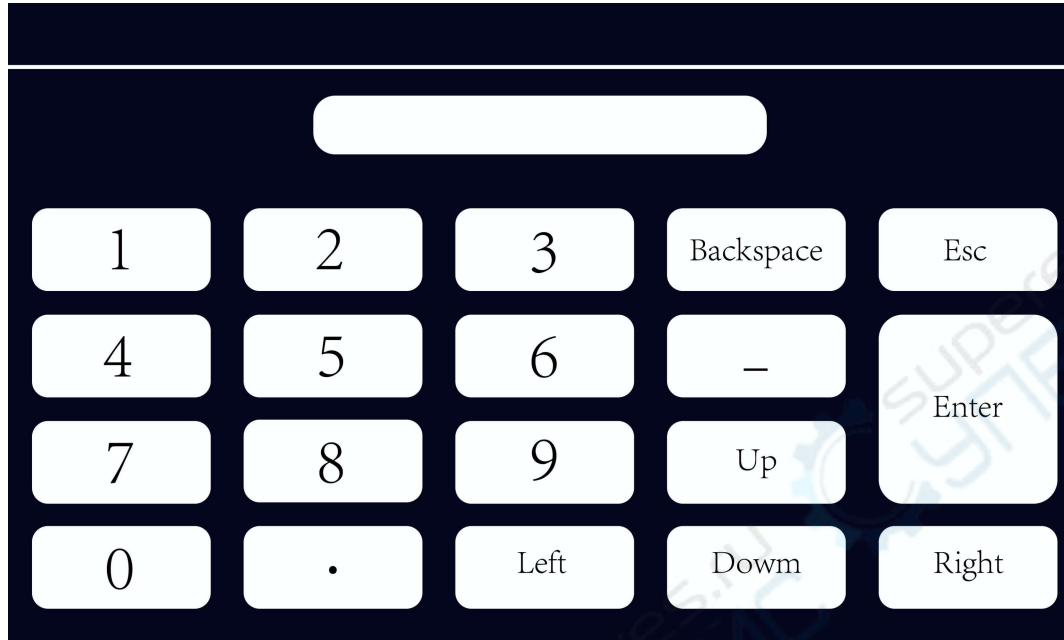
Figure 7　Virtual Keypad

4.2 Rear Panel Introduction
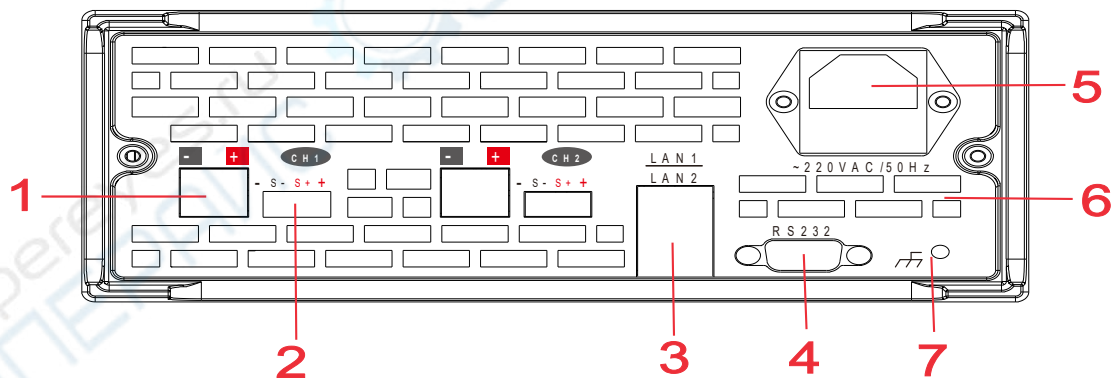
Figure 8　Rear Panel

Table 8

Number	Name
1	Channel interface
2	Four-wire interface
3	LAN port
4	RS232 interface

5	AC power socket
6	Air outlet
7	Grounding screw hole

4.2.1 Channel Interface

Channel interface is used to connect the DUT. Please select the appropriate output wire according to the specific N39200 model. Do not use thin wires to avoid overheating, which may cause danger.

4.2.2 Four-wire Interface
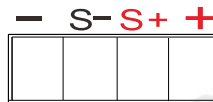
Figure 9　Four-wire Interface

Table 9　Pin Definition

+	Output +　(For local sense, internally connected to positive output terminal)
-	Output -　(For local sense, internally connected to negative output terminal)
S+	Sense +　(For remote sense)
S-	Sense -　(For remote sense)

4.2.3 LAN Port

LAN
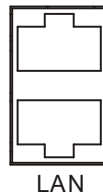
Figure 10　LAN Port

LAN port is used for remote control, by connecting N39200 with PC via an Ethernet cable.

4.2.4 RS232 Interface

RS232 interface is used for remote control. RS232 cable is supplied as standard accessory.
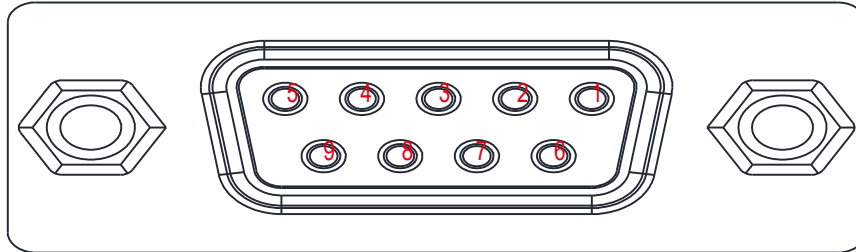
Figure 11   RS232 Interface

Table 10

Pin	Definition
1	NC
2	RXD, receive data
3	TXD, transmit data
4	NC
5	GND, ground
6	NC
7	NC
8	NC
9	NC

4.2.5 AC Power Socket

Please make sure the AC input voltage before supplying power.
Please ensure that the AC input voltage supplied to N39200 should not be too low under high load conditions.

4.2.6 Grounding Screw Hole

The chassis of N39200 is insulated from the inner live conductor. However, after long-term use or by accident, the insulating part may be damaged, which causes the chassis to become charged. Grounding can effectively prevent electric shock.

5 Power-on Test

Proper inspection should be done before operating on N39200 to ensure N39200 can be used normally.

5.1 Preparation

5.1.1 Connection and Setting

Please follow the below steps in below table.

> **Warning: Please confirm the AC input power and connect to correct AC power. Wrong AC power may cause serious damage to the instrument.**

Table 11

Step	Item	Description
1	Inspection	To inspect if there is physical damage
2	Grounding	To connect the ground to prevent an electric shock
3	AC Power Input	To connect to proper AC power
4	Load Connection	To connect to a load with proper wire
5	Default Setting	To do factory reset

> Warning: If N39200 chassis and upper cover are not safely grounded, there is a danger of electric shock.

5.1.2 Switch-on

Please press the power switch on the front panel.

If N39200 can not be switched on properly, please check if the power cord is well connected and AC power supply is available.

> Warning: Even if the power switch is under off state, some components inside N39200 may still carry a high voltage. To avoid electric shock, it is forbidden to open the chassis.

5.2 Output Inspection

The output inspection can ensure that N39200 can reach its rated output and can perform the operations on the front panel properly.

5.2.1 Voltage Output Inspection

Please follow the below steps to verify the basic voltage functions without a load.
1. Press the power switch on N39200.
2. Set voltage to 1V.
3. Press (On/Off) on the front panel to enable output.
4. Check if the displayed voltage is close to 1V.
5. Make sure the voltage can be adjusted from 0V to maximum voltage within the range.

5.2.2 Current Output Inspection

Please follow the below steps to verify the basic current functions with a short on N39200's output.
1. Press the power switch on N39200.
2. Make sure N39200 output is under OFF state. It will show OFF on the LCD.
3. Use an insulated test lead to connect a short across the positive(+) and negative(-) output terminals. The lead should bear the maximum current.
4. Set current to 1A.
5. Press (On/Off) on the front panel to enable output.
6. Check if the displayed current is close to 1A.
7. Make sure the current can be adjusted from 0A to maximum current within the range.

6   Load Connection

> Warning: Please turn off the AC input power before changing any connections on the rear panel. Before supplying power, please check and confirm that all connections are fastened. Touching any terminal or interface on the rear panel with N39200 powered on may cause electric shock.

6.1 Load Wire

Load wire is not included among N39200 series standard accessories. Users need to prepare load wire. Please refer to the follow requirements while selecting load wire.

1. The maximum allowable current of wire.
2. The insulation level of wire should not be lower than the maximum output voltage of the power supply.
3. The maximum wire length and voltage drop.
4. Noise and impedance effects on the load wire.

> Note: Please refer to the recommended wire gauge selection table in the appendix.

6.2 Maximum Allowable Current

The following two factors should be considered when selecting the wire gauge.

1. The wire should be thick enough to avoid overheating when carrying rated load current or load short-circuit current. The greater shall prevail.

2. The wire gauge should be selected properly to minimize the voltage drop on each wire and to prevent excessive output power consumption of the power supply, which affects the load regulation. Although N39200 series adopts remote sense to compensate the voltage, it is still recommended to minimize the voltage drop.

> Note: Please refer to the recommended wire gauge selection table in the appendix.

6.3 Connectors

N39200 is supplied with two 2-pin connector and two 4-pin connector for connection between wire and N39200 output.

Please do not connect wire directly to N39200 output, which is easy to loose. The 2-pin connector or 4-pin connector should be used for connection.

6.4 Effect of Noise and Impedance

In order to reduce noise or radiation, the load wire and the remote sense wire should be twisted pair. The wire length should be as short as possible. Shielded wires must be used in high noise environments. The shielding part is connected to chassis through the grounding screw hole on rear panel.

Even if the noise is not loud, the load wire and remote sense wire should also be twisted pair to reduce coupling and increase the stability of power supply. The remote sense wire must be separated from AC input power cord.

Twisted-pair load wire can reduce the parasitic inductance of the wire and prevent high-frequency voltage peak on the load and the output of power supply, caused by fluctuation of the load current.

The impedance between the output of power supply and the load makes the ripple & noise on the load higher than at the rear panel terminal of power supply. If necessary, an additional filter circuit with a bypass capacitor can be connected to the load to limit the high-frequency load current.

6.5 Inductive Load

When using N39200 to supply power to inductive loads such as motors, users can connect a diode across the output of N39200 since the inductive load will produce a voltage spike which is harmful to N39200. The rated voltage and current of the diode should be higher than the rated output voltage and current of power supply. The negative polarity of diode is connected to the positive output of N39200. The positive polarity is connected to the negative output of N39200.

When using N39200 to supply power to inductive loads such as motors, load transients, such as counter electromotive force from motors, may occur. Please connect a surge current suppressor across the output of N39200 to protect N39200. The rated breakdown voltage of surge current suppressor must be approximately 10% higher than the rated output voltage of N39200.

6.6 Local Sense and Remote Sense

The four-wire interface at rear panel is used for local sense and remote sense. Please refer to four-wire interface introduction. N39200 is supplied with 4-pin green connector for remote sense.
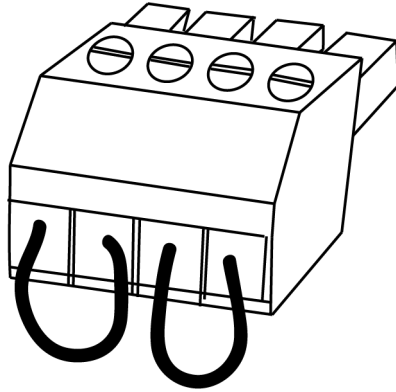
Figure 12　4-pin Green Connector

6.6.1 Local Sense

In local sense, output voltage is adjusted at the output terminal of N39200. This way does not compensate for the voltage drop on the load wire. It is recommended to use local sense when the load current is low or the load regulation is not very critical.

> Note: On the 4-pin connector, jumpers have been used to connect **S+** to **+** and **S-** to **-**. When using local sense, please put the 4-pin connector at rear panel. Unplugging the connector will leave the remote sense terminal disconnected, which will affect the voltage regulation and may cause the power supply to be unstable and dangerous.

6.6.2 Remote Sense

Due to the parasitic resistance on the wire, a voltage drop will be generated on the wire after the current flows. Assuming that output of the power supply is set to 55V/10A and the resistance of the load wire is 0.5 ohms, a 5V voltage drop will be generated on the wire. The actual voltage reaching the load is only 50V, which affects the output accuracy of the power supply. In this case, it is necessary to compensate for the voltage drop on the wire.

The remote sense wire is directly connected to the load from four-wire interface on the rear panel of power supply. Since the remote sense wire is directly connected to the high impedance measurement circuit inside the supply, and the current on remote sense wire is very low, the voltage drop generated is negligible. The voltage across the load is fed back to the power supply control loop via remote sense wire. The supply will adjust its output to compensate for the voltage drop on the load wire so that the voltage across the load is equal to the set voltage.

It is recommended to use remote sense when load regulation is very critical. The procedure is as below.

1. Press the power switch to shut off the power supply.
2. Disconnect the jumpers on the 4-pin green connector.
3. Connect **S+** to positive polarity on load and **S-** to negative polarity on load with proper wire.
4. Plug the connector into the four-wire interface on rear panel of supply.
5. Connect the output of power supply to the load.
6. Press the power switch to power on the power supply.

6.7 Load Connection

Note: When rated output voltage of N39200 series is higher than the safe voltage, a dangerous voltage may exist at the connection between the supply output and the load. In order to protect operators from accidental contact with dangerous voltages, please ensure that there are no accessible live parts on the load and its connections. Please also make sure that the insulation level of the load wire is higher than or equal to the maximum output voltage of N39200.
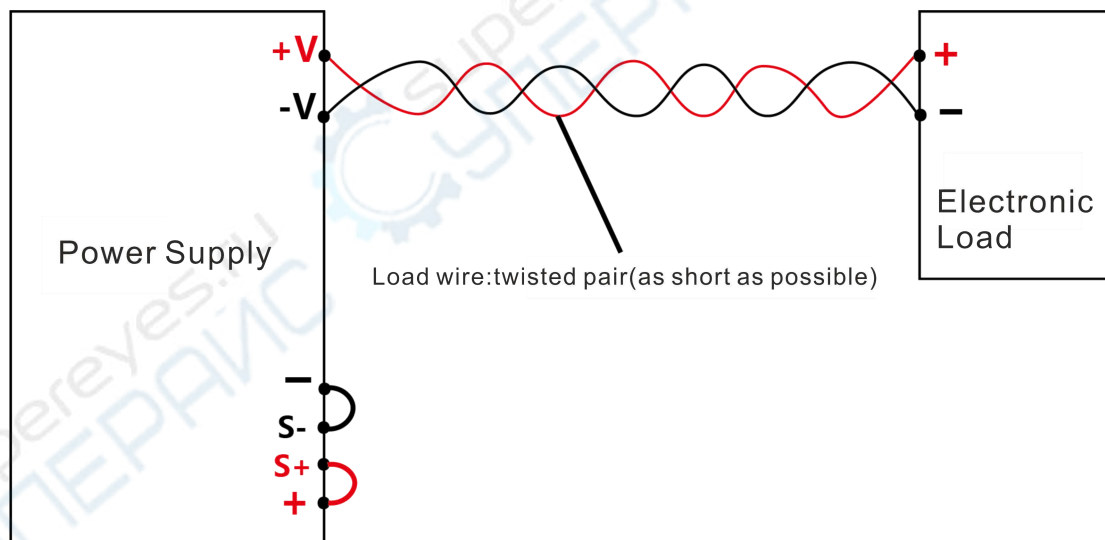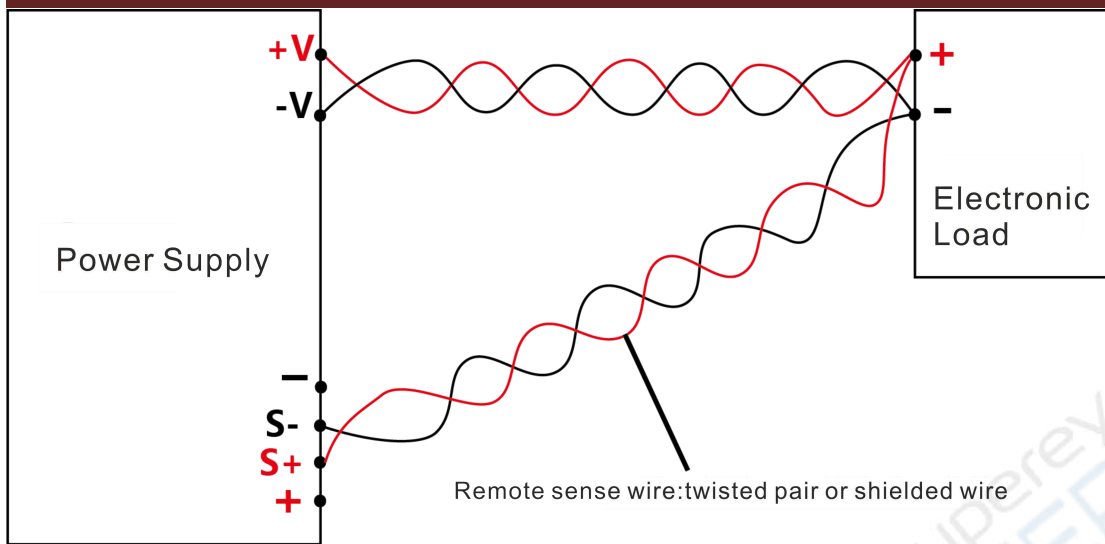

Figure 13   Local Sense Wiring Diagram

Figure 14   Remote Sense Wiring Diagram

7 Operation

This chapter mainly describes N39200 functions and features.

- ●**Menu**

- ●**V/I**

- ●**SEQ**

- ●**SEQ Edit**

- ●**Channel**

- ●**System**

7.1 Menu

After the device is switched on, it will enter **V/I** mode directly. Users can enter **Menu** by pressing ⬤Menu⬤ . There are six options on the menu: **V/I**, **SEQ**, **SEQ Edit**, **Channel**, **System**, and **About Us**. Users can enter the desired option by the following method.

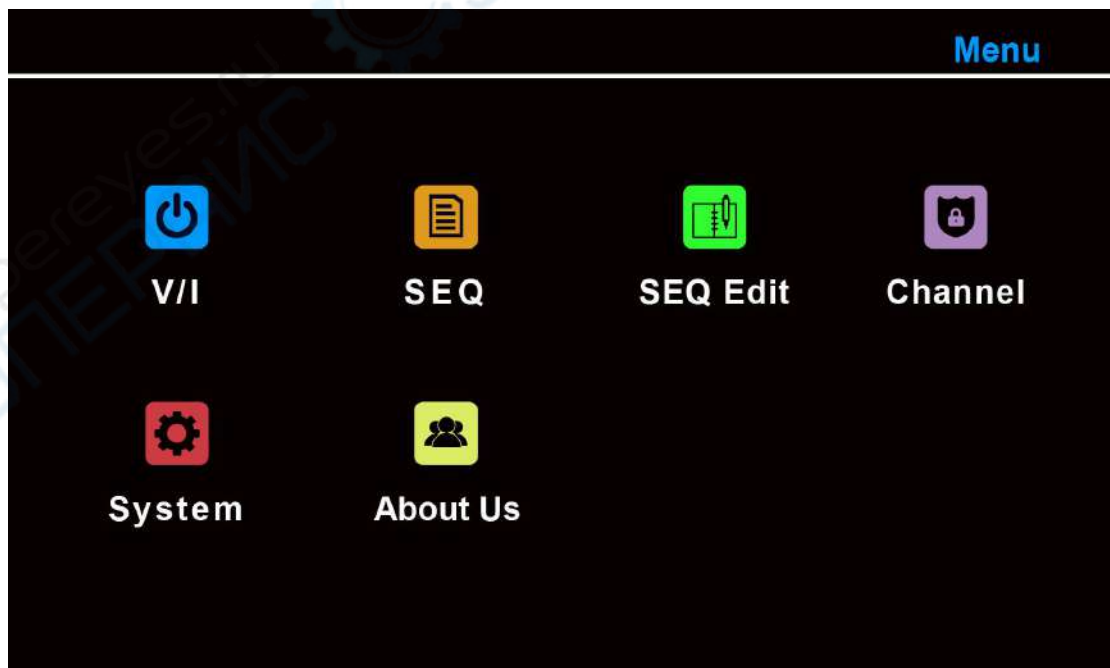- Touch the desired option directly on the screen

- Press ◀ ▶ or rotate ◯ to select the desired option and press ◯

Figure 15   Menu

7.2 V/I

V/I mode provides regular constant voltage and current limit output.

Under V/I, users can set the desired voltage and current for output. Dual channels setting can be completed separately. Readback value for dual channels will be displayed on the same interface.

Methods to enter **V/I** mode:

Method 1: It will directly enter **V/I** mode after power-on.

Method 2: Press (VISet) on the front panel directly.

Method 3: Press (Menu) → Select **V/I** by (◀) (▶) or ◯ → Press ◯ .
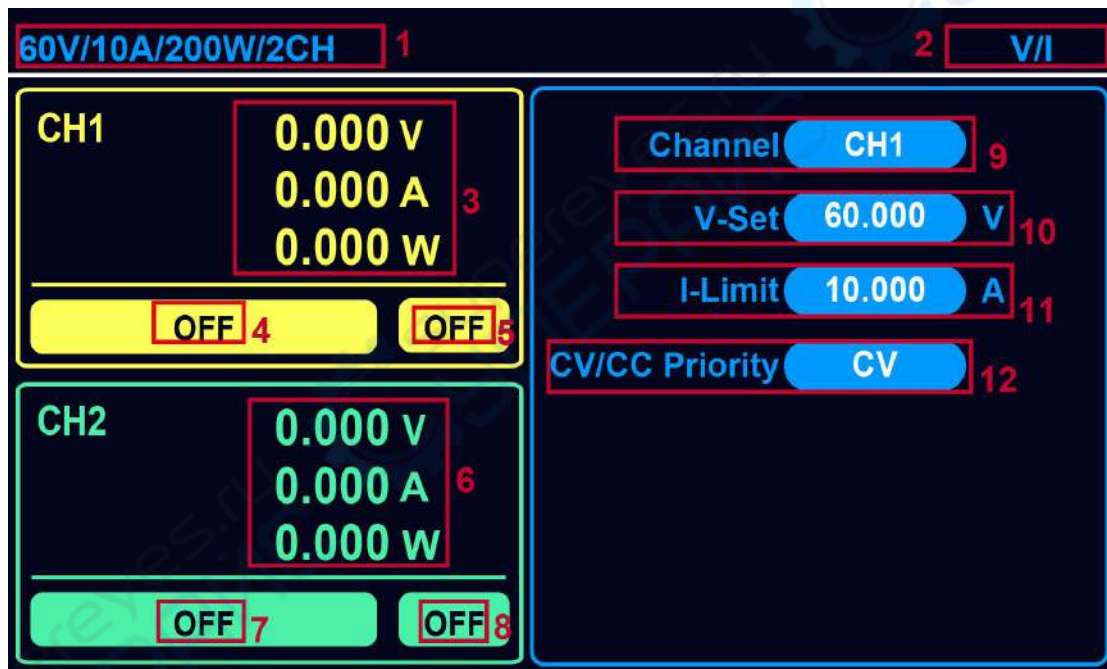
Figure 16   V/I Mode

Table 12

Number	Description
1	Rated voltage, current, power
2	Present mode: V/I
3	Readback of channel 1
4	Operation status of channel 1
5	ON/OFF control for channel 1, touch control available

6	Readback of channel 2
7	Operation status of channel 2
8	ON/OFF control for channel 2, touch control available
9	Channel 1 or 2 selection
10	Output voltage setting for selected channel
11	Output current setting for selected channel
12	CV/CC priority can be set under **Channel**.

7.2.1 Channel Selection

Methods to select the desired channel under **V/I** mode:

Method 1: Press ⬭ᶜ ᴴ directly on the front panel.

Method 2: Touch **Channel** on the screen and select the desired channel.

Method 3: Press ◀ ▶ to select **Channel** → Press ◯ on **Channel** → Press ◀ ▶ to select the desired channel → Press ◯.

Method 4: Rotate ◯ to select **Channel** → Press ◯ on **Channel** → Rotate ◯ to select the desired channel → Press ◯.

Figure 17   Channel Selection

7.2.2 Parameter Setting

Methods to set parameters under **V/I**:

Method 1: Touch the desired parameter on the screen and input the value via virtual keypad.

Method 2: Pres ◀ ▶ to select the desired parameter→ Press ◯ →

Press ◀ ▶ to move the cursor+rotate ◯ to adjust the numeric → Press ◯ .

Method 3: Rotate ◯ to select the desired parameter→ Press ◯ →

Press ◀ ▶ to move the cursor+rotate ◯ to adjust the numeric → Press ◯ .

Figure 18   Parameter Setting

Note 1: To exit from **V/I** mode, please press Menu or the function button required.

Note 2: CV/CC Priority can be set under **Channel**.

7.3 SEQ

SEQ test (sequence test function) supports simulation of complex voltage & current waveform, which is frequently used for automotive electronics test, engine start-up

test, etc.

SEQ operation logic: It will output voltage and current according to the edited test steps. When the dwell time(single step delay time) reaches, it will switch to next step.
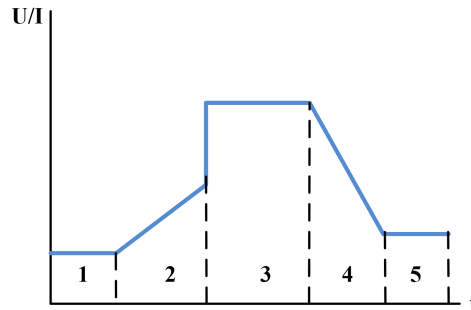
Figure 19   SEQ Output Waveform

Methods to enter **SEQ** mode:

Method 1: Press ⬭SEQ on the front panel directly.

Method 2: Press ⬭Menu → Select **SEQ** by ◀ ▶ or ◯ → Press ◯.

Figure 20   SEQ

Table 13

Parameter	Description
Channel	To select channel number
File No.	To set the test file
Step No.	To display the present test step number
Dwell	To display the delay time for the present step
Cycle Times	To display the number of cycles for the selected file

Under **SEQ**, users choose the desired file number and press ⬭(O n /O f f). It will start sequence test. After all steps of sequence file are operated, it will stop sequence test and the system automatically shuts output.

7.3.1 Channel Selection

Methods to select the desired channel under **SEQ**:

Method 1: Press ⬭(C H) directly on the front panel.

Method 2: Touch **Channel** on the screen and select the desired channel.

Method 3: Press ◀ ▶ to select **Channel** → Press ⭕ on **Channel** → Press ◀ ▶ to select the desired channel → Press ⭕.

Method 4: Rotate ⭕ to select **Channel** → Press ⭕ on **Channel** → Rotate ⭕ to select the desired channel → Press ⭕.
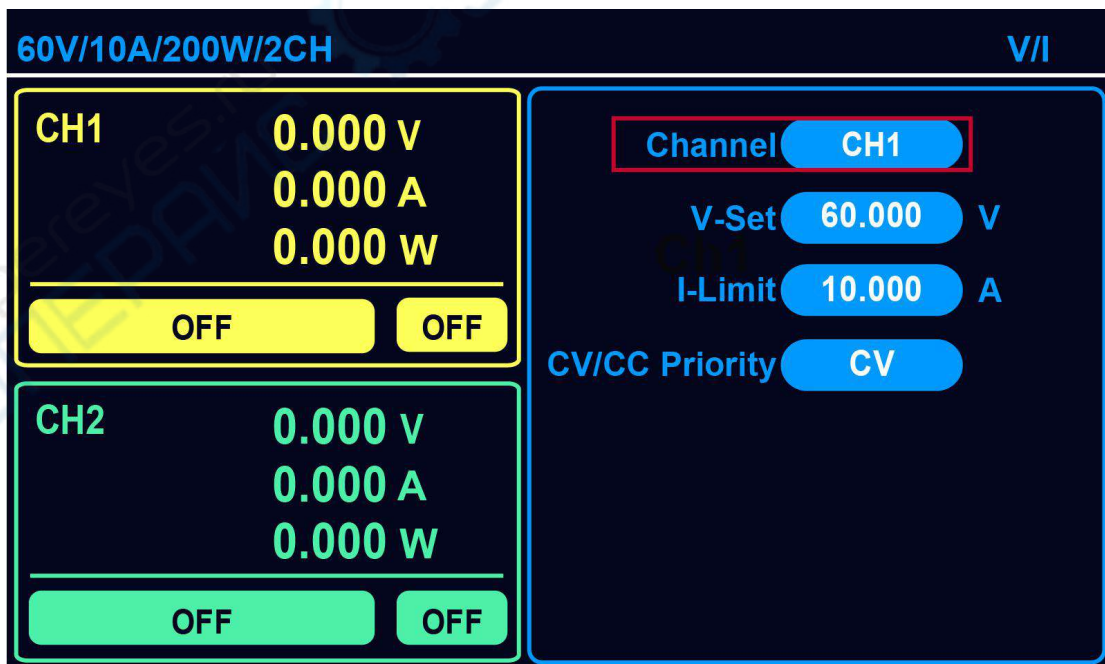
Figure 21   Channel Selection

7.3.2 Parameter Setting

Methods to set **File No.** under **SEQ**:

Method 1: Touch **File No.** on the screen and input the desired file number via virtual keypad.

Method 2: Press ◀ ▶ to select **File No.** → Press ○ → Press ◀ ▶ to move the cursor+rotate ○ to adjust the numeric → Press ○.

Method 3: Rotate ○ to select **File No.** → Press ○ → Press ◀ ▶ to move the cursor+rotate ○ to adjust the numeric → Press ○.
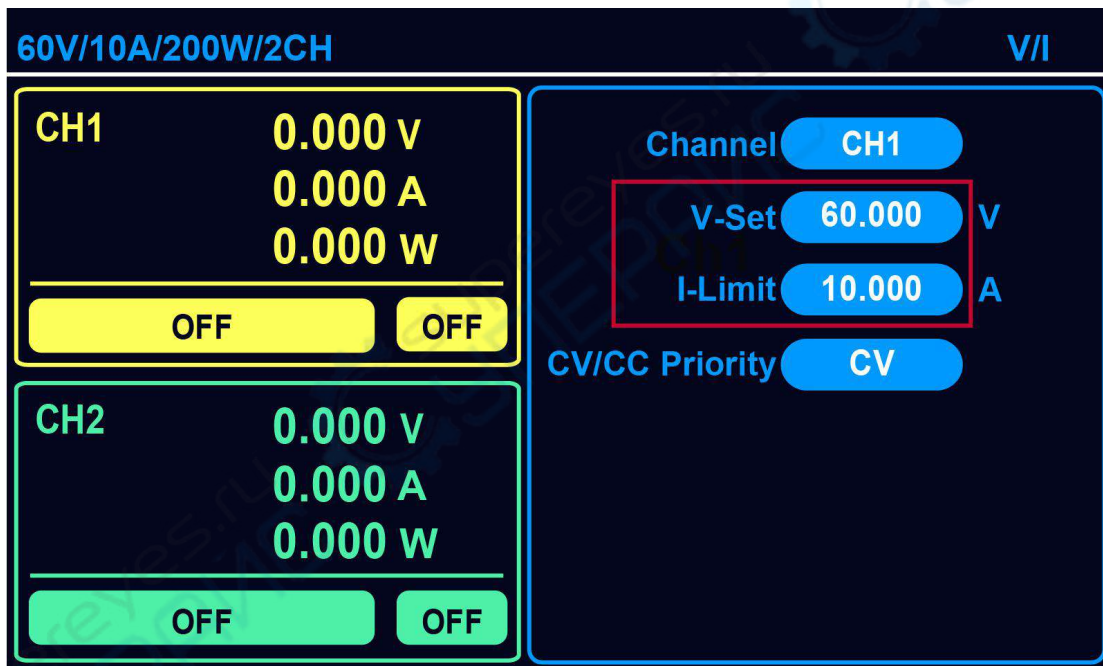
Figure 22   Parameter Setting

Note: To exit from **SEQ**, please press (Menu) or the function button required.

7.4 SEQ Edit

N39200 series supports complex waveform output, with up to 10 sequence files and Max. 200 steps for all files.

Methods to enter **SEQ Edit**:

Method 1: Press (Shift) first and then (SEQ) on the front panel.

Method 2: Press (Menu) → Select **SEQ Edit** by (◄) (►) or ○ → Press ○ .
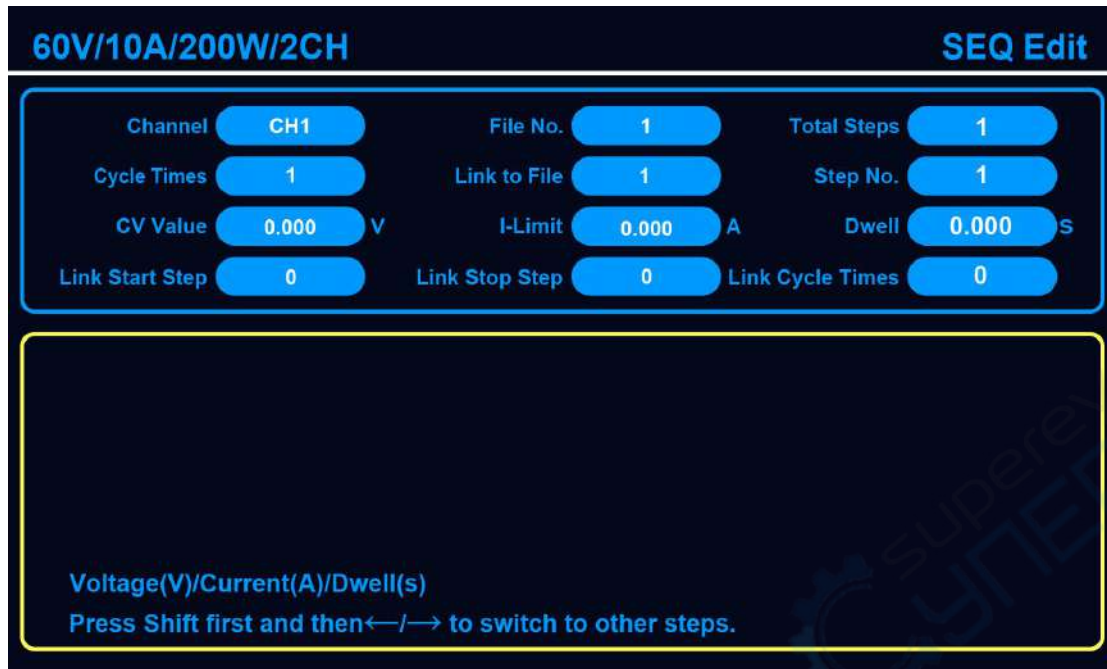
Figure 23   SEQ Edit

Table 14

Parameter	Description
Channel	To select the desired channel
Cycle Times	To set the number of cycles for the file under edit
CV Value	To set voltage value for the step under edit
Link Start Step	To link to the desired step after the present step is completed. Zero means no link.
File No.	To set the test file number, max. 10 files
Link to File	To link to the desired file after the present file is completed. Zero means no link.
I-Limit	To set current value for the step under edit
Link Stop Step	To set the link stop step. Zero means no link.
Total Steps	Displaying the total steps of all files, max. 200 steps
Step No.	To set the step number for editing, max. 200 steps for all files
Dwell	To set delay time for single step
Link Cycle Times	To set cycle times for the link. Zero means no link.

The link will run all the steps from the start step to the stop step. Link operation will not affect the sequence of the original test steps. After the link completes, it will continue to run according to the original test step.

For example, the current test file includes 5 steps. Cycle times is set to 1, link start step to 1, link stop step to 5, and link cycle times to 1. The running sequence will be 1,1,2,3,4,5,2,3,4,5.

7.4.1 Parameter Setting

Methods to set parameters under **SEQ Edit**:

Method 1: Touch the desired parameter on the screen and input the value via virtual keypad.

Method 2: Pres ◀ ▶ to select the desired parameter→ Press ○ →
Press ◀ ▶ to move the cursor+rotate ○ to adjust the numeric → Press ○ .

Method 3: Rotate ○ to select the desired parameter→ Press ○ →
Press ◀ ▶ to move the cursor+rotate ○ to adjust the numeric → Press ○ .

60V/10A/200W/2CH					SEQ Edit
Channel	CH1	File No.	1	Total Steps	1
Cycle Times	1	Link to File	1	Step No.	1
CV Value	0.000 V	I-Limit	0.000 A	Dwell	0.000 S
Link Start Step	0	Link Stop Step	0	Link Cycle Times	0

Voltage(V)/Current(A)/Dwell(s)
Press Shift first and then←/→ to switch to other steps.

Figure 24　Parameter Setting

Note: To exit from **SEQ Edit**, please press [Menu] or the function button required.

7.5 Channel

Under **Channel**, users can set OVP, OCP and OPP for each channel.

The corresponding alarm will be shown on the screen when N39200 is protected. Please press ⬭(P R O T -C L R) to clear the alarm.

Methods to enter **Channel**:

Method 1: Press ⬭(Shift) first and then ⬭(P R O T -C L R) on the front panel.

Method 2: Press ⬭(Menu) → Select **Channel** by ◀ ▶ or ◯ → Press ◯ .

Figure 25   Channel Configuration

Table 15

Parameter	Description
Channel	To select the desired channel
OVP	To set over voltage value
OCP	To set over current value
OPP	To set over power value
CV/CC Priority	To set the operation mode

➢ OVP

This parameter is used to set over voltage protection value. Once the output voltage exceeds the OVP set value, N39200 will immediately shut off the output and protect the DUT. Meanwhile, alarm OVP will be displayed on the screen.

➢ OCP

This parameter is used to set over current protection value. Once the output current exceeds the OCP set value, N39200 will immediately shut off the output and protect the DUT. Meanwhile, alarm OCP will be displayed on the screen.

➢ OPP

This parameter is used to set over power protection value. Once the output power exceeds the OPP set value, N39200 will immediately shut off the output and protect the DUT. Meanwhile, alarm OPP will be displayed on the screen.

➢ CV/CC priority

In general, operation mode of power supply depends on the output voltage setting, output current limit setting and load impedance.

In the case of high impedance or open circuit, the current flowing through the power supply is very low or there is no current. The power supply is in CV (constant voltage) mode.

In the case of low impedance or short circuit, high current flows through the power supply. The power supply is in CC (constant current) mode.

N39200 series allows users to select CV priority or CC priority.

7.5.1 Channel Selection

Methods to select the desired channel under **Channel**:

Method 1: Press ⬭(C H) directly on the front panel.

Method 2: Touch **Channel** on the screen and select the desired channel.

Method 3: Press ◀ ▶ to select **Channel** → Press ◯ on **Channel** → Press ◀ ▶ to select the desired channel → Press ◯.

Method 4: Rotate ◯ to select **Channel** → Press ◯ on **Channel** → Rotate ◯ to select the desired channel → Press ◯.
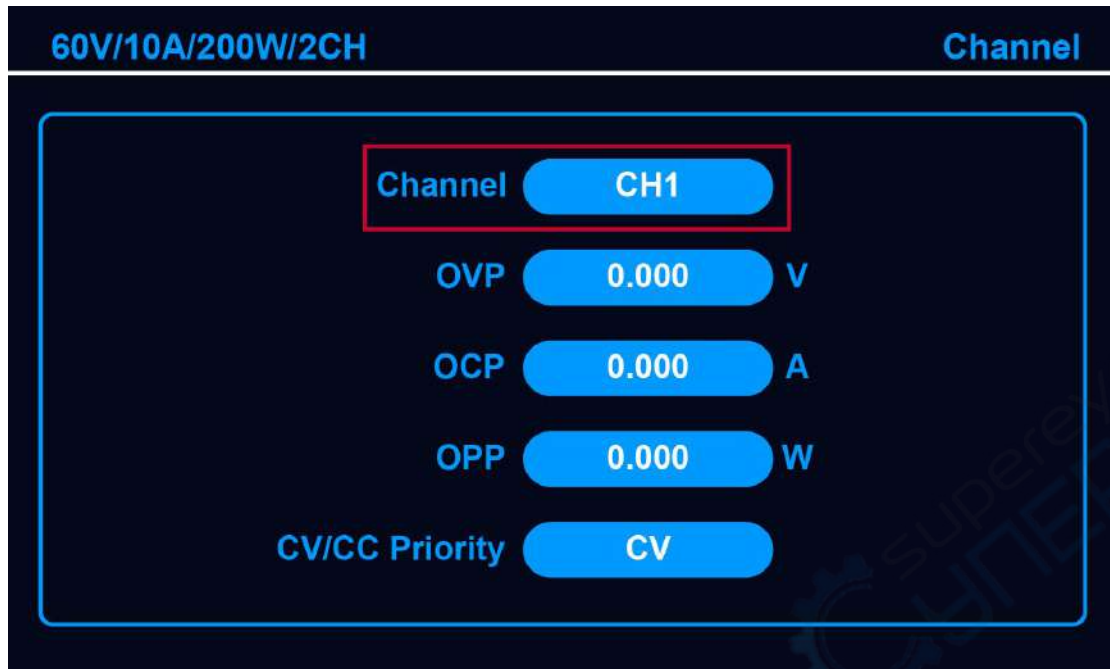
Figure 26　Channel Selection

7.5.2 Parameter Setting

Methods to set **OVP/OCP/OPP** under **Channel**:

Method 1: Touch **OVP/OCP/OPP** on the screen and input the value via virtual keypad.

Method 2: Pres ◄ ► to select **OVP/OCP/OPP** → Press ◯ → Press ◄ ► to move the cursor+rotate ◯ to adjust the numeric → Press ◯.

Method 3: Rotate ◯ to select **OVP/OCP/OPP** → Press ◯ → Press ◄ ► to move the cursor+rotate ◯ to adjust the numeric → Press ◯.
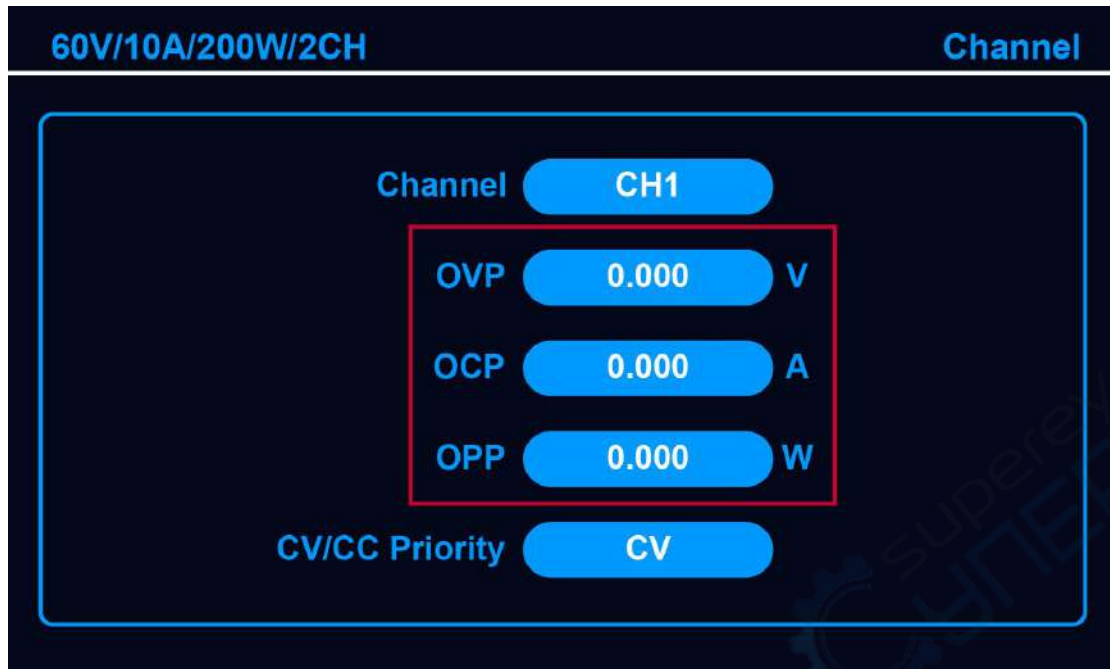
Figure 27   Parameter Setting

7.5.3 CC/CV Priority Setting

Methods to select **CC/CV Priority** under **Channel**:

Method 1: Touch **CC/CV Priority** on the screen and select the desired mode.

Method 2: Press ◄ ► to select **CC/CV Priority** → Press ⬭ on **CC/CV Priority** → Press ◄ ► to select the desired mode → Press ⬭.

Method 3: Rotate ⬭ to select **CC/CV Priority** → Press ⬭ on **CC/CV Priority** → Rotate ⬭ to select the desired mode → Press ⬭.

Figure 28   CC/CV Priority Setting

Note: To exit from **Channel**, please press ⬭Menu⬭ or the function button required.

7.5.3.1 CV/CC Priority Function

The power supply is a feedback control system that can realize the adjustment of specific parameters. Under CV mode, the feedback control loop can adjust voltage. Under CC mode, the feedback control loop can adjust current.

The power supply generally operates in CV mode by default. The supply will adjust the voltage to remain constant until the load consumes enough current to reach the set current value.

Once the supplied current reaches the set current, the power supply will switch from CV mode to CC mode. Under CC mode, the supply will adjust the current to remain constant, and the voltage will begin to drop.

The supply will continue to operate under CC mode until the voltage across the load reaches the set value. In this case, the power supply will switch from CC mode to CV mode. Under CV mode, the power supply will start to regulate voltage again as described above.
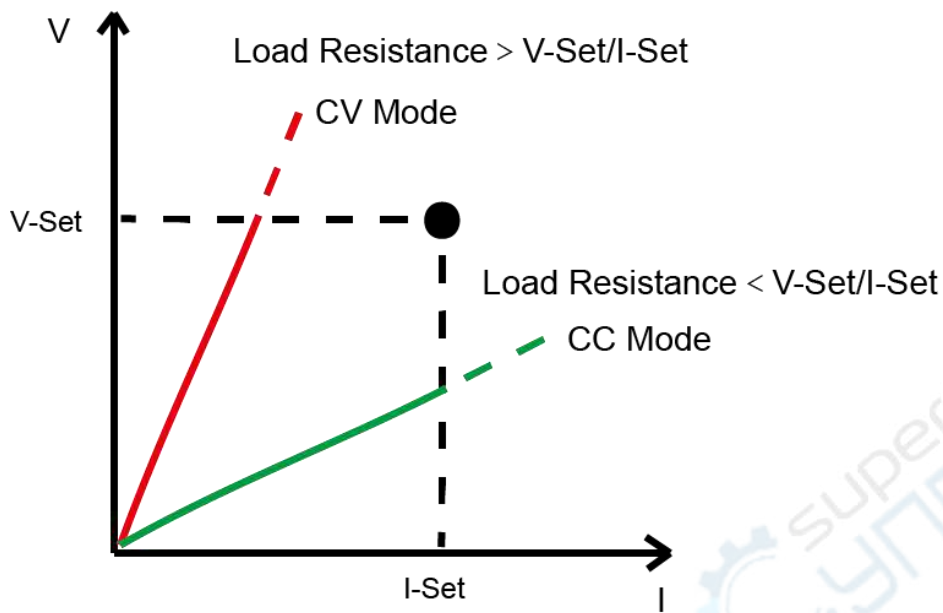
Figure 29   Relationship Between CV/CC Mode and Load

7.5.3.2 CV Priority Mode

Under CV priority mode, the control system will initially set current to the set value and set voltage to 0V. The voltage will continue to rise. During this process, the voltage is always regulated, with fast rise time and minimum overshoot performance.

When supplying power to high impedance loads under CV priority mode, the power supply will always remain in CV mode. In this case, voltage overshoot is rare.

When supplying power to low impedance loads under CV priority mode, the voltage cannot reach the set value due to low impedance. On the contrary, the current will quickly reach the set value. And then CV mode is converted to CC mode, which may cause unstable current control during the conversion process, and current overshoot.
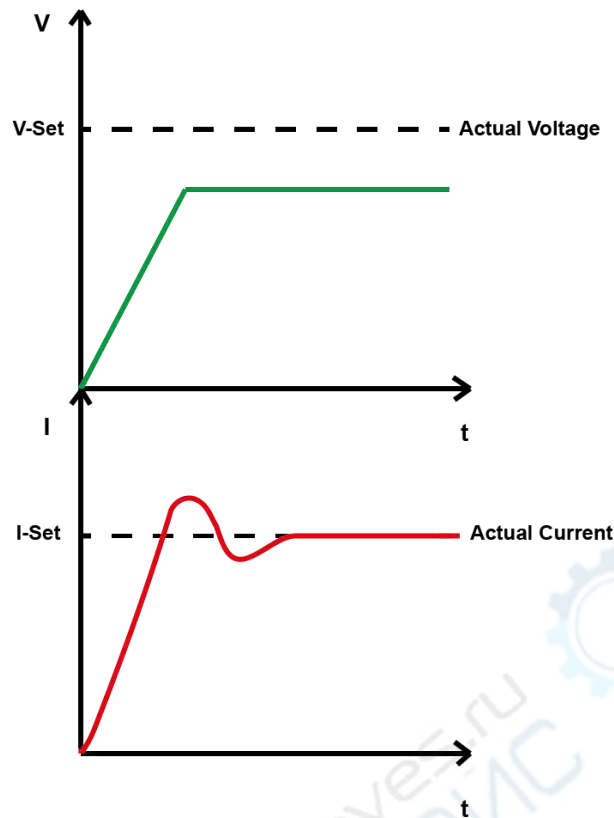
Figure 30   CV Priority and Low Impedance Load

If it requires minimum voltage overshoot, such as supplying power to a low-voltage processor or FPGA core, it is recommended to use CV priority mode.

7.5.4 CV Priority Mode

Under CC priority mode, the control system will initially set voltage to the set value and set current to 0A. The current will continue to rise. During this process, the current is always regulated, with fast current rise time and minimum overshoot. Rush.

When supplying power to low impedance loads under CC priority mode, the power supply will always remain in CC mode.

When supplying power to high impedance loads, high impedance cannot make enough current flow through the load. However, the current flowing through the high impedance load will generate high voltage. The voltage will quickly reach the set value. In this case, CC mode is converted to CV mode, which may cause unstable voltage control during the conversion process, and voltage overshoot.
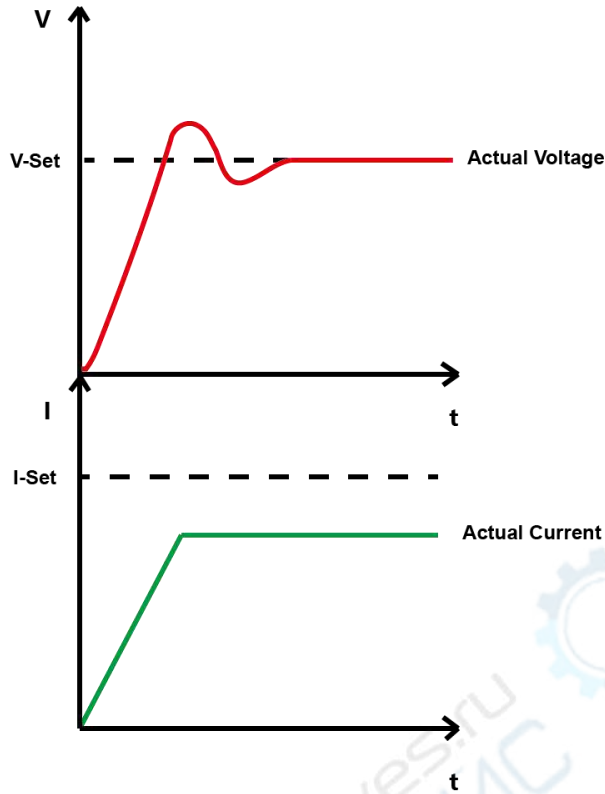
Figure 31   CC Priority and High Impedance Load

7.6 System

Steps to enter **System**:

Press (Menu) → Select **System** by ◄ ► or ○ → Press ○.
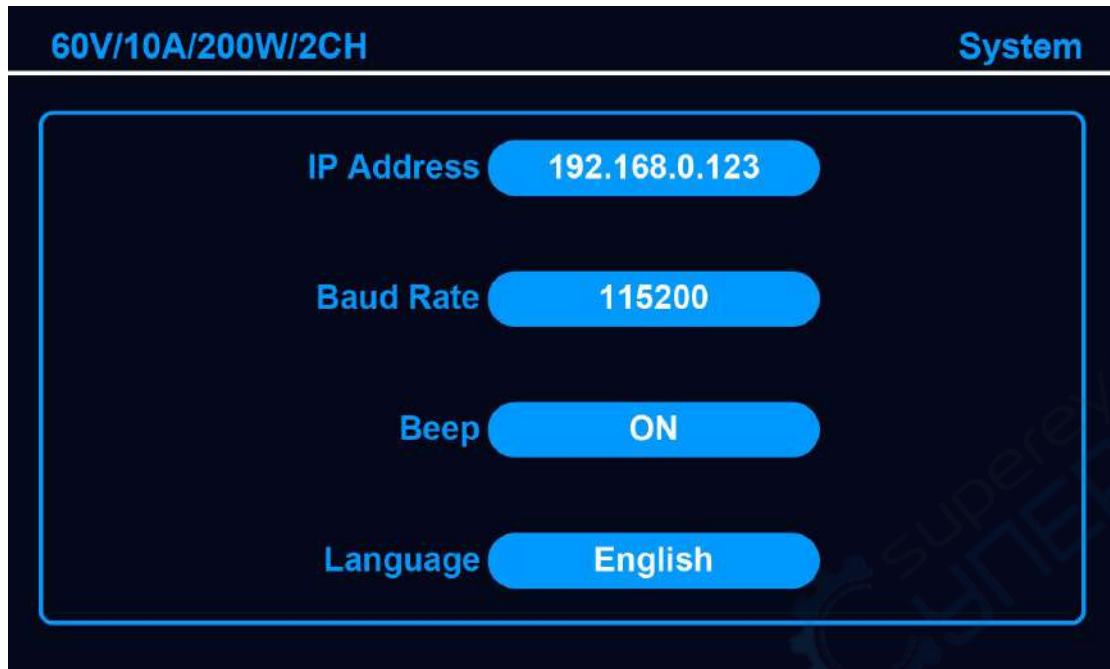
Figure 32   System Configuration

Table 16

Parameter	Description
IP Address	To set IP address
Baud Rate	To select the baud rate
Beep	To set the beep sound
Language	To select the display language

7.6.1 IP Address Setting

Methods to set **IP Address** under **System**:

Method 1: Touch **IP Address** on the screen and input the value via virtual keypad.

Method 2: Pres ◄ ► to select **IP Address** → Press ○ → Press ◄ ► to move the cursor+rotate ○ to adjust the numeric → Press ○ .

Method 3: Rotate ○ to select **IP Address** → Press ○ → Press ◄ ► to move the cursor+rotate ○ to adjust the numeric → Press ○ .
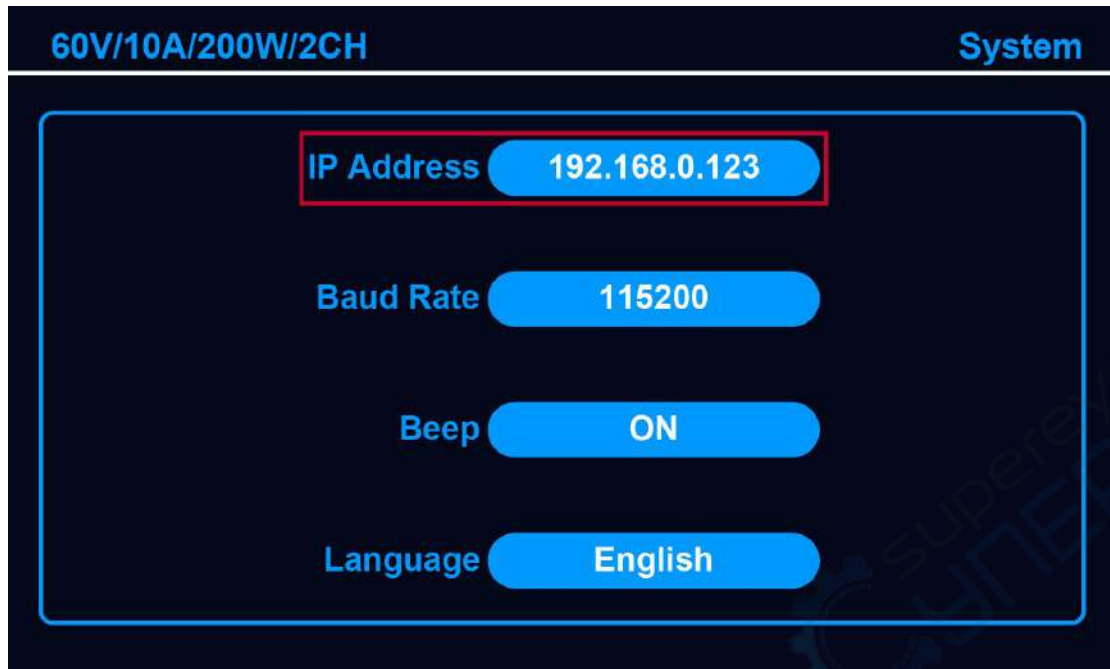
Figure 33   IP Address Setting

7.6.2 Baud Rate, Beep and Language Setting

Steps to select the desired **Baud Rate/Beep/Language** under **System**:

1. Press ◀ ▶ or rotate ◯ to select **Baud Rate/Beep/Language**.

2. Press ◯ on **Baud Rate/Beep/Language**.

3. Press ◀ ▶ or rotate ◯ to select.

4. Press ◯ to complete selection.
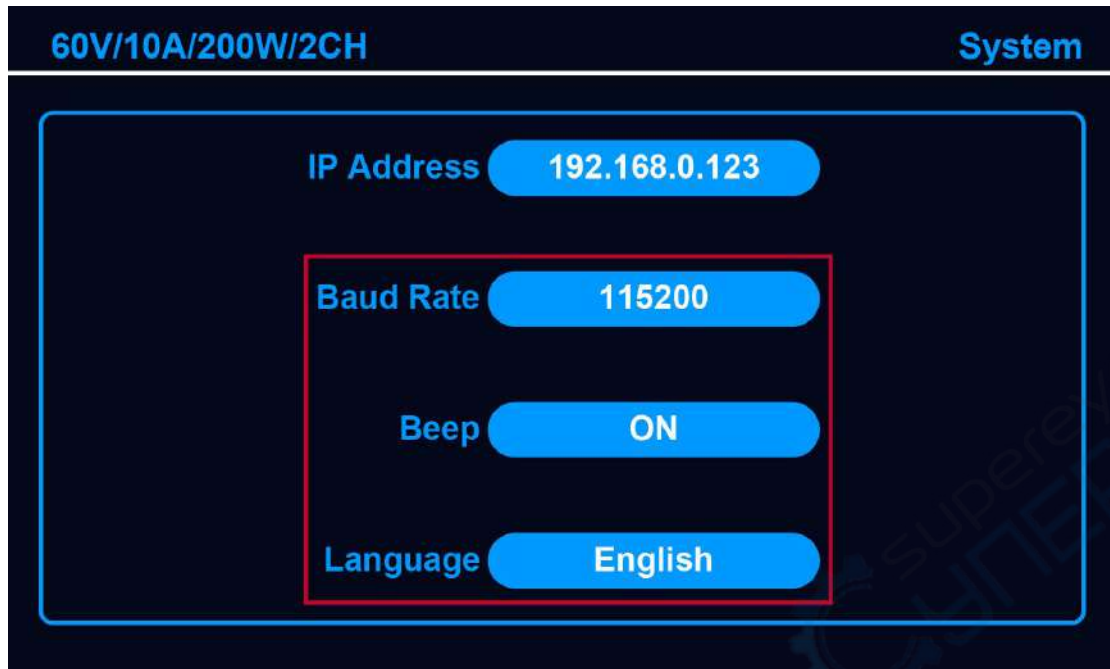
Figure 34   Baud Rate, Beep and Language Setting

8 Remote Operation

N39200 is equipped with two communication interfaces: RS232 and LAN.

N39200 adopts UDP network communication mode. The default port number is 7000. It adopts NGI Standard Communication Protocol and MODBUS Communication Protocol. Users can set the IP address and subnet mask.

8.1 RS232 Interface

On the rear panel, there is a male DB-9 interface with 9 pins.

Please use the supplied RS232 cable with both female ends (COM) for communication.

It is necessary to set baud rate and parity mode in RS232 communication. The baud rate can be set to 4800/9600/19200/38400/115200. The parity mode can be set to None/Odd/Even.

> Note: The RS232 interface of N39200 does not support flow control.

Steps for remote control via RS232 interface:
1. Enter the N39200 Application Software on PC.

2. Find **Hardware Config**.

3. Select COM for **Communication Mode**.

4. Set **Port**, **Baud Rate** and **Parity**.

5. Press **Detect** to connect with N39200.

◆ The port location will change with the interface on the computer. Users can check Device Administrator on the computer to obtain the port location. Users can also try one by one and click **Detect** until the connection is successful.

◆ On **System** interface, users can set **Baud Rate**. The rate of computer must be consistent with rate of N39200.

8.2 LAN Port

The default connection method of N39200 to the computer is via LAN port. Ethernet cable is supplied as standard accessory.

Steps for Ethernet connection via LAN port:

1. Check if N39200 is switched on properly.

2. Make sure the PC is switched on and its LAN port is working properly.

3. Connect one end of Ethernet cable to PC LAN port.

4. Connect another end of Ethernet cable to N39200 LAN port.

5. Check if the indicator light at LAN port on N39200 is flashing.

Note 1: If the indicator light at LAN port on N39200 does not flash after the Ethernet cable was plugged, please check whether the LAN port on computer is working properly and make sure the computer is switched on correctly.

Note 2: After completing the above operations, the indicator light at LAN port on N39200 will stop after a short flash. At this time, the hardware network connection has been established.

There are two LAN ports at N39200 rear panel. Operators can select either LAN port to connect N39200 with computer by an Ethernet cable.

The dual LAN ports design offers feasibility of one computer controlling multiple devices. Below figure shows one computer controlling two devices.
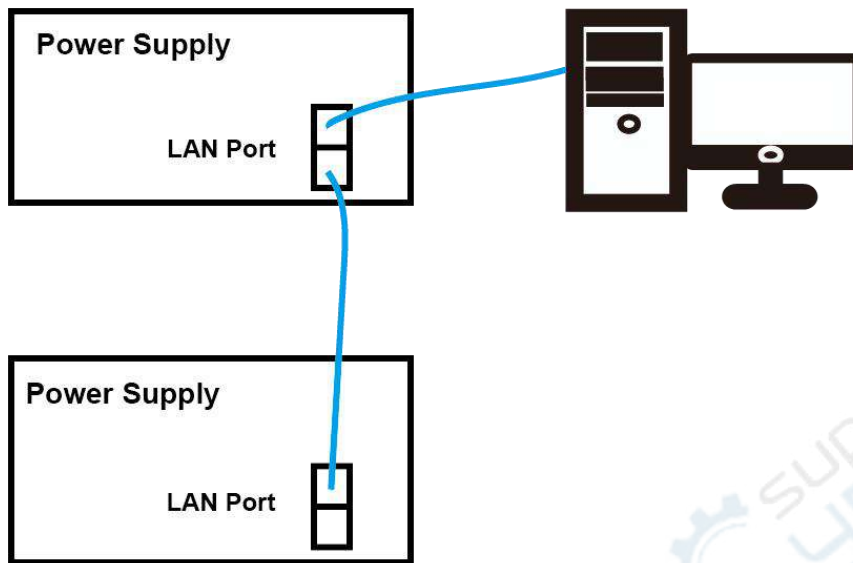
Figure 35　　Multiple Devices Connection Diagram

8.3　Connection to Computer

There are two LAN ports and one RS232 interface for remote communication.

The below steps is for remote control via LAN port:
1.　Enter the N39200 Application Software on PC.

2.　Find **Hardware Config**.

3.　Select LAN for **Communication Mode**.

4.　Set **IP** address. The IP should be consistent with IP of N39200.

5.　Press **Detect** to connect with N39200.

After N39200 receives the correct communication instruction, it will start remote control. Under remote control mode, local operation is disabled and N39200 can only be controlled by programming instructions. Please press Lock to return to local operation.

Remote control and operation can be realized via the application software on PC. The software installation program can be obtained from the USB flash drive.

Figure 36   Remote Mode

9 Maintenance and Self-inspection

9.1 Regular Maintenance

Clean the Device

Please wipe lightly the device with a dry or slightly wet cloth, and do not wipe the inside of it. Make sure the power is disconnected before cleaning.

> ⚠ **Warning: Disconnect power before cleaning.**

9.2 Fault Self-inspection

Device Fault Self-inspection

Due to system upgrade or hardware problem, the device may break down. Please do the following necessary inspection to eliminate the troubles, which can save your maintenance and time cost. If the troubles cannot be recovered, please contact NGI.

The inspection steps are as below.
◆ Check whether the device is powered.
◆ Check whether the device can be turned on normally.
◆ Check whether the fuse has no damage.
◆ Check whether other connectors are correct, including wire cables, plug, etc.
◆ Check whether the system configuration is correct.
◆ Check whether all the specifications and performances are within the device
◆ working range.
◆ Check whether the device displays wrong information.
◆ Operate on a replacement device.

Calibration Intervals

It is suggested that N39200 series should be calibrated once a year.

10 Main Technical Data

Attention:

The measurement accuracy is identified by the following three conditions: within one year after calibration, operation temperature between 18℃ and 28℃, and the relative humidity up to 80%.

Please warm up the device for half hour to ensure the measurement accuracy.

Table 17

Model	N39220-60-10	N39240-60-20	N39260-60-20	N39220-150-04	N39240-150-08	N39260-150-08
Voltage	60V/CH			150V/CH		
Current	10A/CH	20A/CH	20A/CH	4A/CH	8A/CH	8A/CH
Power	200W/CH	400W/CH	600W/CH	200W/CH	400W/CH	600W/CH
Channels	2CH					
CV Mode						
Range	0-60V			0-150V		
Setting Resolution	1mV			10mV		
Setting Accuracy (23±5℃)	0.05%+0.1%F.S.					
Setting Temperature Coefficient (0-40℃)	50ppm /℃					
Readback Resolution	1mV			10mV		
Readback Accuracy (23±5℃)	0.05%+0.1%F.S.					
Readback Temperature Coefficient (0-40℃)	50ppm /℃					
CC Mode						

Range	0-10A	0-20A	0-20A	0-4A	0-8A	0-8A
Setting Resolution	1mA			0.1mA		
Setting Accuracy(2 3±5℃)	0.1%+0.1%F.S.					
Setting Temperature Coefficient (0-40℃)	50ppm /℃					
Readback Resolution	1mA			0.1mA		
Readback Accuracy (23±5℃)	0.1%+0.1%F.S.					
Readback Temperature Coefficient (0-40℃)	50ppm/℃					
Output Noise & Ripple(20Hz-20MHz)						
Voltage Ripple	150mVp-p			200mVp-p		
	10mVrms			15mVrms		
Line Regulation	≤0.015%(Voltage)					
Load Regulation	≤0.01%(Voltage)					
Voltage Rise Time (no load)	≤30ms					
Voltage Fall Time (no load)	≤30ms					
Others						
Interface	LAN/RS232					
AC Input	Single phase, please refer to the voltage mark at the rear panel.					
Temperature	Operating temperature: 0℃~40℃, storage temperature: -20℃~60℃					

Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa
Dimension	2U, 88.0(H)*214.0(W)*546.0(D)mm
Net Weight	Approx. 7 kg

Note 1: For other specifications, please contact NGI.

Note 2: All specifications are subject to change without notice.

11 Appendix

11.1 Protection and Error Alarm Description

Table 18

Alarm	Description
OVP	Over voltage protection
OCP	Over current protection
OPP	Over power protection
OTP	Over temperature protection
LVP	Low voltage protection
FAULT	Power supply error

11.2 Communication Interface

Table 19

N39200 Series		
General	Software Protocol	NGI standard communication protocol
	Driver	NGIInterface.ocx
RS232	Hardware	Standard RS232 interface Baud rate: 4800/9600/19200/38400/115200bps Data length: 8 bits Stop bit:1 bit Parity bit: None Flow control: None
LAN	Hardware	IEEE 802.3 100M Ethernet IPv4, RJ-45 interface

11.3 Recommended Wire Gauge Selection Table

Table 20

Model	Sectional Area	Temperature Conditions			
		60℃	75℃	85℃	90℃
AWG	mm²	Wire model: RUW, T , UF	Wire model: RHW, RH	Wire model: V, MI	Wire model: TA, TBS, SA, AV
		Rated Current (A)			
14	2.08	20	20	20	20
12	3.31	25	25	30	30
10	5.26	30	35	40	40
8	8.36	40	50	55	55
6	13.3	55	65	70	75
4	21.1	70	85	95	95
3	26.7	85	100	110	110
2	33.6	95	115	125	130
1	42.4	110	130	145	150
0	53.5	125	150	165	170
00	67.4	145	175	190	195
000	85	165	200	215	225
0000	107	195	230	250	260

11.4 Trouble Shooting

◆ Screen does not work after power-on.

Table 21

Fault	Possible Causes	Solutions
N39200 screen does not work after power-on.	The power cord is broken.	Change a new power cord.
	The power cord is not properly connected.	Ensure proper connection.

◆ No output.

Table 22

Fault	Possible Causes	Solutions
There is no output after switching on.	The voltage/current setting is zero.	Set the desired voltage/current.
The voltage output stops after transient output.	There is over voltage protection (OVP).	Lower the output setting.

◆ It is not allowed to set output voltage/current properly.

Table 23

Fault	Possible Causes	Solutions
The output voltage/current cannot be set properly.	The set voltage/current is higher than V-Limit Max/I-Limit Max.	Set the desired voltage/current.
	The set voltage/current is lower than V-Limit Min/I-Limit Min.	

◆ Unstable output voltage.

Table 24

Fault	Possible Causes	Solutions
The output voltage are not stable.	N39200 is switching between CV and CC.	Change the setting.
The output voltage is wobbly.	The sense terminal is not connected.	Connect to sense terminal, by using the 4-pin green connector supplied.

◆ High output voltage ripple.

Table 25

Fault	Possible Causes	Solutions
The ripple is high sometimes.	The output voltage is out of range.	Adjust the output voltage.
The ripple is high in another operation environment.	There is strong electromagnetic interference nearby.	Stay away from the interference.