Constant Voltage and Constant Current

DC Power Supply Instruction

Model: RD6006/RD6012/RD6018/RD6024/RD6030/RD6006P/RD6012P

Date: 2024. 6. 18

Dear users, thank you for purchasing the constant voltage constant current DC power supply produced by Hangzhou Ruideng Technology Co., Ltd. In order to let you know more about the full function of this product, get a better experience and avoid misuse. Please read this instruction carefully before using it. Keep it for future reference.

Note: This instruction is corresponding to RD6006(V1.42), RD6012(V1.37), RD6018(V1.39), RD6024(V1.40),RD6030(V1.43),RD6006P(V1.45), RD6012P(V1.49), the page and operation may be different under different firmware versions, please pay attention when using it. We do recommend you to download the latest firmware for better experience.

Content

1.1 Package and Accessory List

The product is packed in a square carton with a plastic sealing film on the outside. After opening the box, there will be an instruction card. Scan the QR code to view the instructions.

On the right side of the product are the accessories. There is an external temperature sensor cable that can be plugged into the S: external temperature sensor interface. If you choose the model with WiFi communication, there will also be a WiFi communication board that can be plugged into U:U:U : Communication module interface, the fuse is a spare, the fuse holder can only be used under 10A, please solder it to the product for long-term use. The U-shaped plug can be used to connect the output line.

	
RD power supply*1	Backup fuse*1
	
External temperature sensor*1 10K B3950	WiFi/RS485 board(order separately)

1.2 Technical Parameter

Model	RD6006	RD6012	RD6018	RD6024	RD6030	RD6006P	RD6012P
Display digit	4-digit					5-digit	
Input voltage range	6-70V			7-70V			
Output voltage range	0-60V						
Output current range	0-6A	0-12A	0-18A	0-24A	0-30A	0-6A	0-12A
Output power range	0-360W	0-720W	0-1080W	0-1440W		0-360W	0-720W
Output voltage resolution	0.01V					0.001V	

Output voltage accuracy	±(0.3%+3 digits)①				±(0.5‰+4 digits)①	
Output current resolution	0.001A	0.01A			0.0001A	0.0001A /0.001A
Output current accuracy	±(0.5%+5 digits)				±(1‰+6 digits)	
Battery voltage resolution	0.01V					
Battery voltage accuracy	±(0.5%+3 digits)					
Battery voltage resolution	0.01V					
Battery voltage accuracy	±(0.5%+3 digits)					
Default battery charging cutoff current	10mA	100mA			10mA	
Output ripple typical (VPP)	100mV	250mV@6A	100mV @12A 150mV @24A	50mV @15A 90mV @30A	20mV②	
Working temperature range	-10℃~40℃					
External sensor Temperature detection range:	-10℃~100℃/0℉~200℉					
External sensor Temperature detection error:	±3℃/±6℉					
Constant voltage mode response time	2ms（0.1A-5A Load）					
Constant voltage mode load regulation	±(0.1%+2 digits)					
Constant current mode load regulation	±(0.1%+3 digits)					
Capacity measurement range	0-9999.99Ah					
Energy measurement range	0-9999.99Wh					
Capacity and energy statistical error	±2%					
Cooling fan start condition	Output voltage >40V or Output current>4A or System temperature >45℃	Output current>8A or System temperature>45℃			Output current>4A or System temperature> 45℃	Output current>4A or System temperature> 50℃
Cooling fan shut down condition when working	Output voltage <40V and Output current <3.9A and System temperature <40℃	Output current <7.9A and System temperature <40℃			Output current <3.9A and System temperature <40℃	Output current <3.9A and System temperature <45℃

Over temperature protection	System temperature >80℃						
Screen brightness setting	0-5(6 level)						
Screen	2.4 inch color HD display						
Input output fuse	1808 fast blow fuse				1032 fast blow fuse	1808 fast blow fuse	
Fuse current	10A	20A	25A	30A	40A	10A	20A
Input terminal	HT508K-2P	HT508K-4P		K14 Terminal		HT508K-2P	HT508K-4P
Product weight(about)	0.58Kg	0.61Kg	0.68Kg	0.72Kg	0.74Kg	0.62Kg	0.66Kg
Product dimension (about)	167*81*69mm						
USB communication	YES						
WiFi communication	Only W version support WiFi communication						

①:1 digit is a minimum resolution, and at 5V the error is ±(5*0.5‰+4*0.001)=5±0.0065V.

②Ripple measurement method: noise and ripple are measured at X1 range, AC coupling,

20 MHz of bandwidth on your oscilloscope with a 0.1uF parallel capacitor at the output terminals

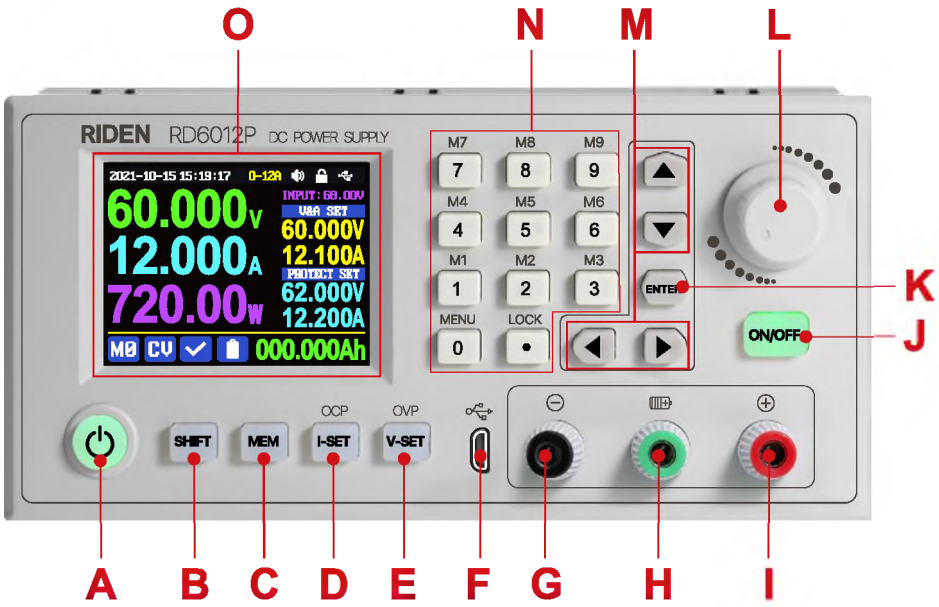
The following takes RD6012P-W as an example to introduce the appearance and usage instructions.

1.3 Core Function

N： Keypad + encoder potentiometer combination adjustment	Firmware update, support more functions later
10 data groups for storage and call out	Brand new PC software
2.4 inch HD color display	Support WiFi communication/USB communication
Battery charging terminal	Support Android/ IOS APP
Integrated panel, can be directly connected to AC power after assembly	Support multiple display interfaces

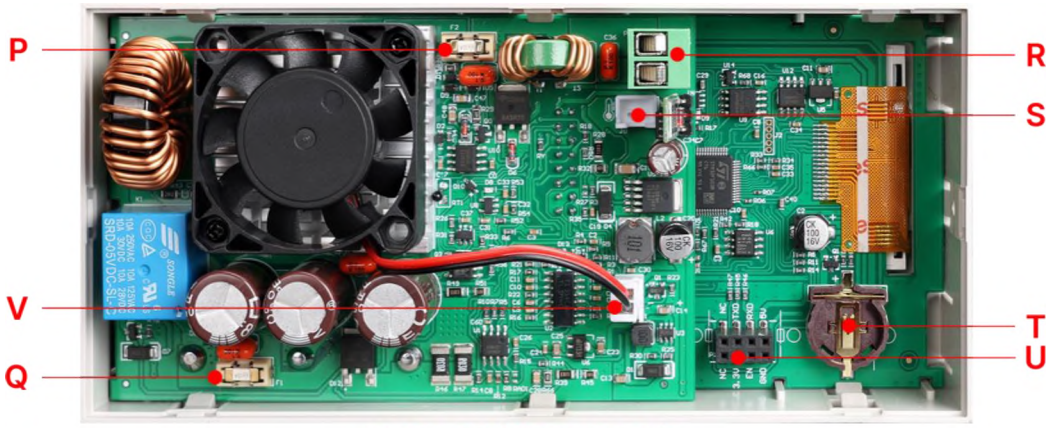
1.4 Panel Instruction

1.4.1 Front Panel

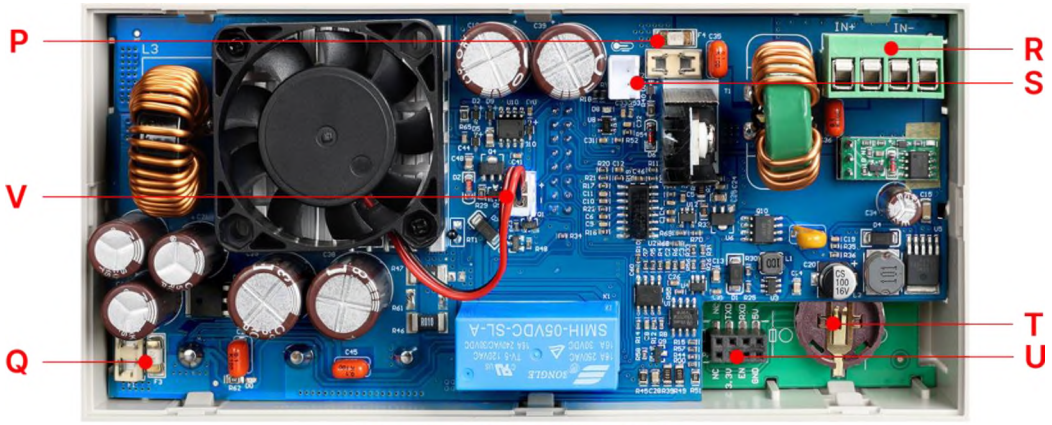


A: Power button	B: SHIFT Second function button
C: Quick storage button	D: Current/Over current protection setting
E: Voltage/Over voltage protection setting	F: Micro USB port
G: Power supply output negative terminal/ Battery charging negative terminal	H: Battery charging positive terminal (Dedicated terminal for battery charging)
I: Power supply output positive terminal connect 4mm banana plug	J: Output ON/OFF switch
K: Enter/ Confirm button	L: Encoder potentiometer(rotate) /Cancel button(Press)
M: Direction button	N: keypad
O: Screen	

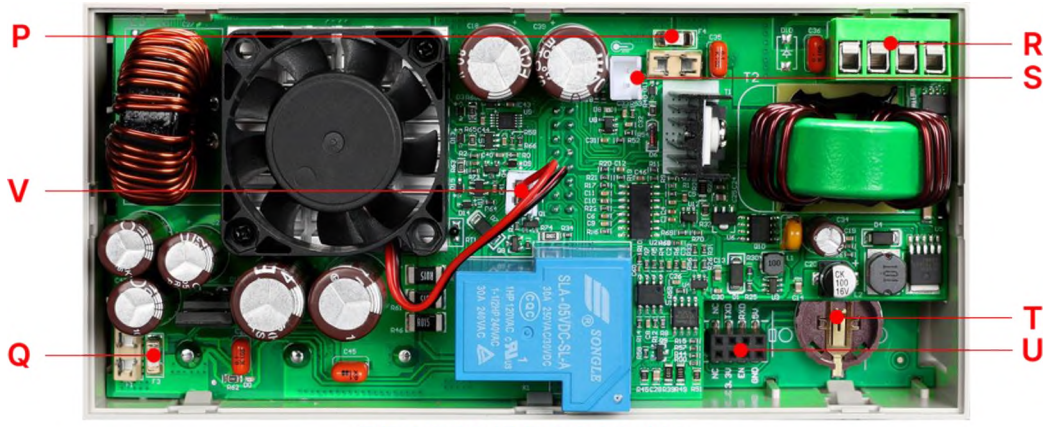
1.4.2 Back Panel



RD6006/RD6006-W

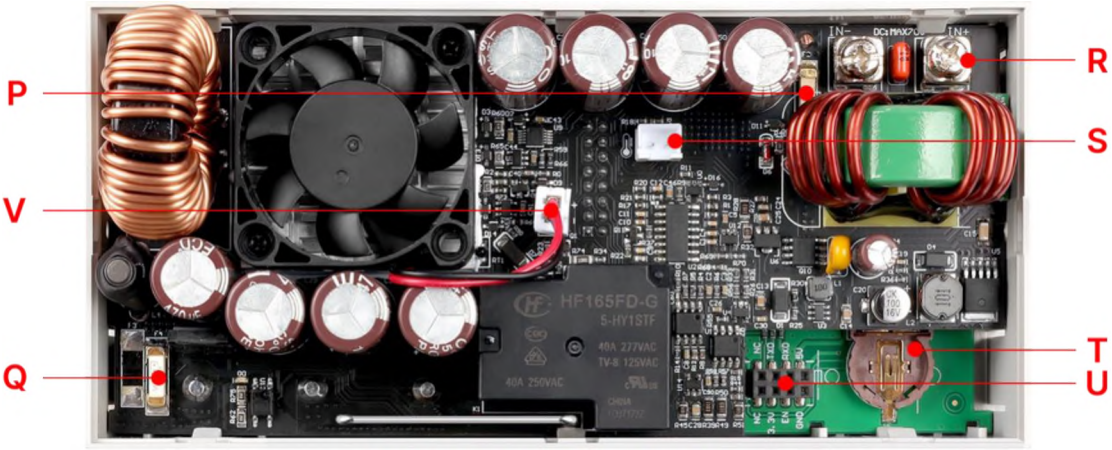


RD6012/RD6012-W



RD6018/RD6018-W

RD6024/RD6024-W



RD6030/RD6030-W

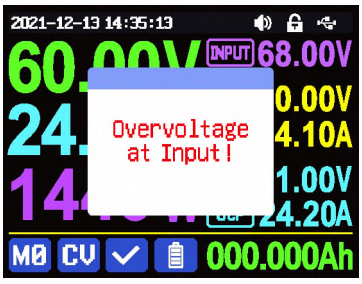
RD6006P/RD6006P-W

RD6012P/RD6012P-W

P: Input fuse(Type: 1808)	Q: Output fuse①
R: Power source input interface (HT508K/K14)	S: External temperature sensor interface (XH2.54-2P)
T: CR1220 battery socket	U: Communication module interface (WiFi or RS485 board)
V: Fan interface(cannot add or replace other fan)	W:Remote sampling switch (only for RD6006P)
X: Remote sampling terminal (only for RD6006P)	

① RD6006/RD6006P fuse 10A, RD6012/RD6012P fuse 20A, RD6018 fuse 25A, RD6024 fuse 30A(1808 fast blow fuse), RD6030 fuse 40A(1032 fast blow fuse). If the fuse is damaged, please solder a new fuse. When using a fuse holder as a temporary replacement, because the fuse holder has a maximum current capacity of 10A, the output current must be ensured to be less than 10A.

NOTE:



R: Power source input interface must be connected to 7-70V constant DC power source. When the input voltage is greater than 72V, the output will be automatically turned off and an alarm (as shown in the right picture) will be automatically prompt. When the input voltage exceeds more, the product will be directly damaged and cannot be repaired!The external sensor cable (as shown on right) must be connected to the external temperature sensor interface. V: Fan interface cannot be connected to other fans.

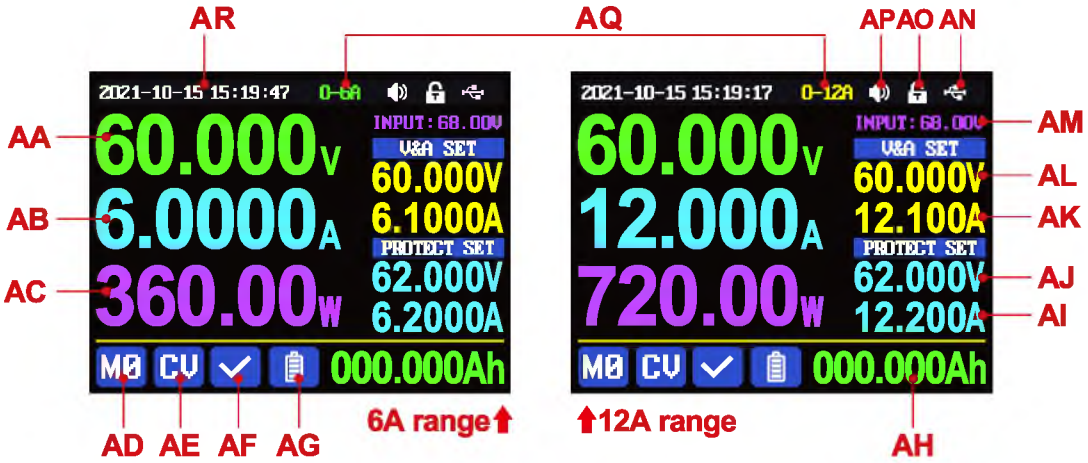
When the system temperature is higher than 80℃, the output will be shut down and show OTP on the screen. CR1220 is the clock battery (Please

prepare by yourself), it can power on the clock function. U:Communication interface is a special interface, please don't connect to other modules or cables.

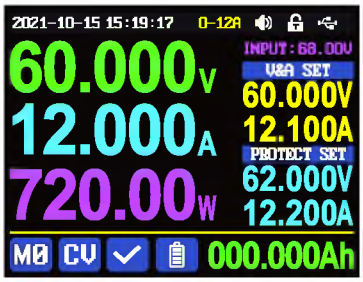
1.5 Operation Instruction

After power-on, it will show boot image first, and then enters the main page.

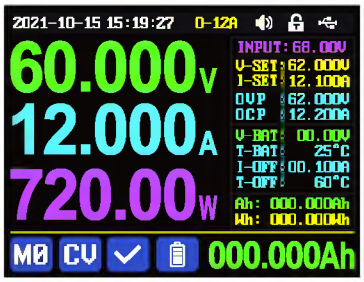
1.5.1 Main Page



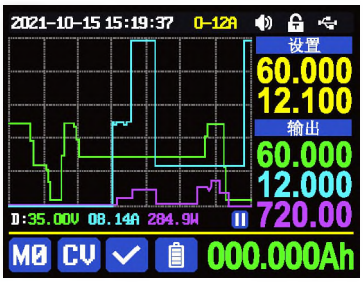
AA: Actual output voltage value	AB: Actual output current value
AC: Output power	AD: Current data group
AE: Constant voltage Constant current status	AF: Protection status indication
AG: Battery charging indication	AH: Battery related information display area
AI: Over current protection value	AJ: Over voltage protection value
AK: Output current preset value	AL: Output voltage preset value
AM: Input voltage	AN: Communication interface
AO: Button lock status	AP: Button tune
AQ: Current range(only RD6012P has)	AR: Date time



Traditional Style



Detail Style



Curve Style

At main page you can press ◀ ▶ button to change the display style between Traditional

Style, Detail Style and Curve Style, under curve style mode, rotate the encoder potentiometer to scale the vertical coordinate of the curve. Press ENTER to pause/start the curve recording, the display style will not be saved automatically, you need to set default boot display at section 1.4.2.6 Main Page Style Setting.

1.5.2 Operation Introduction

In the menu operation, the icon in red, cursor position or the option with base color is the currently selected menu, press ENTER to confirm or enter, press the encoder potentiometer to cancel or return, press M: direction button to move the cursor or switch menu, rotate the encoder potentiometer to change the setting, the settings will be automatically saved when returning from the menu page. Press and hold the 0 button and power on to restore the factory settings, press and hold the 1 button and power on to restore the factory calibration value, press and hold ENTER and power on to enter the boot mode.

1.5.2.1 Battery Charging Function Introduction

The operation way of RD power supplies are similar.

Battery charging operation video：

https://www.youtube.com/watch?v=sOmKoUEmjdQ

After power on, at AH: battery related information display area, external temperature, capacity and energy will loop display. When the output is turned on: capacity, energy will be automatically accumulated, and automatically cleared after power off.

The green terminal(H: Battery charging positive terminal) is connected to the positive electrode of the battery, and the black terminal(G: Battery charging negative terminal) is connected to the negative electrode of the battery. After the battery is correctly connected, the AG:battery charging indicator turns red and the battery is connected. Press ON/OFF to start charging, the AG: battery charging indicator turns green . When the actual output current is lower than cut-off current value

(10mA, can be set by user), or the temperature that the external temperature sensor tested is greater than the cut-off temperature value, the output will be cut off automatically. Battery with protection board needs to be charged with red terminal(I: Power supply output positive terminal) and black terminal(G: Battery charging negative terminal). The charging voltage and current should be set on your own.

It is strongly recommended to use the original charger to charge the battery. The charging function of this machine can only serve as a temporary replacement, not for long-term use. You need to know the battery parameter well so that you can use it to charge, There is a risk of fire and explosion during the charging process if you use the wrong way to charge. Common Battery voltage

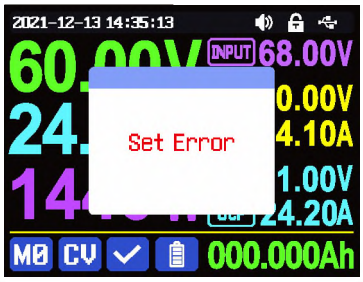


Figure 1

1.5.2.2 Main Page Output Voltage and Current Setting

Output voltage and current setting operation video：

https://www.youtube.com/watch?v=KPnXiwCGSFg

Press ▲ or ▼ to switch the 6A and 12A output range(only for RD6012P), after switching the output range, the output will be cut off. Press I-SET button to set the AK: output current value, you can use encoder potentiometer to adjust the output value directly. And you will not set the value which exceeds the limit in this way, press ◀ ▶ button to move the cursor, and the value will be saved into M0 when you press encoder potentiometer to return. Of course you can use N: keypad to type in the value, and press ENTER to confirm, and it will save the set value and AQ: current range into M0, if you set a value exceeds the limit, it will prompt like what shows in **Figure 1**. If you set the wrong value, you can press encoder potentiometer to cancel.

Press V-SET button to set AL: output voltage value, the operation way is similar to AK:output current setting.

Press SHIFT + I-SET button set the AI: over-current protection, press SHIFT + V-SET button to set AJ: over-voltage protection value. The operation way is similar to AK:output current setting. If you want to set the over current auto cut-off function,

your AI:over current protection value should be higher than the AK: current setting value.

When the device is under constant voltage mode, it will show CV in AE: Constant voltage Constant current status, and it will show CC when under constant current mode; when the device works normally it will show ✓ at AF: Protection status indication, when the AB: actual output current value is higher than the AI: over-current protection value(OCP), the output will be cut off automatically, and show OCP, when the AA: actual output voltage value is higher than the AJ: over-voltage protection value(OVP), the output will be cut off automatically, and show OVP, when the system temperature is higher than 80℃, the output will be cut off automatically, and show OTP.

RD6006P has a remote sampling function, X: remote sampling terminal connected to the load, open the W: remote sampling switch can be compensated for the voltage drop on the output line. Note that the X: remote sampling terminal cannot be connected wrongly or inversely, otherwise the product will be burnt.

1.5.2.3 Data Group Quick Storage and Call out

Data group quick store and call out operation video：

https://www.youtube.com/watch?v=Y4ywGSxDv0M

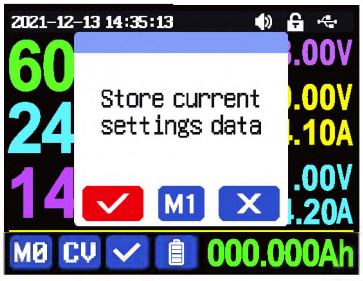


figure 2

Press MEM + N:keypad button 1-9, you can store the AL: output voltage value, AK: output current value, AJ: over voltage protection value, AI: over current protection value and AQ: Current range into the corresponding data group(as shown in figure 2).

then press ENTER to confirm, it will show M1 at AD: Current data group, you can press ▶ button and choose “X”, then press ENTER to cancel, after change the setting value it will show M0.

Press SHIFT + keypad button 1-9 to quick call out the saved data (as shown above in figure 3) from the corresponding data group. Press ENTER to confirm, It will

show M8 at AD: Current data group,

after change the setting value it will show M0. When disable the "Take OK" option, it will be called out directly to change the data setting value, no prompt.

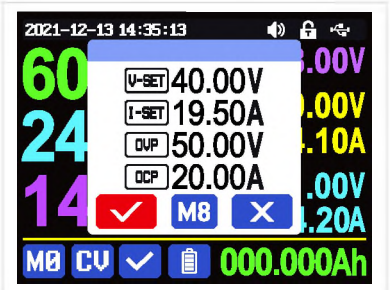


figure 3

M0 is the default data group, when you edit the settings and press ENTER button or rotate encoder potentiometer to change the setting and press encoder potentiometer to return, it will be stored into M0 automatically, or you go to the data group setting menu, change the setting and press encoder potentiometer to return, it will save too, and it will not save by other settings.

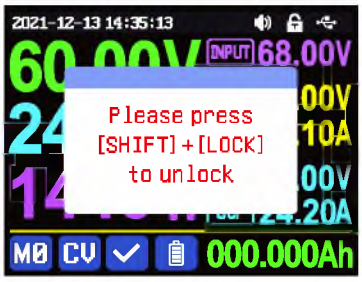


figure 4

1.5.2.4 Keypad lock and unlock

Keypad lock operation video:

https://www.youtube.com/watch?v=UYMcgywKB1Q

Press SHIFT + • to lock or unlock the keyboard. And the keypad will be automatically locked when communication starts, there will be AO: Button lock status displayed on the top (cannot unlock manually), at this time, the A: power button can be used, pressing other buttons will show(as shown in figure 4), the keypad will be automatically unlocked after 3 seconds when the communication disconnected, there will be AO: Button lock status displayed.

1.5.2.5 System Setting

System setting operation video:

https://www.youtube.com/watch?v=ml15mX4u5bE

Press SHIFT + 0 to enter the system setting menu, the icon in Red shows the menu being chosen, press ENTER or ▼ to enter the sub-menu, the option in blue base color is the option being chosen, you can rotate the encoder potentiometer to change setting, press the encoder potentiometer to return, and you can press ◀ ▶ button to select menu.

Press SHIFT + 0 to enter the system setting menu showed in figure 5, press ENTER or ▼ to enter the sub-menu.

figure 5

Settings Sub-menu:

System language is is set to English by default. You can also set Simplified Chinese, French, Germany and Russian language;

Take OK is set to ON by default, when you quickly call out a data group, there will be a prompt to let you confirm, if you set OFF for this option, the settings will be edited directly when call out a data group;

Take Out is set to OFF by default, when call out a data group, it will keep the previous output status, when set it ON, it will output directly when call out a data group.

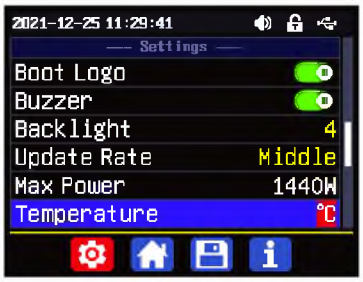


figure 6

Boot Power is set to OFF by default, when boot the device the output is cut off, when set it on, it will automatically turn on the output after booting.

Boot Logo is set to ON by default, when boot the device, it will show the boot logo first, then enter the main interface, when set it OFF, it will enter the main interface directly.

Buzzer is set to ON by default,it will show 🔊 at AP: Button tune, and you can hear the beep when press the button. When set it OFF, it will show 🔇 at AP: Button tune, there will not be beep when press the button.

Backlight is set to level 4 by default, it can be set between level 0-5.

Update Rate is set to Low by default, you can set it low/mid/high, it is the fresh rate of the real output voltage and current.

Max Power is set to 740W by default, you can set it between 0-740W, it is the max output power. On the top you can see the *1 icon, it is the adjustment magnification, you can press ◀ or ▶ to choose the different magnification so that you can set the value quickly, The max output is default voltage priority mode, when

the setting voltage*setting current is higher than the max power, the device will automatically

decrease the output current setting value. When used together with low power power source, it is recommended to set the value as the rated power of the power source*95%;

Temperature unit is ℃ by default, it can be switched between ℃ /℉ (figure 6);

Battery Charger Sub-menu(figure 7):

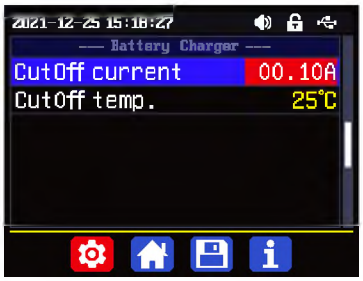


figure 7

Cut-Off Current is set to 10mA by default and it can be edited. On the top you can see the *1 icon, it is the adjustment magnification, you can press ◀ or ▶ to choose the different magnification so that you can set the value quickly, when the AB:real output current is lower than this set value, the output will be cut off automatically.

Cut-Off Temp. is set to 60℃ by default, when the external temperature sensor detect over 60℃, the output will be cut off automatically.

Communication Sub-menu(figure 8):

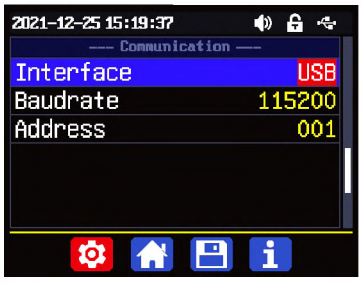


figure 8

Interface is set to USB by default, you can also set it to WIFI/TTL/RS485, USB means the micro USB port, you can see on the top when set it USB, and when the communication starts, it will show ; You need to insert a WIFI board to use the WIFI function, and it will show on the top, and when the communication starts, it will show ; TTL is not available now; You need to insert RS485 module to use RS485, and it will show on the top, and when the communication starts, it will show .

Address is set to 001 by default, you can set it between 001 and 255;

The Baud rate and address on the device should be same with the information on PC software or APP. You can see more communication at PC software and APP section.

figure 9

Date and Time Sub-Menu(figure 9):

Date and Time can be set from Year 2000 to 2100, press ◀ or ▶ you can select the option, and use encoder potentiometer can adjust the value, it will be applied immediately when you change the value, please do not set the wrong time.

figure 10

1.5.2.6 Main Page Display Style Setting

Main interface display style setting operation video:

https://drive.google.com/drive/folders/1gMkuCZr_G-PlyHqO-i6fxdS-XRvuOIG?usp=sharing

You can press SHIFT + 0 to enter the system setting menu, then press ▶ and it will be switched to display style menu(as shown in figure 10): you can press ENTER or ▼ to enter the sub-menu.

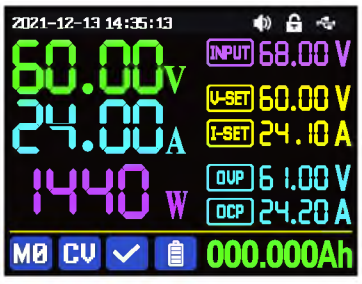


figure 11

Layout Sub-menu:

Digits Style is set to Normal by default, you can set it to Normal/7-Seg V1/7-Seg V2(as shown in figure 11).

Home Style is set to 0(traditional style), you can also set it to 1(Detail Style) or 2(Curve Style), the display style you choose will become the default style after power on.

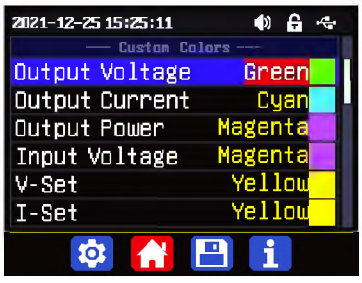


figure 12

Custom Colors(figure 12):

You can set the the display colors for output voltage, output current, output power..... After change the color, you need to turn on the Custom Colors

option to apply the settings(as shown in figure 13).

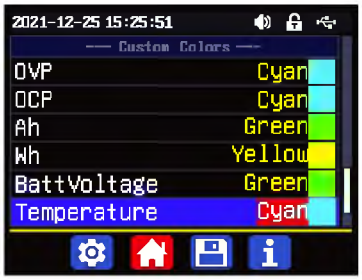


figure 13

1.5.2.7 Storage Data Setting

Data group setting in manual operation video:

https://www.youtube.com/watch?v=0sJlwSGW_oc

You can press SHIFT + 0 to enter the system setting menu, and then press ▶ button twice to enter the data storage setting menu(as shown in figure 14).

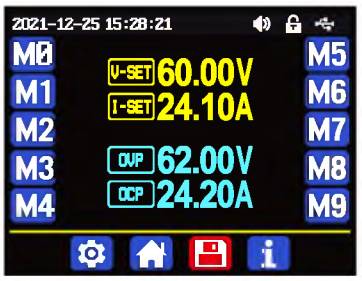


figure 14

Press the ENTER to enter the sub-menu, press M: direction button to choose the data group, you can rotate the encoder potentiometer to switch 6A and 12A range(only for RD6012P), then set the value.

Press I-SET button to set the AK: output current value, you can use encoder potentiometer to adjust the output value directly. And you will not set the value which exceeds the limit in this way, press ◀ ▶ button to move the cursor. Of course you can use N:keypad to type in the value, and press ENTER to confirm, and it will save the set value and set current range, if you set a value exceeds the limit, it will prompt like what shows in Figure 1. If you set the wrong value, you can press encoder potentiometer to cancel.

Press V-SET button to set AL: output voltage value, the operation way is similar to AK:output current setting.

Press SHIFT + I-SET button set the AI: over-current protection, press SHIFT + V-SET button to set AJ: over-voltage protection value. The operation way is similar to AK:output current setting. If you want to set the over current auto cut-off function, your AI:over current protection value should be higher than the AK: current setting value.

After setting, press the encoder potentiometer to return and save setting.

1.5.2.8 System Information

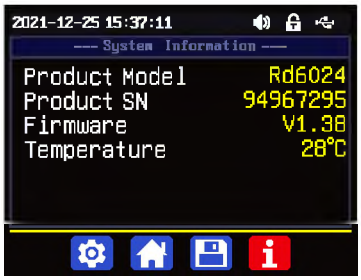


figure 15

System information operation video:

https://www.youtube.com/watch?v=PN8tBhezmtA

You can press SHIFT + 0 to enter the system setting menu, and then press ▶ button 3 times to enter the system information menu(as shown in figure 15).

Product Model is the device name, Product SN is product serial number, Firmware is the firmware version, Temperature is the System temperature.

Android APP Instruction

2.1 Mobile Phone APP Installation

Only RD6012P-W supports WIFI connection. This App only supports Android 5.0 to Android 12.0 operating system, and there may be incompatibilities problems between APP and operating system like Harmony OS, please install and test the software before buying the product. It will apply for location service, please agree and turn on the location service. After downloading the mobile APP zip-file, please install the APP from file manager. Don't install or remove Wi-Fi module when the device is powered on, otherwise it will be damaged. This instruction is made for version 1.0.17, there will be little difference between different versions, and we do recommend you to download the latest APP for better experience.

2.1.1 APP Download

You can download the RD6012P APP zip-file in this URL:
https://drive.google.com/drive/folders/15GfqS3vN3prvdVYOT1_yGHjkz0jHk_LO?usp=sharing
If you cannot find the app, contact the seller to get it.

2.2 Installation Introduction

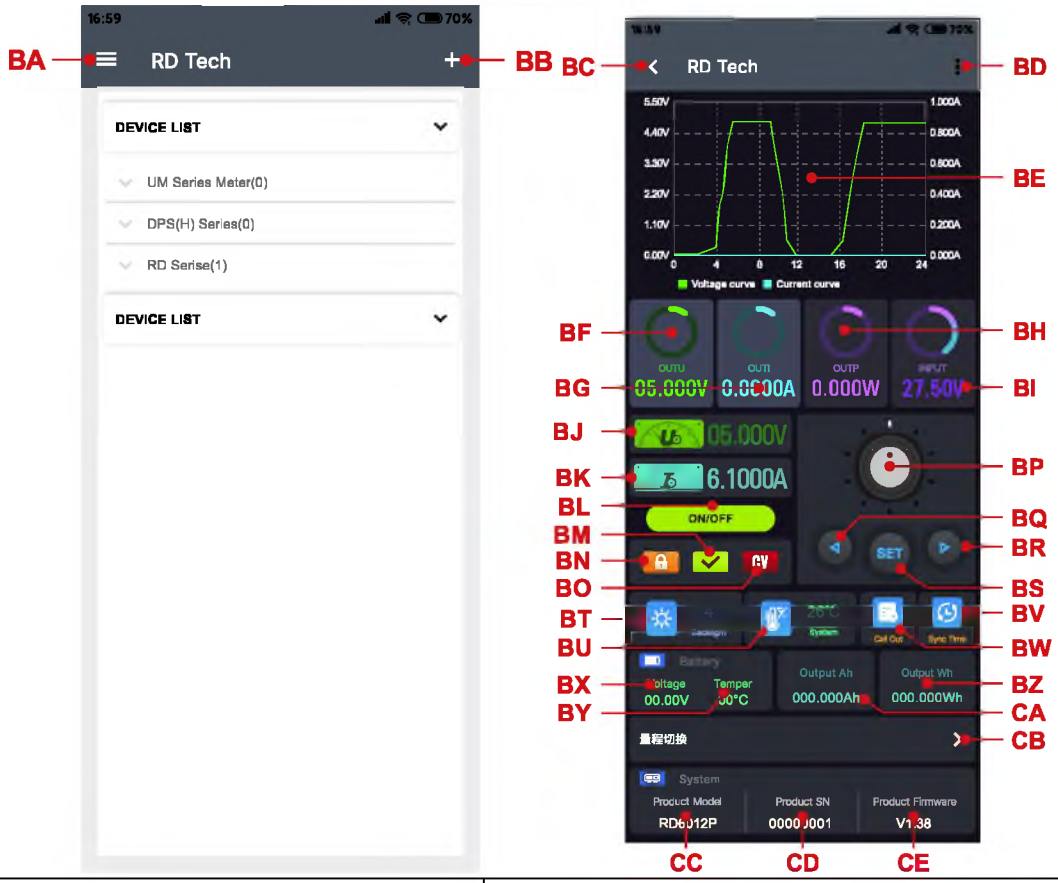
Android APP download and connection video instruction:
https://www.youtube.com/watch?v=BnC9mJ1zevg

2.2.1 APP Update

Click the APP icon, After the APP starts, it will automatically detect whether there is a new version, and it will remind you by popping the window. You need to check if there is a new version by manual detecting. If you download the APP from Google Play, you need to detect new version by yourself.

2.2.2 APP Interface Display

When finish the installation and succeed in connection, it will show the main page as shown in the picture below.



BA: sidebar	BQ: move the cursor to the left
BB: add device	BR: move the cursor to the right
BC: return	BS: set button
BD: more options	BT: screen brightness
BE: curve	BU: system temperature
BF: actual output voltage	BV: sync time
BG: actual output current	BW: data group quick call out
BH: actual output power	BX: battery voltage
BI:input voltage	BY: external sensor temperature detecting value
BJ: preset voltage value	BZ: accumulated output capacity
BK: preset current value	CA: accumulated output energy
BL: ON/OFF button	CB: output range switch
BM: protection status indication	CC: device name
BN: keypad lock indication	CD: product SN number
BO: constant voltage/current status indicator	CE: product firmware version
BP: adjust wheel	

2.2.3 APP Operation

2.2.3.1 Network Distribution

Connect Wi-Fi for the first time, please insert the WiFi board to the right

position, then power on RD6012P, you will see the blue LED blinks once. Set the communication interface to WIFI, restart RD6012P, then place the RD6012P and the

figure 16

mobile phone close to the 2.4G router (the mobile phone must also be under the same 2.4G network, and the router must disable the AP isolation function and the WMM function).

RD6012P will wait for the phone to connect as shown in Figure 16. Press **"BB"** (add device) and choose "RD power series", it will show like Figure 17, then enter the WiFi password and confirm you are using 2.4G network as shown in Figure 18. Press "INITIALIZATION" and wait 10 seconds

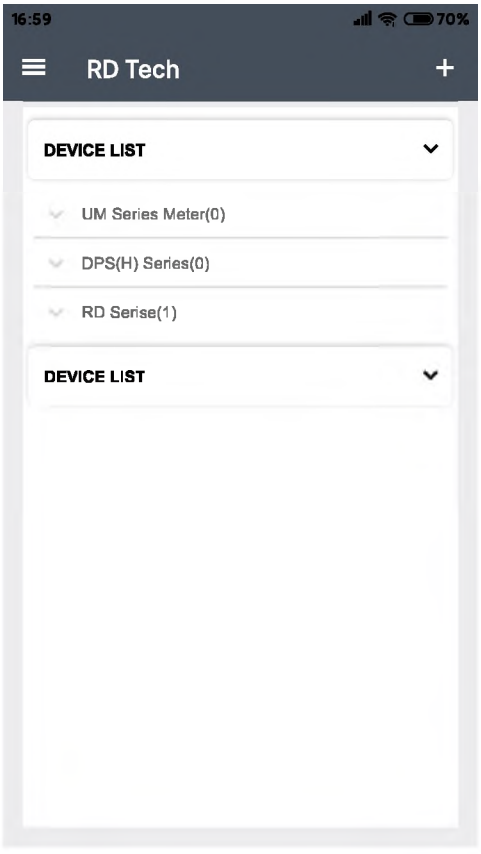


figure 17

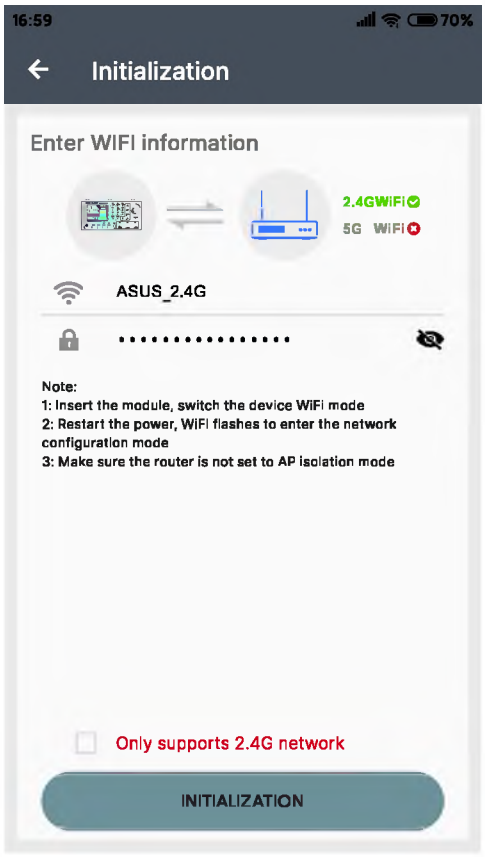


figure 18

RD6012P will obtain the IP address of your phone(figure 19), if it shows right, confirm that “device display sever IP”, and click “Confirm”, wait 20s (figure 20)，APP show connection successful, RD6012P will start automatically, the network distribution success, return to the main page and click the connect in the “BD”.

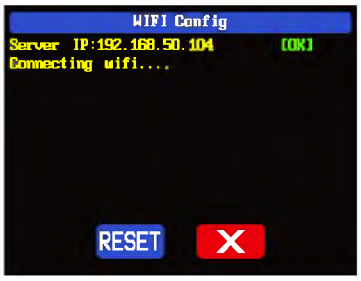


Figure 19

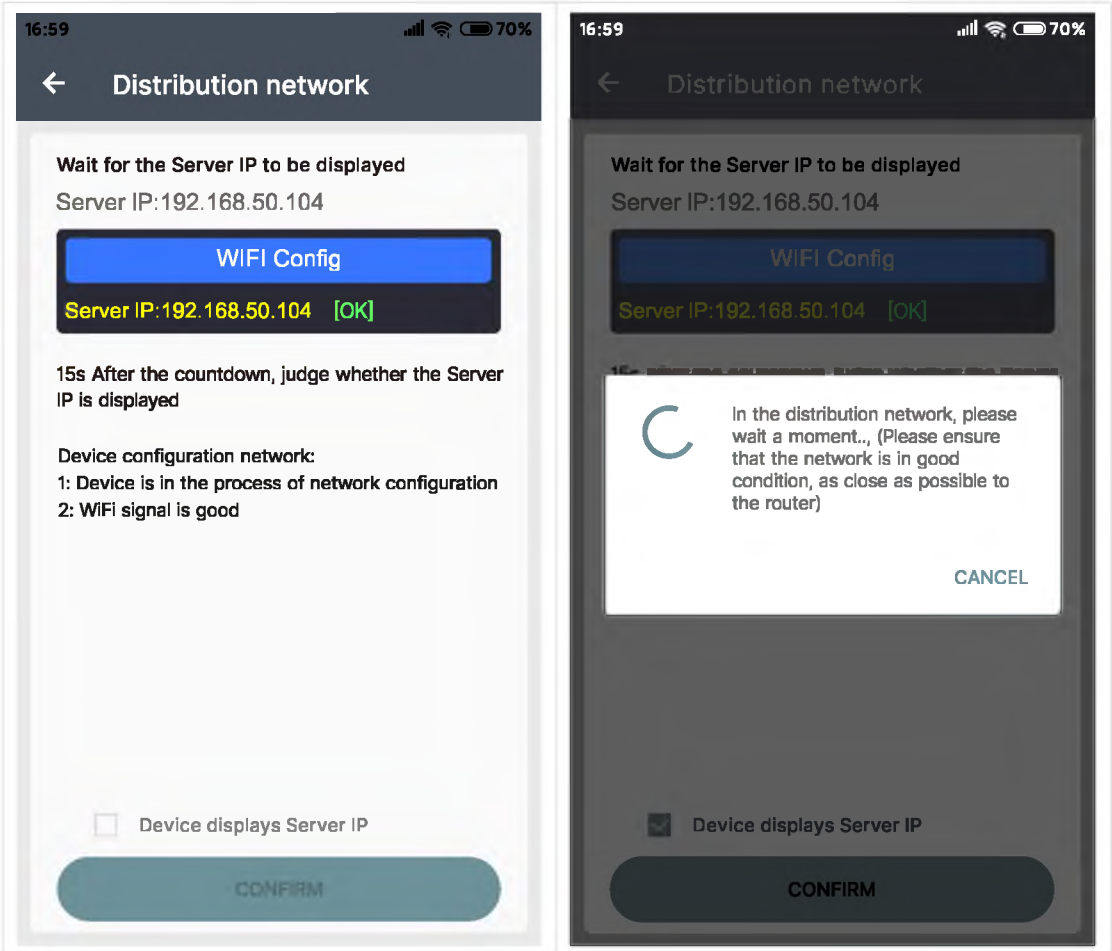


figure 20

If the distribution network fails, please power off the module and re-operate in the same way (multiple networking failures you can watch the video and try to use the hotspot of the mobile phone to test). If you use Huawei brand phone, please turn off the random MAC address function.

2.2.3.2 Proper Wi-Fi Connection

When power on RD6012P, it will connect Wi-Fi first, and then detect if it can be connected to APP, and it may not be connected successfully if the phone is under screen-lock status or the APP is running at the background. If the IP address of the phone has changed, you need to press the ◀ button and then press ENTER button to reset the net, repeat 2.2.3.1 operation. We suggest you to set a fixed IP for your phone in the router setting.

2.2.3.3 APP Operation

Android APP operation video: https://www.youtube.com/watch?v=5AMF8A_KJ3U

Click **"BJ"** preset voltage value to set the output voltage, and use **"BP"** adjust wheel to adjust the value, the **"BQ"** move the cursor to the left, **"BR"** move the cursor to the right to change the position of cursor, click **"BS"** set button to set the parameter. Click **SHARE** in **"BD"** more options to exports the voltage-current curve to excel file, up to 24 hours document can be recorded.

NOTE:

1. There are many kinds of Android phone, so the user interfaces maybe different on some brand phones or different scales of the same brand.
2. Application permission requirements, allow the necessary permissions when the APP is installed (allow background running, using Bluetooth, operation on the folder, reading the application list, etc.) and also set the permissions of the APP after installation: Allow background running, never shut down when lock screen, allow self-starting (it is used to prevent the system from forcibly exiting the APP when recording data), etc.

IOS APP Instruction

3.1 Mobile Phone APP Installation

WiFi connection only supported for RD6012P-W.

3.1.1 APP Download

Apple APP only supports IOS10.0-16.1, iphone6 and above models, search for "RDPower" in the Apple store to download. If you must use the software function, please pre-install the test first. To use the WiFi function of the software, you need to apply for location service. Please agree and turn on location in Settings-Privacy. This manual corresponds to the software version 1.0.16, it is recommended to upgrade to the latest software for a better user experience.

NOTE: the latest APP is “RUIDENG”, if you cannot use RDPower, you can use it.

figure 21

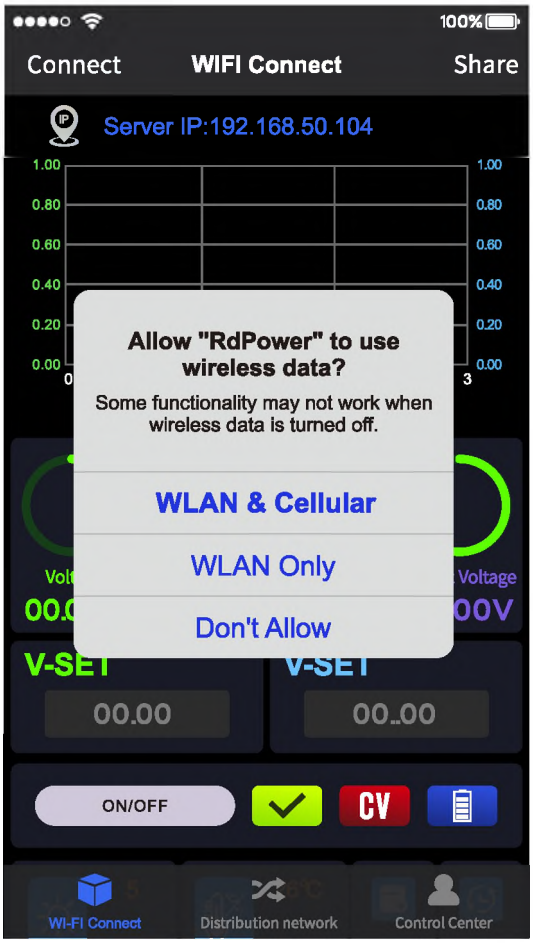


figure 22

3.2 Installation and Operation

When the APP is started for the first time, the system may apply for positioning (as shown in Figure 21), select "Allow when using APP", and apply for data when the APP is running (as shown in Figure 22), select "Wireless LAN and cellular mobile network".

Apple APP installation and connection process video:

https://www.youtube.com/watch?v=Ryy9ko3gqYg

After the installation is complete, the mobile APP icon is shown in the figure on the right:

3.2.1 APP Update

You can get the latest software from the Apple Store. When the software is updated, you will be prompted to update the version.

3.2.2 UI Instruction

You can see the user interface as shown in Picture below.

DA: connect/disconnect	DO: system temperature
DB: export data to mobile phone	DP: data group quick call out
DC: data curve	DQ: sync time
DD: actual output voltage	DR: battery voltage
DE: actual output current	DS: external sensor temperature detecting value
DF: actual output power	DT: accumulated output capacity
DG: input voltage measurement value	DU: accumulated output power
DH: preset voltage value	DV: model being connected
DI: preset current value	DW: product SN number
DJ: output ON/OFF button	DX: product firmware
DK: protection status indication	DY: switch current range
DL: battery status indication	DZ: main page
DM: constant voltage/ constant current status	EA: network distribution page
DN: screen brightness	EB: control center

3.2.3 APP Operation

3.2.3.1 Network Distribution

Connect WiFi for the first time, please insert the WiFi board to the right place, then power on RD6012PW, you will see the blue LED blinks once. Set the communication interface to WIFI, restart RD6012PW, then place the RD6012PW and the mobile phone close to the 2.4G router (the mobile phone must also be under the same 2.4G network, and the router must disable the AP isolation function and the WMM function).

figure 23

RD6012PW will wait for the phone to connect as shown in figure 23. Press **"EA"** network distribution page to choose Network distribution, it will show like figure 24, then enter the WiFi password and click INITIALIZATION. Wait about 20 seconds.

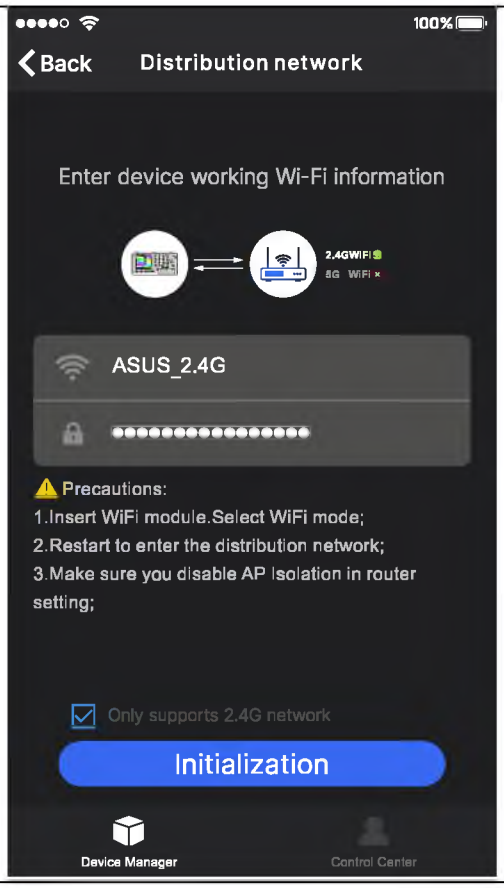


figure 24

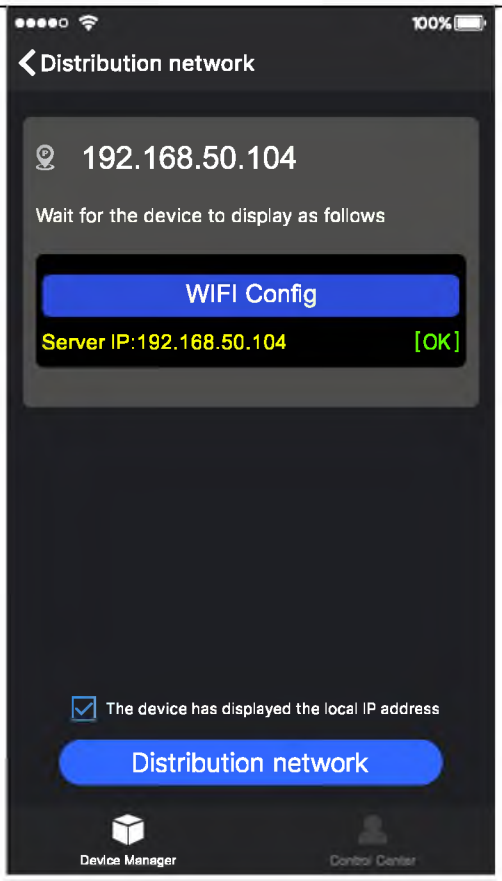


figure 25

RD6012PW will obtain the IP address of your phone(figure 26), if it shows right, confirm that "**device displays sever IP**", and click "CONFIRM", wait 30s (figure 25), APP shows connection successful, RD6012PW will start automatically, the network distribution success, return to the main page and click "DA" connect/disconnect to connect.

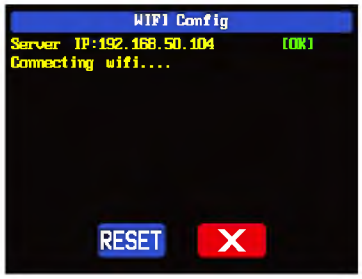


figure 26

If the distribution network fails, please power off the module and re-operate in the same way (multiple networking failures you can watch the video and try to use the hotspot of the mobile phone to test).

3.2.3.2 Proper Wi-Fi Connection

When power on RD6012PW, it will connect Wi-Fi first, and then detect if it can be connected to APP, and it may not be connected successfully if the phone is under

screen-lock status or the APP is running at the background. If the IP address of the phone has changed, you need to press the  button and then press  button to reset the net, repeat 3.2.3.1 operation.

3.2.3.3 APP Operation

IOS APP operation video:

https://www.youtube.com/watch?v=Ryy9ko3gqYg

Click **"DH"** preset voltage value/ **"DI"** preset current value text label and enter the value to set the output voltage/ output current, then click at the blank area to return, if you enter a value exceeds the limit, it cannot be applied. Click **"DB"** to exports the voltage-current curve to excel file, up to 24 hours document can be recorded.

Click the **"EA"** personal center to set the software language or get help to use the APP.

PC Software Installation and Operation Instruction

Requirement: Win 7-Win10 system and the computer has Internet connection.

This PC software is designed by Hangzhou Ruideng technology CO., LTD, it has no virus, if your anti-virus software prompts for a virus warning, please allow all its features, otherwise it will affect the normal operation of the software. PC software supports Win7-Win10 system, and there may be incompatibilities problems, if you really need it, please install and test the software before buying the product. This instruction is made for version 1.0.0.12, there will be little difference between different versions, the version below does not support RD6012P. and we do recommend you to download the latest software for better experience.

RD6012P digital power supply file download link:

https://drive.google.com/drive/folders/1nyd7W_JdeQhPLhKdgG_iCRQ3mHZenbIU?usp=sharing

4.1 Software Download

PC software download and basic operation video:

https://drive.google.com/drive/folders/1jwAnxKiQZKkxMWpQnv4rrPw2KQk9uY-z?usp=sharing

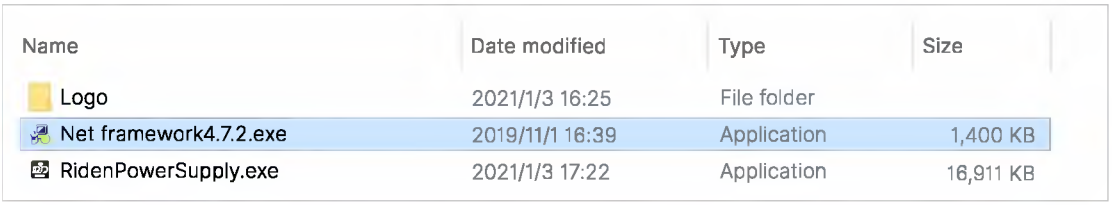
4.1.1 Unzip Files

The first time you use this software, you need to install the driver program first, you need to click CH341SER to install the driver, right click PC-management-device management-port, see if there is USB-SERIAL CH340(COMXX), if you see that, it means installation is successfully, then insert a Micro USB cable into RD6012P and wait for the computer to install the driver.

4.1.2 Unzip Files

Unzip the file to Disk(D) of the PC. You need to run Net framework4.7.2.exe to install the .Net environment, then click RidenPowerSupply.exe directly to use the

software, please do not delete any files.



Name	Date modified	Type	Size
Logo	2021/1/3 16:25	File folder	
Net framework4.7.2.exe	2019/11/1 16:39	Application	1,400 KB
RidenPowerSupply.exe	2021/1/3 17:22	Application	16,911 KB

4.2 Software Operation

RidenPower Supply

4.2.1 Software Connection

Double click **RidenPowerSupply.exe** to run the PC software.

Only RD6012P-W supports WiFi function, WiFi connection is a test function, due to poor compatibility with some computers, if you cannot connect PC software via WiFi, please ignore this function. For this function, we do not provide any guarantee and technical support, and we will decide whether to keep this function based on customer feedback.

WiFi connection video link:

https://drive.google.com/drive/folders/1BZslMRSntMj9Se6hnsYANsv8XAVhIZZi?usp=sharing

Set the RD6012P communication interface to WiFi, and restart, RD6012P displays like figure 27, click "WiFi Network" on the PC software to pop up the WIFI configuration interface (figure 29), click "Initialize" and wait for about 5 -10 seconds, after the RD6012P displays the local IP address (as shown in figure 28), click "Next" and enter the WiFi name and password, then click "Network distribution", wait for about 20 seconds, the PC software prompts that the connection is successful, and then click "Connect".

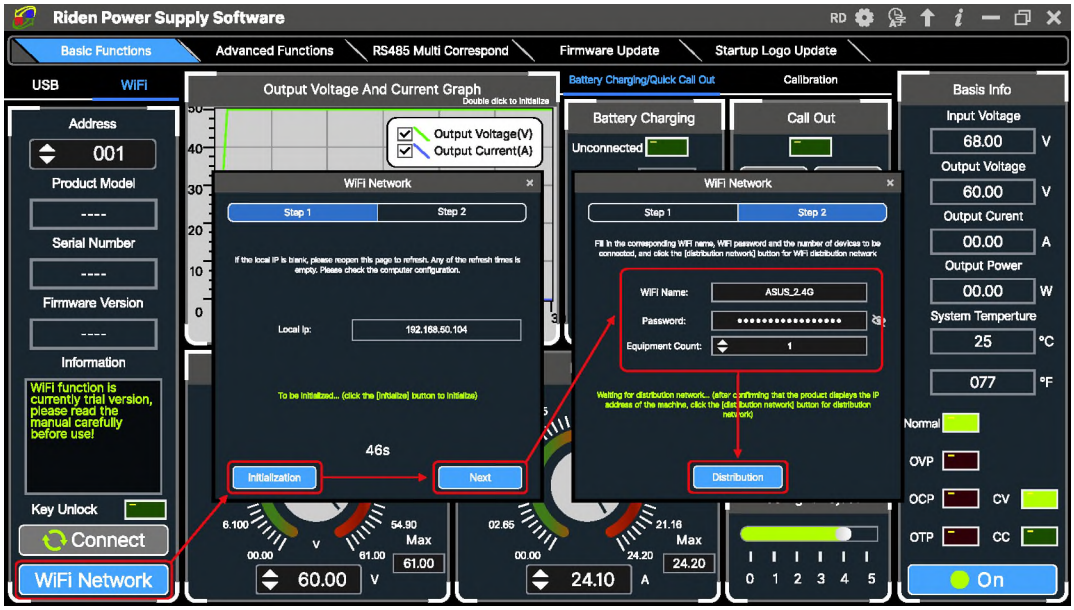


figure 29

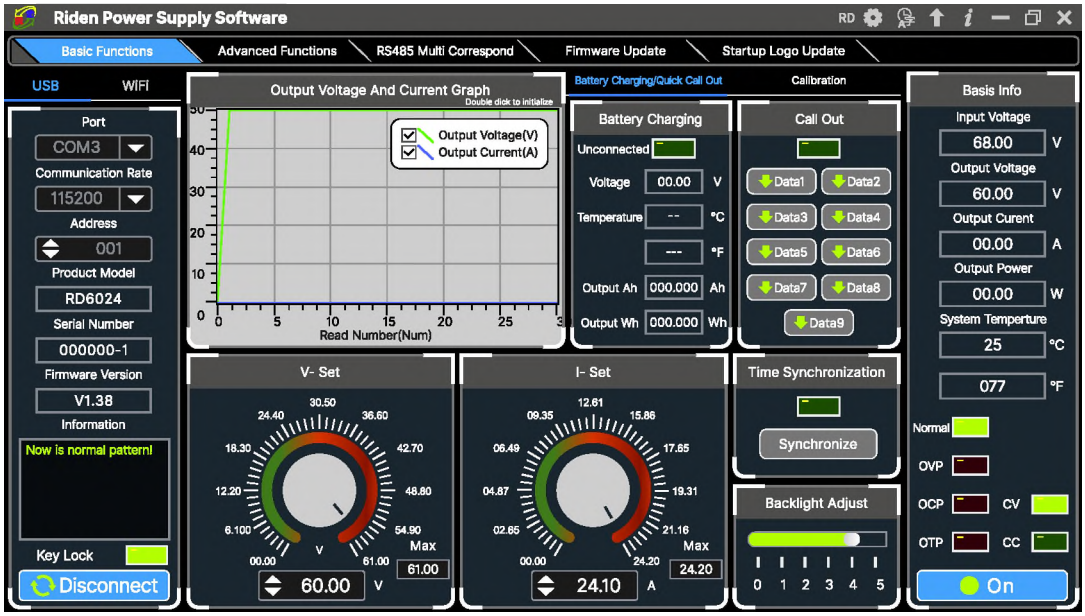
USB connection: Set RD6012P communication interface to USB and connect RD6012P and PC, the PC software prompts the serial port has been updated and clicks "**Connect**".

figure 27

figure 28

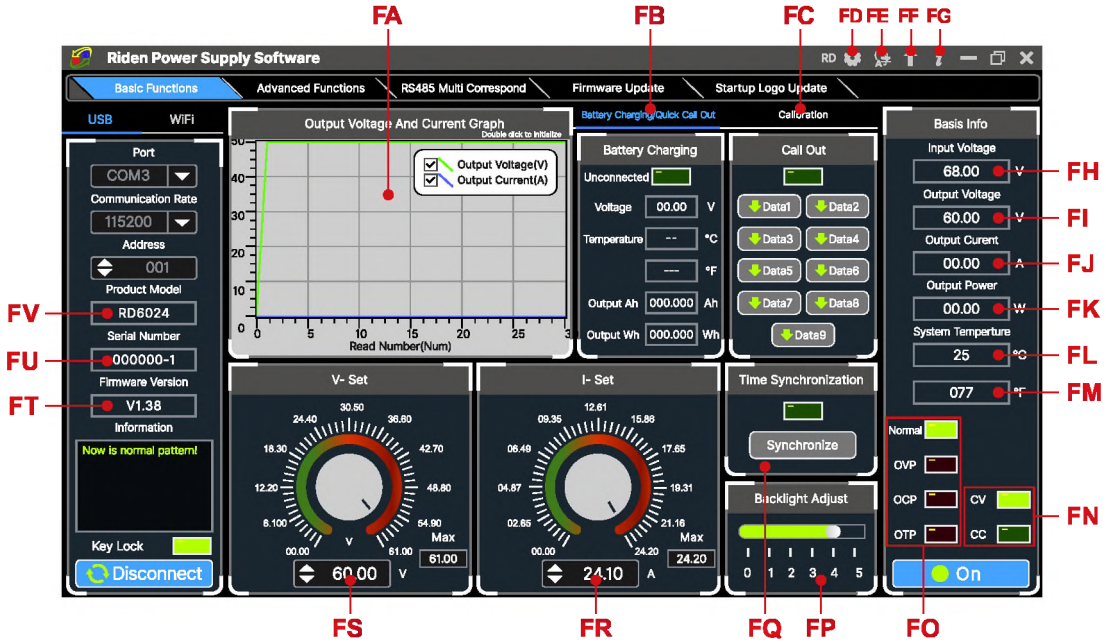
4.2.2 PC Software Operation Instruction

Choose the right communication port, baud rate, slave address (default 001), click **"CONNECT"** to start communication. If the communication succeeds, the power supply button will be locked automatically, the buttons will automatically unlock after 3 seconds of accidental disconnection, and the **"CONNECT"** turns to **"DISCONNECT"**; Click **"ON"** to turn on the output of the power supply, and it will turn to **"OFF"**.



4.3 Functions Introduction

The PC software interface mainly has basic functions, firmware upgrade, Logo upgrade, version update detection and language setting...



FA: Voltage-Current Curve	FB: Battery information/ Data Group Quick Call Out
FC: Calibration	FD: RD/DPS series switch
FE: Language	FF: Software Update
FG: About	FH: Input voltage
FI: Actual Output Voltage	FJ: Actual Output Current

FK: Actual Output Power	FL: System Temperature(℃)
FM: System Temperature(℉)	FN: Constant Voltage/ Constant Current Status
FO: Protection Status Indication	FP: Screen Brightness Setting
FQ: Synchronize System Time	FR: Output Current Preset value
FS: Output Voltage Preset value	FT: Firmware Version
FU: Serial Number	FV: Product Model

4.3.1 Basic Functions

PC software operation video:

https://drive.google.com/drive/folders/1rl-CCOzbFlAONjRfrOpbNsK8rrCGVoKa?usp=sharing

The basic functions of PC software: voltage/current preset, data group quick call out, calibration fine tuning, brightness setting, voltage and current curve exporting. You can rotate the wheel or enter the value to set the voltage and current, the graph above the button shows the real-time voltage and current curve. You can zoom in and out the curve by using the mouse wheel, double click the curve to auto adjusts the axis, you can right click on the curve to clean the curve or export the curve data to picture or excel.

4.3.2 Calibration

The calibration fine-tuning function needs to be operated by a professional electronic person who has more than Six and a half digit multimeter. It will change the system setting, incorrect operation may exceeds the hardware limit and cause damage, and the resulting damage is not covered in the warranty! The limit error of the product is generally much smaller than the nominal error, when the error is close to or even higher than the nominal error, you need to check if the measuring instrument is accurate.

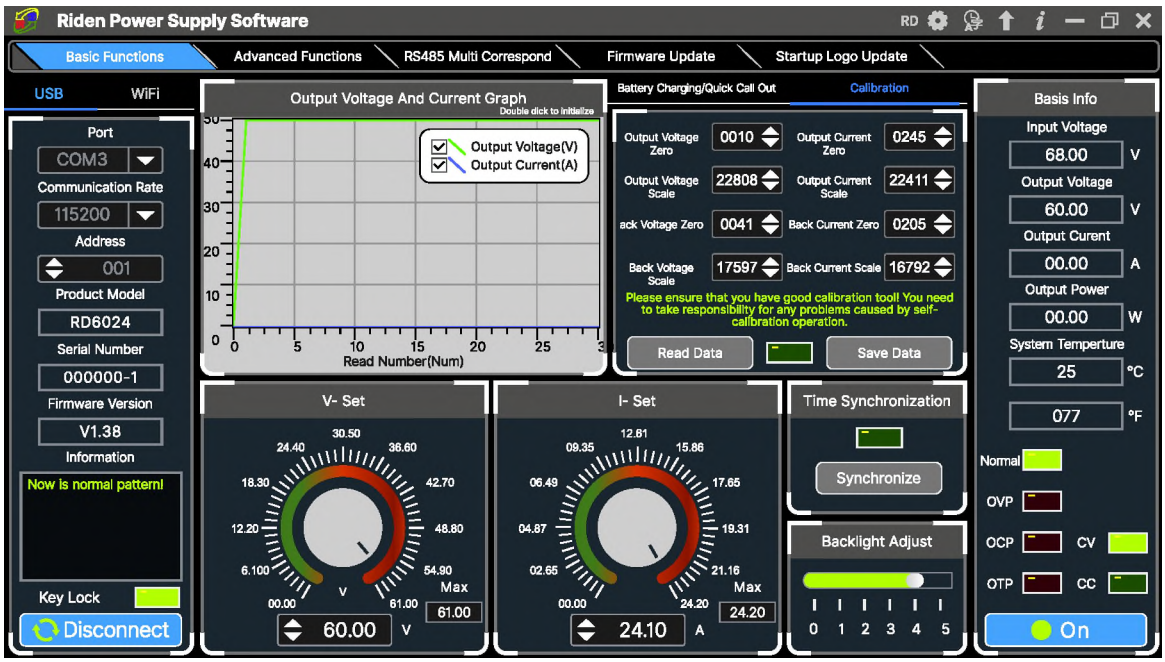
RD6024 calibration operation video:

https://drive.google.com/drive/folders/1WEusRYtpn94BFjyEQjrtsnzTo1K6hYcw?usp=sharing

Click **"Calibration"** and enter the password "168168", you can enter the Calibration Fine Tuning page or save the adjustment data(if you enter the password, by default you have accepted the above red letter agreement). It can read the calibration data after connection; click the arrow to fine tuning the data. According to the linear function y=kx+b, the constant b is equivalent to the zero value, the slope k is equivalent to the proportional value, adjust this two values so that the data will be close to the real test value.

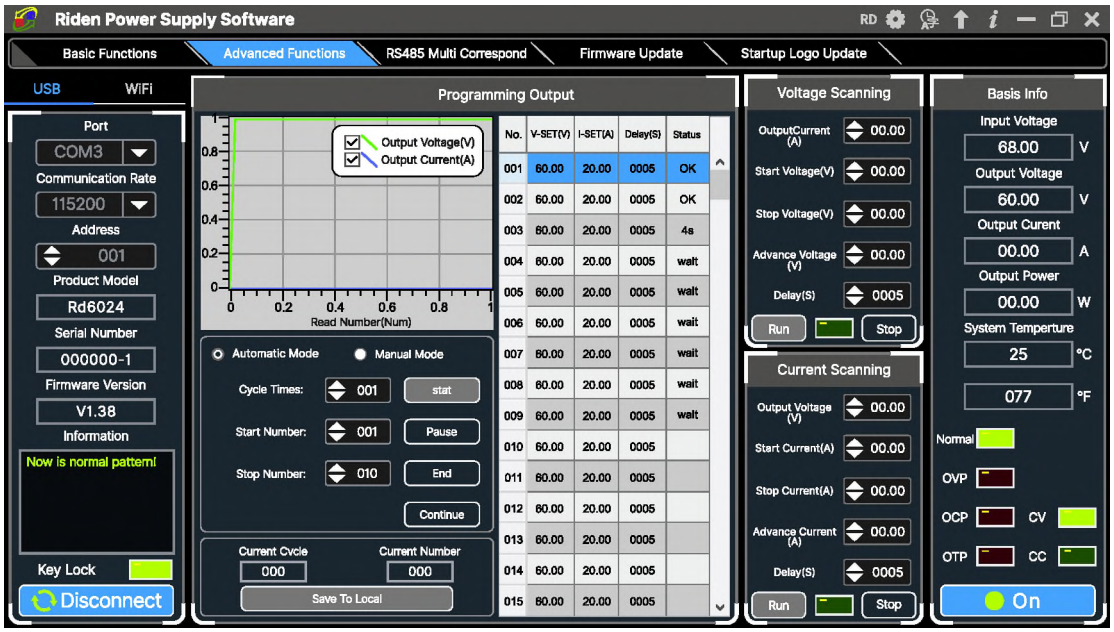
Set the output voltage at 1V, adjust the output voltage zero point to make the multimeter display close to 1V, and then set the output voltage at 30V, adjust the output voltage proportional value to make the multimeter display close to 30V. In the same way you can set 0.1A and 3A output current to calibrate the zero point and proportional value of the output current.

Set the output voltage at 1V and calibrate the actual output voltage zero point to make the actual output voltage displayed on RD6024 close to the value on multimeter. You can set 30V and calibrate the proportional value of actual output voltage. In the same way you can set 0.1A and 3A to calibrate the zero point and proportional value of the actual output current. (This section does not provide technical support. If you do not understand, please check the related information).



4.3.3 Advanced Function

You can set the output voltage and current by chart in the advanced function page, you can set every step between 1 and 9999 seconds, you can set 200 steps max, it can output automatically or manually. You cannot choose other operation page when it performs programming output or other operations, you can only switch other page when it ends.



4.3.4 RS485 Multiple Devices Communication

Use USB to 485 module to connect the AB of the 485 module, if you have multiple device, connect their AB together. Each RD6024 needs a different device address, up to 32 units can be connected, and different models cannot be connected at the same time. The host computer enters the RS485 multi-computer communication, first click search, and click connect after the search is completed.

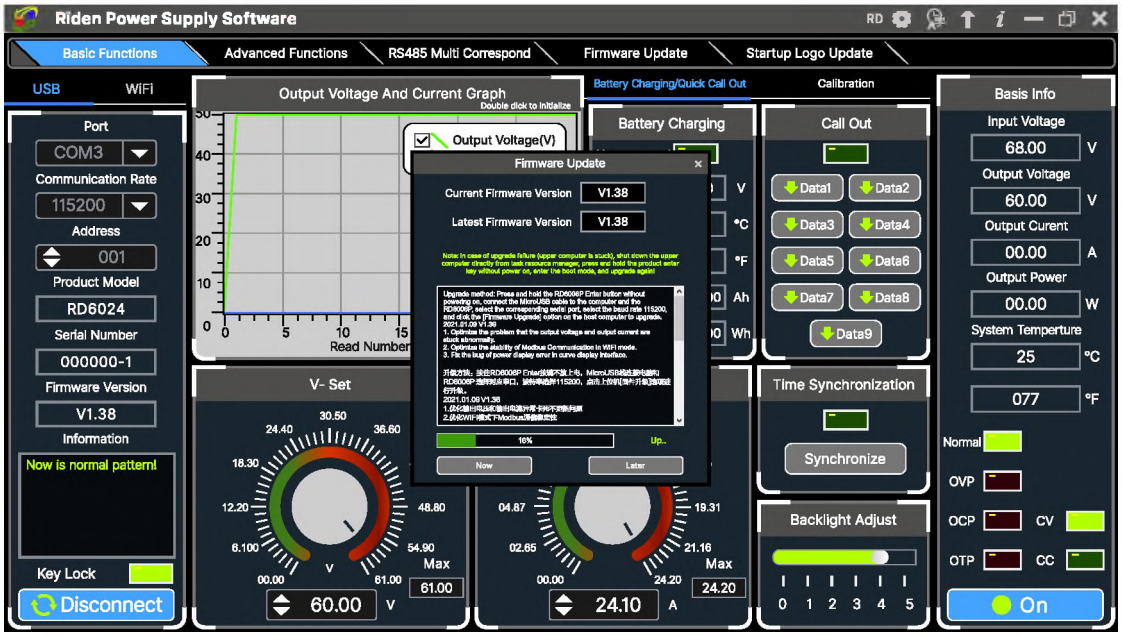
The output voltage and current of a product can be changed arbitrarily in the table, and the voltage and current can be set in batches in the custom setting. You can set several groups of shortcut voltage and current in the shortcut setting for easy recall. Due to the communication frame interval, it takes a certain time to complete each operation, and the longest is no longer than 11 seconds.

4.3.5 Firmware Update

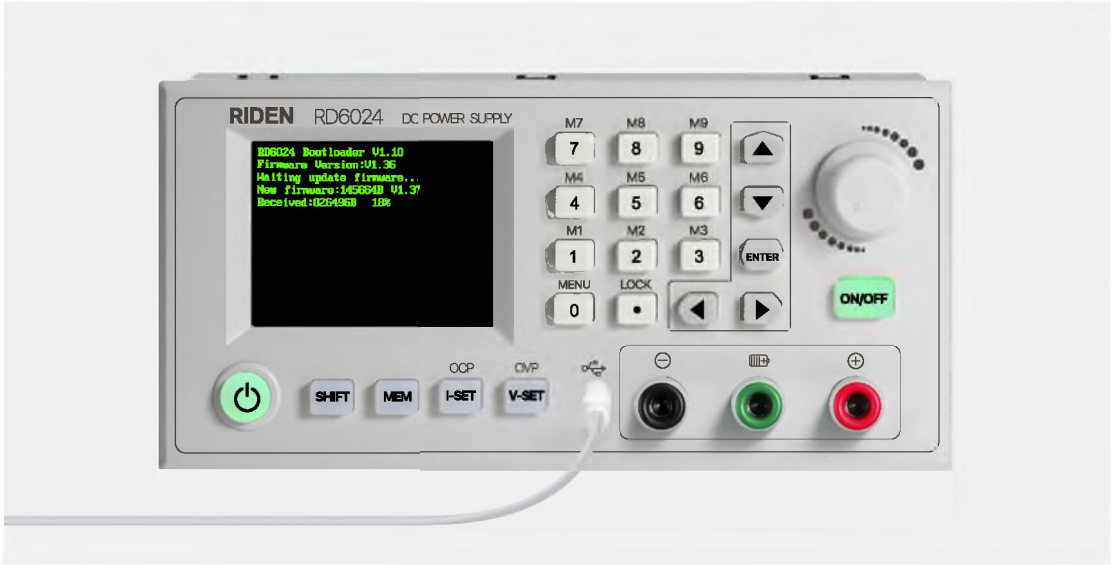
Firmware update operation video:
https://drive.google.com/drive/folders/19A8Rha_sWYuJ6nMGB7S9S7LuoNepe4by?usp=sharing

Press and hold ENTER and power on RD6024, enter the boot mode, then connect it to computer, there will be “boot mode” in the mode information text box, then click **“Firmware Update”**, a firmware update prompt will pop up on the interface, and click “**Now**” to upgrade. (You can update the firmware under the normal mode, if it cannot be started up normally, you should press and hold the

"ENTER" button and power on, update it under boot mode. It doesn't support firmware update under WiFi connection mode).



During the firmware upgrade process, the interface is displayed as follows:

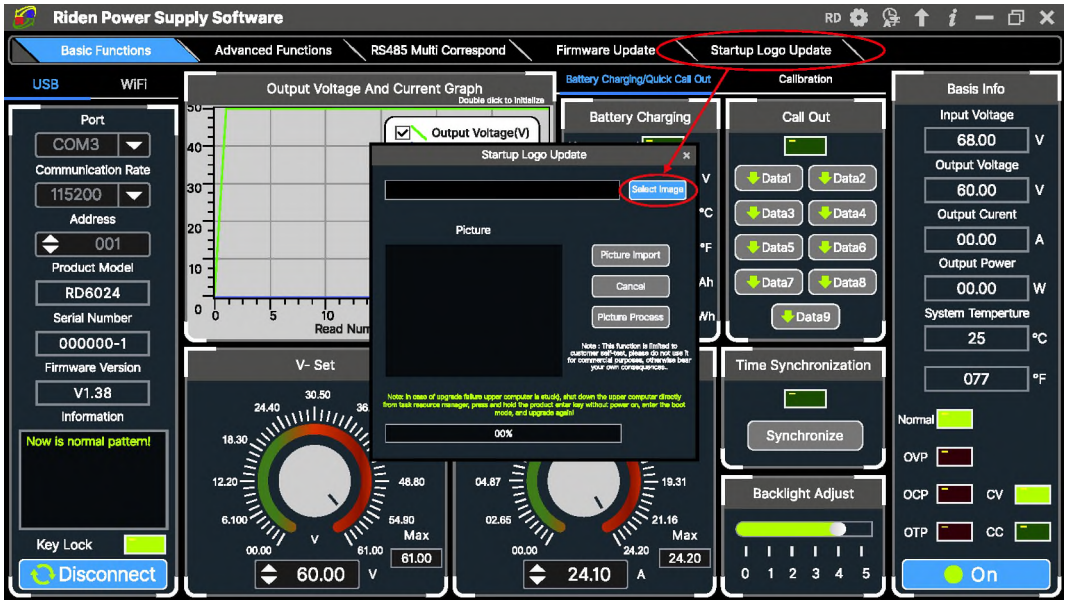


4.3.6 Boot Logo Update

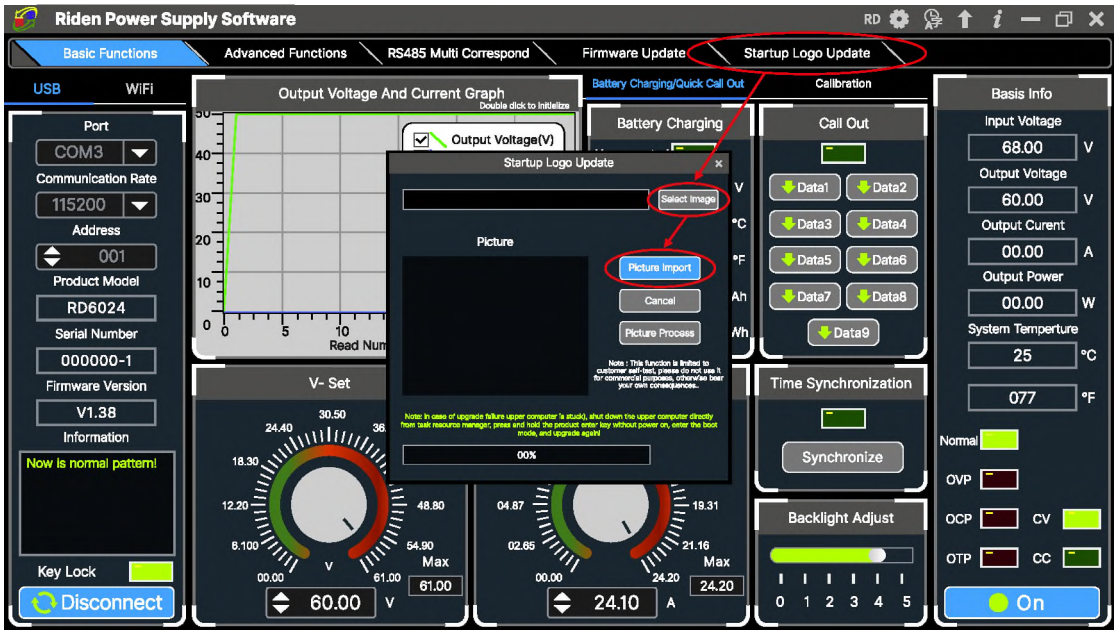
Boot logo setting video:

https://drive.google.com/drive/folders/1J0iOyxZ8DSJaDQD2xgrlukBwJBELQBzf?usp=sharing

Click **"Start Logo Update"**, a Logo upgrade prompt will pop up on the page, please select a picture. Some logo samples can be used in the installation package.

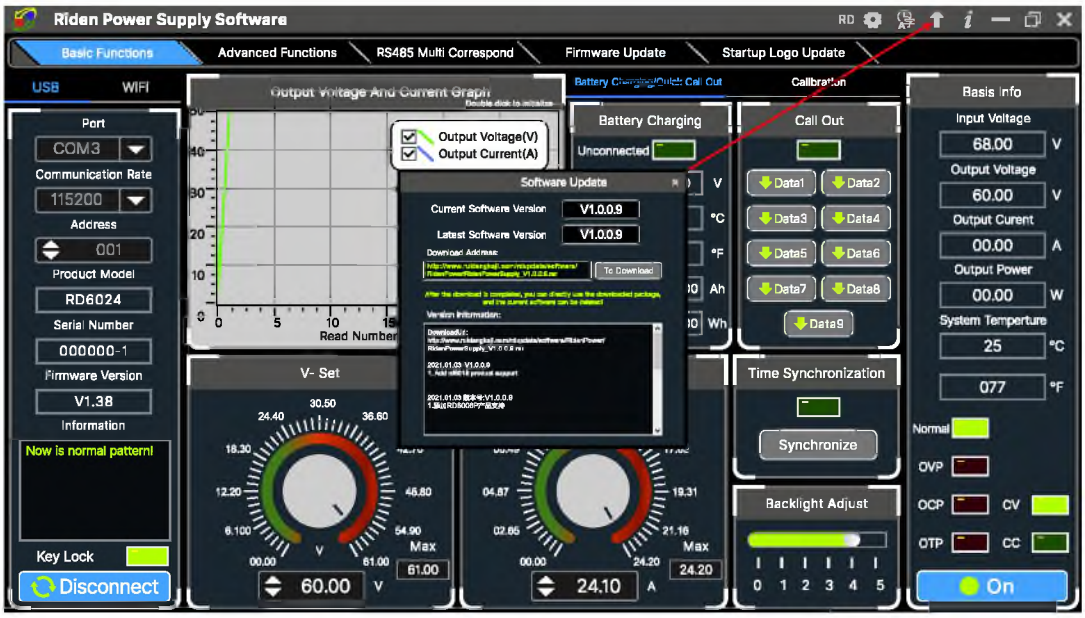


Click “Picture Import” and RD6024 will reboot automatically.



4.3.7 Version Update Detection

Click **“FF”(“Software Update”),** the software will automatically detect if there is a new version, if so, an update prompt will pop up on the interface.

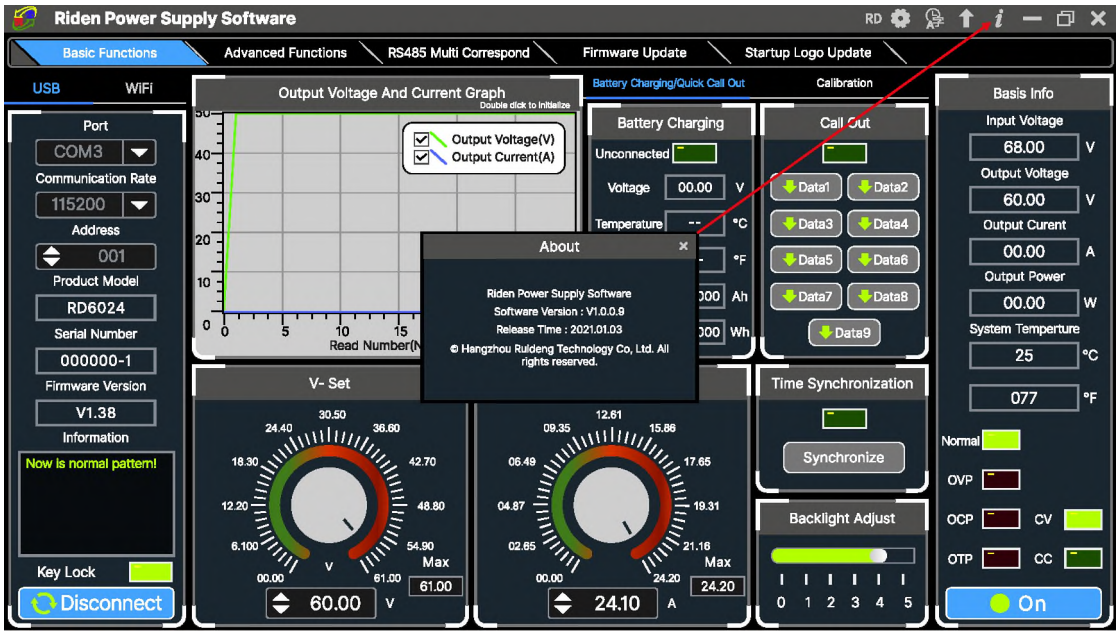


4.3.8 Language Setting

Click **"FE"("Language")**, a language setting prompt will pop up on the interface, you can choose Simplified Chinese, English, France and German.

4.3.9 About

Click **"FG"("About")**, you can check the version number, publish time and copyright Information.



Appendix

Appendix 1: Common Battery Voltage Comparison Table

Battery Type	Nominal Voltage (V)	Final Charge Voltage (V)	Final Discharge Voltage (V)	Application	Characteristics
LiCoMn NiO2	3.7	4.2	3	Digital Device	High capacity
LiFePO4	3.2	3.65	2.5	Electric bike/ electric tool	Large discharge current, inexpensive
Lead Storage Battery	12	14.4	10.5	Car/ electric bike	Inexpensive Lead pollution
Dry Battery	1.5	Cannot charge	0.9	Clock/Remote control	Inexpensive widely used not rechargeable
NICD Battery	1.25	1.5	1.1	Toy	Inexpensive Memory effect
Ni-MH Battery	1.2	1.4	0.9	Toy/Shaver	No memory effect

Appendix 2: Common Electric Car/Bike Battery Voltage Comparison Chart

Nominal Voltage	Battery Type	Number of batteries connected in series	Final Discharge Voltage(V)	Final Charge Voltage(V)
48V	LiCoMnNiO2	14	42	58. 8
	LiCoMnNiO2	13	39	54. 6
	LiFePO4	16	40	58. 4
	Lead Storage Battery	4	42	57. 6
36V	LiCoMnNiO2	10	30	42
	LiFePO4	12	30	43.8
	Lead Storage Battery	3	31.5	43.2
24V	LiCoMnNiO2	7	21	29.4
	LiFePO4	8	20	29.2
	Lead Storage Battery	2	21	28.8

Note: if the final discharge voltage of the battery is higher than 60V, you cannot use RD6024 to charge, it will damage the device.