

Constant Voltage and Constant Current DC Power Supply Manual

Model: RK6006/ RK6006-BT

Date: 2023. 5. 5

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 firmware V1.07, 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.



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1.1 Technical Parameter

Model	RK6006
Input voltage range	12-68.00V
Output voltage range	0-60.00V
Output current range	0-6.000A
Output power range	0-360.0W
Input voltage measurement resolution	0.01V
Output voltage setting measurement resolution	0.01V
Output current setting measurement resolution	0.001A
Input voltage measurement accuracy	±(1%+5 digits)
Output voltage accuracy between setting and measurement	±(0.3%+3 digits)
Output current accuracy between setting and measurement	±(0.5%+5 digits)
Output ripple typical	100mV VPP ^①
Working temperature range	-10°C~40°C
External sensor Temperature detection range:	-10°C~100°C/0°F~200°F
External sensor Temperature detection accuracy:	±3°C/±6°F
External sensor parameter	10K NTC B3950
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
Constant voltage mode response time	±2%

Max output voltage	(input voltage÷1.1) -1 ^①
External cooling fan start condition	Output current>4A or System temperature>45℃
Cooling fan shut down condition when working	Output current <3.9A and System temperature <40℃
Over temperature protection	System temperature >80℃
Screen brightness setting	0-5(6 level in total)
Screen	1.54 inch 240*240 color HD display
Weight(with package)	0.15kg
Product dimension	79*43*54mm
Support USB communication	yes
Support Bluetooth communication	Only RK6006-BT supports

①:Ripple 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

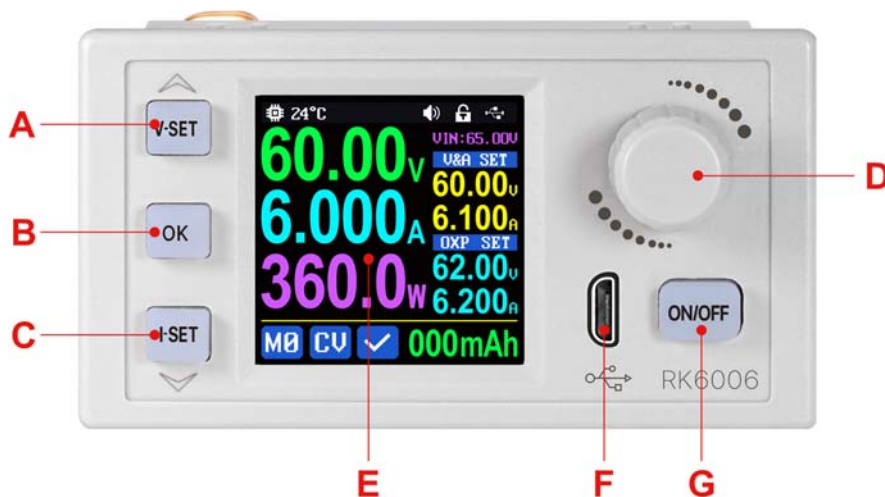
② for example: input voltage is 24V, the max output voltage is 20.8V。

1.2 Core Function

- Compact design, easy to carry
- Firmware update, support more functions later
- 10 data groups for storage and call out
- supports PC software
- 1.54 inch HD color display
- Supports Bluetooth communication(RK6006-BT) /USB communication
- Support Android/ IOS APP
- Embedded design, convenient to use

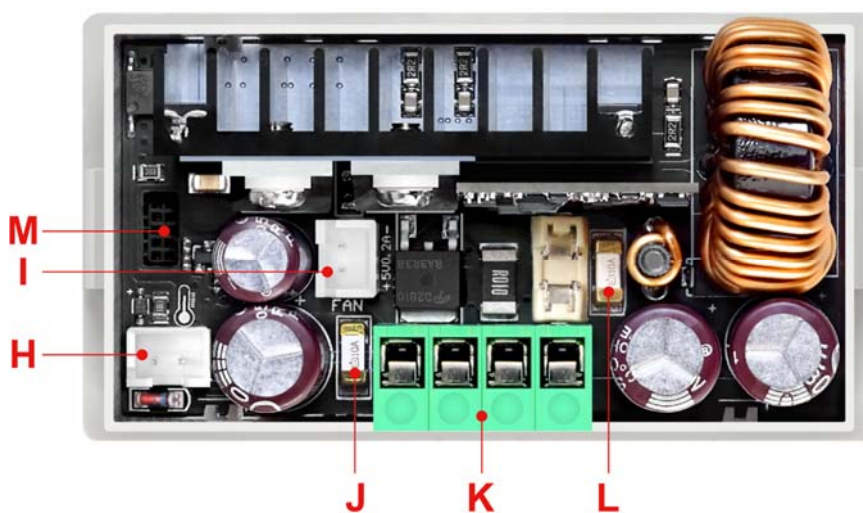
1.3 Panel Instruction

1.3.1 Front Panel



A: Voltage setting/Up Arrow	B: Confirm Button/Set Menu
C: Current setting / Down Arrow	D: Encoder Potentiometer
E: Screen	F: Micro USB port
G: Output Power Button	

1.3.2 Back Panel

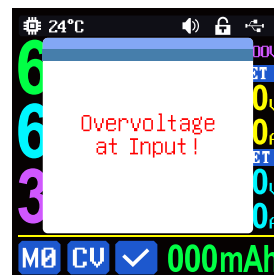


H: External temperature sensor interface	I: External fan interface
J: Input fuse	K: Input and Output terminal
L: Output fuse	M: Communication module interface

NOTE:

This device input terminals must be connected to 12-68V 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!

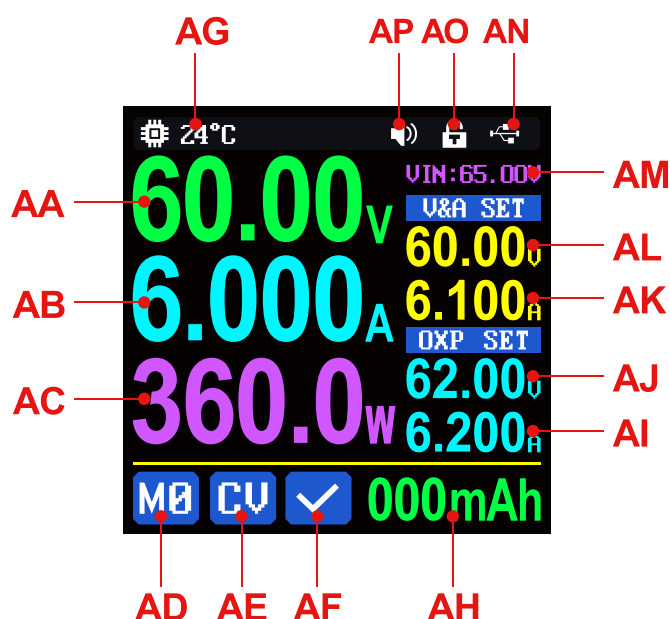
The external fan interface is set to 5V and the current is limited to 200mA. When the system temperature is higher than 80℃, the output will be shut down and show OTP on the screen. Communication interface is only for our communication board, please don't connect to other modules or cables.




1.4 Operation Instruction

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

1.4.1 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: System temperature	AH: Loop 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

When the actual value of output current $> 4A$ or system temperature $> 45^{\circ}C$, the external fan socket output 5V, turn on external cooling fan, when the actual value of output current $< 3.9A$ and system temperature $< 40^{\circ}C$, the external fan socket stop output, fan stop, when the system temperature is greater than $90^{\circ}C$, protection status indication display  and close output.

In the cyclic display area, capacity, energy and external sensor temperature are displayed cyclically. Capacity and energy accumulation after power on, zero after power off, external temperature sensor needs 10K NTC B3950 if you need that.


1.4.2 Operation Introduction


In the menu operation, the icon in red or cursor is the currently selected menu, press the encoder potentiometer to switch the menu, press  to confirm or enter, press the direction button to move the cursor, rotate the encoder potentiometer to change the setting, press the  button again to save the setting. **Press and hold the  button and power on to restore the factory settings, press and hold the  button and power on to restore the factory calibration value, press and hold  and power on to enter the boot mode.**



1.4.2.1 Main Page Output Voltage and Current Setting



Output voltage and current setting operation video:





To be uploaded

Press  button to set the output current value, you can rotate encoder potentiometer to adjust the output value, or press the encoder potentiometer to move the cursor.

Press  button to set the output voltage value, the operation way is similar to output current setting.

Long press  button /  button to set the over current protection/ over voltage protection value. The operation way is similar to output current setting. If you want to set the over current auto cut off function, your OCP value should be higher than the Current setting value.




When the device is under constant voltage mode, it will show , and it will show  when under constant current mode; when the device works normally it



will show  at protection status indication, when the actual output current value is higher than the over current protection value(OCP), the output will be cut off automatically, and show , when the actual output voltage value is higher than the over voltage protection value(OVP), the output will be cut off automatically, and show , when the system temperature is higher than 80°C, the output will be cut off automatically, and show .



1.4.2.2 Data Group Quick Storage and Call out




Data group quick store and call out operation video:

To be uploaded

Long press  button, you can store the **output voltage value, output current value, over voltage protection value, over current protection value**(as shown in Figure 1), rotate the encoder potentiometer to change the data group, press the encoder potentiometer and then press  button to confirm, it will show  on the bottom left to show the current data group.

Long press the encoder potentiometer  to call out the stored setting in the data group(as shown in Figure 2), press the  button and the **output voltage value, output current**



value, over voltage protection value, over current protection value will be changed, it will show  on the bottom left to show the current data group, change the settings manually again it will show , if you disable the **Call Out OK** in the system setting page, it will not prompt the confirm windows and change the settings directly.

 is the default data group, when you edit the settings and press  button or the cursor disappears, it will be stored into  automatically.

1.4.2.3 System Setting

System setting operation video:

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Press  to enter the system setting menu, the icon in Red shows the menu being chosen, press  to enter the sub-menu, the option in blue is the option

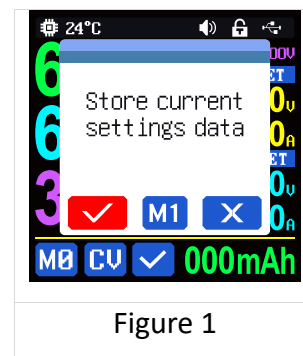


Figure 1

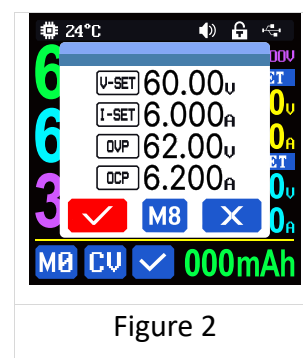




Figure 2

being chosen, you can rotate the encoder potentiometer to change setting, Press

 to return and you can press encoder potentiometer to select menu.

Press  to enter the system setting menu(as shown in Figure 3), press  to enter the sub-menu.



Settings Sub-menu(figure 3,4):

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

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.

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  on the top, and you can hear the beep when press the button. When set it OFF, it will show , 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 S(low)/M(middle)/H(high), it is the fresh rate of the real output voltage and current.

Max Power is set to 380W by default, you can set it between 0-380W, it is the max output power. 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



Figure 3



Figure 4

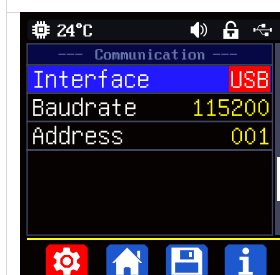






Figure 5

to set the value as the rated power of the power source*95%.

Temperature unit is °C by default, it can be switched between °C and °F (figure 4);

Rotate is default 0, you can set it 90, 180, 270, after setting the display will rotate

Communication Sub-menu(figure 5):

Interface is set to USB by default, you can also set it to Bluetooth/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 Bluetooth board to use the Bluetooth function, and it will show  on the top, and when the communication starts, it will show ; TTL and RS485 is not available now;




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.

1.4.2.4 Main Page Display Style Setting

Main interface display style setting operation video:

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You can press  to enter the system setting menu, then press encoder potentiometer  and it will be switched to Layout menu(as shown in figure 6): you can press  to enter the sub-menu.

Layout Sub-menu:

Digits Style is set to Normal by default, you can set it to NORM/Seg1/Seg2(as shown in figure 7).

Custom Colors(figure 8,9):

You can set the the display colors for output voltage, output current, output power.....as shown in figure 8 and figure 9. After change the color, you need to turn on the **Custom Colors** option to apply the settings(as shown in



Figure 6

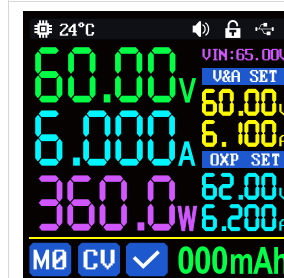


Figure 7

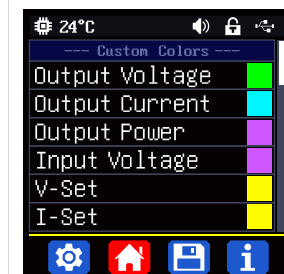


Figure 8

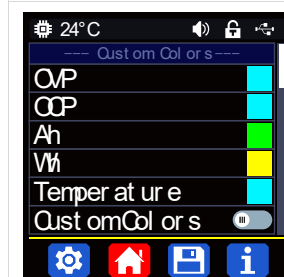




Figure 9










figure 9).

1.4.2.5 Storage Data Setting

Data group setting in manual operation video:

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Press  to enter the system setting menu, then press encoder potentiometer  twice and it will be switched to data group menu(as shown in figure 10):

Press  to enter the menu and choose the data group, press the encoder potentiometer  to setting page, you can see there is cursor on the digit, rotate the encoder potentiometer  to change the setting, press the encoder potentiometer  to move the cursor, press the  and  button to select the option. You can press  button to return to data group choosing menu, press  button again to the main menu, press  a third time to return to the main display interface.

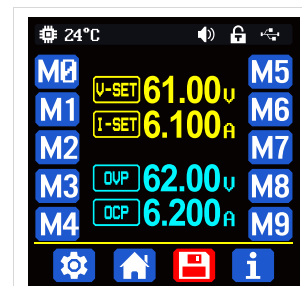




Figure 10

1.4.2.6 System Information

System information operation video:

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Press  to enter the system setting menu, then press encoder potentiometer  3 times and it will be switched to system menu.(as shown in figure 11).

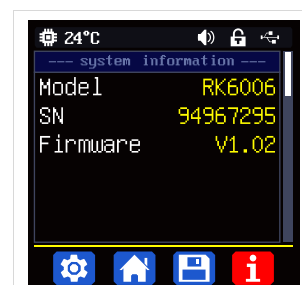


Figure 11

Model is the device name, **SN** is product serial number, **Firmware** is the firmware version

Android APP Instruction

2.1 Mobile Phone APP Installation

Only RK6006-BT supports Bluetooth 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, please install and test the software before buying the product. It will apply for Bluetooth function and 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 Bluetooth module when the device is powered on, otherwise it will be damaged.** This instruction is made for version 1.0.13, 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 APP in Google Play by searching “Ruideng tech”.
If you cannot find the app, contact the seller to get it.

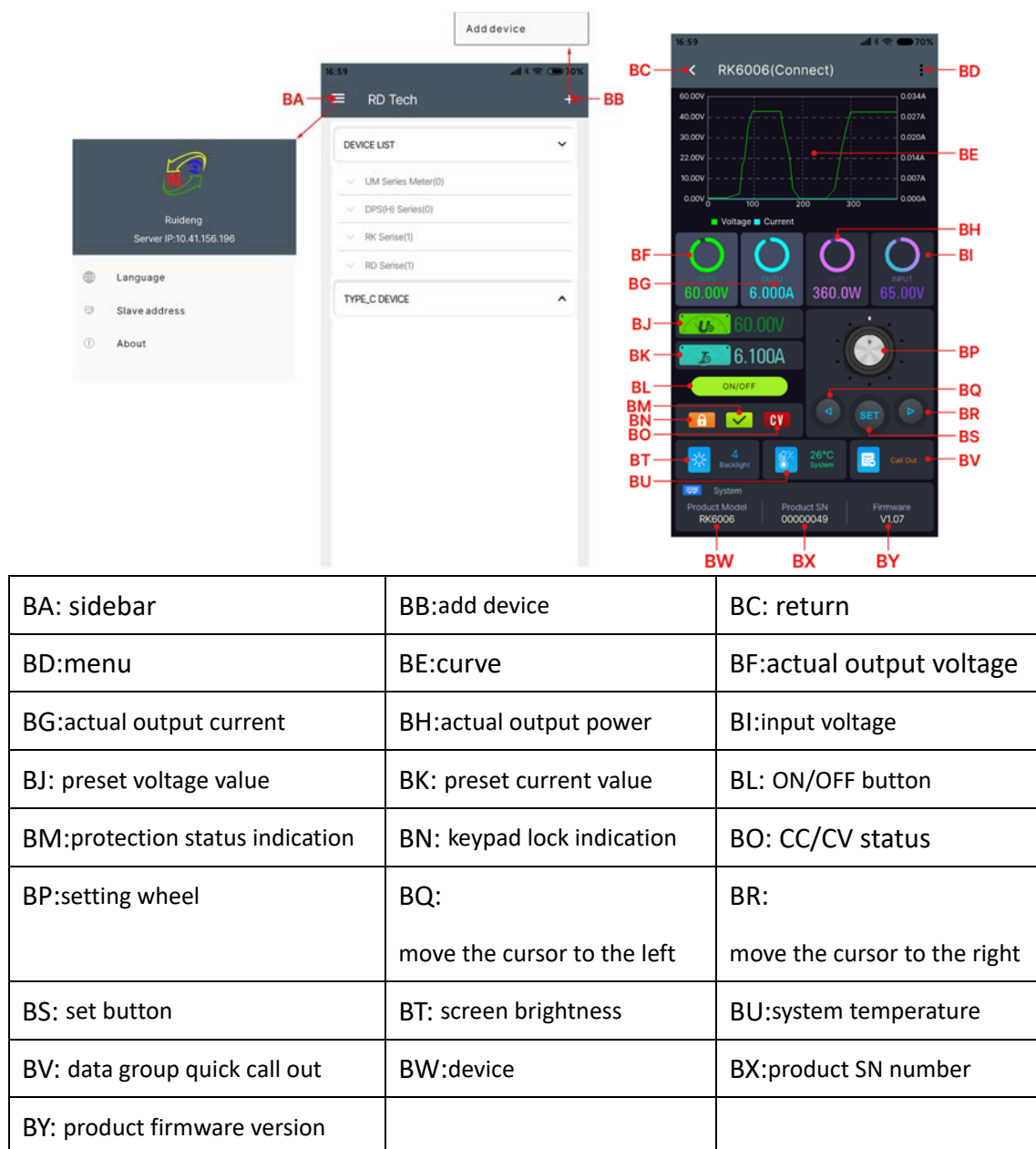
2.2 Installation Introduction

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. The middle is the main interface, the left is the setting interface, and the right is the connection success interface.



2.2.3 APP Operation

2.2.3.1 APP operation

Click **“BA”**, you can set the language and device address in the sidebar.

Click **“BB”**, you can add RK6006, search and add, the code is 1234, after matching, you can return to the main interface to choose RK series.

Click **“BD”** to exports the voltage-current curve to excel file, up to 24 hours document can be recorded.

“BE” is curve, you can display two curves at the same time by clicking **BF**: Output voltage actual value, **BG**: Output current actual value, **BH**: Output power, **BI**: Input voltage control chart.

Click **“BJ”** to set the output voltage, and use the wheel **“BP”** to adjust the value,

the **"BQ"**, **"BR"** to change the position of cursor, click **"BS"** to set the parameter. .

Click **"BL"**: Output on/off key, can control the power supply output, the function is equivalent to the output on/off button of the product.

Click **"BT"**: Backlight brightness, you can set the backlight brightness of the product screen

Click **"BV"**: Quick call out can quickly call out the data group 1-9.

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

Bluetooth connection only supported for RK6006-BT.

3.1.1 APP Download

Apple APP only supports IOS10.0-14.3, iphone6 and above models, search for "Ruideng tech" in the Apple store to download. If you must use the software function, please pre-install the test first. To use the Bluetooth 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 1.1.16, it is recommended to upgrade to the latest software for a better user experience.

3.2 Installation and Operation

When the software is started for the first time, the system may apply for position and Bluetooth function, please allow all the permission from the APP.

After installation, you can see this APP logo

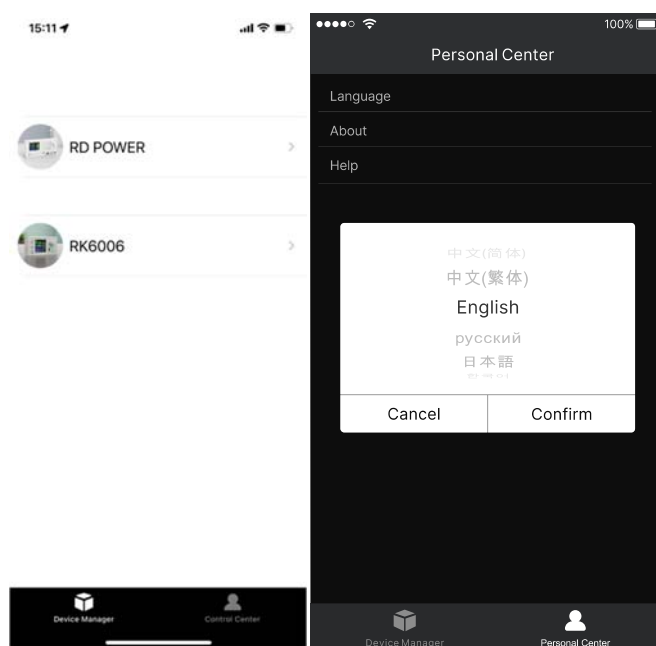


3.2.1 APP Update

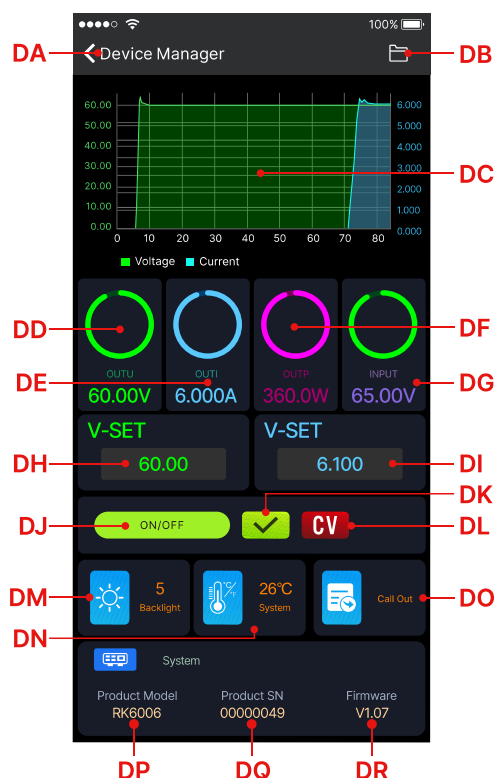
You can get the latest software from the Apple Store. When the software is updated, you will be prompted to update the version.

3.2.2 UI Introduction

When you turn on the app, you can see the device management in the picture below left, you can set the language in the control center as displayed blow right .



It will show RK6006-BT automatically, You can see the user interface as shown in Picture below.



DA: connect/disconnect	DJ: output ON/OFF button
DB: export data to mobile phone	DK: protection status indication
DC: data curve	DL: constant voltage/ constant current status
DD: actual output voltage	DM: screen brightness
DE: actual output current	DN: system temperature
DF: actual output power	DO: data group quick call out
DG: input voltage measurement value	DP: model being connected
DH: preset voltage value	DQ: product SN number
DI: preset current value	DR: product firmware

3.2.3 APP Operation

Click **"DB"** to exports the voltage-current curve to excel file, up to 24 hours document can be recorded.

"DC" is curve, you can display two curves at the same time by clicking **DD**: Output voltage actual value, **DE**: Output current actual value, **DF**: Output power, **DG**: Input voltage control chart.

Click **"DH"** / **"DI"** 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 **"DM"**: Backlight brightness, you can set the backlight brightness of the product screen

Click **"DO"**: Quick call out can quickly call out the data group 1-9.

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 1.0.0.15, there will be little difference between different versions, the version below does not support RK6006. and we do recommend you to download the latest software for better experience.**

4.1 Software Download

RK6006 digital power supply file download link:




https://drive.google.com/drive/folders/1U1g45_d_W2IXQlo4-s5pp4lnu72SbYW6?usp=share_link

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 RK6006 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

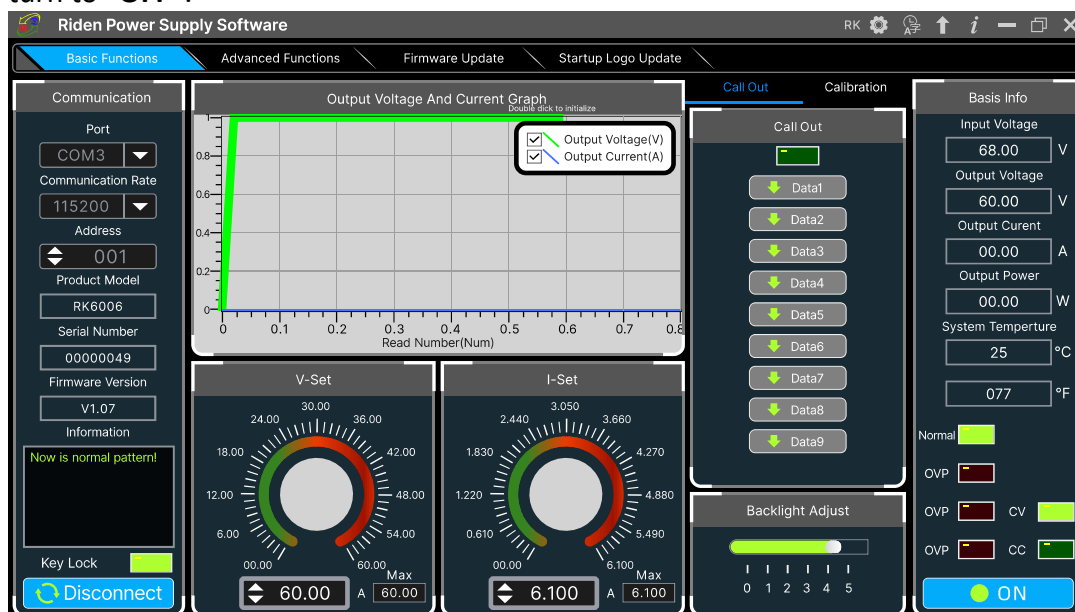
4.2.1 Software Connection

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

4.2.2 PC Software Operation Instruction

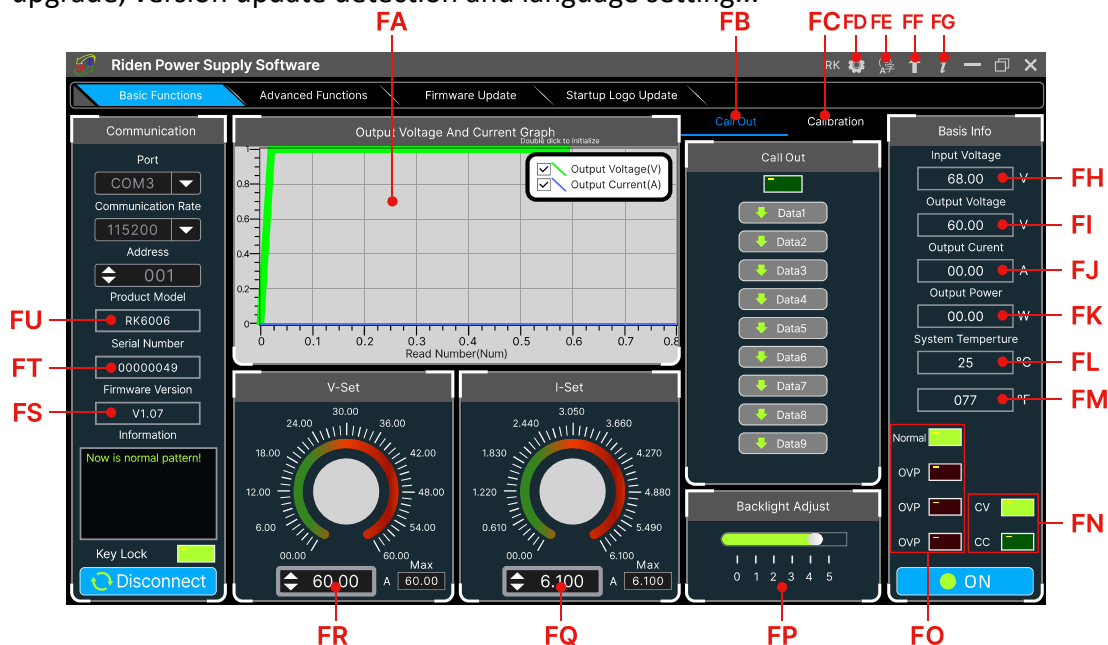
Choose the right communication port, baud rate, slave address (default 001), click **"CONNECT"** to start communication. If the communication succeeds, the power

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: Data Group Quick Call Out
FC: Calibration	FD: RD//RK/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(°C)
FM: System Temperature(°F)	FN: Constant Voltage/ Constant Current Status
FO: Protection Status Indication	FP: Screen Brightness Setting
FQ: Output Current Preset value	FR: Output Voltage Preset value
FS: Firmware Version	FT: Serial Number
FU: Product Model	

4.3.1 Basic Functions

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

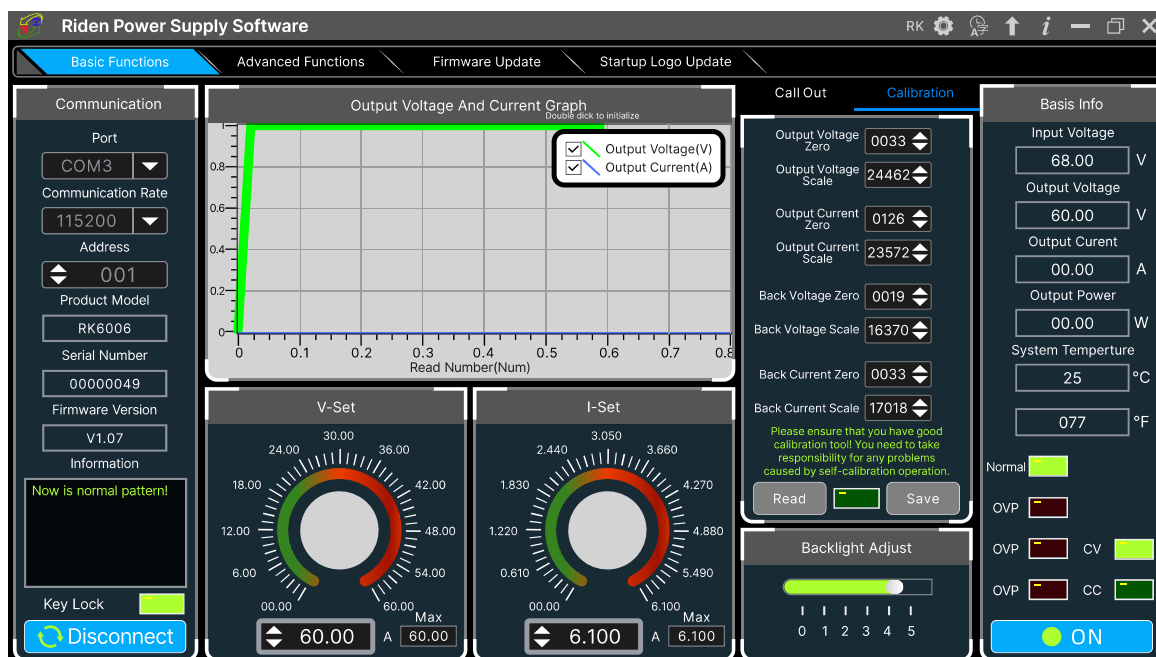
The calibration fine-tuning function needs to be operated by a professional electronic person who has more than Six and a half digit multimeter. It will change the system setting, incorrect operation may exceeds the hardware limit and cause damage, and the resulting damage is not covered in the warranty! 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.

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.

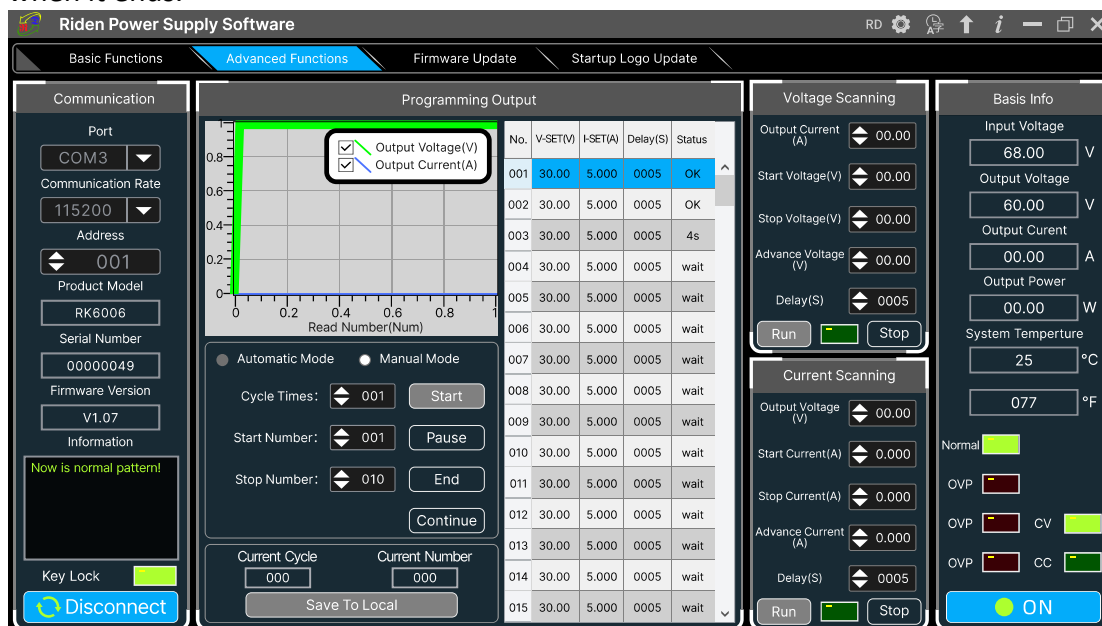
Set the output voltage at 1V and calibrate the actual output voltage zero point to make the actual output voltage displayed on RK6006 close to the value on multimeter. You can set 30V and calibrate the proportional value of actual output

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).



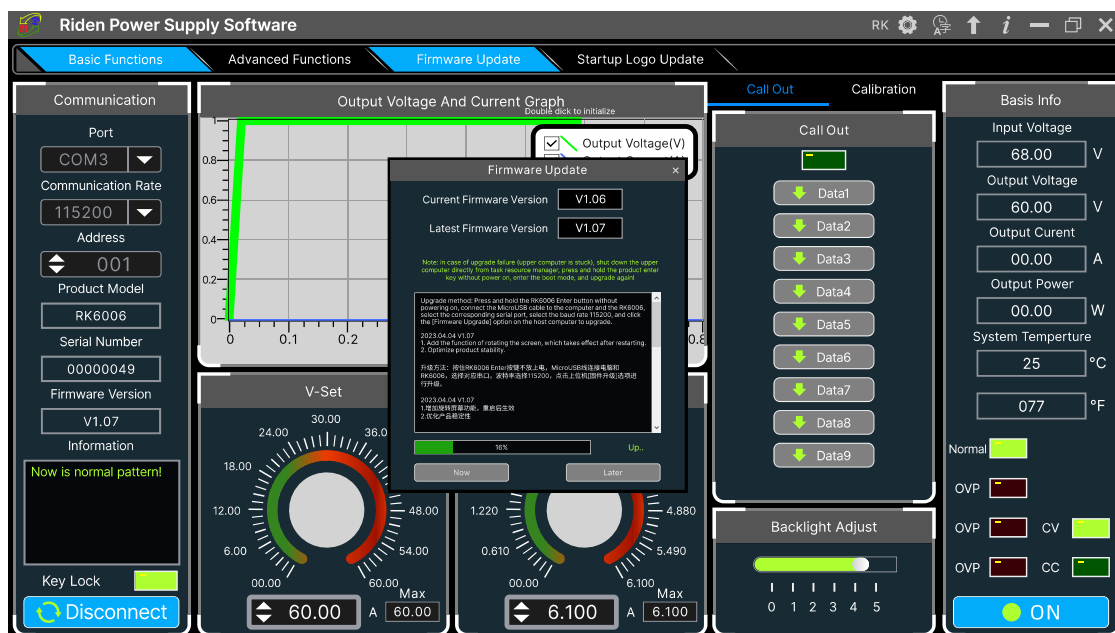
4.3.3 Advanced Function

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 Firmware Update

Press and hold **ENTER** and power on RK6006, 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 Bluetooth connection mode).



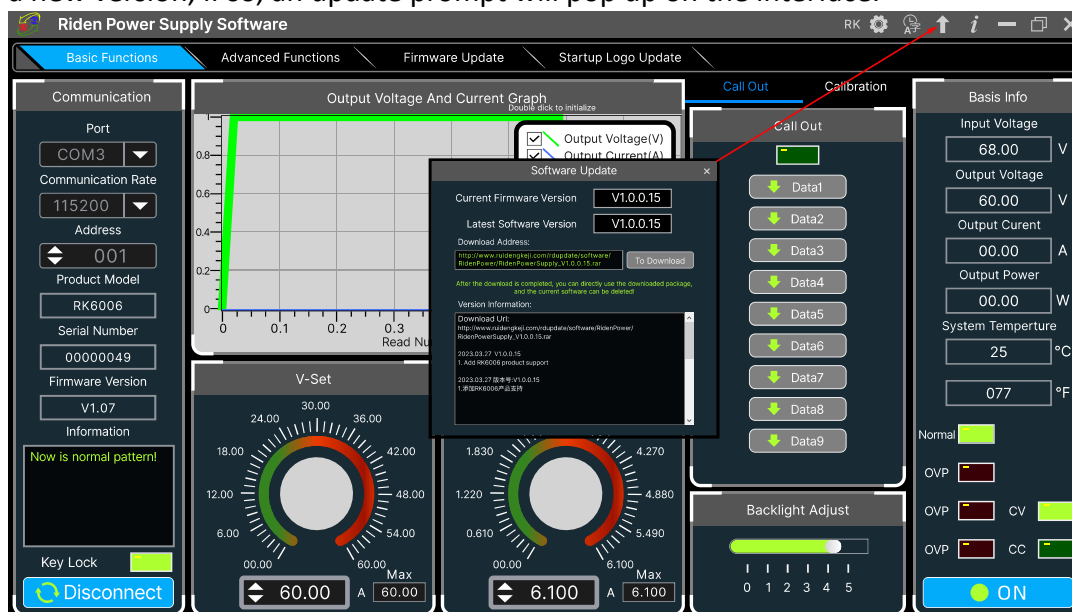
4.3.5 Boot Logo Update

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.



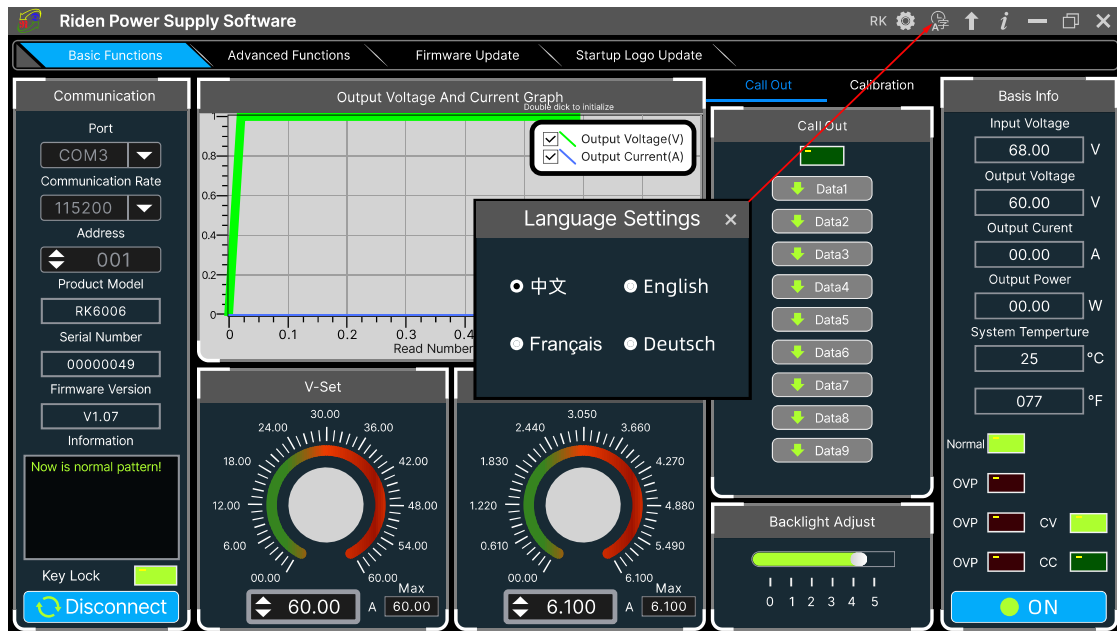
4.3.6 Version Update Detection

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.



4.3.7 Language Setting

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



4.3.8 About

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

