

OPERATING MANUAL

VAC8610F
Wireless Voltage
Ampere
Voltage Meter

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Zhengzhou Blue Electronic Technology Co. Ltd

Retention title

Contact information

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Open-box inspection

As you get a new VAC8610F multifunctional voltage ammeter, it is recommended that you follow the following steps to check the instrument.

1. Check for damage caused by transportation.

If the packing carton or bubble bag protection pad is found to be seriously damaged, please keep it until the whole machine and accessories pass the test.

2. Check that the items in the packing box are complete.

The contents of the packing box are described below. If the content does not match or the instrument is damaged, please contact the dealer or our company.

Host :1 VAC8610F(including display head and measuring board

Annex: User Manual (pdf Edition)1

3. check the whole machine.

If the appearance of the instrument is found to be damaged, the instrument is not working properly, or fails to pass the performance test, please contact the dealer or our company.

Chapter I Overview

I. Introduction to the Instrument

VAC8610F is a multifunctional instrument based on 2.4G wireless data transmission technology, which can display voltage, current, power, capacity, energy, temperature, running time and other physical parameters in real time. battery charging and discharge management, overvoltage, undervoltage, overcurrent protection and buzzer alarm can be realized by two relay interfaces reserved. And the instrument uses 2.4 inch color liquid crystal as the display, the display data is more comprehensive, clear, easy to observe, reserved communication interface, easy to secondary development.

II. Main characteristics

1. wireless data transmission, to avoid the display and detection module between the complex wiring interference, while the wiring is more convenient;
 2. hall sensor to achieve non-contact detection of current without disconnecting wire, safe, reliable, convenient;
 3. voltage, current, power, temperature (optional), capacity, percentage of residual capacity, running time display at the same time;
 4. charging and discharging double relay interface ,5 relay working modes can realize automatic disconnection and automatic closure of charge and discharge
 5. has charging overvoltage, discharge undervoltage, charging overcurrent, discharge overcurrent protection, and with buzzer alarm function;
 6. with power off memory function, can record the number of AH and WH before power off;
 7. the percentage progress bar when charging switch to color flow light display, enhance the display effect;
 8. with voltage, current, temperature waveform display function;
 9. own TTL serial communication function, easy to secondary development;
- Chinese and English language selection, two display color can be switched, three display interface adjustable, suitable for different customer needs;

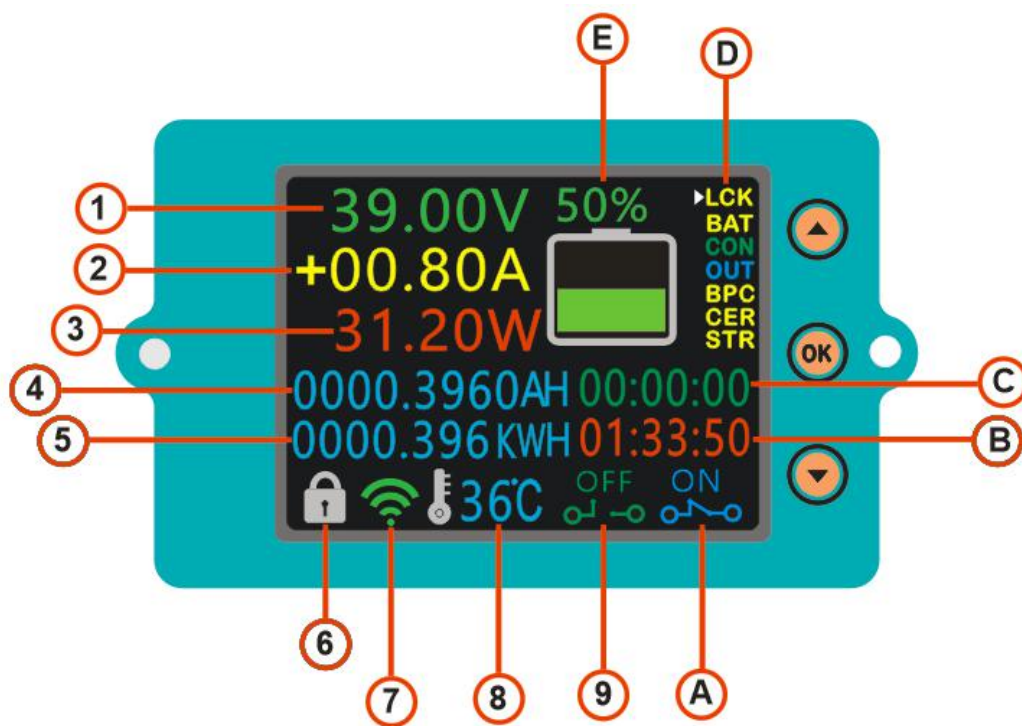
III. Technical indicators

Project		Parameters	
Input voltage	Measuring range for self-powered	8V~100 V	
	Measuring range for external power supply	100V Series	0-120V
		500V Series	0-500V
Input Current Measurement Range		50A Series	0.1-50 A
		100A Series	0.2-100 A
		200A Series	0.3-200 A
		300A Series	0.4-300 A
		500A Series	0.5-500 A
External supply voltage		8-60V	
Display language		C/E	
Communication channels		0-40	
Display mode		2.4 inch colour LCD display	
Display power supply		USB supply	5V
		Independent Power Supply	8-12 V
Scope of measurement	Capacity	0.001 AH ~ 99999.9999AH	
	Energy	0.001 KWH~9999 .999KWH	
	Time	0~100 hours	
	Power value	999KW	
	Temperature	1~100℃	
Accuracy	Voltage	±(1+2) words	
	Current	±(1+5) words	
	Temperature	±2℃	
Measurement rate		20 per second	
Relay delay time		(0-60) S	
Port baud rate for serial communication		9600Bps	
Wireless communication distance		General version	Open space transmission 10 meters
		Enhanced version	Open space transmission 50 meters
Protection Type and Scope	OVP(overvoltage protection)	0.1 V~500 V	
	LVP(undervoltage protection)	0.1~500 V	
	OCP(charging overcurrent protection)	0-500A	
	NCP (discharge overcurrent protection)	0-500A	
Display panel size		87*49*14(mm)	
Measuring board size		114*54*28(mm)	

Table 1-1 VAC8610F Technical indicators

Chapter II Description of the Instrument

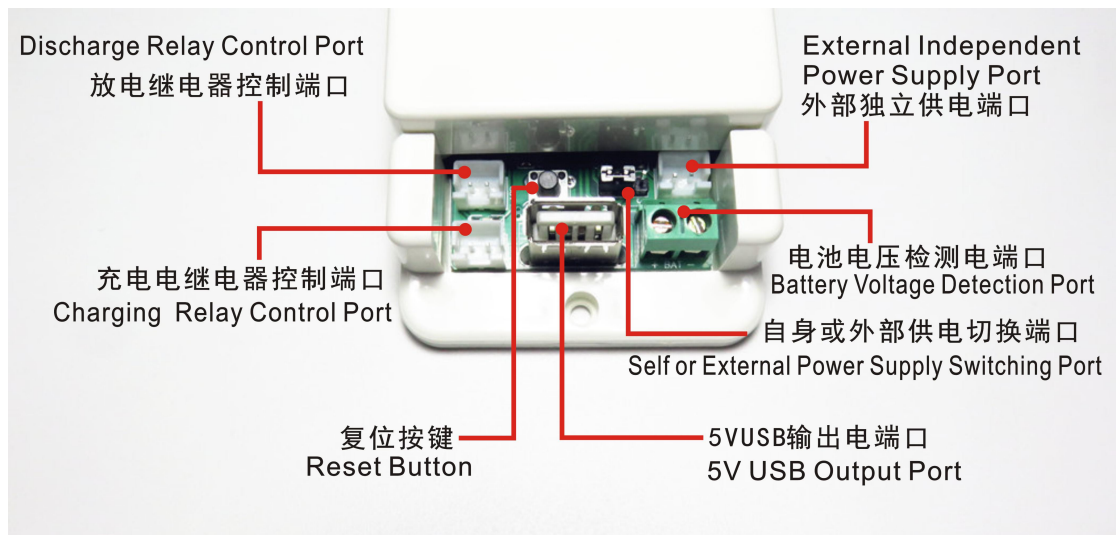
I. Presentation



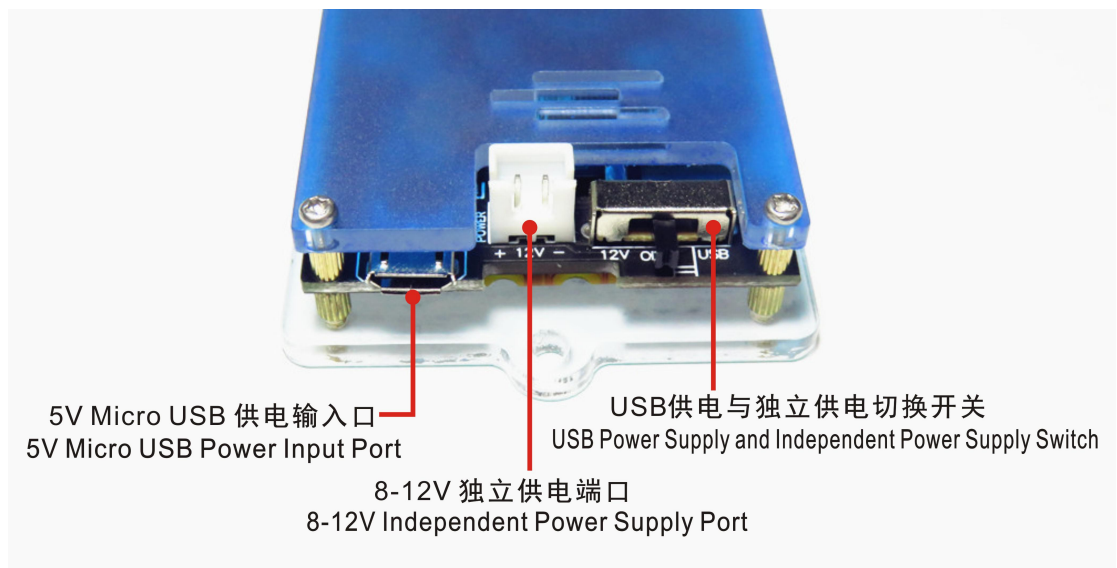
II.

1	Actual voltage value	8	Real-time measurement of temperature
2	Actual current value	9	Working state of charging relay
3	Actual functional rate value	A	Working state of discharge relay
4	Cumulative AH	B	(OTP=0) Ordinary timer ,(OTP >0) Timing timer
5	Cumulative WH	C	Time required for battery filling or discharge (based on charge/discharge current and capacity)
6	Press lock indication	D	Function Settings Options
7	Wireless communication signal indication	E	Percentage of remaining capacity

II.Description of interface of measuring board

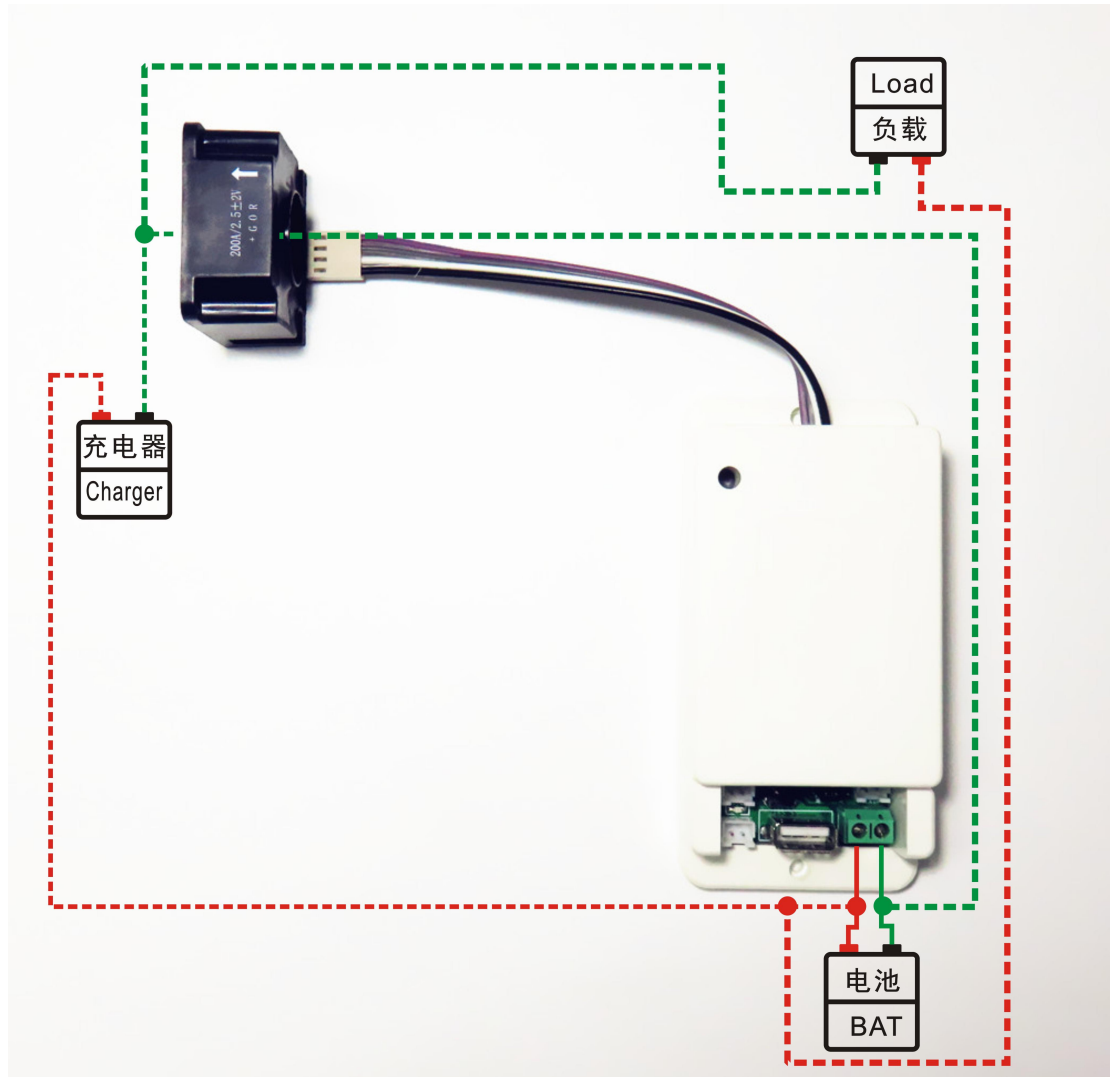


III.Display Interface Description



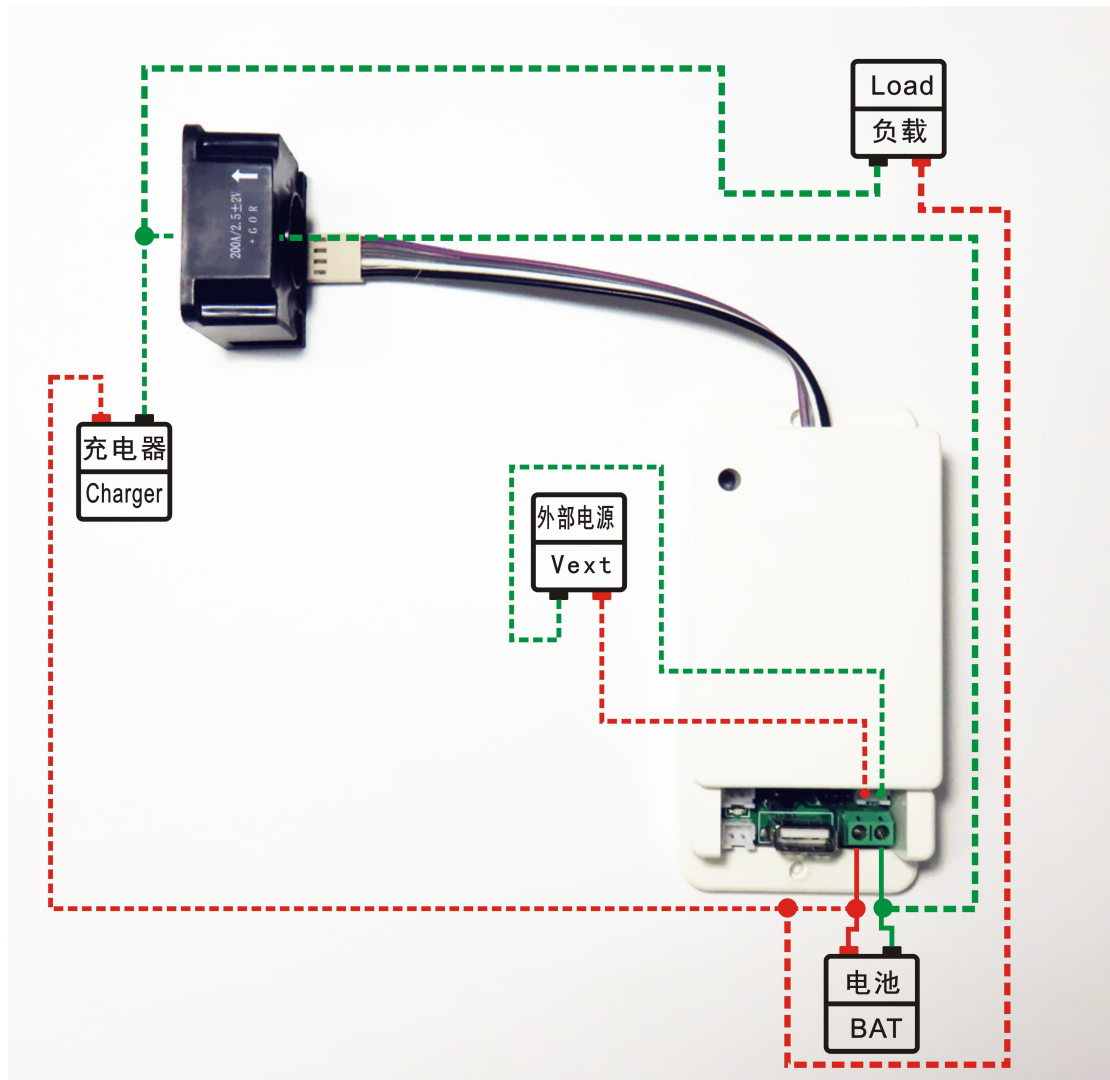
IV. Wiring

(1) Self-supply wiring instructions (red positive, green negative)



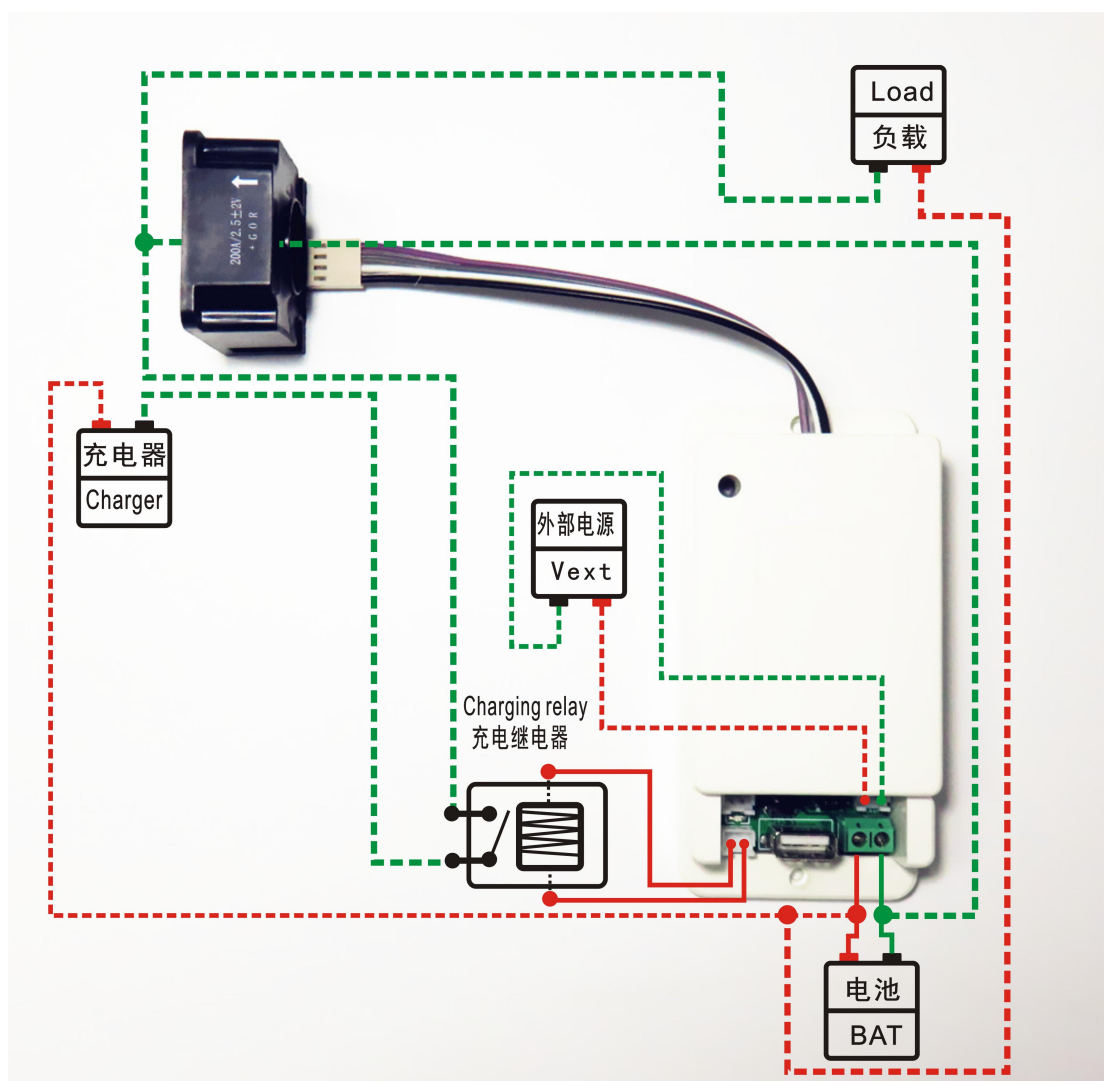
Note: if the voltage range of the battery (power supply) under test is between (8-100 V), the jumper cap of the power supply selection interface can be adjusted to "2 W" first. Connect the positive and negative electrodes of the battery (power supply) to the voltage measurement port "+Bat-"; If the current direction of the current flowing through the Hall sensor is the same as the direction of the arrow on the Hall sensor, the measured current will show positive value, whereas the measured current will show negative value, otherwise the measured current will show negative value

(2) External power supply wiring instructions (red positive, green negative)



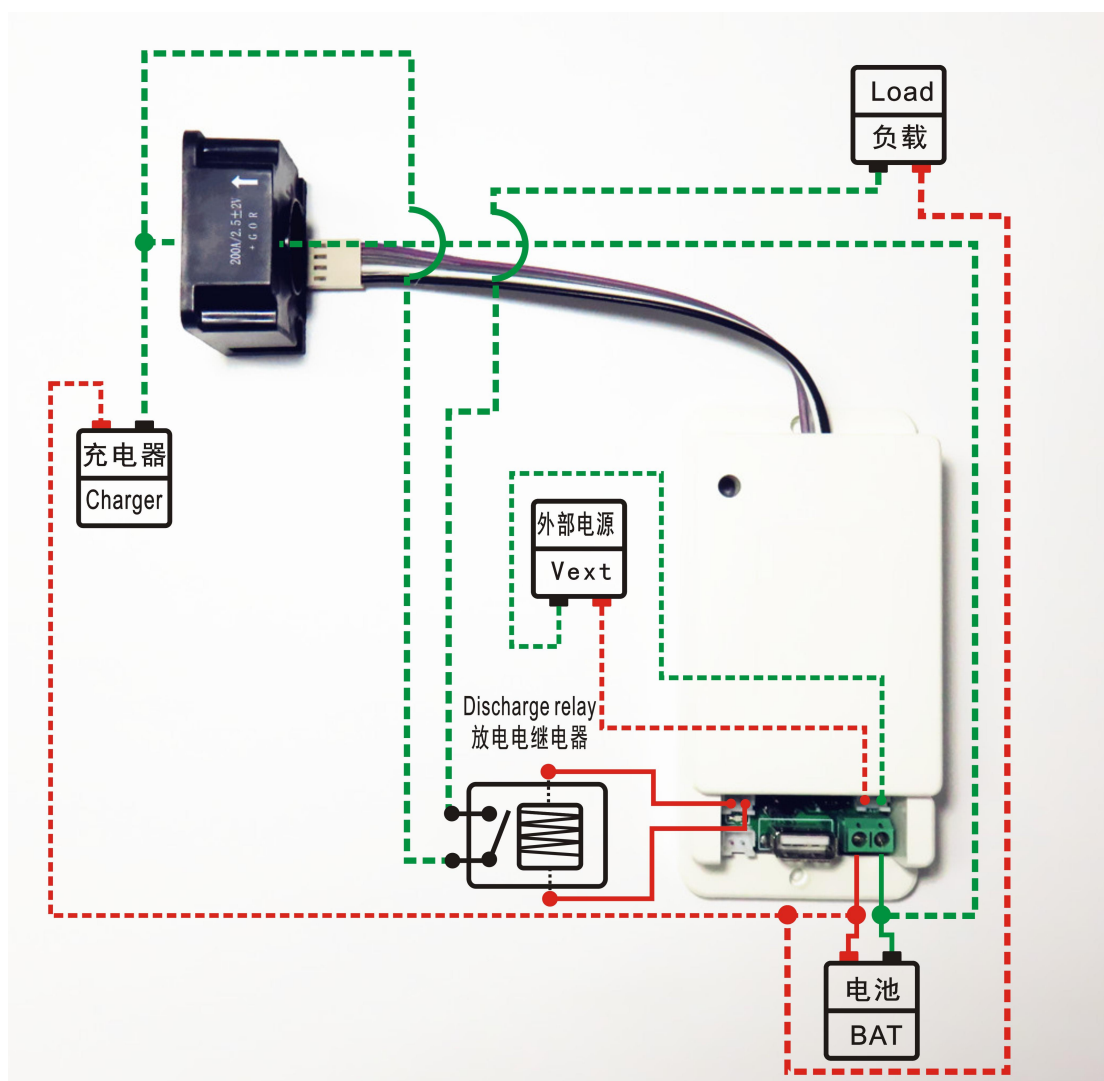
Note: if the voltage range of the battery (power supply) is not between (8-100 V), the jumper cap of the power supply selection interface can be adjusted to "3 W" first. Connect the positive and negative poles of the battery (power supply) to the negative pole of the external power supply. Do not misconnect or reverse the positive and negative electrodes of the battery (power supply). Connect the positive electrode of the battery (power supply) to the negative electrode of the load through the Hall sensor. When the current direction flowing through the Hall sensor is consistent with the arrow direction on the Hall sensor, the measured current is positive and negative.

(3) Charges relay wiring instructions (red positive, green negative)



Note: the working power of the relay is provided by external power supply, if the relay is connected, it should provide an external power supply with the same working voltage as the relay. Connect the control port of the relay to the charging controller interface, if you want to control the charging positive pole, pass the positive pole through the relay, and if you want to control the charging negative pole, connect the negative pole to the relay. When the relay is sucked, the “IN” lights are lit and extinguished as a hint.

(4) Discharge relay wiring instructions (red positive, green negative)



Note: the working power of the relay is provided by external power supply, if the relay is connected, it should provide an external power supply with the same working voltage as the relay. Connect the control port of the relay to the interface of the discharge controller. If you want to control the positive electrode of the discharge, pass the positive wire through the relay, and if you want to control the negative electrode of the discharge, connect the negative wire to the relay. When the relay is sucked, the “OUT” lights are lit.

Chapter III Description of use

I. Wiring

Select the appropriate wiring method according to the range of the measured voltage to ensure that the input voltage is within the range of the instrument. The external power supply voltage is 8-60V, and the measured voltage exceeds 70V. It is better to use independent power supply for the display screen to reduce the power consumption of the motherboard.

Note: Self-supply detection voltage range :8V ~100V;

Test voltage range for external supply :0V ~120V;

II.Parameter Introduction and Setting

Parameter settings have a total of 4 pages, click the next key, you can enter the next parameter or enter the next parameter settings page

(1) "LCK" key lock control, this function can lock the keys to prevent incorrect operation to change the parameters, long press the up key to unlock;

(2) "BAT" set the total battery capacity value, which is used to calculate the percentage of battery residual capacity, the specific parameter setting method reference parameter setting method 1;

(3) "CON" the charging relay control option, move the cursor to this option, click the OK button to control the charging relay on and off;

(4) "OUT" the discharge relay control option, move the cursor to this option, and click the OK button to control the on-off of the discharge relay;

(5) "BPC" set the percentage of battery residual capacity, specific parameter setting method reference parameter setting method two;

(6) "CER" the no-load current zero option, move the cursor to this option in the no-load state, and click the OK button to zero the no-load current when the no-load current value is not zero;

(7) "STR" the timing function control option, move the cursor to this option, and click the OK button to start or pause the timing count;

(8) "TTL" the default discharge output relay status setting option, move the cursor to

this option, click the OK key to enter the settings interface, click the upper key or lower key adjustment option, and then click the OK key to exit the settings page;

(9)"NCP" setting the protection option of charging overcurrent value, when the external relay controls charging, when the charging current value is greater than the NCP set value, the charging relay will disconnect and stop charging, and the buzzer will alarm. Specific parameter setting method reference parameter setting method 1;

(10)"OCP" set the protection option of discharge overcurrent value, when the external relay controls the discharge, when the discharge current value is greater than the OCP set value, the discharge relay will disconnect and stop the discharge, and the buzzer will alarm. Specific parameter setting method reference parameter setting method 1;

(11)"SFH" the communication channel search function, the display can not accept the signal of the measurement module, enter this option, by adjusting the channel value, search for the signal channel value, the channel is a matching successful channel value;

(12)"FCH" the communication channel setting function to set the search SFH value to the FCH, the next time the power on the default matching channel value;

(13)"OVP" set the protection option of charging overvoltage value, when the external relay controls charging, when the charging current value is greater than the OVP set value, the charging relay will automatically disconnect, stop charging and the buzzer will alarm; and when the OVP value is not 0, the battery capacity will automatically return to 100 when the battery voltage is greater than OVP;

(14)"LVP" set the protection option of discharge undervoltage value, when the external relay controls the discharge, when the battery voltage value is less than the LVP set value, the discharge relay will disconnect and stop the discharge, and the buzzer will alarm. Specific parameter setting method reference parameter setting method 1;

(15)"STV" setting the protection option of the voltage value of the discharge start voltage, when the battery discharge relay is disconnected and the battery charging voltage is higher than the voltage value set by the STV, the discharge relay is automatically closed, and the specific parameter setting method refers to the

parameter setting method 1;

(16) "BWH" set the total energy value of the battery, which corresponds to the nominal WH number of the battery, the specific parameter setting method reference parameter setting method 1;

(17)" DEL" setting the relay delay action time value, when the actual parameter value exceeds the protection value, the relay will not start the protection function if it returns to normal within the DEL set delay time, and the specific parameter setting method refers to the parameter setting method 1;

(18)" STI" the option of setting the current value of the screen, after setting this parameter, when the actual current value is less than the set current value for a period of time, the LCD screen of the display will automatically extinguish, and when the actual current value is greater than the set current value, the display screen will automatically light up. Specific parameter setting method reference parameter setting method 1;

(19)" TME" set the time value option of the fixed screen, after setting the parameter, when the S TI value is 0, the time is started when no operation is done on the display, and when the time value exceeds the set TME time value, the display will automatically extinguish

When the STI value is less than 0, when the actual current value is less than STI, the LCD screen automatically extinguishes when the timing time value is greater than the TME value. When the actual current is greater than the set value, the LCD screen automatically lights up;

"(20)" HUM" the LCD display color switching option, move the cursor to this option, click the OK key to enter the settings interface, click the upper key or lower key to adjust the option, and then click the OK key to exit the settings page, after restart into the changed settings state;

(21)" LAG" the LCD display language option, move the cursor to this option, click the OK key to enter the settings interface, click the upper key or lower key to adjust the option, and then click the OK key to exit the settings page, and the display restarts and enters the changed settings state;

(22)"OTP" setting the time value option for discharge, after starting the timing function, the output state of the discharge relay will be switched when the timing time value is greater than the OTP value, and then click STR to return to 0 to restart the timing;

(23)"RUN" curve mode waveform refresh start and stop control option, move the cursor to this position, click OK key to start or pause waveform refresh;

(24)" CRU "; reservation non-functional

(25)" UYD" the curve shows the voltage magnification option, and when the voltage value is too small to be displayed in the waveform table, the display effect of the voltage waveform curve can be enhanced by adjusting the parameter value of the option;

(26)" IYD" the curve shows the current magnification option. When the current value is too small to be displayed in the waveform table, the display effect of the current waveform curve can be enhanced by adjusting the parameter value of the option;

(27)"RSH" the curve refresh time adjustment option, by adjusting the parameter value of the option can speed up or slow down the curve waveform refresh time;

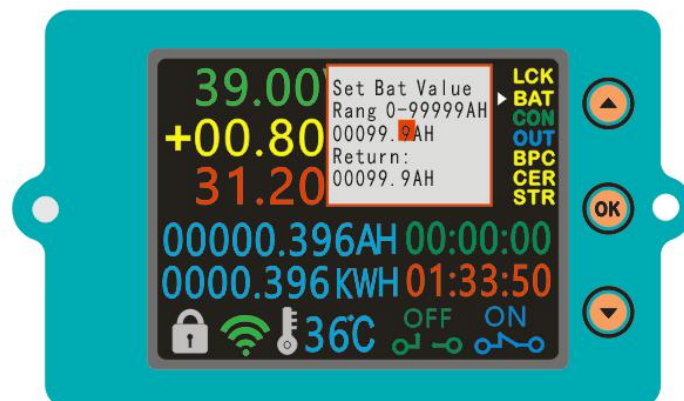
(28)"SVE"; reserved non-functional

(29)"MOD" relay operating mode switching options, there are five relay working modes; set five working modes to match different customer requirements;

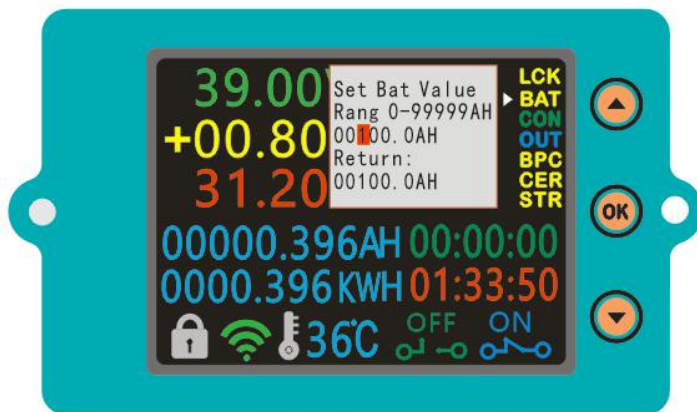
Project	Battery voltage below LVP discharge relay disconnected	Battery voltage below LVP charging relay closed	Battery voltage higher than OVP charging relay disconnected	Battery voltage higher than OVP discharge relay closed	Battery voltage higher than STV discharge relay closed
Mode 0	Automatic regulation	Manual adjustment	Automatic regulation	Manual adjustment	No
Mode 1	Automatic regulation	Manual adjustment	Automatic regulation	Automatic regulation	No
Mode 2	Automatic regulation	Automatic regulation	Automatic regulation	Manual adjustment	No
Mode 3	Automatic regulation	Automatic regulation	Automatic regulation	Automatic regulation	No
Mode 4	Automatic regulation	Automatic regulation	Automatic regulation	No	Automatic regulation

Parameter setting method 1: here according to the setting B AT as an example, how to set parameters;

1: first click on the upper key or lower key to move the cursor to the BAT position, click on the OK key to enter the parameter setting page, as shown in the following figure;



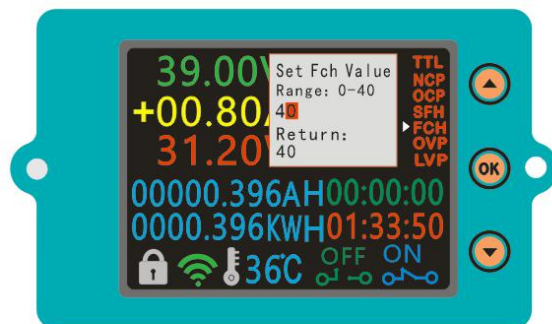
2: click the lower key to switch the parameter adjustment bit, click the upper key to change the parameter value, when the return value and the set value are the same as the data sent successfully, click the OK key to exit the parameter save, At the same time, the buzzer will send an alarm to indicate that the parameter is saved successfully.



Parameter setting method 2: here according to the set communication channel value FCH as an example, how to set parameters;

1: first click on the upper key or lower key to move the cursor to the FCH position, click on the OK key to enter the parameter setting page, as shown in the following figure;

2: click the lower key or the upper key to change the parameter value. When the return value and the set value are the same as the data sent successfully, click the OK key to exit the parameter save, and the buzzer of the measuring board will send out the alarm sound to show that the parameter is saved successfully.



III. Display mode switching

The instrument has three display modes: full data mode, simple data mode, voltage, current and temperature curve display mode. The method of display mode switching: select the first item of cursor movement function, then click on the upper key to switch the display mode, and the instrument will remember the set selection mode.



Description: Green curve is voltage curve, red curve is current curve, The orange curve is the temperature curve, The corresponding voltage range of the Y axis V,0-500 Current range 0-500A, Temperature range 0-100 degrees Celsius, When the measured data is too small, For example, the current is only 0.8A so it is not obvious in the curve, By adjusting the current curve magnification IYD to 50, Amplify the Y axis of the current curve 50 times, So the current curve is more obvious. voltage curves can be set UYD to achieve the same effect. Y axis coordinates have 270 points, The longest refresh time is 90 seconds, By setting a curve to record a battery charge discharge, Realize intuitive performance judgment.

Communication Protocol:

Baud rate: 9600

Send data format 0xFA +(FCH value)

Beginning value 0xFA(hexadecimal)

The address bit (FCH value) is converted to the corresponding hexadecimal number if

the FCH value is tested with the serial port assistant

If sent: 0xFA 0x40

Returns 27 data:

Data1= xFA0

Data2=FCH

DC current value: $(\text{Data3} \ll 8 | \text{Data4}) / 1000$

DC voltage value: $\text{Data5} \ll 8 | \text{Data6}$

Cumulative energy value (WH): $(\text{Data7} \ll 24 | \text{Data8} \ll 16) / 1000$

Cumulative capacity value (AH): $(\text{Data11} \ll 24 | \text{Data12} \ll 16) / 1000$

Percentage of residual capacity: $\text{Data15} / 100$;

Current direction: Data16(0:negative current ;1: positive current)

Charging relay working status: Data17

Discharge relay working status: Data18

Run cumulative

time : $(\text{Data19} \ll 24 | \text{Data20} \ll 16 | \text{Data21} \ll 8) / 1000$ (seconds)

Temperature: Data23

Output status value: Data24

Timing start-stop value: Data25

Empty: Data26

Empty: Data27

Attention and maintenance

1. can not exceed the instrument voltage and current range, otherwise it will damage the instrument.
2. positive and negative electrodes can not be reversed, the reverse can not be measured correctly.
3. operating temperature-10~50 °C , storage temperature-20 and 70 °C , and keep the instrument in a dry environment.
4. do not try to disassemble this instrument, damage to the package will lead to warranty failure. There are no parts that can be repaired by the user. The maintenance can only be sent back to the factory through the designated maintenance network.

Do not move the instrument violently 5. the instrument works to avoid irreparable damage to the internal circuit.