Our multifunctional meter measures DC voltage, current, power levels, charge and discharge capacity, wattage, time and other physical quantities. It has protection against over current, as well as over and under voltage protection, and time-limited protection by setting the parameters. The meter is suitable for monitoring output voltage and current, battery charging and discharging.

Product Features:

- Data can be transmitted wirelessly between the meter and the device to be tested, which can reduce cumbersome wiring and avoid errors caused by losses in the wiring. The furthest communication distance is 10 meters. You can also use the standard USB cable for wired communication.
- Bi-directional Current Detector: when checking battery charging and discharging bidirectional currents can be detected without changing the wiring.
- Power-off Memory Function: when the power is off, the meter will remember various settings such as Ah, wattage and time if saved before powering off. Please note that you need to press the OK button to save these parameters before switching off the power.
- It can display voltage, current, power, charge and discharge capacity, wattage and time simultaneously; all information is clearly displayed.
- This meter has protection against over current, over and under voltage protection, time-limited protection (extended relay working time) and other functions.
- The Ah, wattage and time reset functions will not affect the next measurement.
- You can set the address and channel individually for each machine so they will not interfere with each other.
- When using multiple machines simultaneously, machines can be set individually to different channel to avoid mutual interference.
- There are functions for screen lock, timed closure, brightness adjustment and change of the display language.

Technical Specifications:

Specification	Parameter
Voltage measurement range	0.01~120Volts
Voltage accuracy	0.01Volts
Voltage error range	±1%+2digits
Current measurement range	0~100Amps
Current accuracy	0.1A
Current error range	±2%+5digits
Power measurement range	0~200 KW
Capacity measurement range	0~2000 KAH
Wattage measurement range	0~4000 KWH
Time measurement range	0~999 days
Address range	A01~A99
Wireless channel setting range	A-Z
Decimal display will automatically change as the data value changes, for example at zero it displays as 00.000Ah, but when it reaches 100Ah, the display becomes 000.00	
Negative over current protection NCP	0~-300 Amps
Over current protection OCP	0~300 Amps
Low voltage protection	0~to 120 Volts
Over voltage protection	0~120 Volts
Time delay protection	0~10 seconds
Power measurement plate	0.4 Watts per second
Display panel power consumption	0.5 Watts per second
Sample rate	5 times per second
Communication range	10 meters in open space
Display panel size	79x43x52 mm
Meter size	81x50x59 mm

Instrument Description:

Display Description

- This meter is a split structure, consisting of a display panel and the measuring board. Figure 2-1 is the diagram for the display board interface. The two parts can transfer data via the wireless module, and can also be connected via wire.

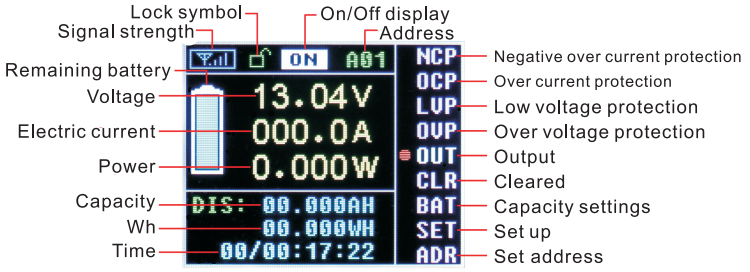

Figure 2-1

Wiring Method

Electricity supply wiring diagram

- The display panel can use a standard 5V USB connection to supply power; either insert the provided USB extension cable to the USB power port, or use it connected to the USB port of measuring board (shown in Figure 2-2).

Figure 2-2

- The display panel can also be powered by connected to the extension power supply port; the power supply needs direct current with a voltage range between 10V-30V. (Shown in Figure 2-3)

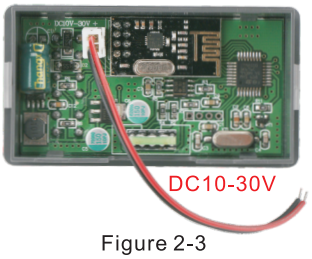

Figure 2-3

Wiring diagram and power supply method

- Check the wiring is in accordance with the wiring diagram shown in Figure 1. The positive terminal of VIN + and the load are connected to the power supply positive terminal; the negative terminal of the power supply is connected to the left large screw on the measuring board (small current can also be connected to VIN-), and the negative terminal of the load is connected to the right large screw, at the same time, put jumper at "2W" position. Note that the Vext. and Relay don't need to have wires connected. Please check that the negative terminal wiring is properly in contact with the brass screw, as this will reduce any error.

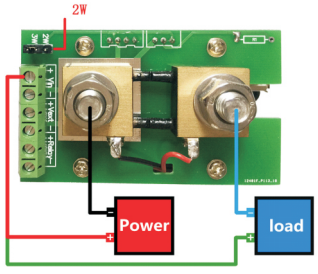

Figure1 Two-wire wiring diagram

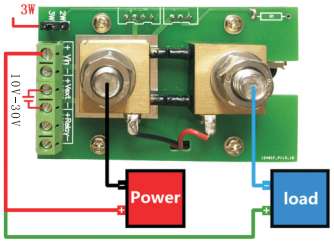

Figure 2 Three-wire wiring diagram relay is not connected

Wiring diagram and external power supply method when not connected to the relay

- Check the wiring is in accordance with wiring diagram shown in Figure 2. The positive terminal of VIN + and the load are connected to the positive terminal of the power supply; the negative terminal of the power supply is connected to the left large screw on the measuring board, and the negative terminal of the load is connected to the right large screw, at

the same time put jumper at "3W" position. Vext. needs to be connected to an external power supply to power the meter, and the external power supply voltage should be DC10V - 30V. Please note that the wiring should be in accordance with the wiring schematic, do not connect wrongly or get wires reversed.

Wiring diagram and external power supply method when connected to the relay

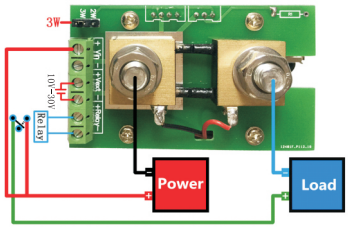

Figure 3 Three-wire connection Relay wiring diagram

- Check the wiring is in accordance with the wiring diagram shown in Figure 3. The positive terminal of the power supply is connected to the measuring board Vin+, and the negative terminal of the power supply is connected to the left large screw on the measuring board; the negative terminal of the load is connected to the right large screw. The control terminal of the relay needs to be connected between the positive terminal of the load and the positive terminal of the power supply. Vext. needs an external power supply to power the meter, the external power supply voltage should be DC10V - 30V. The "relay" place connects to the relay, and the voltage of the relay needs to match the voltage of the external power supply.

Description: Relay users need prepare their own equipment

How to Use

Wiring

- Select the appropriate wiring based on the measured voltage, and ensure that the input voltage is within the tolerance range of the instrument.

NOTE:

- Range of voltage when supplying own electricity: 10V~120V, 2W jumper inserted in place.
- Range of voltage when electricity from external power supply: 0~120V, 3W jumper inserted in place.

Communications

- Before operation, please carefully check that the wiring is correct. After the power switch on, the red LED on the measurement board comes on; on the top left corner of the screen, the signal indicator will show "  ", if the connection is unsuccessful, it shows"  ", and will show"  " when the wires are connected.

Operation

- The display of this instrument shows English by default; if you want to change the language display, please check how in the special functions menu.
- **OUT open output:** "OUT" is used to control the screen "OFF/ON", "OFF" refers to closed output, "ON" refers to open output. After the voltmeter ammeter powers on, the default state is "OFF", and the red cursor points to "OUT", then give the "OK" button a short press, the "OFF" turns to "ON"; meanwhile, the measurement functions of AH, WH and time are enabled, and on the bottom of the screen, the three data displays begin to change. During the measuring process, when the "OK" button is pressed shortly, the measurement function will close and save the parameters automatically. In the case of a three-wire connection to a relay, a short press on the "OK" button will control the closing and opening of the relay.
- **NCP** negative over-current protection (Note: discharging means positive current, charging refers to negative current, it automatically detects this.): After powering up, pressing the up arrow key makes the red cursor point to "NCP", then give a short press on the "OK" button, at this time the "NCP" backlight becomes a white small square, and an adjustable function area will appear below the corresponding screen, where the settings can be entered; you can set the numerical value by pressing up and down arrow keys and after finishing the settings, press the"OK" button to save the settings (the method of entering each function's setting is the same, so we will not go into details below).
- **OCP** is positive over-current protection; OVP is overvoltage protection; LVP is under-voltage protection; operations are as stated above.
- **CLR** (zero-clear function for AH, WH and time): after the red cursor points to "CLR", give "OK" button a short press and the AH, WH and time become zero, "BAT" battery capacity setting will become zero and real-time capacity setting will become one hundred percent.
- **BAT** battery capacity setting and real-time capacity setting: after this function is turned on, press the "OK" button to set the battery capacity and real-time capacity.
  - Setting the battery capacity: after turning on "BAT", "Setting the battery capacity (range: 0~6500AH)" shows on the bottom of the screen, you can then set the capacity value by pressing up and down arrow keys, and then give "OK" button a short press to save after setting is finished.
  - Real-time capacity setting function: after turning on the "BAT", give "OK" button a short press to switch to the real-time capacity setting function, then you can set the real-time capacity percentage by pressing up and down arrow keys.
  - Situation under Charging Mode:
    After entering BAT, set the battery capacity to an appropriate value; assuming that the value is about 10AH, then set to 80% capacity, the 80% capacity means that there is 20% capacity that needs to be charged, and then press "OK" to exit. At this time, we can see CHG displays 002.00A that means it still needs 2AH. This value constantly decreases as the time increases. It will display in real time how much electricity needs to be charged, if it can still be charged when the charged electricity is over 2AH, the value will continue to decrease to a negative value, and the negative value indicates the over-charge energy.
  - Situation under Discharge Mode:
    After entering BAT, set the battery capacity to an appropriate value; assuming that the value is about 10AH, then set to 80% capacity, the 80% capacity means that there is 20% capacity has discharged, and then press "OK" to exit. At this time, we can see DIS displays 002.00AH that means it has discharged 2AH. This value constantly increases as the time increases. It will display in real time how much capacity has been discharged, if it still can discharge when the released capacity is more than 10AH, then again, this value will continue to increase.
- **SET** Restore to factory settings and set boot default state, time delay, relay level and off-screen time. When the red cursor points to "SET", give a long press on the "OK" button and the function bar which displays the time on the bottom of screen will suddenly show –OK–, which means that it is successfully restored to the factory settings. When the red cursor points to "SET", give the "OK" button a short press and then the four functions will show up in circles, and you can change every function's setting by pressing the up and down arrow keys.
  - Set boot default state: after entering the interface, you can change the default status to "ON" by pressing the arrow key. After the voltmeter ammeter power is on, the measurement functions of AH (capacity), WH (wattage), H (time) will be turned on automatically.
  - Time delay setting: it's range is 0~10 sec, and this function is mainly to cater for the various protection functions, for example: set the delay time as 2 seconds, and open the "OVP" function, then set the protection voltage as 30V; when the voltage is higher than 30V for an instant and this high voltage lasts for less than 2s, the circuit will not be protected, if it is constantly more than 30V for more than 2s, the protection function is activated. Meanwhile, the "ON" backlight on the top of the screen turns red and displays "OVP".
  - Relay level setting: when it is set to H, the relay terminal outputs at high level and the relay connects to normally close the contact; when set to L, the relay outputs at low level and connects to normally open the contact.
  - Off-screen time setting: the range is 0~60s. Assuming that it is set to 10s, press "OK" to save and the screen will automatically turn off after 10 seconds; press any key and the screen will re-open.
- **ADR** is the address setting and view function for different addresses on the measuring board.
  - Enter the settings interface in the wired connection status and you can change the screen with the up and down keys above the address "A01" value; then the address can be set in the range from A01 ~ A99, at this time, if it is set to A02, and the "OK" button is given a long press, it means that the address of measurement board is set to A02.
  - Enter the "ADR" settings page in the wireless state, and then you can change the address "A01" by pressing arrow key; press "OK" to view the parameters of the different addresses on the measurement board, thus you can view the multiple parameters of the measuring board.

Special Functions

After moving the red cursor to "ADR" by pressing the arrow key, give a long press on the button to access the special functions.

- **LNG** language function setting: move the red cursor to "LNG", give a short press on the "OK" button to enter the settings interface, then you can change the current status by pressing the arrow key, "CHN" represents Chinese, "ENG" represents English, press the "OK" button to save after setting.
- **FCH** channel setting function: this function should be carried out in wired connection state, or it will be invalid. When multiple machines are used at the same time, you can use this function in order to avoid interference. After entering the function-setting interface, you can set the parameters by pressing the arrow key. The range is from A to Z, and then press the "OK" button to save.
- **BRI** screen brightness setting: after entering the setting interface, you can adjust the brightness of the screen by pressing the arrow key. The screen brightness has 15 levels, after setting, press "OK" button to save.
- When the red cursor points to "OUT", give the "OK" button a long press to lock the screen, at this time, the lock symbol will begin to change, and then turns red. If you want to open after locking, give the "OK" button a long press to open.