



Instruction



TR24 COULOMETER

IP68 Waterproof Battery Monitor



IP68



Bluetooth
(Optional)



APP
(Optional)



Physical
Buttons



Light Sensing
(Optional)



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Introduction



■ This product is a high-precision current collection type battery monitor (also called coulometer). It features a color TFT LCD screen, delivering clear and visually appealing display. With an IP68 waterproof and dustproof rating, it includes an intelligent light sensor for automatic brightness adjustment of the battery monitor (optional). It can accurately detect the real-time voltage, current, power, real capacity, remaining time of the battery pack etc, so that the working status of the battery is obtained accurately at any time.

■ Supports customized communication protocols to meet diverse application requirements. This product can be used for marine vessels, RVs, motorhome, campervans, golf carts, yacht, forklifts, electric bikes, outdoor power supply, emergency power supply, energy storage power supply, measuring equipment, medical equipment, various instruments and meters using battery equipment etc.

■ It is suitable for ternary lithium batteries, lithium iron phosphate batteries, lead-acid batteries and other battery packs with operating voltage of 8V~120V. Please be noted that this product must be combined with shunt.

Interface

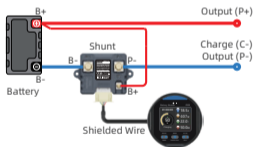


- Attention:**
1. Bluetooth, light sensing, and silicone casing are all optional.
 2. Using the communication module based on bluetooth protocol version 5.0, you can use the App to communicate with the device, such as parameter settings or data receiving.

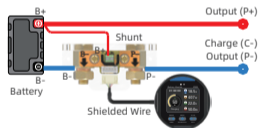
★ Wiring Method

- It is necessary to connect the matching shunt in series to the negative circuit of the battery pack when using. The B- of the shunt is connected to the negative B- of the battery pack, and the P- is connected to the negative P-/C- of the charge and discharge.
- Take a red wire (20-22AWG) to connect the positive electrode of the battery to the shunt B+ for power supply of the battery monitor.
- Connect the shunt to the battery monitor with a shielded wire. Power on after confirmation.
- Wiring principle: **Ensure that all current flowing through the battery goes through the shunt.**

■ Wiring method of 50A shunt :



■ Wiring method of 100A/350A shunt :



Attention: Please wire strictly as shown. The shunt must be connected in series with the negative circuit of the battery. It is strictly forbidden to connect the positive circuit. **Do not extend the shielded wire on your own.**

★ Setup & First Use

On first use, complete the following setup to enable basic functionality of this product.

1 Finish wiring and check current

After completing the connection according to the [Wiring Method \(see page 03\)](#), power on and the screen should be able to display. If there is no display, power off and check if the connection is correct. Then discharge or charge the battery and check whether the displayed current/power value is consistent with the actual value. If the error is large, please check again whether the wiring is correct.

Please make sure that all current flowing through the battery passes through the shunt.


2 Set effective battery capacity

If the effective capacity is known:

- Go to the [Submenus I \(see page 09\)](#) to complete the "Effective Capacity" setting.
- then **set capacity to full*** and fully charge the battery.
- After completing the above steps, it can be used normally.



If the effective capacity is unknown (after the first use or replacement of the battery):

- The actual effective capacity of the battery needs to be tested, and the testing steps are as follows:
 - A. Go to the [Submenus I \(see page 09\)](#) and select the "Effective Capacity" setting. Set the capacity as high as possible (for example, if the estimated battery is 20Ah, set it to 30Ah first);
 - B. Empty the battery, **set capacity to zero***, and then charge the battery;
 - C. After the battery is fully charged, the capacity value (Ah) displayed on the battery monitor is the effective capacity of the battery.
- After testing the effective capacity, enter the [Submenus I \(see page 09\)](#) to complete the "Effective Capacity" setting.
- After completing the above steps, it can be used normally.

*Set capacity to full: In the main interface, long press  to set the capacity percentage (SOC) to 100%.

*Set capacity to zero: In the main interface, long press  to set the capacity percentage (SOC) to 0%.





Instructions for Use I

- 1 The battery monitor must be in working condition when charging and discharging, otherwise the battery capacity cannot be accurately calculated. This product is a low-power consumption design, the power consumption is very low when entering standby mode. Don't connect the power supply B+ behind the power switch (always keep the power on).
- 2 Connecting the load, when the discharge current > STBY current, the symbol  will be displayed, which indicates that the battery is discharging.
- 3 Disconnecting the load and connect the charger, when the charge current > STBY current, the symbol  will be displayed, which indicates that the battery is charging.
- 4 When the charge or discharge current < STBY current, it will enter a low-power consumption state. When the STBY brightness is set to 0%, the battery monitor completely turns off; When the STBY brightness is set to 1%, the battery monitor remains slightly bright; When the charging or discharging current > STBY current, the battery monitor returns to normal brightness.
- 5 Since the shunt is connected in series with the battery's total negative terminal, the battery monitor displays the net current during simultaneous charging and discharging. For example, if charging current is 10A and discharging current is 30A, the battery monitor will indicate a discharge current of 20A.
- 6 If the percentage or capacity value occasionally drifts over time, you can manually synchronize (calibrate) the battery capacity, refer to [Setup & First Use \(see P. 04\)](#) → "Set capacity to full" & "Set capacity to zero".
- 7 If capacity deviations occur frequently, it is recommended to configure the "Full CAP U" (the voltage at full charge). Automatic synchronization (calibration) can be performed via [Settings Menu I \(see P. 07\)](#) → "Full CAP U" & "Zero CAP U", for details on parameter entry, refer to [Submenus I \(see P. 09\)](#).

Instructions for Use II

- 8** If deviations remain after following the item **6** or **7**, the battery capacity may have degraded, or the effective capacity configured in the battery monitor may not match the actual battery. In this case, re-test and reset the battery capacity by referring to **Setup & First Use (see P. 04)** → **If the effective capacity is unknown.**
- 9** This product has a power-off capacity memory function.
- 10** A certain error may occur in the case when the current changes drastically, which affects the capacity value.
- 11** This product needs to be used with the shunt, it is forbidden to mix the shunt and the battery monitor with different specifications (the internal parameters of the battery monitor are different). The shunt is a heat-generating component, and it should be installed in the air circulation as much as possible, do not wrap or cover it! Always keep ventilation and heat dissipation when using the maximum current for long periods of time.
- 12** This product may be technically improved or updated. If the product you purchased differs from the appearance and technical parameters described in this manual, please refer to the actual product or website.

Settings Menu I

Long press the button  to enter the settings menu, press the button  or button  to select the setting item, and press the button  to enter the corresponding submenu.

◀ Settings	
1 BAT CAP	100.0Ah
2 FULL CAP U	54.6 V
3 ZERO CAP U	42.0 V
4 TURN OFF U	41.5 V
5 CAP Alarm	20.0Ah

1 BAT CAP (Battery capacity): Essential setup. The factory default is 100Ah. Please set the capacity based on the actual effective capacity of the battery pack. Otherwise, the capacity percentage (SOC) will be incorrect.

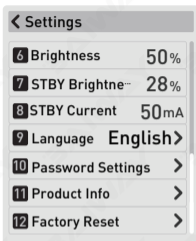
2 FULL CAP U (Full capacity voltage): When the battery is charging, if the battery voltage exceeds this value, the capacity will automatically be set to 100% (full). This function enables automatic calibration, preventing inaccurate readings caused by accumulated errors. Configure this setting when the total voltage at full charge is known (incorrect configuration may cause the capacity to be set to full unexpectedly). Once configured correctly, this setting can eliminate deviations caused by cumulative errors.

3 ZERO CAP U (Zero capacity voltage): When the battery is discharging, if the battery voltage drops below this value, the capacity will automatically be set to 0% (zero). This function enables automatic calibration, preventing inaccurate readings caused by accumulated errors. Configure this setting when the total voltage at full discharge is known (incorrect configuration may cause the capacity to be set to zero unexpectedly). Once configured correctly, this setting can eliminate deviations caused by cumulative errors.

4 TURN OFF U (Turn off voltage): When the battery voltage is lower than the set voltage and in a non charging and non discharging (Standby) state, the screen will turn off without display and enter a low-power shutdown state, press any button to temporarily restore the display. Normal operation automatically resumes when voltage > set value.

5 CAP Alarm (Capacity alarm): When the battery capacity is lower than the set capacity and is in a discharged or uncharged state, the buzzer will sound per 10s if below this capacity.

Settings Menu II



6 Brightness: The backlight brightness during work (same as the brightness value of the main interface). Adjustable range: STBY brightness < Brightness ≤ 100%.

7 STBY Brightness (Standby brightness): The minimum brightness level during standby mode is adjustable, offering lower power consumption. The configurable range is 0%-30%. When it is set to 0%, the battery monitor completely turns off; When it is set to 1%, the battery monitor remains slightly bright; the STBY brightness < the working backlight brightness.

8 STBY Current (Standby current): After the battery current drops below this value for 10 seconds, it will automatically standby and enter a low-power state. The maximum standby current value can be set to

999mA. When the battery current is higher than this current, the battery monitor returns from standby brightness to working backlight brightness.

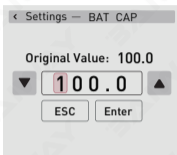
9 Language: Can switch between Chinese and English languages.

10 Password Settings: Please remember your password before setting it, as it cannot be recovered once lost. After setting the password, you need to enter this password when entering the settings interface again from the main interface.







11 Product Info (Product information): This setting allows you to view detailed information about the product, such as hardware version number, software version number, etc.

12 Factory Reset: This operation will clear all personalized configuration information and reset the device to factory defaults. Deleted data can't be restored. If the operation is incorrect and you need to revert to the original state, you can restore factory settings and then recalibrate the device.

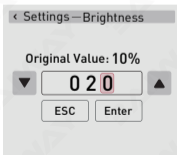
Submenu I

1 Set **Effective Capacity**







Select the function to be set and press the button  to enter the corresponding settings submenu

- ① Press  to select the digit
- ② Press the  or  to set the value
- ③ Press and hold  and select , press  to finish setup

The submenu interfaces for **1** Effective capacity, **2** Full capacity voltage, **3** Zero capacity voltage, **4** Turn off voltage, **5** Low capacity alarm, and **8** STBY current value are the same.

2 Set **Brightness/STBY Brightness**

Select Brightness/STBY brightness, press the button  to enter the settings submenu

- ① Press  to select the digit
- ② Press the  or  to set the value
- ③ Press and hold  and select , press  to finish setup

Submenus II

3 Set Language



Select language settings, press the button to enter the settings submenu

- ① Press or to select language
- ② Press to directly return to the settings interface

4 Set Password



Select password settings, press the button to enter the settings submenu

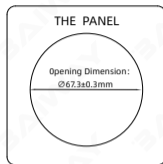
- ① Press to select the digit
- ② Press the or to set the value
- ③ Press and hold and select , press to finish setup

Note: If you need to cancel the password, please change it to 0000.

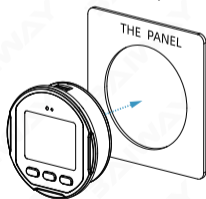
Installation

- Step1: Make a hole in the panel to be installed according to the opening dimension.
- Step2: Insert the battery monitor into the panel from the front.
- Step3: Insert the clip from the rear side of the product in the direction shown in the figure, then press to lock, as shown in Figure 1.

Step 1



Step 2



Step 3

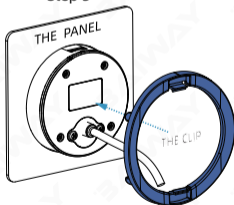
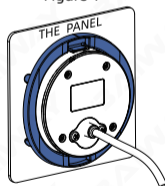


Figure 1



Note: The device panel is not a product accessory and is not included in the product.

Technical Parameters


Parameter		Min.	Regular	Max.	Unit
Working voltage		8.0	50	120	V
Working consumption	Brightness 10%			0.3	W
	Brightness 50%			0.5	W
	Brightness 100%			0.7	W
Standby consumption	Brightness 0% (screen off)			50	mW
	Brightness 2% (screen dims)			150	mW
Accuracy of collecting voltage			±1.0		%
Accuracy of collecting current			±1.0		%
Accuracy of capacity collecting capacity			±1.0		%
Capacity detection range		0.1	100	999	Ah
Matched Shunt Current detection range	50A specification	0.0	50	75	A
	100A specification	0.0	100	150	A
	350A specification	0.0	350	500	A
Ambient temperature range		-10.0	25.0	60	°C
Dimensions		72.5×72.5×20.75			mm
TR24 weight		81			g

Safety and Risk I

1 Wiring safety:

- Before wiring, installation, or maintenance, the battery main switch must be turned off to prevent short circuits and sparking.
- The shunt must be connected in series in the battery negative circuit. The copper terminals of the shunt can only be connected to the battery main negative, output negative and charger negative.
- Connecting the battery positive to the shunt's B- or P- terminals is strictly prohibited, as it will cause a severe short circuit, equipment damage, or even fire.
Note: Always verify battery polarity. Do not reverse the connections!
- Terminals must be firmly tightened. Loose connections can lead to overheating, corrosion, and potential fire hazards.

2 High-temperature warning about shunt:

- The shunt is a power heating component, and the surface temperature is high when it operates continuously with high current, which poses a risk of burns .
- Do not touch the shunt with bare hands during operation or shortly after shutdown.
- The shunt must be installed in a well-ventilated location. Never wrap, cover, or place it near flammable materials.

3 Environmental limitations:

- This product features an IP68 waterproof rating. However, waterproof performance may be compromised due to aging components or temperature variations. Please avoid prolonged immersion in water, exposure to steam, cleaning with high-pressure water jets, or any operation that may allow water to enter through the battery monitor's connector interfaces.
- Don't install or operate in environments with flammable/explosive gases or dust (eg: near gasoline or gas sources).
- Avoid use in areas with strong electromagnetic interference, severe vibration, or continuous direct sunlight.

Safety and Risk II

- During work, do not expose the product to extreme temperatures below -10°C or above 60°C for extended periods.

4 Equipment usage guidelines:

- Select a shunt of appropriate specification based on the actual current. Do not exceed its rated capacity, and ensure it is compatible with the battery monitor's specification.
- Do not disassemble, modify, or attempt to repair the unit unless you are a qualified technician.
- In case of abnormal conditions such as severe overheating, unusual odor, or smoke, immediately cut off the power and stop using the device.

5 Installation and maintenance:

- Install the unit away from heat sources, battery exhaust ports, and flammable materials.
- Regularly check for loose wiring and abnormal heating of the shunt.
- This product is covered by a 1-year warranty from the original date of purchase. Any non-human-induced quality issues occurring within the warranty period will be repaired free of charge.