

# Battery Monitor

## — Instructions (English version) —



### Product Overview

This is a typical high precision current type battery capacity monitor (also known as coulometer), designed to test the voltage, current and capacity of a battery to help users know the state of a battery in real time. This device has a memory function, low voltage and capacity alarm function. It is suitable for mobile and portable equipment using battery power, e.g. e-bike, balance car, cleaning machine, RV's, Marine, Mobility Vehicles, Remote Power, Instruments, UPS etc.

### Application

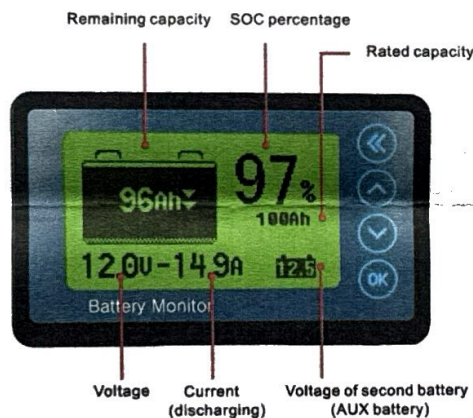
This product is suitable for Lithium battery, Lithium Iron Phosphate battery (LiFePO4), Lead-Acid battery and Nickel Metal Hydride battery with a working voltage from 10V to 120V.

### Basic Parameters

Parameter	Min	Type	Max	Unit
Voltage range	10.0	50.0	120.0	V
Power consumption		10.0	15.0	mA
Standby consumption		1.0	2.0	mA
Voltage accuracy		±1.0		%
Current accuracy		±1.0		%
Capacity accuracy		±1.0		%
Capacity range	1.0		9999.0	Ah

Parameter	Min	Type	Max	Unit
Output current for relay			0.5/60	A/V
Current range (100A)	0.0	100.0	150.0	A
Current range (350A)	0.0	350.0	500.0	A
Current range (500A)	0.0	500.0	750.0	A
Temperature range	0	20	35	°C
Backlight on current (50A)		30/60		mA
Backlight on current (>50A)		80/120		mA
Weight		75		g
Meter size		100x61x17		mm

### Monitor Display Description



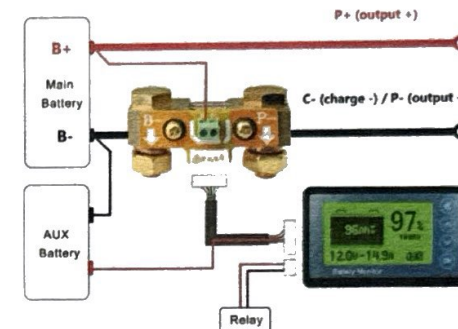
### Connection

1. First, connect the current sampler/shunt in series with negative pole of battery, the B- terminal on the shunt connects to the Battery - (neg) terminal. P- on the shunt connects to power output/charger - .

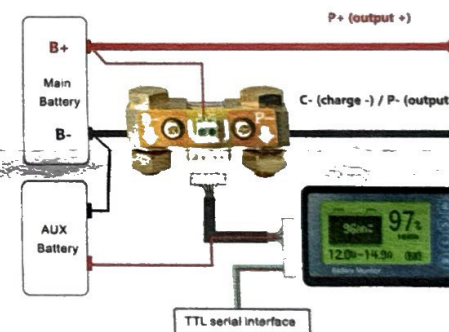
**Attention: \*\*IMPORTANT\*\*** Made sure the negative from the battery is the only wire connected to the B- pole on the shunt. All other negative wires are connected to the P- pole on the shunt.

2. You require a standard insulated wire (0.3-0.75mm<sup>2</sup>). One end of the standard wire connects to the Battery + (Pos) terminal and the another end connects to any one of B+ on the current shunt.

3. Finally, connect the shunt to the coulometer display using the shielded wire/ cable (Supplied with coulometer).



(1) Wiring diagram with Relay output



(2) Wiring diagram with TTL output

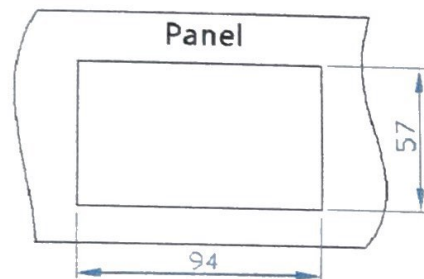
4. Connect and check the reading. Complete the connection as shown and power on, the screen should display the battery voltage, current, capacity percentage and other information. If the screen does not display, then please check the wire connections. Next step, run a charge or discharge and check that display current is consistent with actual current. If the difference is large, please check the connections.

**Attention: \*\*IMPORTANT\*\*** Please connect as illustrated. The shunt must be connected to the negative circuit, it must not be connected to the positive circuit. If you wish to extend the shielded wire, you must use the same wire specification.



## Installation

Cut a rectangle opening (94mmx57mm) to suit the display dimensions. Insert the Coulometer from the front of the panel. Fix the Coulometer in place by buckles. As shown below:



## Initial Setup

### 1. Set the rated capacity :

Determine the rated capacity of battery, expressed in Amp-hours, eg. 100 Ah. If your battery does not state a amp hour rating printed on it, contact the manufacture and ask them what it is, or use this meter to measure the actual capacity yourself (refer to Note section below).

CAP : 100.00Ah  
HIGH V : 000.0V  
LOW V : 000.0V  
Alarm : 000.0Ah

Hold the **OK** key for 3 seconds to setting menu, press the **^** or the **v** to select item CAP. Press the **OK** key to enter capacity setting mode, press the **OK** again to select different bits, press the **^** or the **v** key to increase or decrease the value, set the capacity equal to the rated capacity, press the **<<** key to complete the setting.

**Note:** If you find the rated capacity doesn't match the actual battery capacity, you can use this meter to measure the actual capacity: Set the rated capacity of your battery as high as possible, for example 999Ah. Then discharge the battery totally. Hold the key **v** for 3 seconds to set the capacity to zero. Next, charge the battery fully. The displayed capacity is the actual capacity. Finally set the rated capacity equal to the displayed capacity (Please refer to above section).

### 2. Capacity initialization:

At first use, the percentage and capacity displayed is not the actual correct value. To fix this you should initialize the capacity by charging the battery fully. Next, hold the **^** key for 3 seconds to set the capacity to full (100%). Alternatively, discharge the battery totally and then hold the **v** key for 3 seconds to set capacity to zero. The coulometer is now calibrated. There is no need to repeat this process unless you replace the battery.

### 3. Preset voltage setting (automatically resetting the capacity to zero or full):

Hold the **OK** key for 3 seconds to setting menu, press the **^** or the **v** key to select item HIGH V or LOW V, press the **OK** key to enter HIGH V or LOW V mode, press **OK** again to select different bits, press the **^** or **v** key to increase or decrease the value. Press the **<<** key to save the setting.

When the voltage is lower than the value of LOW V, the Ah and percentage reading will be reset to 0 (0%) and the back-light will turn off. When the voltage is higher than the value of HIGH V, the Ah and percentage reading will be reset to full (100%).

**Note:** It is not mandatory to set this voltage values. The default is 0V, which is the invalid / not set value. If you want to set this values, please ensure you know the actual charge and discharge voltages of the batteries before proceeding.

### 4. Alarm setting:

1. when the capacity is lower than the preset value of [Alarm], percentage reading and battery symbol will flicker, and the buzzer will sound an alarm every 10 seconds.

2. Under charge/discharge and sleep mode, it will trigger external relay when voltage lower then preset value.
3. Under discharge and sleep mode, it will trigger external relay when capacity lower than preset value.

## Product Operation

1. Hold the **<<** Key for 3 seconds to turn off backlight, hold the **<<** key again to turn on backlight.
2. When charging or discharging, the coulometer must be operational, otherwise the capacity displayed will not be accurate.
3. Connect the load. If the discharge current is higher than "back-light on current", the display back-light will turn on indicating that the battery is discharging (if back-light is blinking, the B- and P- are inversely connected).
4. Disconnect the load, and connect the charger. When the charge current is higher than "back-light on current", the back-light will blink indicating that the battery is charging (if the back-light is solidly on, the B- and P- are inversely connected).
5. When the charge or discharge current value is lower than "back-light off current", the coulometer will enters a low power state and the back-light will turn off. The coulometer will remember the capacity.
6. Because of high sensitivity, if the coulometer is in standby mode (ex: battery has no input or output current) and it is exposed to electromagnetic radiation (ex: open or close inductive loads, such as a electric motor), the back-light will briefly turn on.
7. When the current makes drastic and frequent changes the coulometer may fail to capture data correctly resulting in errors and a loss of accuracy.

## Warning & Warranty

The monitor must not be exposed to direct sunlight for long periods of time or to an environment with large amounts of ultraviolet radiation, particular in winter ( $< -20^{\circ}\text{C}$ ) and summer ( $> 60^{\circ}\text{C}$ ), otherwise it will shorten the life of the LCD display.

AiLi® warrants each AiLi® branded Battery Capacity Monitor sold by AiLi® or any of its authorized dealers or distributors worldwide, to be free of defects from the date of sale for 12 months. The warranty period starts at the time of purchase. For further warranty details refer to our website.