
CL212 Battery Monitor User Manual

Dongguan Leyi Intelligent Technology Co., Ltd.

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1. Product Features

This product integrates the first-generation CZSOC-Coulomb System and offers the following advantages for battery monitoring applications:

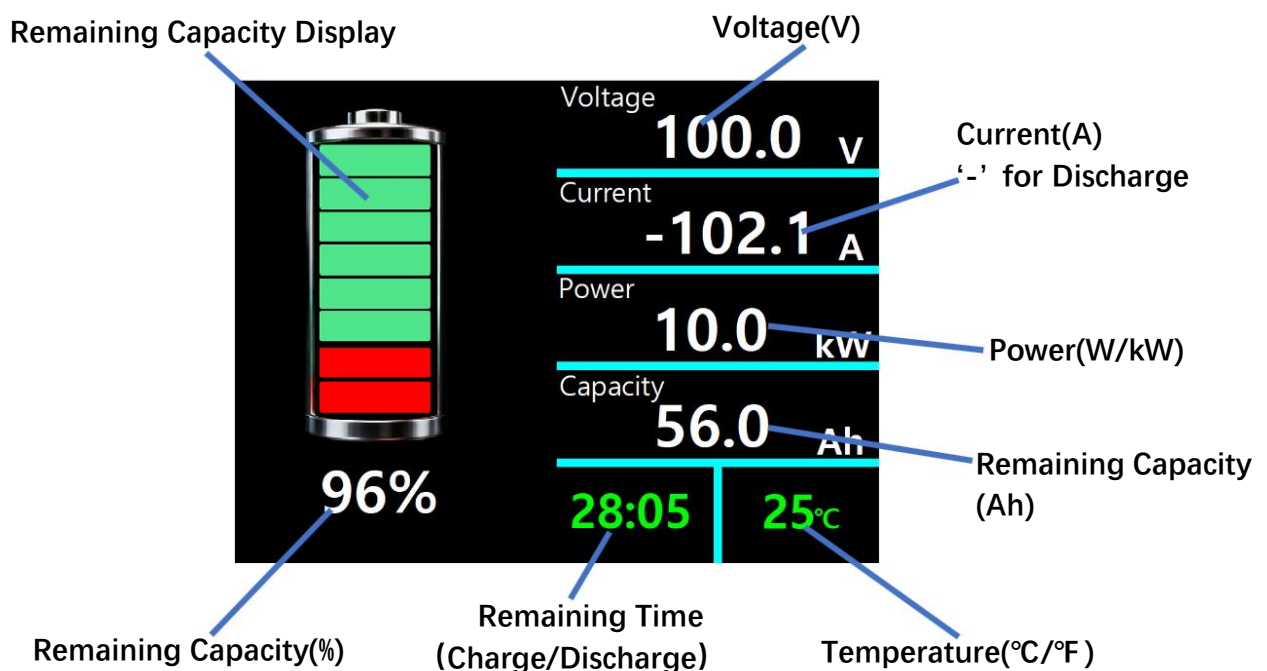
1. Accurate and stable battery capacity readings without fluctuation or false capacity indications.
2. Real-time charge/discharge current monitoring and automatic calculation of remaining discharge time.
3. Only one initial setup is required for long-term operation without repeated calibration.
4. Multiple protection and alarm functions help prevent battery damage caused by overcharging or over-discharging.

2. Warning



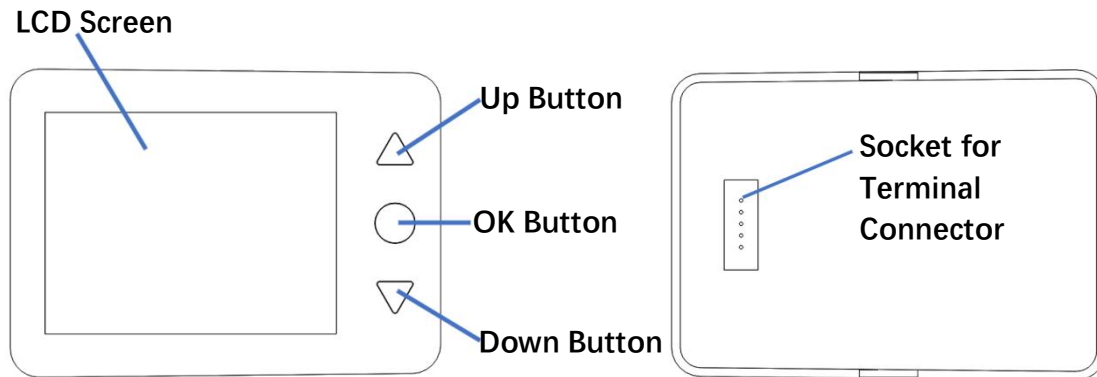
- The product must be installed and wired correctly otherwise, it may not function properly.
- Initial setup is required before use. Otherwise, battery capacity and SOC (State of Charge) will not display correctly.
- The battery monitor must be used with a matching shunt. Different shunt model can not be mix used.
- This product is equipped with a **300A shunt** and supports current measurement up to **300A**.

3. Main Screen Overview

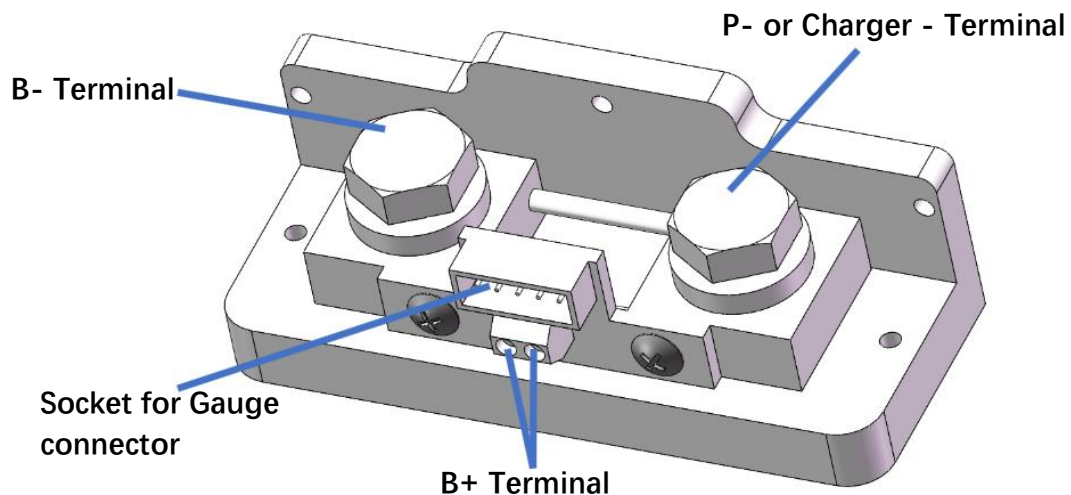


4. Product Function Description

4.1 Battery Monitor Display Layout



4.2 Shunt Layout

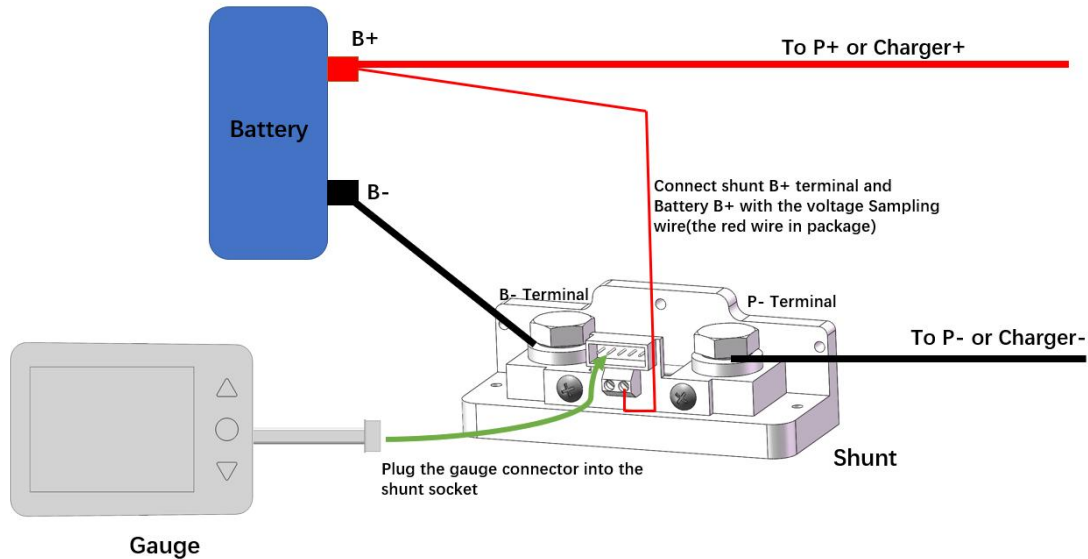


4.3 Button Functions

1. On the main screen, tap the **OK Button** to enter sleep mode. Tap it again to wake up the display.
2. On the main screen, hold the **OK Button** to enter the Settings Menu.
3. In the Settings Menu, tap the **Up Button** or **Down Button** to navigate between different menu items.
4. On the selected settings page, tap the **OK Button** to enter parameter setting mode.
5. Tap the **Down Button** to move between digits. The selected digit will be highlighted in red.
6. Tap the **Up Button** to adjust the value of the selected digit.
7. After completing the setting, tap the **OK Button** to confirm, then hold the **OK Button** to return to the Main Screen.

5. Wiring Instructions

5.1 Wiring Procedure



- Step 1.** Disconnect the battery negative circuit to ensure that the installation procedures are performed safely.
- Step 2.** Connect the battery negative terminal to the shunt (B-) terminal. **Using Suitable cables (NOT included).**
- Step 3.** Connect the shunt (P-) terminal to the negative terminal of the load or charger. **Using Suitable cables (NOT included).**
- Step 4.** Using the included voltage sampling wire, connect the shunt (B+) terminal to the battery positive terminal.
- Step 5.** Insert the battery monitor connector into the shunt connector socket.
- Step 6.** Perform a wiring check. (For details, refer to Section 5.2 Wiring check.)

Important Wiring Notes

- The shunt generates heat during operation and should be installed in a well-ventilated location whenever possible. Do not wrap or cover the shunt. When operating at or near the maximum rated current for extended periods, ensure adequate ventilation and heat dissipation.
- Keep the shunt dry at all times. Do not expose it to water or moisture to prevent short circuits.
- Ensure that the shunt is installed in series with the battery negative circuit. Never install the shunt in the battery positive circuit.
- Select correct wire gauge according to the operating current. Refer to the Appendix for the relationship between wire gauge and maximum current capacity.

- lugs are recommended for wiring connections. Select terminal sizes that match the wire gauge being used.

5.2 Wiring Check

After completing the wiring according to Section 4.1, a wiring check must be performed. ******Failure to perform this check may result in incorrect measurement results.******

- If the screen does not turn on, disconnect the power and verify that all wiring connections are correct, especially the positive voltage sampling wire. Also ensure that all connection points provide reliable electrical continuity.
- Charge or discharge the battery and verify that the displayed current value is correct. If the current reading is incorrect, make sure that all charging and discharging current flows through the shunt, which must be connected in series with the battery negative circuit.
- During charging, the current value should be displayed as a positive value. During discharge, the current value should be displayed as a negative value (-). If the polarity is reversed, check whether the battery negative terminal is connected to the shunt **B- Terminal**.

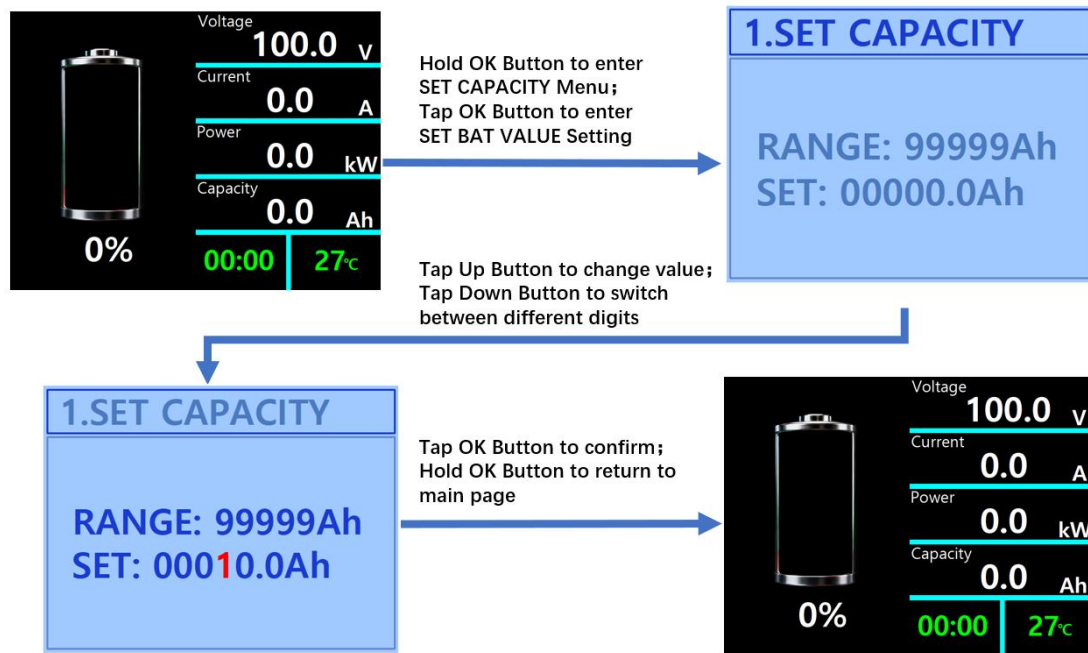
6.Initial Setup (Compulsory)

Before using the battery monitor for the first time, the Battery Full Capacity and Initial SOC must be configured.

6.1 Battery Full Capacity Setting

Setup Procedure:

1. On the Main Screen, hold the **OK Button** to enter the **01. SET BAT VALUE** menu.
2. Tap the **OK Button** to enter the Battery Full Capacity setting.
3. Tap the **Up Button** to change the value of the selected digit. Tap the **Down Button** to move between digits.
4. Tap the **OK Button** to confirm the setting.
5. Hold the **OK Button** to return to the Main Screen.



Important Capacity Setting Notes

- The Battery Full Capacity must be set correctly; otherwise, the SOC (State of Charge) value will not be displayed accurately.
- If the battery pack consists of multiple identical batteries connected **in series**, the total Battery Full Capacity of the battery pack is equal to the **capacity of a single battery**.
- If the battery pack consists of multiple identical batteries connected **in parallel**, the total Battery Full Capacity of the battery pack is equal to the **sum of the capacities of all batteries**.

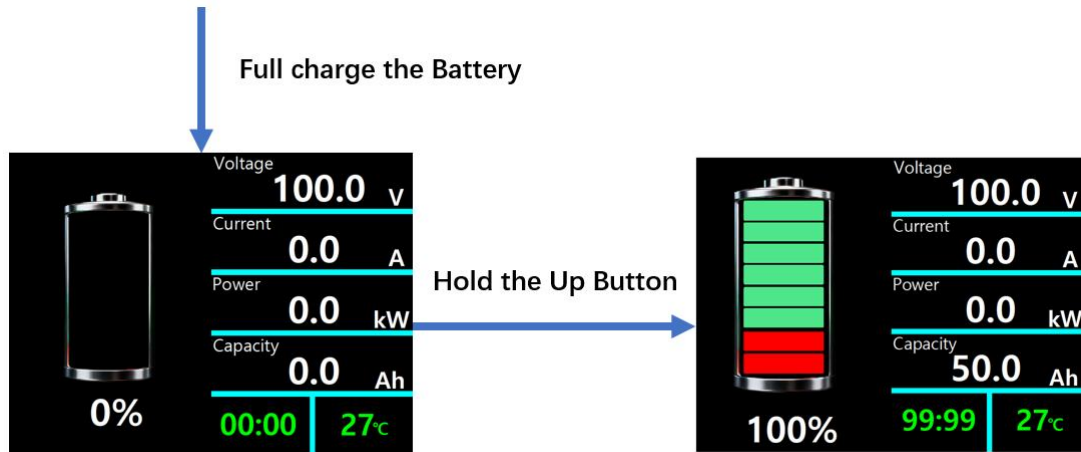


6.2 Initial Battery Capacity Setting

After the Battery Full Capacity has been configured, the displayed capacity must be aligned with the actual battery capacity. Two methods are available for setting the Initial Capacity. Either method may be used.

Method 1: Set the Initial Capacity to Full When the Battery Is Fully Charged

1. Fully charge the battery, and set the capacity status to "Full" while in this condition.
2. Setting the battery capacity status to full: On the main screen, hold the Up Button to set full capacity. The SoC will be set to 100%.

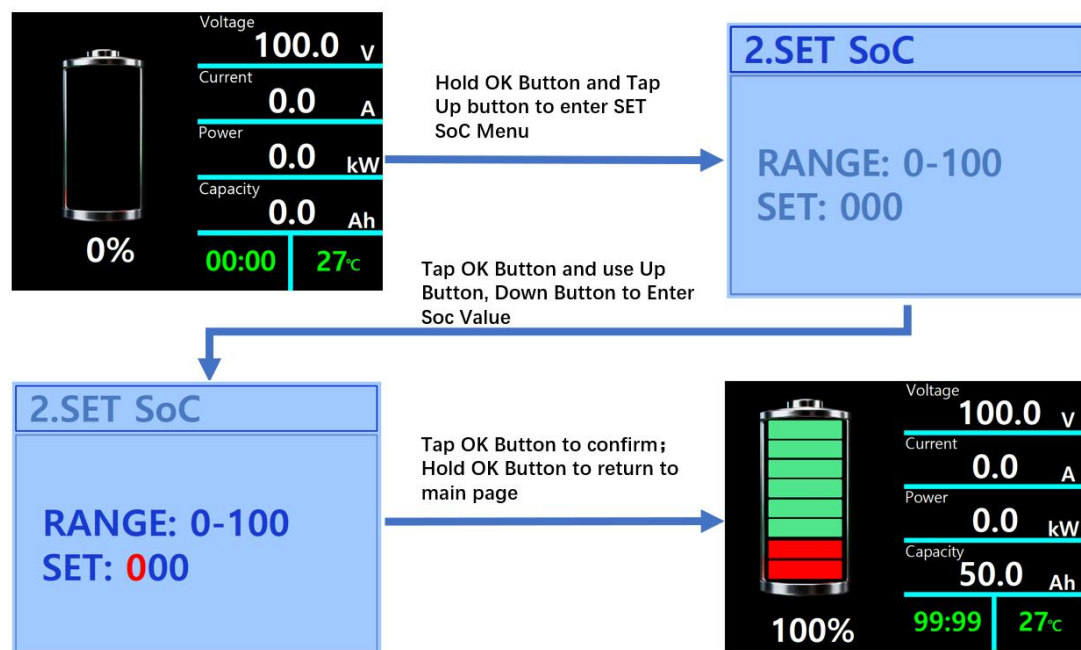


Method 2: Enter the Current SoC Value

If the State of Charge (SoC) is known, it can be entered directly in the settings menu.

The SoC value can be set any value between 0% and 100%.

1. On the main screen, hold the **OK Button** to enter the settings page.
2. Tap **Up Button** to guide to the **SET SoC** page.
3. Tap **OK Button** to enter **2.SET SoC**. And tap the **Up Button** to change the value of the selected digit, tap the **Down Button** to switch between different digits.
4. After the setting is completed, tap **OK Button** to confirm, then hold **OK Button** to return to the main screen.



After completing the above settings, the Battery Monitor is ready for use.

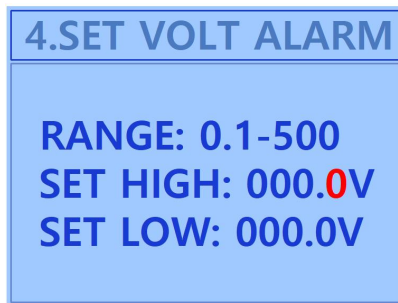
7.Other Functions

The following functions are optional and not compulsory for normal use. Incorrect settings may result in inaccurate SoC or other parameter readings. If you need to use these functions, please read the instructions carefully and perform setting according to the spec parameter of your battery.

7.1 Setting the Voltage vs SoC

No.	Function Description	Figure
3	Set the upper and lower voltage thresholds. When the battery voltage exceeds the upper threshold, the SoC will be set to 100%. When the battery voltage falls below the lower voltage threshold, the capacity will be set to 0%.	
Setting Procedure: - On the main screen, hold the OK Button to enter the Settings Menu, guide to 3. SET VOLT vs SoC then tap the OK Button to enter. - Use the Up Button and Down Button to adjust the parameter values. - After the settings are complete, tap the OK Button to confirm the parameters, then hold OK Button to return to the main screen.		
Notes: - The default values for both the high voltage threshold and low voltage threshold are 0, function is disabled. - The high voltage and low voltage thresholds can be used together (both set to non-zero values) or independently (one set to a non-zero value while the other remains at 0). - If the high voltage threshold is set lower than or equal to the low voltage threshold, the setting will be invalid. The threshold values must be corrected before the function can take effect.		

7.2 Setting High and Low Voltage Alarms

No.	Function Description	Figure
4	Configure a high voltage threshold and a low voltage threshold. When the measured voltage rises above the high voltage threshold or falls below the low voltage threshold, the buzzer alarm will be activated, and the voltage reading will flash in red to indicate an alarm condition.	 4.SET VOLT ALARM RANGE: 0.1-500 SET HIGH: 000.0V SET LOW: 000.0V
Setting Procedure: - On the main screen, hold the OK Button to enter the Settings Menu, then guide to 4. SET VOLT ALARM. - Set voltage alarm thresholds using the steps described in Section 7.1, then return to the Main Screen when finished.		
Notes: - The default values for both the High Voltage Threshold and Low Voltage Threshold are 0, which disables this function. - The high and low voltage alarms can be enabled together (both thresholds set to non-zero values) or independently (one threshold set to a non-zero value while the other remains at 0). - If the High Voltage Threshold is set lower than or equal to the Low Voltage Threshold, the configuration will be invalid. The threshold values must be corrected before the alarm function can operate properly.		

7.3 Configuring a Low SoC Alarm

No.	Function Description	Figure
5	When the State of Charge (SoC) falls below 20% , the alarm will be triggered. This feature can be enabled or disabled as needed.	
Setting Procedure: 1. On the main screen, hold the OK Button to enter the Settings Menu, then guide to 5. CAPACITY ALARM. 2. Set 0 (Off) or 1 (On) to disable or enable this feature. tap OK Button to save the setting, then hold OK Button to return to the Main Screen.		

7.4 Adjusting Screen Brightness

No.	Function Description	Figure
6	Adjust the brightness of the LCD screen. There are 10 levels available.	
Setting Procedure: 1. On the main screen, hold the OK Button to enter the Settings Menu, then guide to 6. SET BRIGHTNESS. The brightness level can be set from 0 to 10. 2. Set the parameter following the method described in Section 7.1, then return to the Main Screen when finished.		

7.5 Auto Screen Off

No.	Function Description	Figure
7	Set a screen-off current threshold. When the current drops below the screen-off current threshold and no operation is performed for longer than the screen-off delay time (described in Section 7.6), the battery monitor will turn off the screen and enter low-power mode.	 7.SET OFF CURRENT RANGE: 0.1-500A SET: 000.0A
Setting Procedure: - On the main screen, hold the OK Button to enter the Settings Menu, then guide to 7. SET OFF CURRENT. - Configure the parameter following the method described in Section 7.1, then return to the main screen.		

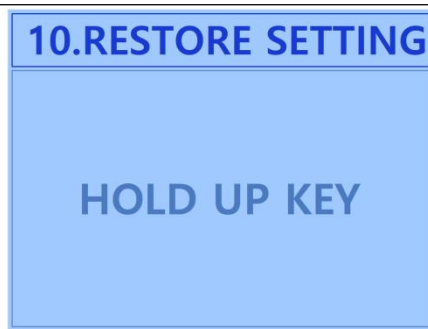
7.6 Auto Screen Off Time

No.	Function Description	Figure
8	Set a screen-off delay time. If the current stay below the screen-off current threshold (7. SET OFF CURRENT) and no operation is performed in the set time; the battery monitor will turn off the screen and enter low-power mode.	 8.SET OFF TIME RANGE: 0-999S SET: 000S
Setting Procedure: - On the main screen, hold the OK Button to enter the Settings Menu, then guide to 8. SET OFF TIME. - Configure the parameter following the method described in Section 7.1, then return to the Main Screen when finished.		

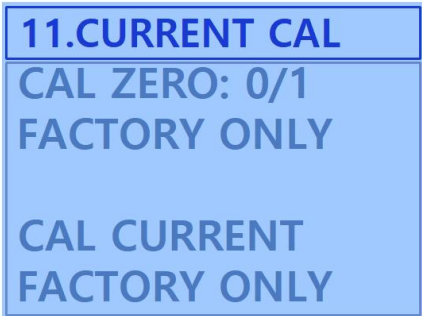
7.7 Setting Temperature Display Unit

No.	Function Description	Figure
9	Set the temperature unit to Celsius or Fahrenheit. The default unit is Fahrenheit.	
Setting Procedure: - On the main screen, hold the OK Button to enter the Settings Menu, and guide to 9. SET TEMP UNIT. - Select 0/1 to switch between °F / °C. tap OK Button to confirm the setting, then press and hold the OK Button to return to the Main Screen.		

7.8 Factory Reset

No.	Function Description	Figure
10	Restore all parameters to factory default settings via the menu. Please note that after restore, all settings will be reset to their original values.	
Setting Procedure: - On the main screen, hold the OK Button to enter the Settings Menu, then guide to 10. RESTORE SETTING. - No confirmation via the OK Button is required. Hold the UP Key directly to initiate the reset. The characters will flash for 2 seconds, after which the device will restore factory settings and return to the Main Screen.		

7.9 Factory Production Mode

No.	Function Description	Figure
11	This function is intended for factory production line testing only. WARNING: Do not operate this function.	
###WARNING: Do not operate this function.		

8.Packing List

Packing List		
Name	Quantity	Specification
Battery Monitor	1	CZSOC System Integrated
User Manual	1	For CZ212
Shunt	1	300A
Shielded Cable	1	Cable Length: 3 m (9.84 ft)
Positive Signal Cable	1	Cable Length: 1 m (3.28 ft)

9. Customer Service and Technical Support

If you encounter any issues with the product, please scan the QR codes below for further assistance.



SETUP GUIDE



SUPPORT



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Appendix: AWG Wire Gauge Reference Table

AWG Gauge	Diameter (Inches)	Diameter (mm)	Ohms per 1000' (@ T=20°C)	Ohms per km (@ T=20°C)	Max amps for chassis wiring	Max amps for power X-mission
0000	0.4600	11.6840	0.0490	0.160720	380	302
000	0.4096	10.40384	0.0618	0.202704	328	239
00	0.3648	9.26592	0.0779	0.255512	283	190
0	0.3249	8.25246	0.0983	0.322424	245	150
1	0.2893	7.34822	0.1239	0.406392	211	119
2	0.2576	6.54304	0.1563	0.512664	181	94
3	0.2294	5.82676	0.1970	0.646160	158	75
4	0.2043	5.18922	0.2485	0.815080	135	60
5	0.1819	4.62026	0.3133	1.027624	118	47
6	0.1620	4.11480	0.3951	1.295928	101	37
7	0.1443	3.66522	0.4982	1.634096	89	30
8	0.1285	3.26390	0.6282	2.060496	73	24
9	0.1144	2.90576	0.7921	2.598088	64	19
10	0.1019	2.58826	0.9989	3.276392	55	15
11	0.0907	2.30378	1.2600	4.132800	47	12
12	0.0808	2.05232	1.5880	5.208640	41	9.3
13	0.0720	1.82880	2.0030	6.569840	35	7.4
14	0.0641	1.62814	2.5250	8.282000	32	5.9
15	0.0571	1.45034	3.1840	10.44352	28	4.7
16	0.0508	1.29032	4.0160	13.17248	22	3.7
17	0.0453	1.15062	5.0640	16.60992	19	2.9
18	0.0403	1.02362	6.3850	20.94280	16	2.3
19	0.0359	0.91186	8.0510	26.40728	14	1.8
20	0.0320	0.81280	10.150	33.29200	11	1.5
21	0.0285	0.72390	12.800	41.98400	9	1.2
22	0.0254	0.64516	16.140	52.93920	7	0.92
23	0.0226	0.57404	20.36	66.78080	4.7	0.729
24	0.0201	0.51054	25.67	84.19760	3.5	0.577
25	0.0179	0.45466	32.37	106.1736	2.7	0.457
26	0.0159	0.40386	40.81	133.8568	2.2	0.361
27	0.0142	0.36068	51.47	168.8216	1.7	0.288
28	0.0126	0.32004	64.9	212.8720	1.4	0.226
29	0.0113	0.28702	81.83	268.4024	1.2	0.182
30	0.0100	0.254	103.2	338.4960	0.86	0.142
31	0.0089	0.22606	130.1	426.7280	0.700	0.1130
32	0.0080	0.2032	164.1	538.2480	0.530	0.0910
Metric 2.0	0.00787	0.200	169.4	555.6100	0.510	0.0880
33	0.00710	0.18034	206.9	678.6320	0.430	0.0720
Metric 1.8	0.00709	0.18000	207.5	680.5500	0.430	0.0720
34	0.00630	0.16002	260.9	855.7520	0.330	0.0560
Metric 1.6	0.00630	0.16002	260.9	855.7520	0.330	0.0560
35	0.00560	0.14224	329.0	1079.120	0.270	0.0440
Metric 1.4	0.00551	0.14000	339.0	1114	0.260	0.0430
36	0.00500	0.12700	414.8	1360	0.210	0.0350
Metric 1.25	0.00492	0.12500	428.2	1404	0.200	0.0340
37	0.00450	0.11430	523.1	1715	0.170	0.0289
Metric 1.12	0.00441	0.11200	533.8	1750	0.163	0.0277
38	0.00400	0.10160	659.6	2163	0.130	0.0228
Metric 1	0.00394	0.10000	670.2	2198	0.126	0.0225
39	0.00350	0.08890	831.8	2728	0.110	0.0175
40	0.00310	0.07874	1049	3442	0.090	0.0137
41	0.00280	0.07112	1323	4341		
42	0.00250	0.06350	1659	5443		
43	0.00220	0.05588	2143	7031		
44	0.00200	0.05080	2593	8507		
45	0.00176	0.04470	3348	10984		
46	0.00157	0.03988	4207	13802		
47	0.00140	0.03556	5291	17359		