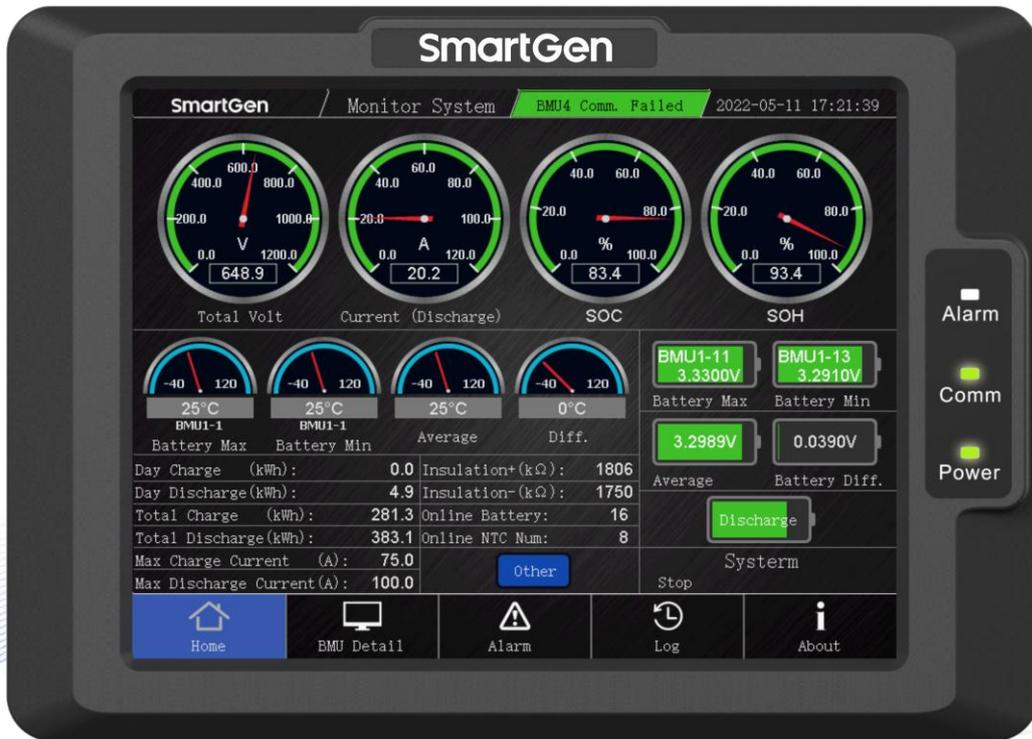


SmartGen

MAKING CONTROL SMARTER

HMU8-BMS DISPLAY MODULE USER MANUAL



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Table 1 Software Version

Date	Version	Note
2024-09-25	1.0	Original release.

Table 2 Notation Clarification

Sign	Instruction
 NOTE	Highlights an essential element of a procedure to ensure correctness.
 CAUTION!	Indicates a procedure or practice, which, if not strictly observed, could result in damage or destruction of equipment.
 WARNING!	Indicates a procedure or practice, which could result in injury to personnel or loss of life if not followed correctly.

Glossary and List of Abbreviations

PCS: Power Conversion System

BMS: Battery Management System

BCU: Battery Control Unit

BMU: Battery Management Unit

SOC: State of Charge

SOH: State of Health

SOP: State of Power

SOE: State of Energy



1 OVERVIEW

HMU8-BMS Display Module is a significant part of the storage battery cabinet. It can perform data monitoring, data calibration, parameter recovery, parameter setting of HBCU100, HBCU200 and visually display alarm information and historical record data in system operation via RS485 interface, in which the parameter settings include important battery cluster parameters, protection parameters, digital input and output, RS485 communication and network communication parameters; and firmware upgrade of the master control module through the CAN interface. The display module performs data monitoring, data calibration and firmware upgrade of HBMU100 and HBMU200 through the CAN interface.

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2 PERFORMANCE AND CHARACTERISTICS

- The display module adopts 8-inch 800*600 resolution LCD, HMI interface, capacitive touch screen operation; Chinese and English optional interface operation, and can be selected on site, which is convenient for factory commissioners to test the machine;
- With power indicator, communication indicator and alarm indicator;
- The module has 10 levels of dimming, which can adjust the brightness for different environments;
- With 4 RS485 interfaces, 1 CANBUS interface, and 1 ETHERNET interface. RS485-1 is used to communicate with the BCU master control module. The CANBUS interface can debug the CAN communication of BCU and BMU, and the rest are reserved interfaces;
- With USB device interface for upgrading display module firmware;
- With USB host interface for upgrading interface pictures and font library of the display module;
- A rubber seal ring is designed between the housing and the control panel, and the waterproof performance of the front panel can reach IP65;
- The controller is fixed with metal clips;
- Modular structure, pluggable terminals, embedded installation, compact structure, easy installation.

3 SPECIFICATION

Table 3 Specification Parameters

Items	Contents
Operating Voltage	DC10V ~ DC35V continuous power supply, DC reverse connection protection
Overall Consumption	<6W
RS485 Interface	Isolated, half-duplex, 9600/19200/38400/57600/115200bps baud rate, maximum communication distance 1000m (under 9600bps).
Ethernet Interface	Self-adapting 10/100Mbit
CAN BUS Interface	Isolated, maximum communication distance 250m, using Belden 9841 cable or equivalent.
Vibration	5Hz~8Hz: ±7.5mm 8Hz~500Hz: ±2g IEC 60068-2-6
Shock	50g, 11ms, half-sine, three consecutive shocks are applied in each of the three mutually perpendicular directions, i.e. a total of 18 times. IEC 60068-2-27
Bump	25g, 16ms, half-sine IEC 60255-21-2
Overall Dimensions	221mm x 163mm x 51mm
Cutout	205mm x 147mm
Working Temperature	(-25~+70)°C
Working Humidity	(20~93)%RH
Storage Temperature	(-30~+80)°C
Protection Level	Front shell: IP65, when a waterproof rubber ring is installed between the controller and the control panel Rear shell: IP20
Weight	1.3kg

4 DISPLAY AND OPERATION

4.1 MODULE PANEL



Fig.1 Front Panel

Table 4 Indicator Description

Indicator	Function
Alarm Indicator	<p>The indicator slow flashes (once per second) when the level-1 fault alarm occurs.</p> <p>The indicator fast flashes (5 times per second) when the level-2 fault alarm occurs.</p> <p>The indicator is always illuminated when the level-3 fault alarm occurs.</p> <p>The indicator is extinguished when there is no alarm.</p>
Comm. Indicator	<p>The indicator is always illuminated when the communication between the display module and the master control module is normal.</p> <p>The indicator is extinguished when the communication is abnormal.</p>
Power Indicator	<p>The indicator is always illuminated when the controller is powered on and working.</p> <p>The indicator is extinguished when the controller stops working.</p>

4.2 HOMEPAGE DISPLAY

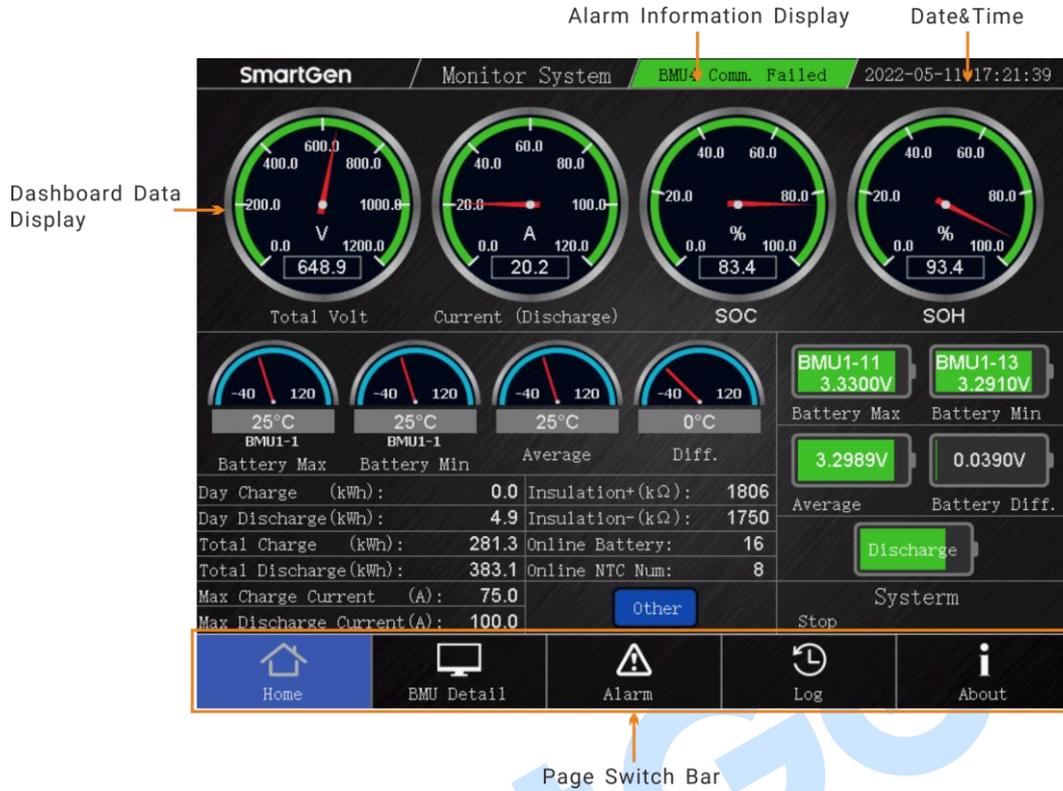


Fig.2 Homepage Display

4.3 BMU DETAILS



Fig.3 BMU Details

This page displays all cell voltage and temperature data for a single BMU, as well as the current equalization state of the cell. BMU display can be switched by turning left or right buttons.

4.4 ALARM PAGE

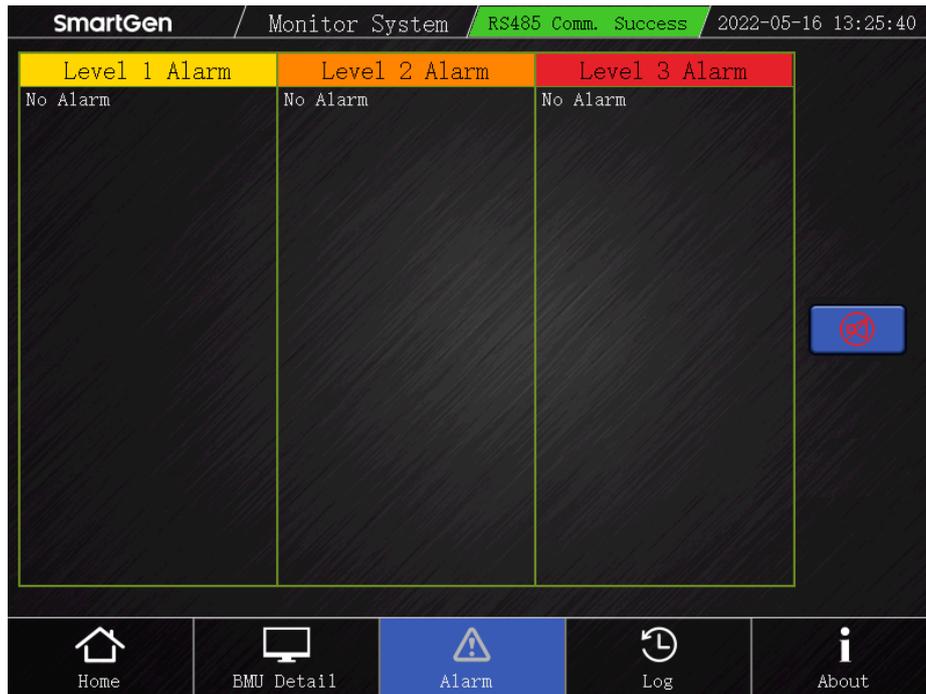


Fig.4 Alarm Page

The alarm interface can display three alarm types: level-1 fault alarm, level-2 fault alarm and level-3 fault alarm.

Tale 5 Button Description

Icon	Button	Description
	Alarm Mute	Press it to eliminate the alarm sound of the display module and the master control module, and the white part of the button will turn red. Press it again, the alarm sound will be active again, and the red part of the button will turn white.

4.5 HISTORY

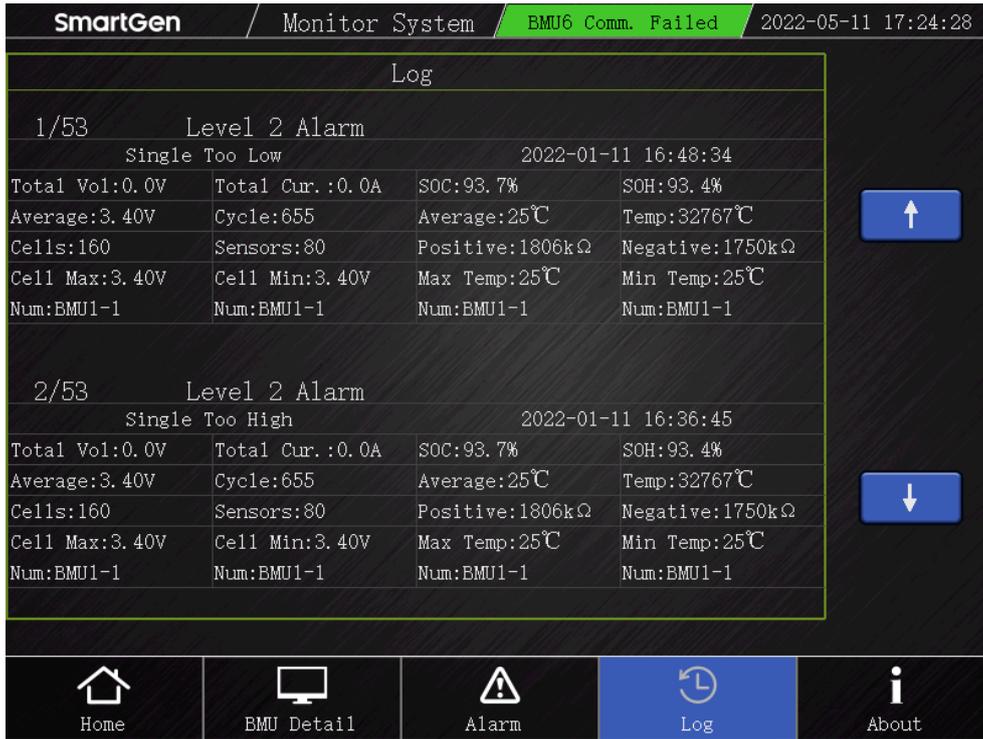


Fig.5 History

Each page of the history page can display 2 event records, including the serial number/total number of the current event, event type, event specific content, event generation time and data details.

Up to 200 event records can be viewed in a cycle with the up and down buttons.

4.6 ABOUT PAGE

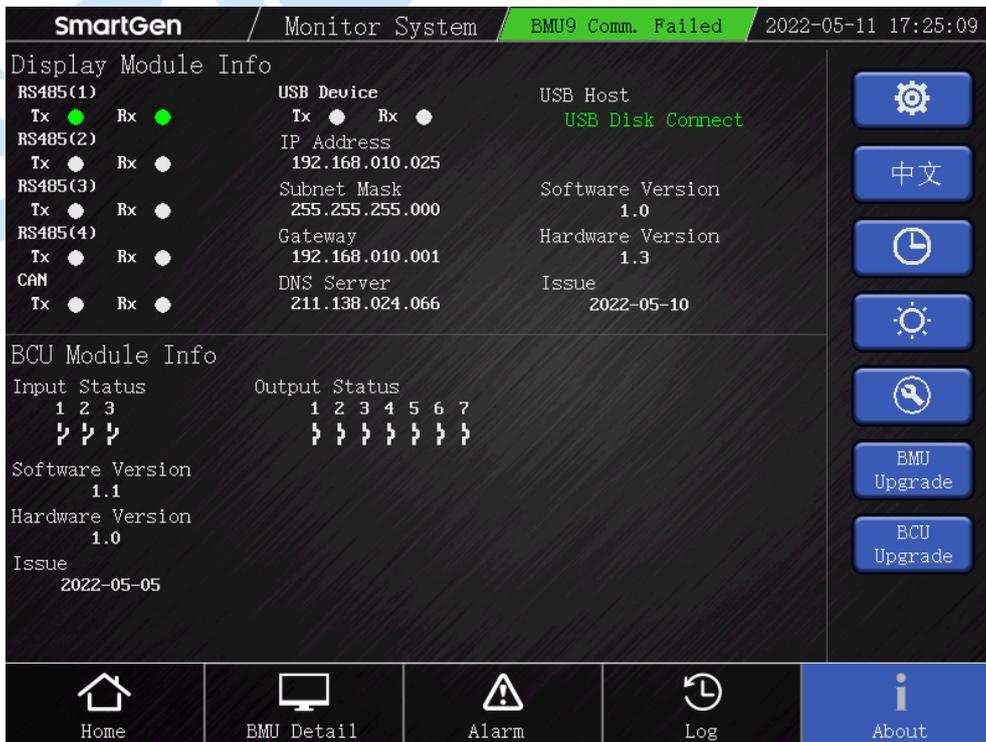


Fig.6 About Page

Table 6 Button Description

Icon	Button	Description
	Parameter Setting	Press it to select the display module and the master control module to set parameters respectively.
	Language Setting	Press it to set the language of the display module to Chinese or English.
	Time and Date	Press it to set the time and date of the master control module.
	Brightness	Press it to adjust the screen brightness of the display module, and at the same time, you can test the light for 2 seconds.
	Advanced Parameter Setting	Press it and enter the password to perform data calibration and parameter recovery of the master control module.
	BMU Upgrade	Press it to enter the HBMU100 and HBMU200 firmware upgrade interface.
	BCU Upgrade	Press it to enter the HBCU100 and HBCU200 firmware upgrade interface.

4.7 PARAMETER SETTING

In the About page, press  to enter the module selection page and select the module that needs to be configured.

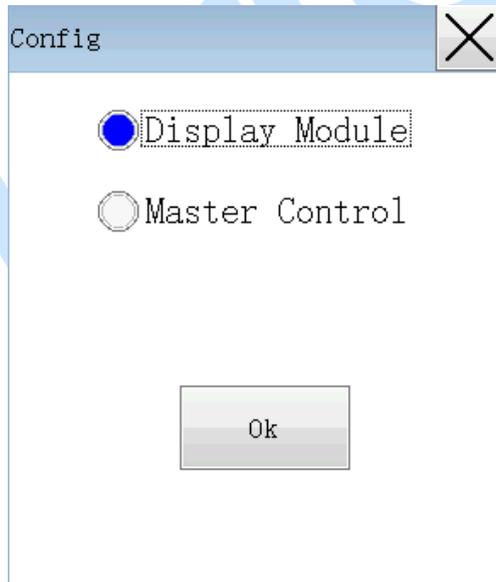


Fig.7 Module Select

4.8 PARAMETER SETTING OF DISPLAY MODULE

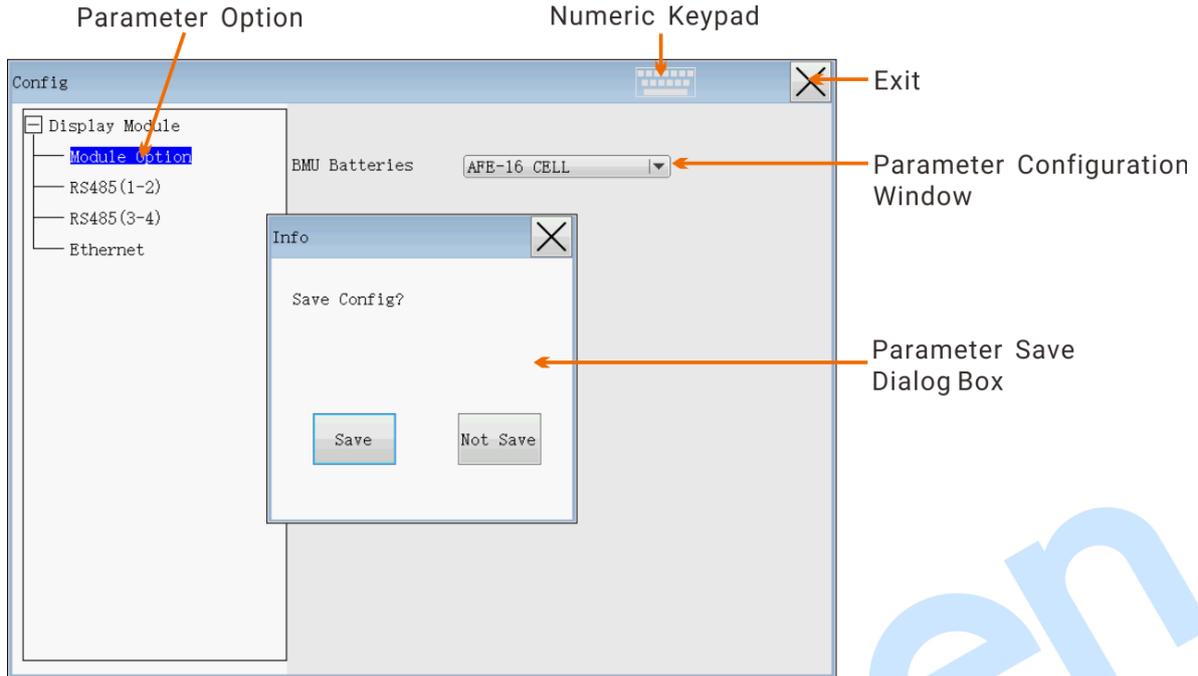


Fig.8 Parameter Setting of Display Module

The parameter configuration steps of the display module are as follows:

- 1) Select the parameter items to be configured through the tree diagram;
- 2) Set the parameters to be changed in the right window, and press the keys to pop up the keypad when needed;
- 3) After the parameter configuration is completed, press the exit button to open the parameter save dialog box, and save it according to the prompts.

4.9 PARAMETER SETTING OF MASTER CONTROL MODULE

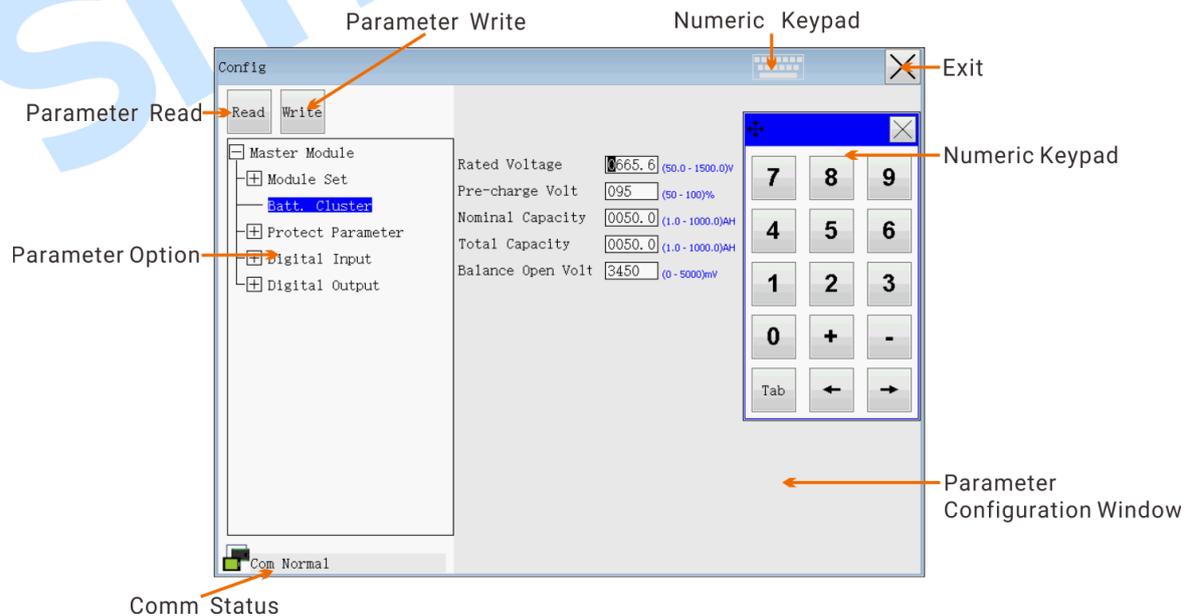


Fig.9 Parameter Setting of Master Control Module

Before entering the parameter configuration interface of the master control module, the display module will read the parameters of the master control module first. If the communication fails, the display module will load the factory default parameter values of the master control module.

The parameter configuration steps of the master control module are as follows:

- 1) Select the parameter items to be configured through the tree diagram;
- 2) Set the parameters to be changed in the right window, and press the keys to pop up the keypad when needed;
- 3) After the parameter configuration is completed, click the parameter write button to write the parameter. Before writing, if the password of the master control module saved by the display module is inconsistent with the password of the master control module itself, a password dialog box will pop up. Only after entering the correct password of the master control module can the parameter be written successfully, otherwise, it cannot be written. If the correct master control module password has been saved before, the parameters are written directly.
- 4) After the parameters are written, click the exit button to exit the interface.

NOTE1: The default password of the master control module is "01234". When the password is forgotten, please contact the manufacturer.

NOTE2: In the process of parameter configuration, if the communication fails and is normal, the display module will re-read and load the parameter configuration of the master control module.

NOTES:

- a) Please modify the internal parameters of the module (such as various protection thresholds and their delays, etc.) when the battery cluster is still, otherwise BMS alarm protection may occur, resulting in load power failure.
- b) The too high threshold must be greater than the too low threshold, for example, the overvoltage threshold must be greater than the undervoltage threshold, otherwise there will be both overvoltage and undervoltage.
- c) When setting the self-reset alarm, please set the return value correctly, otherwise the alarm will be abnormal. When setting the too high threshold, the return value should be less than the set value, and when setting the too low threshold, the return value should be greater than the set value.
- d) The programmable input port cannot be set to the same item, otherwise the correct function cannot appear, and the programmable output port can be set to the same item.

5 BACK PANEL OF DISPLAY MODULE

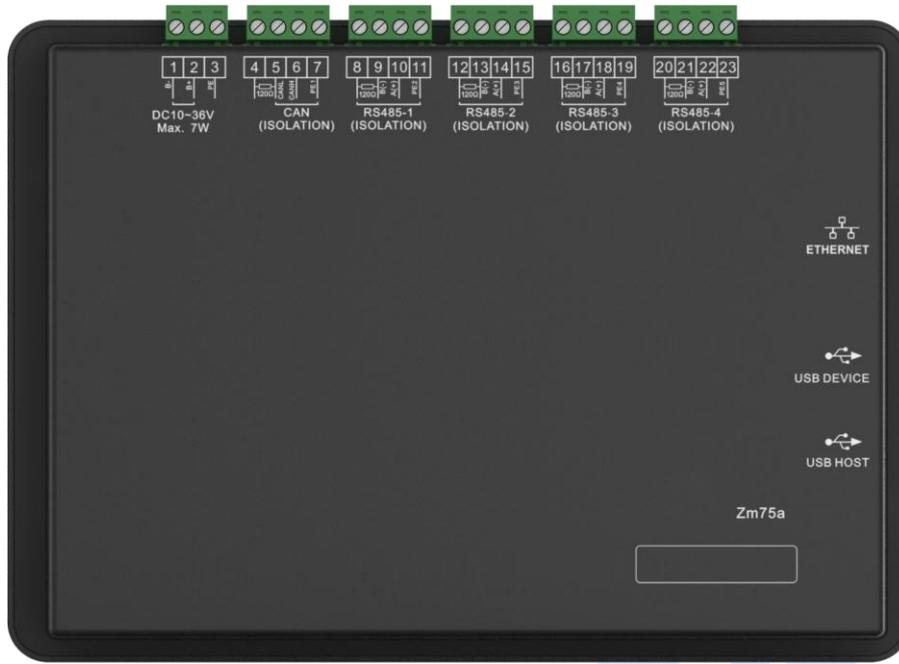


Fig.10 Controller Back Panel

Table 7 Terminal Description

No.	Function		Cable	Remark
1	B-		1.0mm ²	Connect to the negative electrode of the starting battery.
2	B+		1.0mm ²	Connect the positive electrode of the starting battery.
3	PE			Protected ground.
4	CAN	Termination matching resistance (120Ω)	0.5mm ²	Used to debug BMU module, upgrade BCU module and BMU module firmware. It is recommended to use twisted pair shielded wire with impedance of 120Ω, and the shielded wire is grounded at one end.
5		CAN L	0.5mm ²	Short-circuit No.4 and No.6 terminals to 120Ω terminal resistor.
6		CAN H	0.5mm ²	
7		PE1		Protected ground.
8	RS485-1	Termination matching resistance (120Ω)	0.5mm ²	Used to connect the master control module. It is recommended to use twisted pair shielded wire with impedance of 120Ω, and the shielded wire is grounded at one end.
9		B(-)	0.5mm ²	Short-circuit No.8 and No.10 terminals to 120Ω terminal resistor.
10		A(+)	0.5mm ²	
11		PE2		Protected ground.
12	RS485-2	Termination matching resistance (120Ω)	0.5mm ²	Reserved interface. It is recommended to use twisted pair shielded wire with impedance of 120Ω, and the shielded wire is grounded at one end.

No.	Function	Cable	Remark
13	B(-)	0.5mm ²	Short-circuit No.12 and No.14 terminals to 120Ωterminal resistor.
14	A(+)	0.5mm ²	
15	PE3		Protected ground.
16	RS485-3	Termination matching resistance (120Ω)	Reserved interface. It is recommended to use twisted pair shielded wire with impedance of 120Ω, and the shielded wire is grounded at one end.
17		B(-)	0.5mm ²
18		A(+)	0.5mm ²
19		PE4	
20	RS485-4	Termination matching resistance (120Ω)	Reserved interface. It is recommended to use twisted pair shielded wire with impedance of 120Ω, and the shielded wire is grounded at one end.
21		B(-)	0.5mm ²
22		A(+)	0.5mm ²
23		PE5	

NOTE1: The slave USB interface on the side of the controller is used for controller firmware upgrade.

NOTE2: The main USB interface on the side of the controller is used to update the display pictures and font library.

NOTE3: The ETHERNET interface on the side of the controller is reserved.

6 INSTALLATION

6.1 FIXING CLIPS

- The controller is designed to be panel-mounted and is fixed by a clip during installation.
- Screw out the fixed metal clip counterclockwise to the appropriate position.
- Pull the fixed metal clip back toward the back of the controller to determine whether all four fixed metal clips are fixed in the designated slots.
- Tighten the screws of the metal clip clockwise to make sure it is fixed to the controller panel.
- Do not over-tighten the screws of the metal clips, torque 2.75 kgf.cm (0.27 N.m).

6.2 OVERALL DIMENSION AND PANEL CUTOUT

Unit: mm

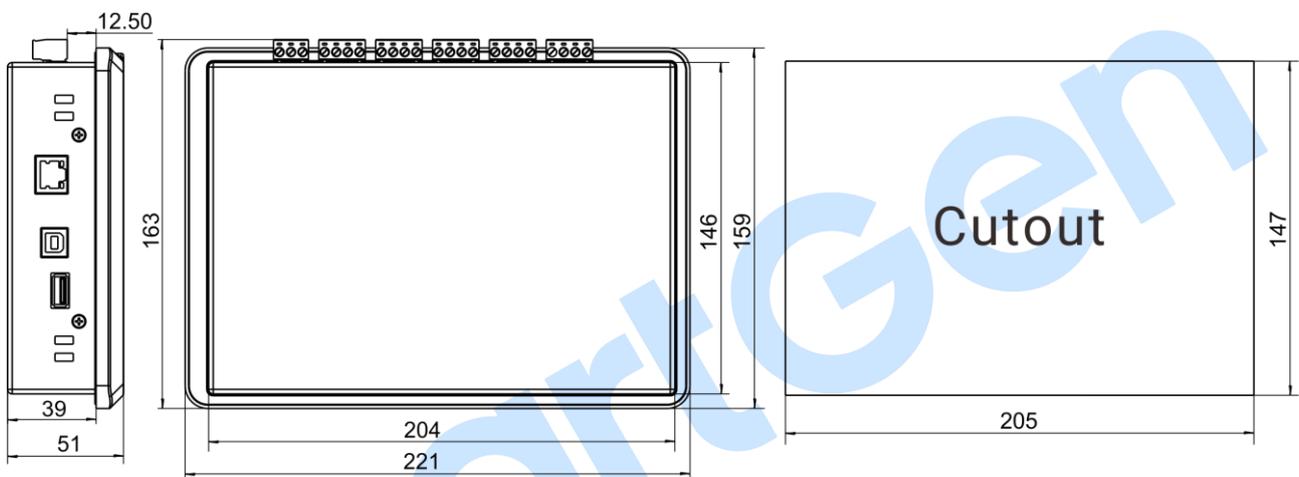


Fig.11 Overall Dimension and Panel Cutout

7 TYPICAL APPLICATION DIAGRAM

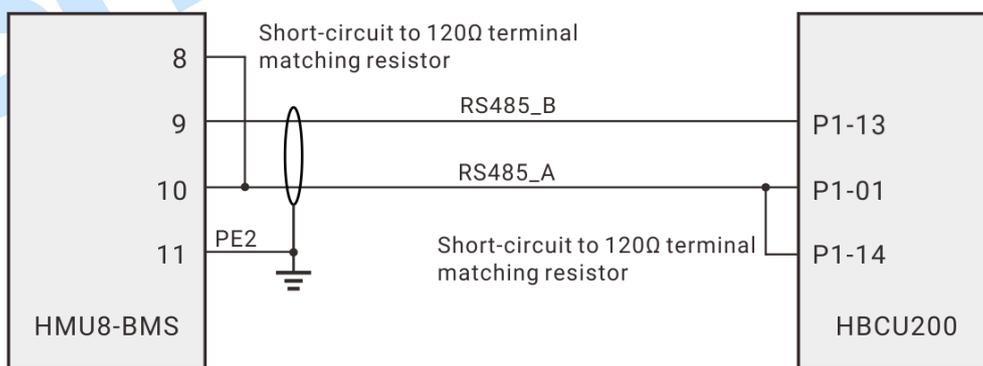


Fig.12 Master Control Module Monitoring RS485 Communication

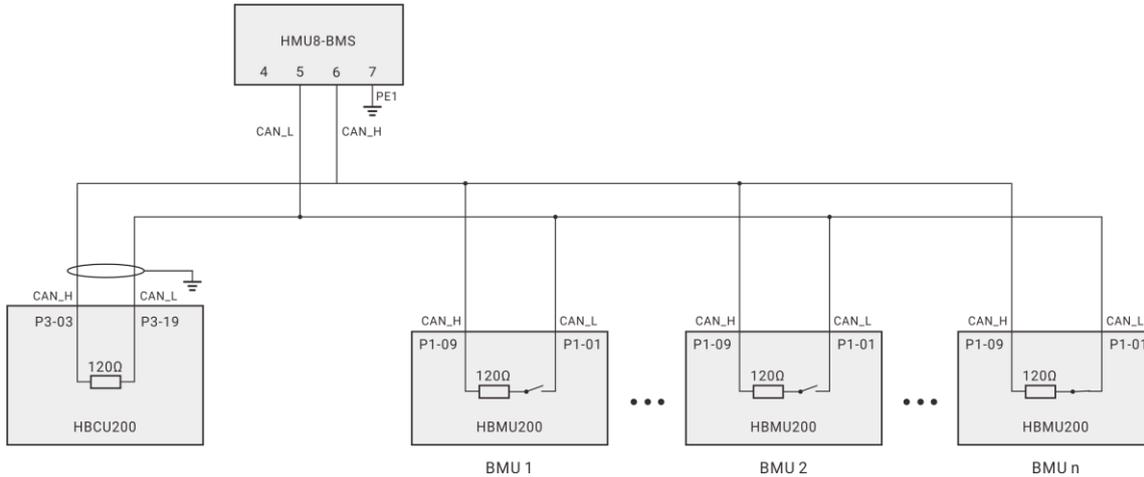


Fig.13 Master Control Module Debugging CAN Communication

8 COMMISSIONING

The following checks are recommended before the system is officially running:

- Check that all wiring is correct and the wire diameter is appropriate;
- Check that the display module is correctly connected to the master control module;
- After the system is powered on, check whether there is data in each monitoring interface of the display module and whether the communication status is normal.

If you have any other questions, please contact our service staff in time.

NOTE1: HMU8-BMS is only connected to the RS485-1 communication interface when monitoring the data of the master control module, and the CAN communication interface needs to be disconnected; HMU8-BMS only connects to CAN communication interface when upgrading firmware to the master control module or slave control module.

9 TROUBLESHOOTING

Table 8 Troubleshooting

Fault Phenomenon	Possible Measures
Controller no response when powered on	Check controller wiring; Check whether the power supply module has a voltage output.
RS485 cannot communicate properly	Check wiring; Check whether COM port settings are correct; Check whether the A and B lines of RS485 are connected reversely; Check whether the 120Ω termination resistance of the communication line matches.
CANRS485 cannot communicate properly	Check wiring; Check whether CANH and CANL are connected reversely; It is recommended to add a 120Ω resistor between the controller CANH and CANL.