Free-Standing System User Manual

Applicable models
UNIV-16.2kWh(S)

This manual describes the Free-Standing Series battery. Please read this manual before installing the battery module and follow the instructions carefully during assembly.

If you have any questions, please contact your dealer immediately for advice and instructions

Contents

1 Safety Precautions

This section describes the safety information that must be observed when working with battery packs. To prevent any damages, or personal injury, and to ensure the performance of the battery packs, please read this section carefully and observe the safety precautions at all times.

1.1 Precautions

- It is very important and necessary to read the user manual carefully before installing or using the product.
- Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury or death, and could damage the battery, or potentially rendering it inoperable.
- If the battery pack is stored for long time, it is required to charge them every six months, and the SOC should be no less than 50%.
- Battery startup sequence:
  1.Connect external wiring properly.
  2.Press the power button and ensure the battery status is normal.
  3.Turn on the circuit breaker to begin usage.
- Battery turn off sequence:
  1.Press the power button and confirm the battery is off.
  2.Turn off the circuit breaker.
  3.Disconnect external cables.
- If the battery is not fully charged and discharged over a long period, the SOC may become inaccurate. Please perform a full charge calibration at least once every two weeks.
- Please recharged the battery pack within 12 hours, after fully discharged.
- All the battery pack terminals must be disconnected before any maintenance.
- Do not use cleaning solvents to clean battery pack.
- Do not expose battery pack to flammable or harsh chemicals, or corrosive gases or liquids.
- Do not paint any part of battery pack, include any internal or external components.
- Do not expose the battery pack to direct sunlight for extended periods of time.

- Do not connect battery pack with PV solar wiring directly.
- Do not insert any foreign object into any part of the battery pack.

1.2 Warning

- Do not touch the battery pack with wet hands.
- Do not crush, drop or puncture the battery pack.
- Always dispose of the battery pack according to local safety regulations.
- Store and recharge the battery pack in a manner in accordance with this user manual.
- Ensure reliable grounding.
- Do not reverse the polarity when installing.
- Do not short circuit the terminals, remove all jewelry items that could cause a short circuit before installation and handling.
- Disconnect battery from power or loads, and then power off battery before installation and maintenance.
- The battery packs should be not stacked more than specified numbers.
- Continued operation of a damaged battery pack can result in dangerous situation.

2 Introduction

UNIV16.2kWh(S) lithium iron batteryis the new energy storage products , it can be used to support reliable highpower for various types of equipment and systems.

2.1 Features

1) Dual active protection on BMS level.
2) Automatic address setting when connect in multi-group.
3) Support upgrade battery module from upper controller via RS485 communication.
4) Enable 90% depth of discharge, available for the inverter which completely follow Supplier latest protocol to operate.
5) The module is non-toxic, non-pollution and environmentally friendly.
6) Cathode material is made from LiFePO4 with safety performance and long cycle life.
7) Battery management system(BMS) has protection functions including over-discharge, over-charge, over-current and high/low temperature.

8) Flexible configuration, multiple battery modules can be in parallel for expanding capacity and power.
9) Adopted self-cooling mode rapidly reduced system entire noise.

2.2 Equipment interface instruction

2.2.1 Charge mode

When the battery string detects that the charger is connected and the best charging voltage is greater than 0.5V, when the charging current reaches the effective charging current, the charging mode is entered.

2.2.2 Discharge mode

The battery string enters discharge mode when it detects that the load is connected and the discharge current reaches the effective discharge current.

2.2.3 Standby Mode

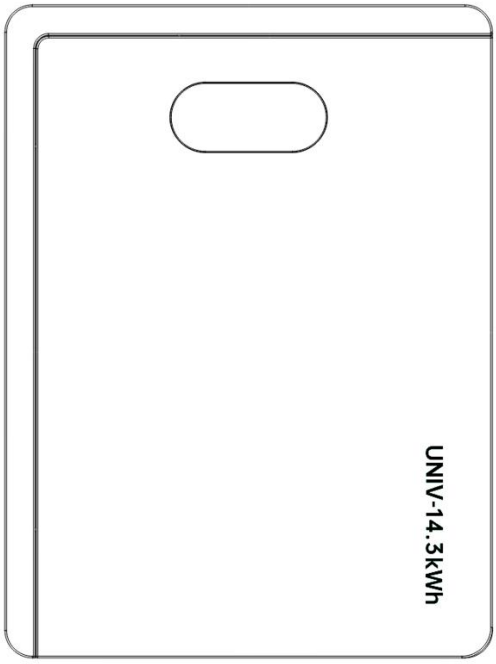
If the above two modes are not satisfied, enter the standby mode.

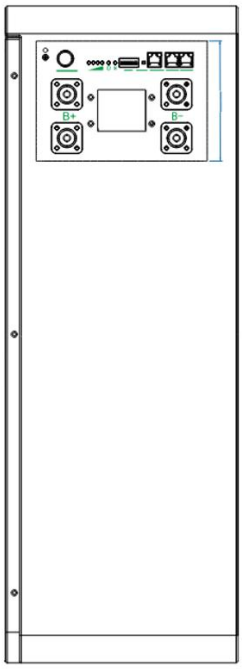
2.2.4 Shutdown Mode

Normal standby for 48 hours, the battery pack triggers the under voltage protection, execute the switch button or reset button to shut down, Wake-up conditions of shutdown mode: ⑴ charging activation; ⑵ 48V voltage

3 Battery System Introduction

3.1 Battery Appearance Introduction



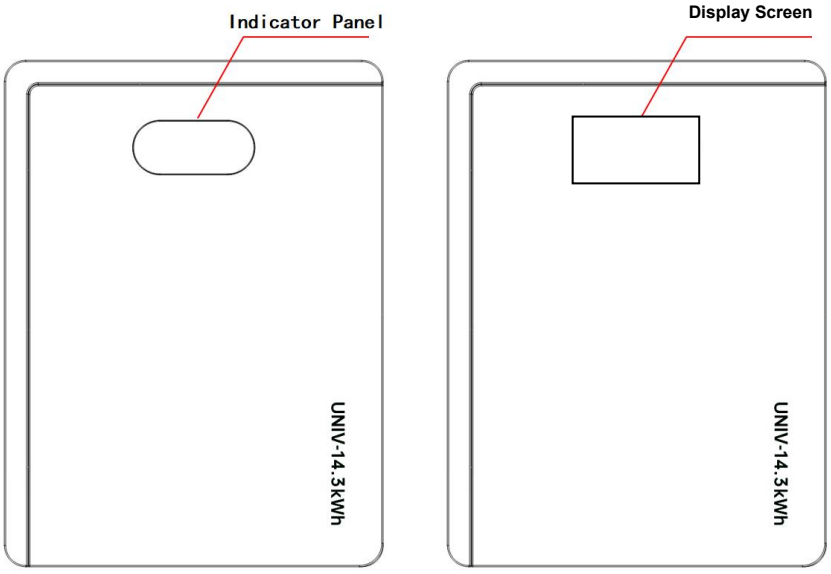


3.2 Battery Specification

MODEL	UNIV-16.2kWh(S)
BATTERY PARAMETERS	
Total Energy (kWh)	16.2
Useable Energy (kWh)	15.2
Nominal Voltage (Vd.c)	51.2
Voltage Range (Vd.c)	44.8 ~ 57.6
Rated Capacity (Ah)	316
Recommend Charge Current (A)	158
Recommend Discharge Current (A)	158
Max. Charge Current (A)	200
Max. Discharge Current (A)	200
Recommend Using DOD	90%
Dimension (W *H* D) (mm)	560*830*270
Weight (KG）	136

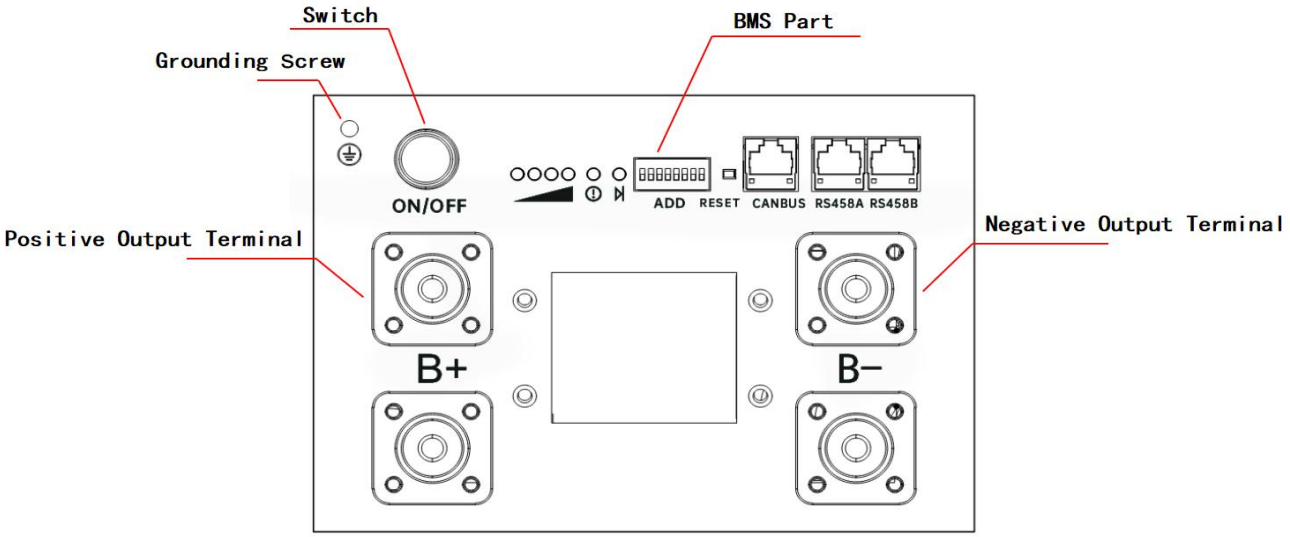
BMS Features	Over-voltage Protection Over-current Protection Short-circuit Protection Low-voltage Protection/ Cell Balance Over Temperature Protection
Communication	CAN/RS485
Scalability	Max 20 in Parallel
OPERATING CONDITION	
Operate Temperature (Charge)	0℃ ~ 55℃ (32℉ ~ 131℉)
Operate Temperature (Discharge)	-20℃ ~ 60℃ (-4℉ ~ 140℉)
Storage Temperature	-20℃ ~ 50℃ (-4℉ ~ 122℉)
IP Rating	IP20
Cooling Type	Natural
Operating Environment	Indoor (5% ~ 95%(RH) No Condensing)
Altitude	＜4000 m
CERTIFICATION AND SAFETY	
Warranty	10 Years
Operation Life	15+ Years (25℃/77 ℉)
Cycle Life	＞8000@25℃, 80%DOD
Certification	CE/Cell UL 1973/UN38.3/MSDS

3.3 Battery Function Introduction



	Indicator Panel: Displays SOC (State of Charge) status.

	Display Screen: Used to view data and modify protocols



Item	Function Description
	SOC indicator lights: Each light represents a 25% capacity range, increasing from left to right.
	Alarm light: If the battery has an alarm, it will emit a red light.
	Operation light: When the battery is running normally, it will flash a green light.
ADD	Dip switch: Used for communication when batteries are connected in parallel.
CANBUS	CAN interface: used for communication with the inverter.
RS458A RS458B	RS485 interface: used for communication between batteries in parallel
RESET	Reset button: Used to restore factory settings.
	Switch. Press the switch to turn the battery on or off.
	Output/Input port: Used for battery charging and discharging.

⏚	Grounding screw: Used for grounding the product to protect personnel safety.

3.4 Communication Instructions

3.4.1 Communication with the inverter

Note: Please read the definition of the Battery Communication interface in the inverter's instruction manual before proceeding with this part of the operation.

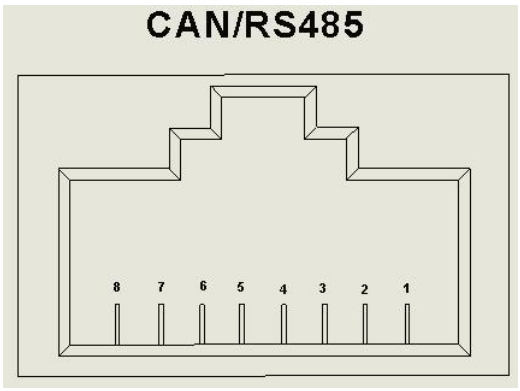
If you use RS485 communication, you need to pay attention to RS485-A and RS485-B in the definition of battery interface, if you use CAN communication, you need to pay attention to CAN_H and CAN_L in the definition of battery interface.

When the pin definition of communication between the inverter side and the battery side is the same, the communication can be done by using normal network cable.

If the pin definition of communication between inverter and BMS is not the same, you need to make a special cable according to the inverter pin, otherwise the inverter will not recognize the battery.

If you have problems with this part of the communication, please contact Supplier's after-sales department or Supplier's authorized dealers.

Interface Definition



CAN/RS485	
Pin	**Definition description**
1/8	RS485-B
2/7	RS485-A
4	CAN-H
5	CAN-L
3/6	GND

3.4.2 Communication between the batteries

Communication between batteries can be done using the network cable included in the battery package.

3.4.3 Dialing Instructions

The BMS of this product is equipped with the function of automatic address allocation, so there is no need to dial the code when using it, and it can be used with the regular network cable when paralleling the inverter. The wiring sequence should be in accordance with the following wiring method:
The first RS485B connects to the second RS485A, the second RS485B connects to the third RS485A, and so on.

3.5 LED Indicator Explanation (Optional)

3.5.1 LED light

10 capacity indicator lights, 4 operation lights, 1 protection indicator light, and 1 alarm indicator light. The SOC capacity indicator lights start at LED1.

LED1~LED10 ◯	**LED11、LED12、LED15、LED16◯**	**LED13 🔴**	**LED14 🟡**
SOC	**RUN**	**Protection**	**Alarm**

3.5.2 LED Capacity Indication

Status		**LED Capacity Indication**									
/		L10 ◯	L9 ◯	L8 ◯	L7 ◯	L6 ◯	L5 ◯	L4 ◯	L3 ◯	L2◯	L1 ◯
Power off		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Charge	10%~20%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Flash
	10%~20%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Flash	ON
	20%~30%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Flash	ON	ON
	30%~40%	OFF	OFF	OFF	OFF	OFF	OFF	Flash	ON	ON	ON
	40%~50%	OFF	OFF	OFF	OFF	OFF	Flash	ON	ON	ON	ON
	50%~60%	OFF	OFF	OFF	OFF	Flash	ON	ON	ON	ON	ON
	60%~70%	OFF	OFF	OFF	Flash	ON	ON	ON	ON	ON	ON
	70%~80%	OFF	OFF	Flash	ON	ON	ON	ON	ON	ON	ON
	80%~90%	OFF	Flash	ON	ON	ON	ON	ON	ON	ON	ON
	90%~100%	Flash	ON	ON	ON	ON	ON	ON	ON	ON	ON
Disc	0%~10%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
	10%~20%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON
	20%~30%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
	30%~40%	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON

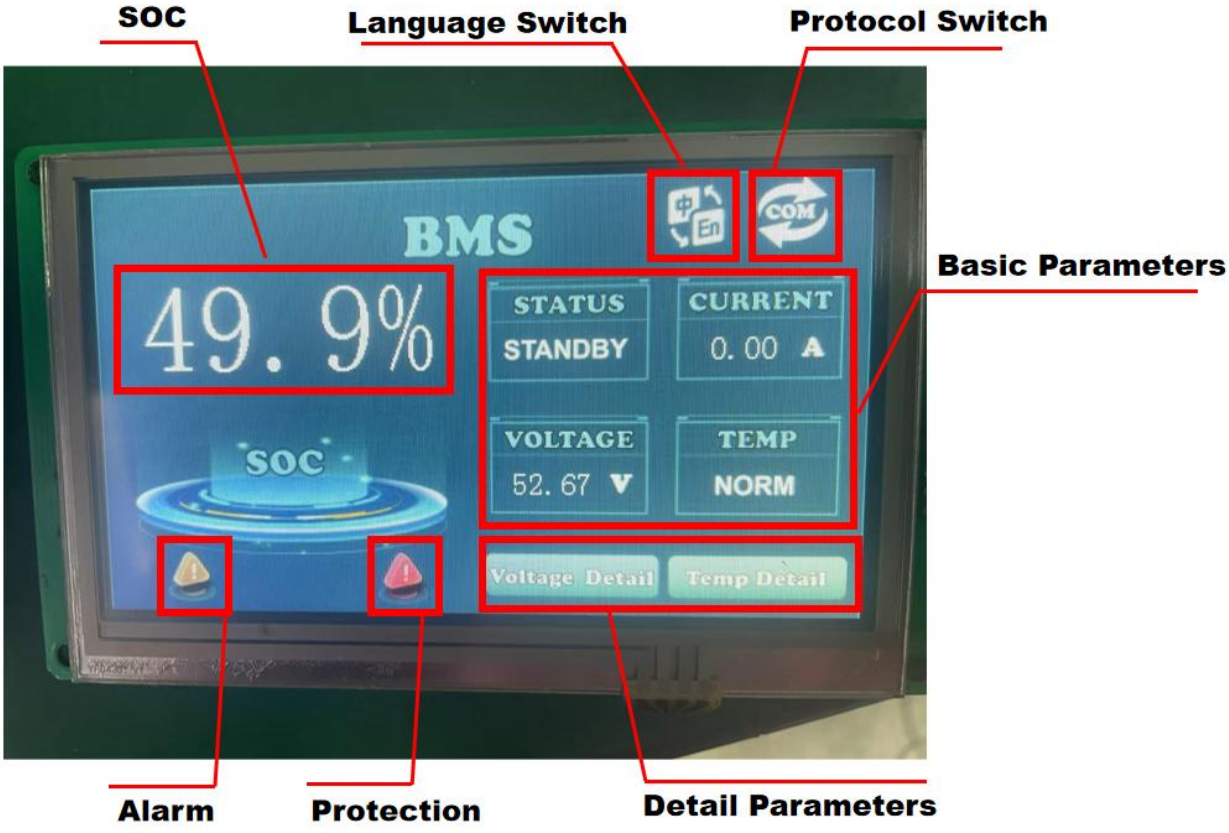
h a r g e	40%~50%	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON
	50%~60%	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
	60%~70%	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON
	70%~80%	OFF	OFF	ON	ON	ON	ON	ON	ON	ON	ON
	80%~90%	OFF	ON	ON	ON	ON	ON	ON	ON	ON	ON
	90%~100%	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON

Status	Alarm and Protection Status		RUN ○	Alarm 🟡	Protection 🔴
Power off	/		OFF	OFF	OFF
	Normal		ON	OFF	OFF
	Voltage Sensor Failure	Secondary trip	OFF	OFF	ON
	Temperature Sensor Failure		OFF	OFF	ON
	Current Sensor Failure		OFF	OFF	ON
	Button Switch Failure		OFF	OFF	ON
	Cell Voltage Difference Failure		OFF	OFF	ON
	Charging Switch Failure		OFF	OFF	ON
	Discharging Switch Failure		OFF	OFF	ON
	Current Limiting Switch Failure		OFF	OFF	ON
	Single Cell High Voltage Alarm		ON	OFF	OFF
	Single Cell Low Voltage Alarm		ON	OFF	OFF
Charge	Total Voltage High Voltage Alarm		ON	OFF	OFF
	Total Voltage Low Voltage Alarm		ON	OFF	OFF
Discharge	Charging High-Temperature Alarm		ON	OFF	OFF
	Charging Low-Temperature Alarm		ON	OFF	OFF
Standby	Discharging High-Temperature Alarm		ON	OFF	OFF
	Discharging Low-Temperature Alarm		ON	OFF	OFF
	Environment High-Temperature Alarm		ON	OFF	OFF
	Environment Low-Temperature Alarm		ON	OFF	OFF
	Power High-Temperature Alarm		ON	OFF	OFF
	Charging Overcurrent Alarm		ON	OFF	OFF
	Discharging Overcurrent Alarm		ON	OFF	OFF
	Remaining Capacity Alarm		ON	ON	OFF
	Single Cell Undervoltage Protection		ON	OFF	ON
	Total Voltage Overvoltage Protection		ON	OFF	OFF
	Total Voltage Undervoltage Protection		ON	OFF	ON
	Charging Overvoltage Protection		ON	OFF	ON

	Charging Overtemperature Protection	ON	OFF	ON
	Charging Undertemperature Protection	ON	OFF	ON
	Discharging Overtemperature Protection	ON	OFF	ON
	Discharging Undertemperature Protection	ON	OFF	ON
	Environment Overtemperature Protection	ON	OFF	ON
	Environment Undertemperature Protection	ON	OFF	ON
	Power Overtemperature Protection	ON	OFF	ON
	Charging Overcurrent Protection	ON	OFF	ON
	Discharging Overcurrent Protection	ON	OFF	ON
	Transient Overcurrent Protection	ON	OFF	ON
	Transient Overcurrent Lockout	ON	OFF	ON
	Output Short Circuit Protection	OFF	OFF	ON
	Remaining Capacity Protection	ON	OFF	ON
	Output Reverse Connection Protection	ON	OFF	ON
	Output Short Circuit Lockout	OFF	OFF	ON
	Output Connection Fault	OFF	OFF	ON

3.6 Display Screen Instructions (Optional)

3.6.1 Home Screen

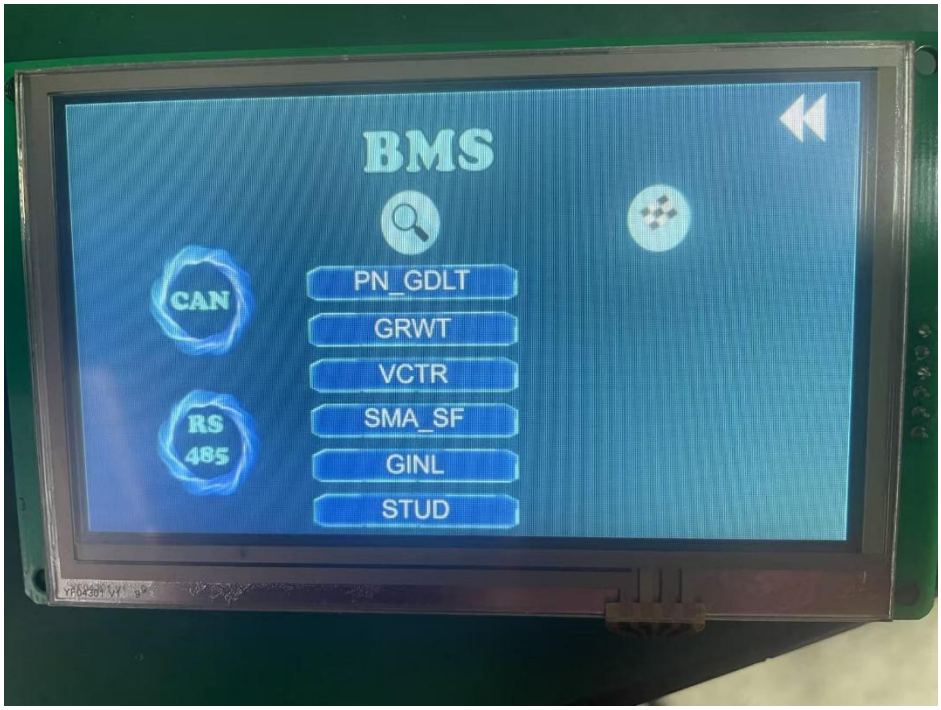


As shown in the image above, the display screen will show the current working status of the protection board, such as 'Standby,' 'Charging,' or 'Discharging' modes. It will also display the main parameters of the current BMS board: SOC, current, voltage, and temperature. The orange and red icons represent the alarm and protection items of the BMS board, respectively. If you want to check specific voltage and temperature parameters, you can click on these two icons. The two small icons in the upper right corner are used to switch the interface language and switch protocols.

3.6.2 Cells Detail Parameters

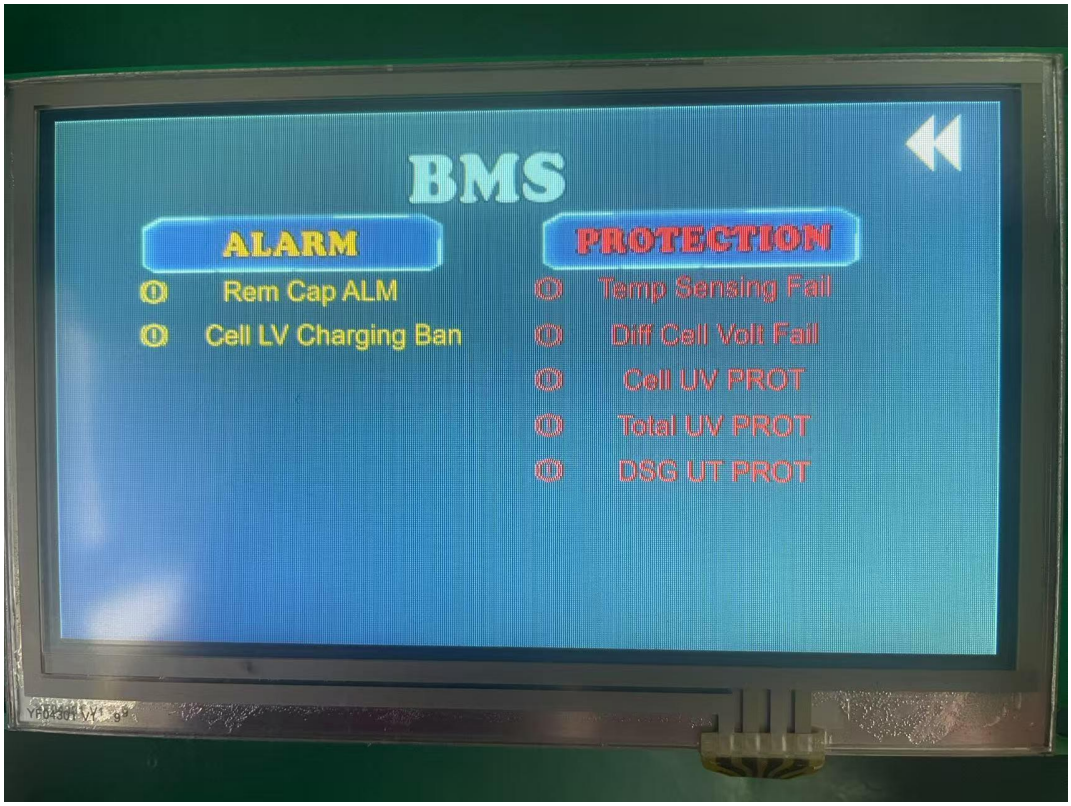
You can view detailed information such as the cell voltage, cell temperature, total battery voltage, total battery current, ambient temperature, and more through this interface.

3.6.3 Protocol Switch



You can adjust different protocols through this interface to correspond to different inverters.

3.6.3 Alarm and Protection information



You can view warning and protection information through this interface.

4 Installation Instructions

4.1 Tools

 **Wire Cutter**	 **Cable Ties**	 **Electric Screw Driver**
 **Screw Driver Set**	 **Sleeve Piece**	 **Multimeter**

NOTE: Use properly insulated tools to prevent accidental electric shock or short circuits. If insulated tools are not available, cover the entire exposed metal surfaces with available insulated alternatives, except their tips, with electrical tape.

4.2 How to Connect The Wire