BSM48106 Unit

User Manual

BLUESUN ESS

Content

1. Introduction

1.1 Important Safety Instructions

Danger!

●Please do not put the battery into water or fire, in case of explosion or any other situation that might endanger your life.

●Please connect wires properly while installation, do not reverse connect.
To avoid short circuit, please do not connect positive and negative poles with conductor on the same device.

●Please avoid any form of damage to battery, especially stab, hit, trample or strike.

Danger!

●Please shut off the power completely when removing the device or reconnecting wires during the daily use or it could cause the danger of electric shock.

●Please use dry powder extinguisher to put out the flame when encountering a fire hazard, liquid extinguisher could result in the risk of explosion.

●For your safety, please do not arbitrarily dismantle any component in any circumstances. The maintenance must be implemented by authorized technical personnel or our company's technical support. Device breakdown due to unauthorized operation will not be covered under warranty.

Caution!

●Our products have been strictly inspected before shipment. Please contact us if you find any abnormal phenomena such as device outer case bulging.

●The product shall be grounded properly before use in order to ensure your safety.

●To assure the proper use please make sure parameters among the relevant device are compatible and matched.

●Please do not mixed-use batteries from different manufacturers, different types and models, as well as old and new together.

Caution!

●Ambient and storage method could impact the product life span, please comply with the operation environment instruction to ensure device works in proper condition.

●For long-term storage, the battery should be recharged once every 6 months, and the amount of electric charge shall exceed 80% of the rated capacity.

●Please charge the battery in 18 hours after it fully discharged or over-discharging protection mode is activated.

●Formula of theoretical standby time: T=C/I (T is standby time, C is battery capacity, I is total current of all loads).

BSM48106 lithium iron phosphate battery system is a standard battery system unit, customers can choose a certain number of BSM48106 according to their needs, by connecting parallel to form a larger capacity battery pack, to meet the user's long-term power supply needs. The product is especially suitable for energy storage applications with high operating temperatures, limited installation space, long power backup time and long service life.

1.3 Product Properties

BSM48106 energy storage product's positive electrode materials are lithium iron phosphate, battery cells are managed effectively by BMS with better performance, the system's features as below:

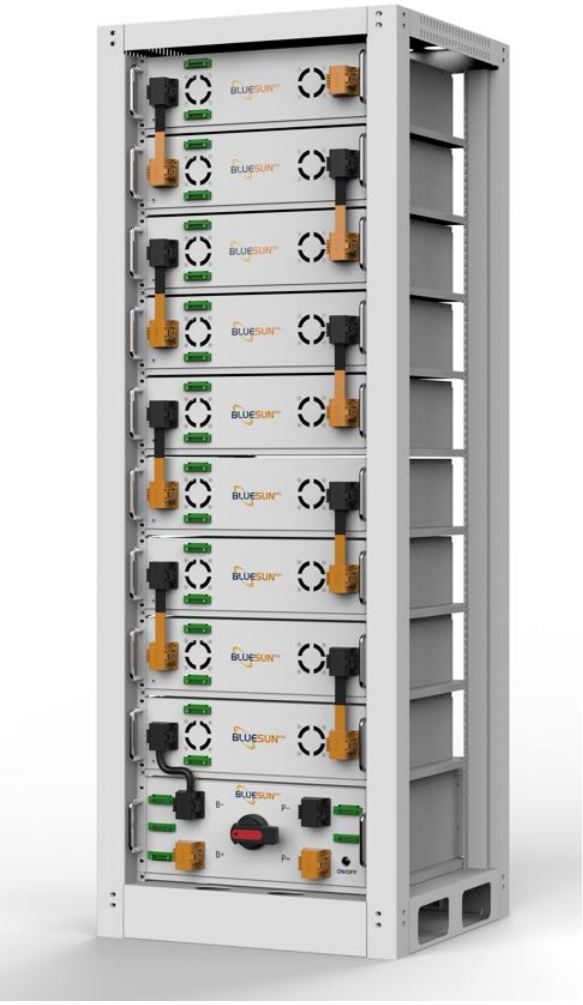
- The whole module is non-toxic, non-polluting and environmentally friendly;
- Cathode material is made from LiFePO4 with safety performance and long cycle life
- Battery management system with better performance, possesses protection function like over-discharge, over-charge, over-current, abnormal temperature.
- Self-management on charging and discharging, Single core balancing function.
- Intelligent design configures integrated inspection module.
- Flexible configuration, multiple battery modules can be in parallel for expanding capacity and power.
- Flexible configurations allow parallel of multi battery for longer standby time.
- Self-ventilation with lower system noise.
- Less battery self-discharge, then recharging period can be up to 10 months during the storage.
- No memory effect so that battery can be charged and discharged shallowly.
- With wide range of temperature for working environment, -20℃ ~ +55℃, circulation span and discharging performance are well under high temperature.
- Small size and light weight, standard of 19-inch embedded designed module is comfortable for installation and maintenance;

2. Product Specification

2.1 Performance Parameter

Table 2-2 BSM48106 performance parameter

Basic Parameters	BSMH-409.6V-106AH
Nominal Voltage (V)	409.6V
Nominal Capacity (KWH)	43.4176
Usable Capacity (KWH)	39.07584
Battery Controller Name	BSMC-1000-120
Battery Module Name	BSMH48106
Battery Module Quantity	8
Battery Module Capacity(KWH)	5.4272
Battery Module Voltage(V dc)	51.2
Battery Module Capacity (Ah)	106
Battery System Charge Voltage(V dc)	448
Battery System Charge Current(Normal)	50
Battery System Charge Current（Max）	106
Battery System Discharge lower-Voltage(Vdc)	384
Battery System Discharge Current (Standard)	50
Battery System Discharge Current(Normal)	100
Efficiency	96%
Depth of Discharge	RS485/RS232/CAN
Working Temperature	0℃~50℃ Charge -10℃ ~50℃ Disharge
Shelf Temperature	-20℃~60℃
Communicaiton	RS485/CAN
Certification	CE/IEC/UL/UN38.3/MSDS
Design Life	10 years+
Cycle Life	>6000
Other: 1） Battery Controller Dimensions (W*D*H) 2） Battery Module Dimensions(W*D*H)	 450*412*133 450*412*177.8



2.2 Battery Module

No.	Product Type	BSMH48106
1	Cell Technology	Li-ion(LFP)
2	Battery Module Capacity (KWH)	
3	Battery Module Voltage (Vdc)	
4	Battery Module Quantity (PCS)	
5	Battery Cell Voltage（Vdc）	
6	Battery Cell Capacity (AH)	
7	Battery Module Cell Quantity in Series(pcs)	
8	Battery Module Charge Voltage(Vdc)	
9	Battery System Charge Current(Standard)	
10	Battery Module Charge Current(Normal)	
11	Battery Module Charge Current(Max)	
12	Battery Module Discharge Lower-Voltage(Vdc)	
13	Battery System Discharge Current (Standard)	
14	Battery Module Charge Current (Normal)	
15	Battery Module Charge Current (Max)	
16	Efficiency	
17	Depth of Discharge	
18	Dimension(W*D*H, mm)	
19	Communication	
20	Protection Class	
21	Weight	
22	Operation Life	
23	Operation Cycle Life	
24	Operation Temperature	
25	Storage Temperature	
	Product Certificate	

	Transfer Certificate	

2.2.1 Battery Module Information

2.2.2 Battery Module Front Interface

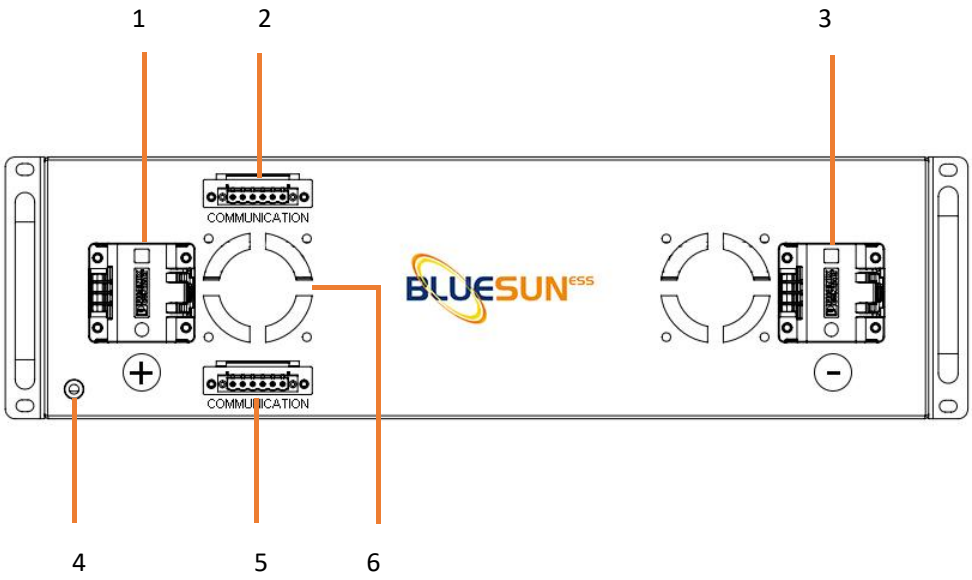


Table 2-3 Interface Definition

Item	Name	Definition
1	Positive socket	Battery output positive or parallel positive line
2	Communication Port	Support RS485 communication between battery module, and control module
3	Negative socket	Battery output positive or parallel positive line
4	SW (battery wake/ sleep switch)	When the "OFF/ON" switch button is in the ON state, press and hold this button for 3 seconds to put the battery into the power-on or off state.
5	SOC	The number of green lights shows the remaining power. Table 2-3 for details.
6	ALM	Red light flashing when an alarm occurs, red light always on during protection status. After the condition of trigger protection is relieved, it can be automatically closed
7	RUN	Green light flashing during standby and charging mode. Green light always on when discharging.
8	COM	Communication cascade port, support RS232
9	CAN/485	Communication cascade port, support CAN/ RS485 communication (factory default CAN communication)

10	DRY CONTACT	/
11	Negative socket	Battery output negative or parallel negative line
12	Grounding	Shell ground connection

2.3 Control Module (internal power supply)

2.3.1 Control Module information

Item	Product Type	BSMC-1000V-120A
1	Related Product	1000V 120A
2	AC Supply	
3	System Operation Voltage (Vdc)	
4	Operation Current (Max.) (A)	
5	Self-consumption Power(W)	
6	Dimension (W* D* H, mm)	
7	Communication	
8	Protection Class	
9	Weight(kg)	
10	Operation Life	
11	Operation Temperature	
12	Storage Temperature	

2.3.2

Control Module has two types: internal and external power supply

Control Module (BSMC-1000-250) Front Interface

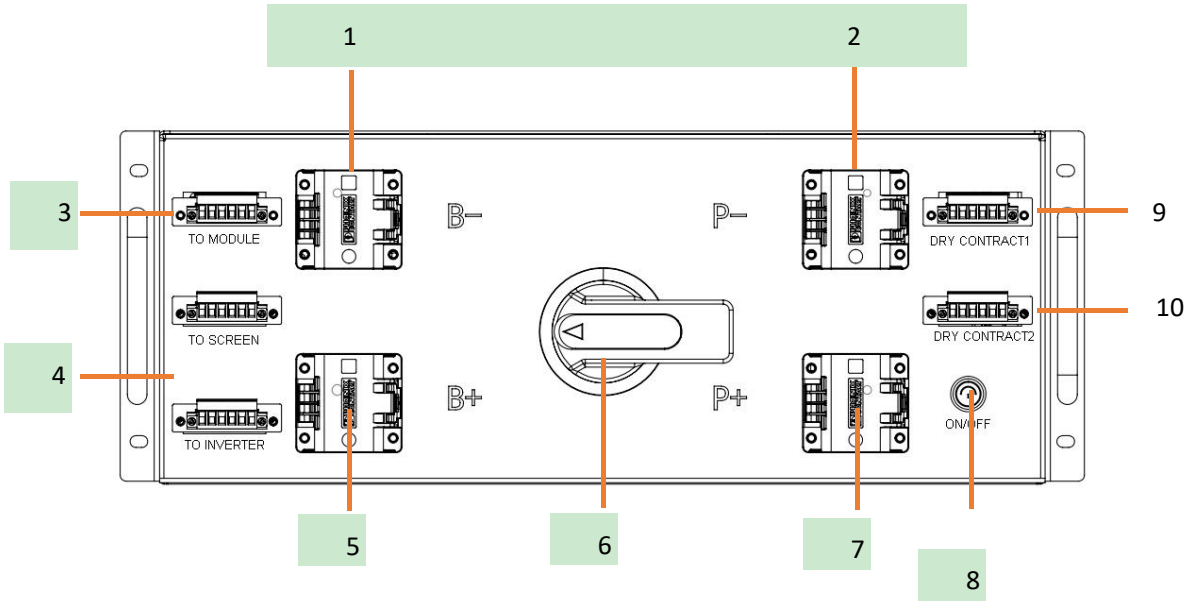


Table 2-3 Interface Definition

Item	Name	Definition
1	Power switch	OFF/ ON, must be in the "ON" state when in use
2	Positive socket	Battery output positive or parallel positive line
3	ADD	DIP switch
4	SW (battery wake/ sleep switch)	When the "OFF/ON" switch button is in the ON state, press and hold this button for 3 seconds to put the battery into the power-on or off state.
5	SOC	The number of green lights shows the remaining power. Table 2-3 for details.
6	ALM	Red light flashing when an alarm occurs, red light always on during protection status. After the condition of trigger protection is relieved, it can be automatically closed
7	RUN	Green light flashing during standby and charging mode. Green light always on when discharging.
8	COM	Communication cascade port, support RS232
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10	DRY CONTACT	/
11	Negative socket	Battery output negative or parallel negative line
12	Grounding	Shell ground connection

1. Installation and Configuration

1.1 Preparation for installation

3.1.1 Safety Requirement

This system can only be installed by personnel who have been trained in the power supply system and have sufficient knowledge of the power system.

The safety regulations and local safety regulations listed below should always be followed during the installation.

- All circuits connected to this power system with an external voltage of less than 51.2V must meet the SELV requirements defined in the IEC60950 standard.
- If operating within the power system cabinet, make sure the power system is not charged. Battery devices should also be switched off.
- Distribution cable wiring should be reasonable and has the protective measures to avoid touching these cables while operating power equipment.
- when installing the battery system, must wear the protective items below:

		
The isolation gloves	Safety goggles	Safety shoes

3.1.2 Environmental requirements

Working temperature: -20℃ ~ +55℃

Charging temperature range is 0oC~+55℃,

Discharging temperature range is -20℃ ~+55℃

Storage temperature: -10℃~ +35℃

Relative humidity: 5% ~ 85%RH

Elevation: no more than 4000m

Operating environment: Indoor installation, sites avoid the sun and no wind, no conductive dust and corrosive gas.

And the following conditions are met:

• Installation location should be away from the sea to avoid brine and high humidity environment.

- The ground for product arrangement shall be flat and level.
- No flammable explosive materials near the installation site.
- The optimal ambient temperature is 15℃~ 30℃
- Keep away from dust and messy zones

3.1.3 Tools and data

Tools and meters that may be used are shown in table 3-1.

Table 3-1 Tool instrument

NAME	
Screwdriver（Slotted、Phillips）	Multimeter
Torque wrench	Clamp current meter
Diagonal pliers	Insulation tape
Pointed nose pliers	Temperature meter
Pliers to hold the wire	Anti-static bracelet
Stripping pliers	Cable tie
Electric drill	Tape measure

3.1.4 Technical preparation

Electrical interface check

Devices that can be connected directly to the battery can be user equipment, power supplies, or other power supplies.

- Confirm whether the user's PV power generation equipment, power supply or other power supply equipment has a DC output interface, and measure whether the DC power output voltage meets the voltage range requirements in Table 2-2.
- Confirm that the maximum discharge current capability of the DC power interface of the user's photovoltaic power generation equipment, power supply or other power supply equipment should be higher than the maximum charging current of the products used in Table 2-2.

If the maximum discharge capacity of the DC power interface of the user's photovoltaic power generation equipment is less than the maximum charging current of the products used in Table 2-2, the DC power interface of the user's photovoltaic power generation equipment shall have a current limiting function to ensure the normal operation of the user’s equipment.

- Verify that the maximum operating current of the battery-powered user equipment (inverter DC input) should be less than the maximum discharge current of the products used in Table 2-2.

The security check

- Firefighting equipment should be provided near the product, such as portable dry powder fire extinguisher.
- Automatic fire fighting system shall be provided for the case where necessary.
- No flammable, explosive and other dangerous materials are placed beside the battery.

3.1.5 Unpacking inspection

- When the equipment arrives at the installation site, loading and unloading should be carried out according to the rules and regulations, to prevent from being exposed to

sun and rain.

- Before unpacking, the total number of packages shall be indicated according to the shipping list attached to each package, and the case shall be checked for good condition.
- In the process of unpacking, handle with care and protect the surface coating of the object.
- Open the package, the installation personnel should read the technical documents, verify the list, according to the configuration table and packing list, ensure objects are complete and intact, if the internal packing is damaged, should be examined and recorded in detail.

Packing list is as follows:

Item	Specification	Quantity	Figure
Battery-BSM48100	51.2V/106AH	1	
Positive Cable to inverter	Red/25mm2 /L2000mm	1	
Negative Cable to inverter	Black/25mm2 /L2000mm	1	
Communication Cable for parallel	L300mm	1	
Communication Cable to inverter	L2000mm	1	
Ground Wire	L500mm/4mm2	1	
User Manual		1	

1.2 Equipment installation

3.2.1 Installation Steps

Step 1 Mechanical Installation

(1) Brackets installation:

(2) Battery cabinet installation:

Step 2 Electrical installation

(1) Connect with inverter power lower than 5kw (including 5kw)

(2) Connect with inverter power higher than 5kw

(3) Connect with Inverter connected in parallel

3.2.2 Battery parameter settings on the inverter

If your inverter do not have communication function with BSM48106 battery pack, please set inverter follow next data.

Max Charging(Bulk) Voltage: 57V
Absorption Voltage: 56.5V
Float Voltage: 56V
Shut Down(cut off) Voltage: 49V
Shut Down(cut off) SOC: 20%
Restart Voltage: 51.2V
Max Charge Current: 100A*battery QTY
Max Discharge Current: 100A*battery QTY

2. Installation and Configuration

2.1 Battery system usage and operation instructions

After completing the electrical installation, follow these steps to start the battery system.
1. Refer to the description of the DIP switch of 2.3.1 to prepare the battery module before starting up, then press the ON/OFF button to the ON position.
2. After the indicator self-test, the RUN indicator will light and the SOC indicator will be on (50% SOC status in the 2.3.4).

1. After pressing the power button, if the battery status indicator on the front panel continues to be red, please refer to the "4.2 Alarm description and processing ". If the failure cannot be eliminated, please contact the dealer timely.
2. Use a voltmeter to measure whether the voltage of the circuit breaker battery access terminal is higher than48V, and check whether the voltage polarity is consistent with the inverter input polarity. If the circuit breaker battery input terminal has a voltage output and is greater than 48V, then the battery begun to work normally.
3. After confirming that the battery output voltage and polarity are correct, turn on the inverter, close the circuit breaker.
4. Check if the indicator of the inverter and battery connection (communication indicator and battery access status indicator) is normal. If it is normal, successfully complete the connection between the battery and the inverter. If the indicator light is abnormal, please refer to the inverter manual for the cause

4.2 Alarm description and processing

When protection mode is activated or system failure occurred, the alarm signal will be given through the working status indicator on the front panel of the A48100. The network management can query the specific alarm categories.

If the fault such as single cell over voltage, charging over-current, under-voltage protection, high-temp protection and other abnormalities which affects the output, please deal with it according to Table 4-1.

Table 4-1 Main alarm and Protection

Statue	Alarm category	Alarm indication	Processing
Charge state	Over-current	RED	Stop charging and find out the cause of the trouble
	High temp	Red	Stop charging
Discharge state	Over-current	Red	Stop discharging and find out the cause of the trouble
	High temp	Red	Stop discharging and find out the cause of the trouble
	Total voltage undervoltage	Red	Start charging
	Cell voltage undervoltage	Red	Start charging

4.3 Analysis and treatment of common faults

Analysis and treatment of common faults in the Table 4-2:

Table 4-2 Analysis and treatment of common faults

No.	**Fault phenomenon**	**Reason analysis**	**Solution**
1	The indicator does not respond after the power on Total voltage lower than 40V Check the total voltage	Total voltage lower than 40V	Check the total voltage
2	No DC output	Battery data status is abnormal. Battery gets into over-discharged protection	Read the battery information on the monitor.
3	The DC power supply time is too short	Battery capacity become smaller	Storage battery replacement or add more modules

4	The battery can't be fully charged to 100%	Charging voltage is too low	Adjust charging voltage at 57V
5	The power cable sparks once power on and ALM light RED	Power connection short-circuit	Turn off the battery, check the cause of the short circuit
6	Communication fault	The DIP setting of the host is wrong/ the battery type of the inverter is wrong/ Communication cable used incorrectly/The communication cable is incorrectly connected at the battery communication port or the inverter communication port/The battery firmware version is too low to support the inverter	Check these possible causes one by one

If you need any technical help or have any question, please contact the dealer in time.