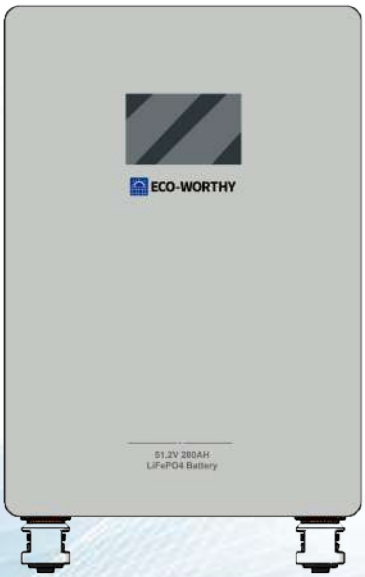
ECO-WORTHY

Version: 1.1

LiFePO4

51.2V 280AH LIFEPO4 BATTERY MANUAL

Operation and Maintenance



SUPPORT

If you are experiencing technical problems and cannot find a solution in this manual,please contact ECO-WORTHY for further assistance.

·Call:1-866-939-8222(US&CA)
+49 6175 6514 999(DE)
+44 7553 406988(UK)

·Web://www.eco-worthy.com/

·E-mail: customer.service@eco-worthy.com

Description

This manual describes in detail the requirements and procedures for safe installation and operation of ECO-WORTHY lithium battery pack. Please read this manual carefully. Only qualified persons are allowed to install, operate and maintain the system, otherwise it may cause product damage or personal safety risks.

Any actions against safety operation, or do not follow rules of this manual and limited warranty letter, will void warranty and qualification of this product. Meanwhile, the manufacturer will be not responsible for the product damage, property damage, personal injury or even death.

The information contained in this manual is accurate when it's issued. ECO-WORTHY reserves right to change specification (such as optimization, upgrade or other operations) without prior notice, and please always view the latest document via QR code on the label.

In addition, please noted that the diagrams/schematics in this document are used to help understand system configuration and installation instructions, which may be different from the actual items in the installation.

Contents

I.Information

1.1 Validity

This document is valid for: **ECO-LFP4828000**

1.2 Target Group

This document is intended for qualified persons and operators. Only qualified persons are allowed to perform activities marked with a warning symbol and the caption“Qualified person" in this document. Qualified persons must have the following skills:

* Knowledge of how lithium iron phosphate batteries work and are operated.

* Knowledge of how an energy storage system (including PV/battery/hybrid inverter, MPPT, Meter,Distribution box etc.) works and is operated.

* Knowledge of local applicable connection requirements, standards, and directives.

* Training in the installation and commissioning of electrical devices, batteries.

* Training in how to deal with the dangers and risks associated with installing, repairing and using electrical devices and batteries.

1.3 Levels of warning messages

The following levels of warning messages may occur when handling the product.

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury or product permanent damage.

NOTICE
Indicates a situation which, if not avoided, can result in property damage or product not work or accelerated product damage.

1.4 Symbol Description

1.4.1 Symbols on products label

Symbols	Definition
	Indicates the danger of electric shock. If not avoided, it would cause casualities.
	Indicates a potentially dangerous condition which could result in injury or death.
	Indicates important information or warnings related to concepts talked about in the text.
	Indicates more information is available in other documents relating to the subject and reader.
	Indicates important steps or tips for optimal performance.
	Do not place the battery within children/pet touchable area.
	Do not place the battery near heat source and flammable material.
	Do not expose the battery to direct sunlight, rain and snow.
	Do not short circuit the battery.
	Recycle label
	WEEE designation

1.4.1 Other symbols

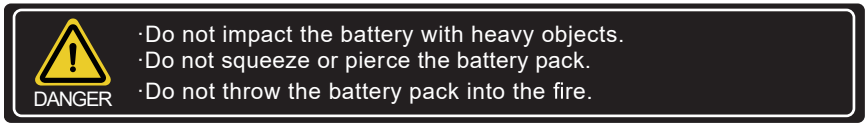
Label	Definition
	Indicates activities that can only be performed by qualified persons
	Grounding point

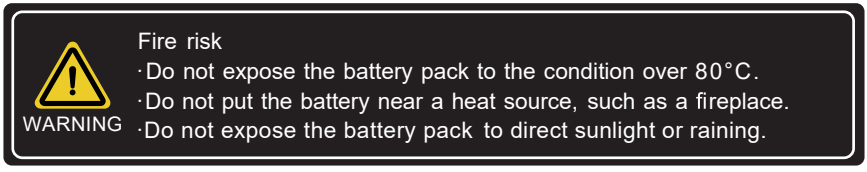
1.5 Abbreviation Description

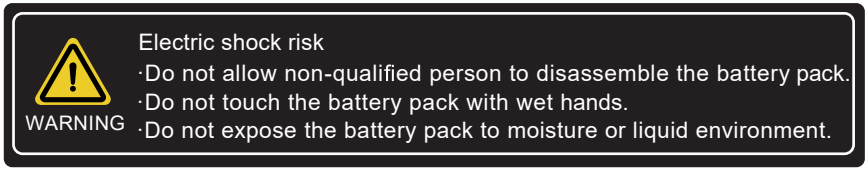
Abbreviation	Definition
Battery/battery pack/battery module	Single ECO-LFP4828000 rechargeable lithium iron phosphate battery pack including cells, BMS and enclosure etc.
Battery system/ cluster	Multiple ECO-LFP4828000 battery pack connected in parallel with power, communication and grounding cables and installation auxiliaries.
BMS	Battery management system Electronical Unit to ensure lithium cells'safety and display information or control the battery work mode.
SOC	State of charge The battery state of charge refers to the percentage of the remaining capacity and rated capacity of the battery.
SOH	State of health The battery health status refers to the percentage between the full charged capacity and the rated capacity of the battery.
DIP switch	Dual in-line package switch

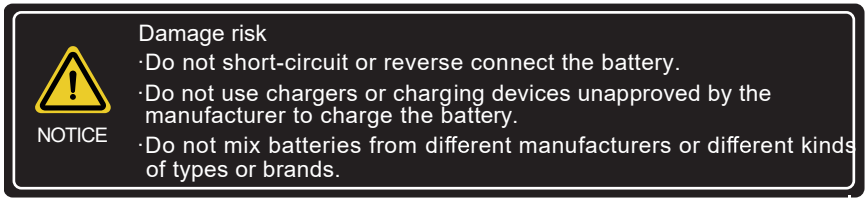
II.Safety

2.1 Safety precautions









2.2 Safety instructions

The battery has been designed and tested in accordance with international (such as UL, IEC, UN38.3 etc.) safety requirements. However, due to various factors during the whole lifetime process, ECO-WORTHY cannot guarantee absolute safety, in order to prevent personal injury and property damage and ensure long-term operation of the battery. Please do read and following the below section carefully to operate the battery and handle emergency situations.

2.2.1 Safety gear

It is required to wear the following safety gear when installing and handling the battery pack.

Insulated gloves

Safety Glasses

Safety Shoes

2.2.2 Emergency safety measures

* Water invasion

Please cut off the AC power supply of the system first and then disconnect all switches under the premise of ensuring safety.

* Electrolyte or gas leakage

If the battery pack leaks electrolyte, avoid contacting with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below.

·Gas Inhalation: Evacuate the people from the contaminated area and seek medical aid immediately.

·Eye Contact: Flush your eye with clean and flowing water for 15 min, and then seek medical aid immediately.

·Skin Contact: Thoroughly rinse the exposed area with soap and water to be sure no chemical or soap is left on them, and seek medical aid immediately.

·Ingestion: Induce vomiting, and seek medical help immediately.

WARNING

In case of fire situations, please use carbon dioxide fire extinguisher rather than liquid to put out fires.

2.2.3 Other Tips

·All the product are strictly inspected before shipment. Please contact us for replacement if you notice there are any defectives such as swelling etc.

·Do not disassemble batteries and components, otherwise the manufacturer will not be responsible for any damage caused by unauthorized disassembly or repair.

·Enable the battery to be safely grounded before use to make sure the system in safe and normal operation.

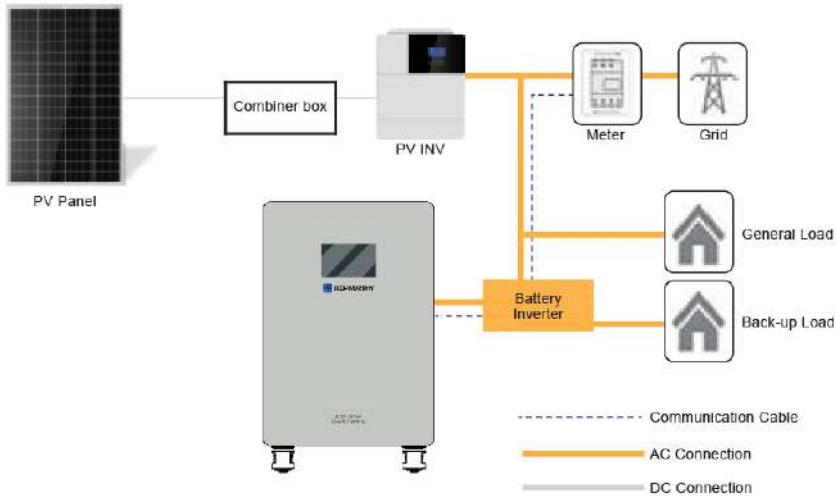
·Please ensure that the electric parameters of these devices are compatible mutually before connecting the battery to other devices.

·Please take the environmental factors into careful considerations to ensure that the system can work in a suitable condition as the environment and storage methods have a certain impact on the service life and reliability of this product.

III.Product Overview

3.1 Introduction

The ECO-LFP4828000 battery is designed for residential application and works as a storage unit in the photovoltaic system. It is a 48V Li-ion battery storage system, with BMS inside itself. It could be operated in both on-grid, back-up and off-grid modes with compatible inverters. Below is the general schematic of an AC-coupled system.



This electrical connection in this diagram is only for illustration, please follow the Manual suggestions of related devices and operate in accordance with locally applicable connection requirements, standards, and directives.

3.2 Features

·With highest safety, battery is made from LiFePO4 chemistry and complies with highest international safety and transport standard.

·Modular and flexible, it supports up to 15 batteries connected together expand the system energy.

·Built -in pre-charge circuit to avoid rush currented when connecting with different inverter/chargers.

·Automatic dynamic addressing function when connecting multiple batteries together.

·Rapid shutdown function for North American market.

·Support a maximum of 96% DOD under off-grid and back-up application

·Built-in BMS provides warning and protection functions including over-discharged, over-charged, over-current, short-circuit and high/low temperature.

·LiFePO4 is equipped with cathode material and automatic balancing function to meet long cycle life.

·Compact size and light weight for easy installation and maintenance.

·CAN/RS485 port for external communication and upgrade the BMS firmware.

3.3 Specification

3.3.1 Dimension

3.3.2 Parameters

Items	ECO-LFP4828000
Rated voltage	**51.2V**
Max. voltage range	**40~58.4V**
Charge voltage	**58.4V**
Low voltage cut-off	**40.0V**
Nominal energy	**14.336KWh**
Usable energy	**14.336KWh**
Nominal capacity	**280Ah**

Dimension	**20.5*9.9*29.3in/52.0*25.2*74.5cm**	
Weight	**297.6lb/135kg**	
Standard charge current	**≤100A**	
Max. charge current	**200A**	
Standard discharge current	**≤100A**	
Max. discharge current	**200A(initial temp.≤35℃)**	
Communication	**RS232/CAN/RS485**	
Max. parallel number	**15pcs**	
Operating temperature	**Charge:0~55℃**	**Discharge:-20~55℃**
Storage temperature	**-20~25℃**	**Less than 1 year**
	20~40℃	**Less than 3 months**
	Environment at the shipment state	**60±25%R.H.**

BMS Parameters			
Charge	**Spec**	**Delay**	**Recovery**
Cell Voltage Protection	**3600mV**	**1000mS**	**3380mV**
Module Voltage Protection	**58.4V**	**1000mS**	**54V**
Charge Over Current	**210A**	**1000mS**	**Automatically recover after 1min**
High Temperature Protection	**65℃**	/	**55℃**
Low Temperature Protection	0℃	/	**5℃**

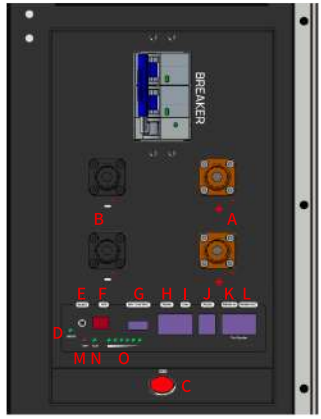
Discharge	**Spec**	**Delay**	Recovery
Cell Voltage Protection	**2700mV**	**1000mS**	2950mV
Module Voltage Protection	**43.2V**	**1000mS**	47.2V
Discharge Over Current 1	**210A**	**1000mS**	**Automatically recover after 1min**
Discharge Over Current 2	**250A**	**500mS**	**Automatically recover after 1min**
High Temperature Protection	**70℃**	/	55℃
Low Temperature Protection	**-20℃**	/	5℃

BMS	Parameter		Condition
Consumption Current	Working Self-Consumption Current	≤75mA	
	Low Power Mode Current	200uA	
Sleep Function	Sleep Voltage	3150mV	
	Delay Time	5min	
Low Battery Warning	SOC＜5%		No warning during charging.
Battery Cell Failure Protection	Cell voltage difference ＞1v		Charging and discharging are not allowed.
Full Charge Judgement	Full charge voltage	＞56V	Charging stops and SOC is updated to 100% when both conditions are met.
	Cut-off current	＜2A	
Communication Ports	RS485、CAN、RS232		

NOTICE

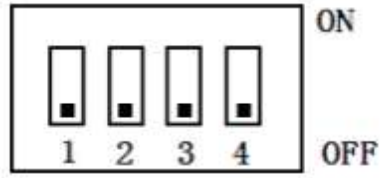
The optimum operating temperature range is from 15°C to 30°C. Frequent exposure to the harsh temperatures may worsen the performance of the battery pack and cycle life.

3.3.3 Panel Interface



NO.	Items	Usage description	Remark
A	Positive terminal	Used to connect the inverter/charger	
B	Negative terminal	Used to connect the inverter/charger	
C	Power switch	Used to power on/off battery	
D	ON/OFF indicator	Indicates whether the battery is turned on or off	
E	Reset	Used to reset the BMS	
F	ADD	Used to set the address ofthe battery in the battery pack	
G	Dry contact	2 channels output signal 1 channel input signal	Pin1 on the left
H	RS485-1	Connect to host computer/inverter	
I	CAN	Connect to host inverter	
J	RS232	Host computer communication interface	
K	RS485 IN	For communication between batteries	
L	RS485 OUT	For communication between batteries	
M	RUN	Used to show battery is in running status when lighting or flashing	
N	ALM	Used to show battery Alarm/Protection status	
O	SOC	Used to show battery real-time SOC	
P	250A breaker & shunt release	Over-current protection & BMS Second level of protection	Connected in series to the positive busbar

3.3.3.1 F: ADD



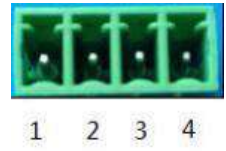
When PACKs are used in parallel, different PACKs can be distinguished by setting the address through the dip switch on the BMS. It is necessary to avoid setting the address to the same. The definition of the BMS dip switch refers to the table below. In parallel mode, the default dip address 1 is the host.

ADD	Dial switch position			
	1	2	3	4
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

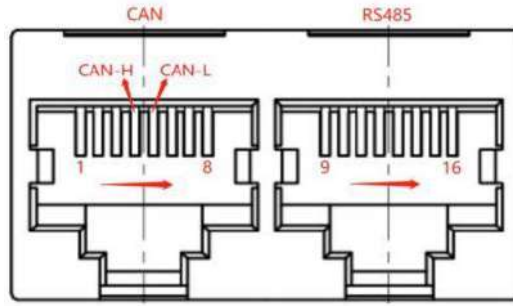
NOTICE

Failure to follow the DIP switch setting will cause the communication fault between battery and inverter, for more detail setting with different inverter/charger, please contact your supplier or ECO-WORTHY for consultation.

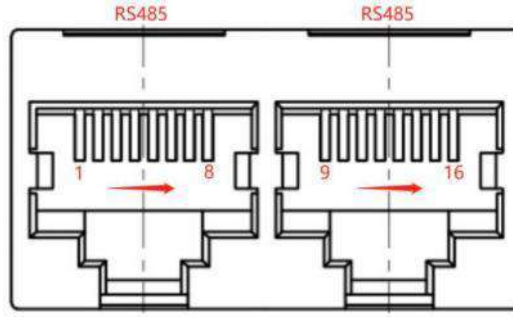
3.3.3.2 Introduction to Communication Interface



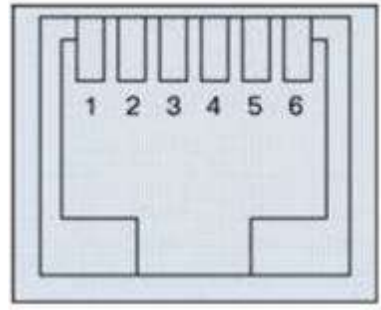
（Dry Contact）



CAN--Adopting 8P8C vertical RJ45 socket		RS485--Adopting 8P8C vertical RJ45 socket	
RJ45 Pin	Definition	RJ45 Pin	Definition
1、3、6、7、8	NC	9、16	RS485-B1
4	CAN-H	10、15	RS485-A1
5	CAN-L	11、14	GND
2	GND	12、13	NC



RS485--Adopting 8P8C vertical RJ45 socket		RS485--Adopting 8P8C vertical RJ45 socket	
RJ45 Pin	Definition	RJ45 Pin	Definition
1、8	RS485-B	9、16	RS485-B
2、7	RS485-A	10、15	RS485-A
3、6	GND	11、14	GND
4、5	NC	12、13	NC



RS232- using 6P6C vertical RJ11 socket	
RJ11 Pin	Definition
1、2、6	NC
3	TX（single board）
4	RX（single board）
5	GND

3.3.3.4 LED Display Description

LED working status indication

STATE	Normal/Warning / Protection	ON/ OFF	RUN	ALM	Battery LED indicator						EXPLANATION
					L6	L5	L4	L3	L2	L1	
					●	●	●	●	●	●	
Shutdown	Hibernation	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	All OFF
Standby	Normal	ON	Flash 1	OFF	According to the power indicator						Standby mode
	Alerts	ON	Flash 1	Flash 3							Module low voltage
Charge	Normal	ON	ON	OFF	According to the power indicator (Power indicator LED Flash 2)						The highest power LED flashes (2 flashes) , ALM does not flash when charging alarm occurs
	Alerts	ON	ON	Flash 3							
	Overcharge protection	ON	ON	OFF	ON	ON	ON	ON	ON	ON	If there is no mains power, the indicator light turns to standby mode
	Temperature, overcurrent, failure protection	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging
Discharge	Normal	ON	Flash 3	OFF	According to the power indicator						
	Alerts	ON	Flash 3	Flash 3							
	Undervoltage protection	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharge
	Temperature, over current, short circuit, Reverse connection, failure protection	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharge
Invalidation		OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging and discharging

Capacity Indicator

STATE		CHARGE						DISCHARGE					
Capacity indicator light		L6 ●	L5 ●	L4 ●	L3 ●	L2 ●	L1 ●	L6 ●	L5 ●	L4 ●	L3 ●	L2 ●	L1 ●
Battery capacity (%)	0% ~17%	OFF	OFF	OFF	OFF	OFF	Flash 2	OFF	OFF	OFF	OFF	OFF	ON
	18%～33%	OFF	OFF	OFF	OFF	Flash 2	ON	OFF	OFF	OFF	OFF	ON	ON
	34%～50%	OFF	OFF	OFF	Flash 2	ON	ON	OFF	OFF	OFF	ON	ON	ON
	51%～66%	OFF	OFF	Flash 2	ON	ON	ON	OFF	OFF	ON	ON	ON	ON
	67%～83%	OFF	Flash 2	ON	ON	ON	ON	OFF	ON	ON	ON	ON	ON
	84% ~100%	Flash 2	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Running indicator light ●		ON						Flash (Flash 3)					

LED Flashing Description

Flashing mode	Bright	Destroy
Flash 1	0.25S	3.75S
Flash 2	0.5S	0.5S
Flash 3	0.5S	1.5S

;

3.4 Buzzer Action Description

In case of fault, it beeps for 0.25S every 1S;
In case of protection, it beeps for 0.25S every 2S (except overvoltage protection); In case of alarm, it beeps for 0.25S every 3S (except overvoltage alarm);

The buzzer function can be enabled or disabled by the host computer, and is disabled by factory default.

3.5 Button Description

When the BMS is in Hibernation mode, press the button (3~6S) and release it; The protection board is activated, and the LED indicators light up for 0.5 seconds starting from "RUN".

When the BMS is in active mode, press the button (3~6S) and release it; The protection board is in Hibernation mode, and the LED indicators light up for 0.5 seconds starting from the lowest power indicator.

When the BMS is in active mode, press the button (6~10S) and release it; The protection board is reset, and all LED indicators light up for 1.5 seconds at the same time.

After the BMS is reset, the parameters and functions set by the host computer are still retained. If you need to restore to the initial parameters, you can use the "Restore Defaults" of the host computer to achieve this, but the relevant operation records and storage data remain unchanged (such as power, number of cycles, protection records, etc.).

3.6 Hibernation and Wake up

3.6.1 Hibernation

When any of the following conditions are met, the system enters low power mode:
1) Single or overall over-discharge protection is not released within 30S.
2) Press the button (3~6S) and release it.
3) The lowest single voltage is lower than the sleep voltage, and the duration reaches the sleep delay time (no communication, no protection, no balance, and no current).
4) The standby time exceeds 24 hours (no communication, no charging and discharging, and no mains power).

5) Force shutdown through the host computer software.

Before entering sleep mode, make sure that the input terminal is not connected to external voltage, otherwise it will not be able to enter low power mode.

3.6.1 **Wake up**

When the system is in low power mode, if any of the following conditions are met, the system will exit low power mode and enter normal operation mode:
1) Connect to a charger, and the charger output voltage must be greater than 48V.
2) Press the button (3~6S), and then release the button.
3) RS232 is activated.

3.7 Communication Description

3.7.1 RS232 Communication

BMS can communicate with the host computer through the RS232 interface, so that the host computer can monitor various battery information, including battery voltage, current, temperature, status and battery production information, etc. The default baud rate is 9600bps.

3.7.2 CAN Communication

The default baud rate is 500K. This interface is used to communicate with the inverter. When this battery is the host, it can summarize the slave data and communicate with the inverter.

3.7.3 Parallel RS485 Communication

You can view the information of PACK, and the default baud rate is 9600bps. If you need to communicate with the monitoring device via RS485, the monitoring device acts as the host and polls data according to the address. The address setting range is 2~15.

3.7.4 Independent RS485 Communication

The default baud rate is 9600bps. This interface is used to communicate with the inverter. When this battery is the host, it can summarize the slave data and communicate with the inverter.

CAUTION

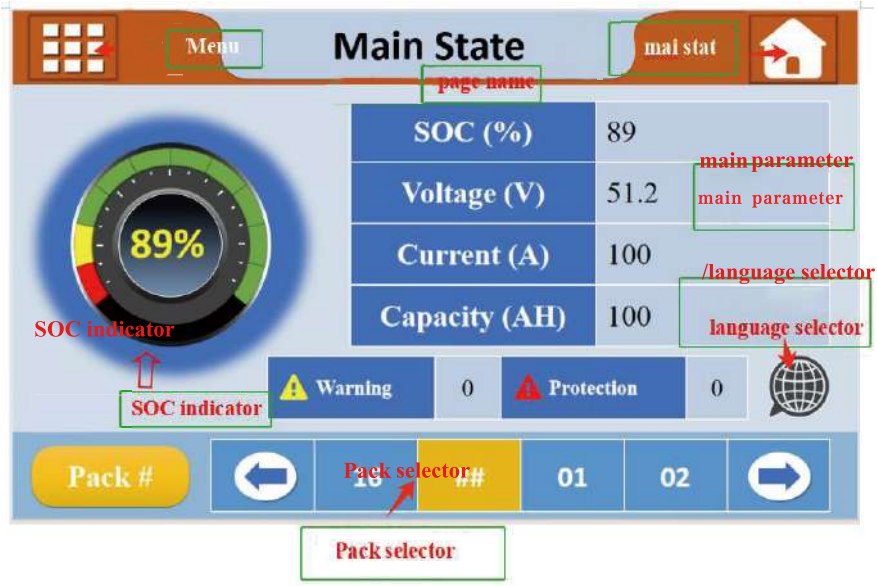
Please re-charge the battery via solar,grid/generator or other energy source within 24h if the battery is over-discharged.

NOTICE

Manually reversing the battery will void the warranty.

IV.Display

4.1Main state page

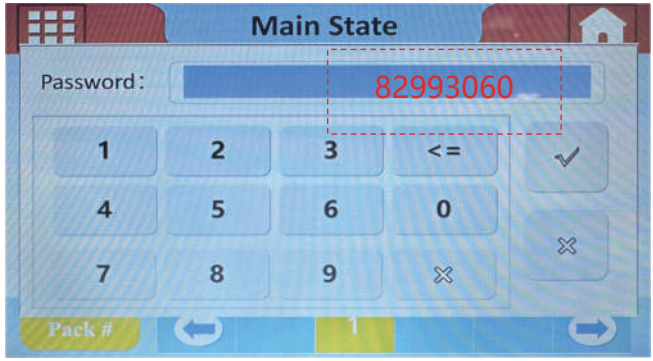


Note: After 3 seconds of the startup welcome interface, it will automatically enter this interfaceany time, automatically enter this interface after waking up from the screen;

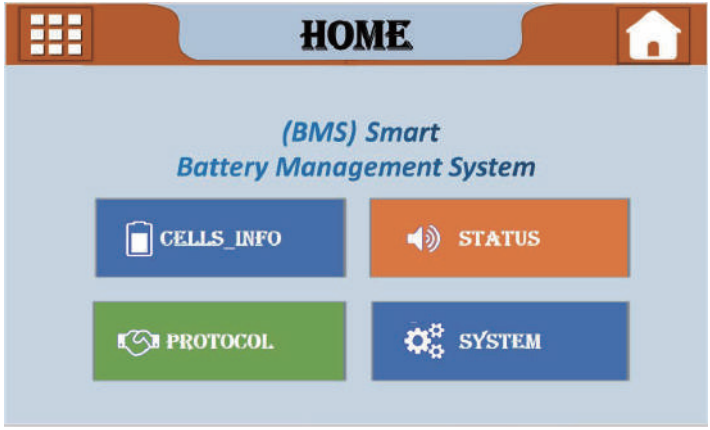
Icon Description

	Main menu icon, click to enter the main menu interface
	Main state icon, click to enter the Main State interface
	System Settings/Language Selection

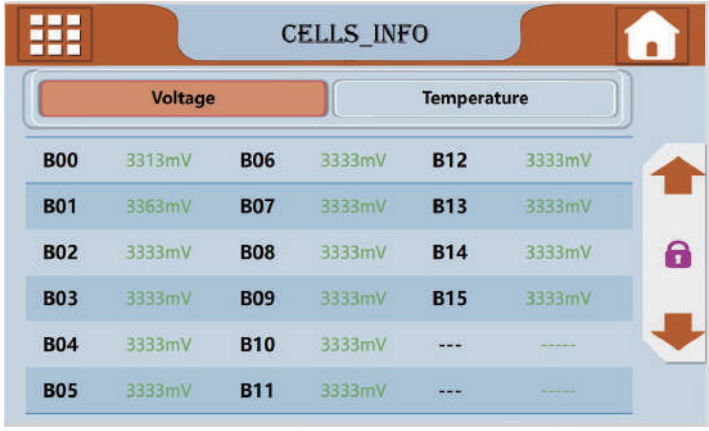
Password for the menu page



4.1.2 HOME page

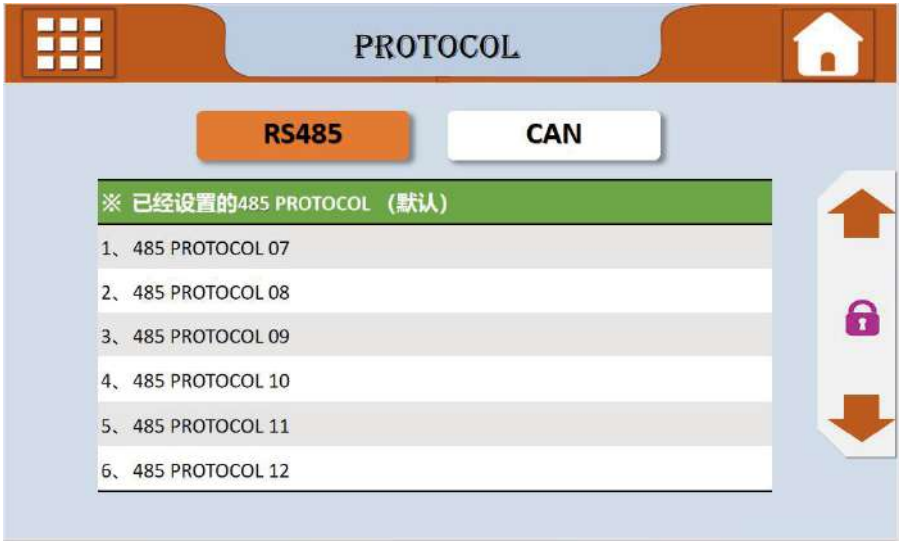


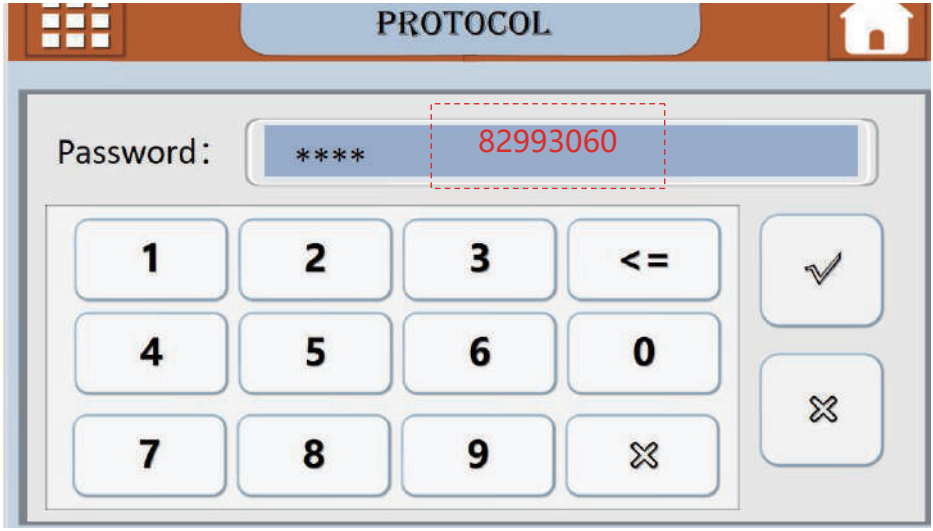
CELLS INFO



STATUS

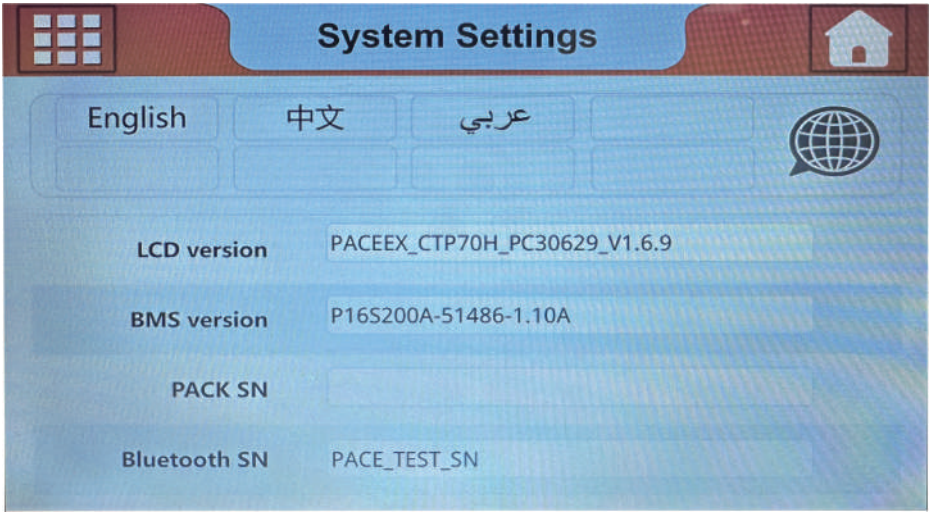
PROTOCOL





Note: Built in unlock password 82993060; Exit the protocol interface, the permission is invalidmodify the protocol again, and the permission needs to be verified again.

SYSTEM



V.Installation

5.1 Preparation

5.1.1 Safety Compliance

The system installation must be finished by qualified person(s). During the whole installation process, please strictly follow the local safety regulations and related operating procedure

5.1.2 Environment

The operating environment shall meet the following requirements:

Category	Description
Working temperature	-20℃-55℃(maximum operating range) 15℃-30℃ (optimal temperature)
Relativehumidity	5%~90%, No condensation
Altitude	<3000m
Safety requirement	· Do not expose the battery to direct sunlight, rain and snow. · Do not place the battery within children/pet touchable area. · Do not place the battery near he at source and flammable material. · Do not place the battery in a closed place where the ventilation is not available. · Do not drop, deform, impact, cut or spear with a sharp object. · Do not put heavy things on battery. · Do not disassemble the battery without Manufacturer's permission. · No conductive dust and water or other liquid to contact battery. · Follow the emergency measure if there is water invasion or electrolyte and gas leakage. · Contact your supplier within 24 hours if any product failure happens.

5.1.3 Tools

Tools	
Screwdriver (slot, cross)	Multi-meter
Wrench	Clamp meters
Diagonal pliers	Insulating tape
Needle nose pliers	Thermometer (observe the installation environment)
Clamping pliers	Anti-static bracelet
Wire stripper	Cable ties

5.2 Inspection

5.2.1 Unpack precautions

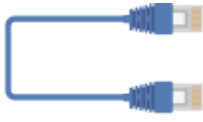
* Please load and unload it in accordance with the specified equirements to prevent sun and rain when you receive the equipment.

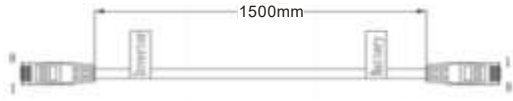
* Please check and confirm the goods (such as quantity, appearance, etc.) according to the "scope of delivery " before unpacking.

* Do light take and put during unpacking process to protect the surface coating of the object.

* Please record and contact to the manufacturer if the inner packing is damaged after unpacking.

5.2.2 Scope of delivery

General materials		
 Battery Pack *1pcs	 Manual *1pcs	 Communication cable *1pcs

Type	Detail	Qty.
Cables	A: Battery to Inverter negative cable(2AWG 1500mm BLACK) 	1pcs
	B: Battery to Inverter positive cable(2AWG 1500mm RED) 	1pcs
Communication Cables	C: Battery to Inverter communication cable (1500mm) 	1pcs

NOTICE

Keep the unused cable pins NULL to avoid affecting the closed loop communication.

NOTICE

A ground connection of communication cable may be required from some inverters. Please follow the rules from inverter manufacture.

5.3 Start Installation

☐ **Qualified person**

5.3.1 Remainder

Before installation, please double check if the following conditions or equipment meet the requirements:

*Check if there is enough installation space and if the ground is flat enough;

*Check if the power cords used meet the maximum current requirements for operation;

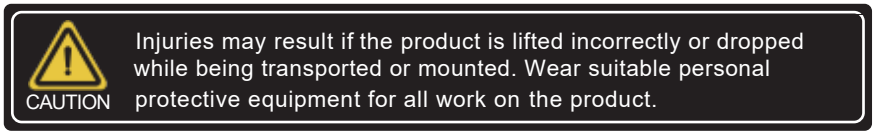
*Check whether the overall layout of power supply equipment and batteries on the construction site is reasonable;

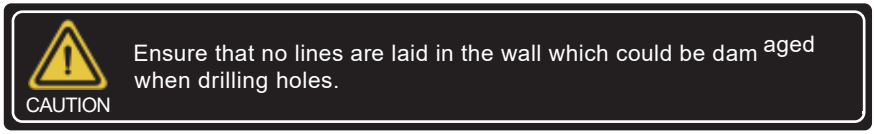
*Check if the installation personnel are wearing anti-static wristbands;

*Check if there are two people performing installation work on the construction site;

*Check the installation site for potential risks such as flooding, sun exposure, corrosion, and salt spray.

5.3.2 Procedures





5.3.2.1 Unbox

1. Remove the battery from the wooden box.
2. Prepare the battery and place it horizontally in a reasonable position with the wheels facing down.
3. Rotate the red gear of the wheel clockwise, and then move the battery to the installation location.
4. Rotate the red gear counterclockwise to fix the wheel.
5. Complete the cable connection.

NOTICE

ANY others installations, please avoid the battery directly contacting the ground and avoid of high salinity, humidity to prevent the product from rusting and corrosion.

VI.Cable connection and commissioning

☐ **Qualified person**

6.1 Get battery ready

6.1.1 Ensure all the battery is in OFF mode, and confirm the installation is tightened and stable.

6.1.2 Check the number and specification of cable kit accessories are correct according to the Scope of delivery item. If you are making cable yourself, please follow manufacturer's requirements.

6.1.3 Switch on all battery individually.Check whether there is any alarm/protection information; if yes, turn to troubleshooting and then switch off al batteries.

6.2 Communication cable connection

6.2.1 Take out battery to battery communication cable.

6.2.2 Confirm the location of Master battery, insert the RJ45 plug into the Link Out port and connect the other side to next battery Link IN port, chained all batteries.

6.3 DC power cable connection

6.3.1 Take out battery to battery power cable.

6.3.2 Use the M8 screws on the battery to fix the battery connection wire and install the insulating protective cover.

6.4 Connecting with inverter

6.4.1 Connecting Master battery Link IN port with inverter CAN or RS485 communication port via inverter communication cable.

6.4.2 Connecting battery OUTPUT (+) with inverter battery INPUT (+), battery OUTPUT (-) with inverter battery INPUT (-), an external disconnection breaker between battery system and inverter is recommended. Choose the corresponding power cable pair and wire them correctly.

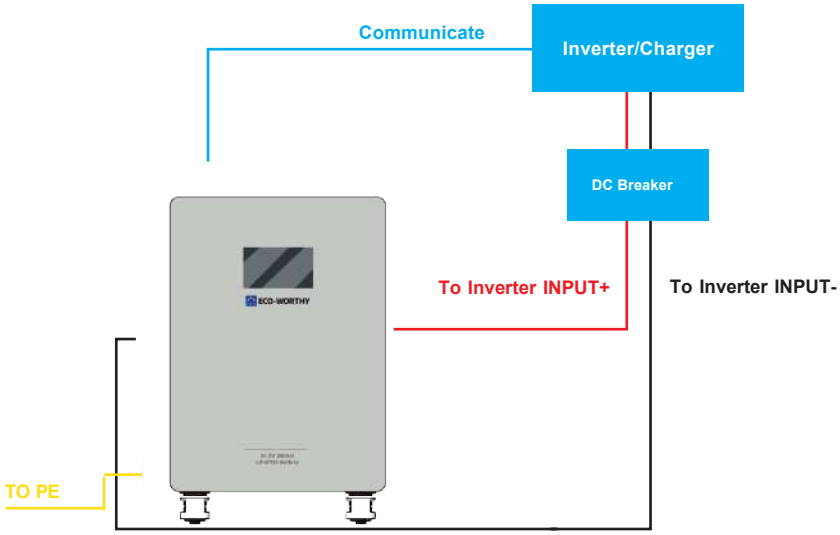
CAUTION

Confirm inverter AC input and PV input are disconnected befor wiring connection, and the DC/ signal switch of inverter/ is in off status.

NOTE

Choose the suitable disconnection breaker considering the inverter power/current, rated voltage, and tripping characteristic etc.

Wiring diagram allowed:



NOTICE

The maximum communication cable length is required to be less than 15m between inverter/charge and battery.

The maximum power cable length is suggested to be less than 10m between inverter/charge and battery.

For other type of installation, please also follow the rules above to wire your system.

CAUTION

The maximum tolerance current of each power cable and terminal is 125A, 100A for continuously is suggested. Please use corresponding number of power cable pairs according to the field configuration and local connection requirements, standards, and directives.

6.5 Commissioning

6.5.1 Set the DIP address of the Master battery (and the Slave battery if there is any RS485 baud rate change).

6.5.2 Switch on all battery modules, wait 1 minute, and make sure that ON/OFF led is on Master battery.

6.5.3 Turn on the breaker between the inverter and battery if there is any, then turn on the inverter/charger isolation.

6.5.4 Finish the setting on inverter/charger or any other control devices. If everything is correct, it's ready to use the system.

CAUTION
If your system is an back-up or off-grid system, make sure your configuration can cover the worst situation to avoid battery to be over-discharging.

6.6 Switch off battery

6.6.1 Turn off the inverter.
6.6.2 Turn off the disconnection breaker if there is any.
6.6.3 Turn off all batteries.

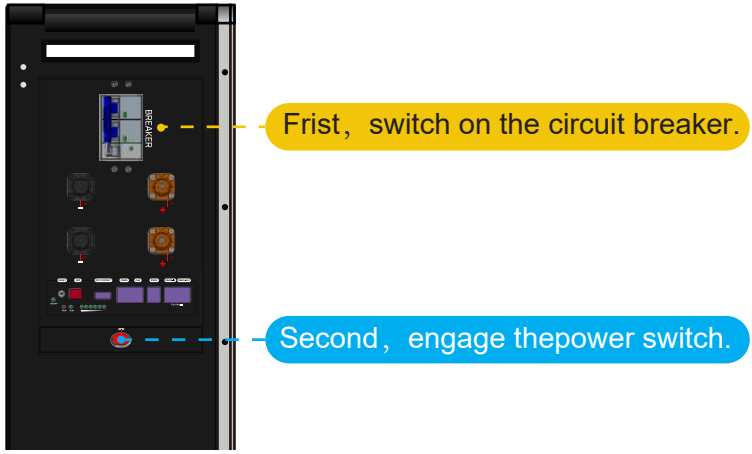
Tips:
①Proper Procedure to Activate the Battery:
First, switch on the circuit breaker.Then, engage the power switch.

②Proper Procedure to Deactivate the Battery:
First, disengage the power switch.Then, switch off the circuit breaker.

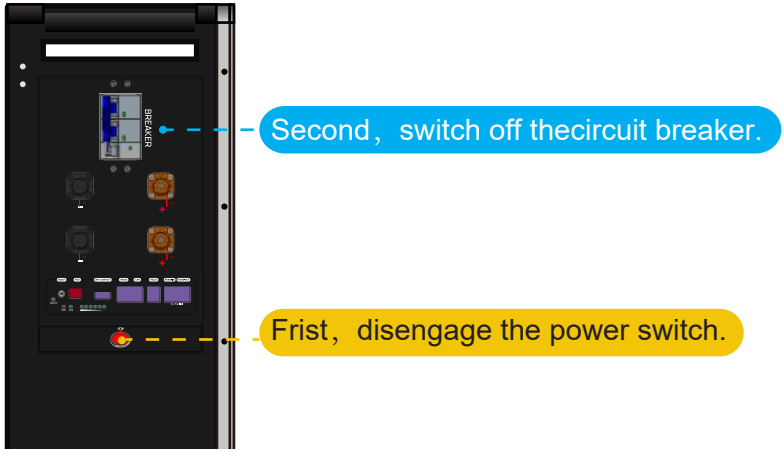
③Failure to follow the proper procedures for activating and deactivating the battery may result in erroneous SOC data. A full charge cycle of the battery is necessary to reset the SOC.

Attached:

Proper Procedure to Activate the Battery



Proper Procedure to Deactivate the Battery



VII.Troubleshooting

Items	Solution	Measure
Unable to start	1. Switch on battery and press RESET for 6s to observe whether the battery can be started. 2. Charge the battery with a charge or inverter to provide 54~57.6V voltage and observe whether it can be started.	If the abnormal status still alive after above steps, please contact your supplier. If there is any other situation(s) excluding in this table, turn off the fault battery, and contact youry supplier.
Unable to charge	1. Check whether the cable connection between the battery and the inverter/charger is correct. 2. Check whether the inverter/charger setting is correct. 3. Check whether the battery is in charge protection mode; if yes, try to discharge the battery.	
Unable to discharge	1. Check whether the cable connection between the battery and the inverter/charger is correct 2. Check whether the battery occurs short circuit, reverse connection, or pre-charge failure during connection inverter etc. 3. Check whether the battery is in discharge protection mode; if yes, try to charge the battery.	
High/Low temperature	1. Stop the battery system for a while, and check whether the installation location temperature meets the require ment. 2. Avoid continuous full charging and discharging.	
High current	Check whether the configuration and parameters setting on the inverter/charger are correct.	
ALM ON	Turn off all the batteries, and remove the faulty battery from the system.	
Communica-tion failure	1. Check whether the communication cable type is correct and is contacted well. 2. Check whether the DIP switch setting is correct. 3. Check whether the inverter protocol related setting is correct. 4. Check whether both battery and inverter are working properly.	

NOTICE

Please restart after software is upgraded.

VIII.Transport and Storage

* Do not violently shake, impact or squeeze, and prevent sun and rain during the transportation.

* Do light take and put and strictly prevent falling, rolling, and heavy pressure during loading and unloading.

* The battery should be placed in a dry, clean, dark, and well ventilated indoor environment for long- term storage, and the recommended storage temperature range is 15~30℃ .

* No harmful gases, flammable and explosive products and corrosive chemical substances in the storage location.

* The batteries should be stored and transported in close to 50% SOC, and do not store over 80% SOC for longtime.

* The battery needs to be charged every 6 months if it is not used for a long time.

* Do not fall down or pile up.

IX.Disposal of battery

Disposal of battery must comply with the local applicable disposal regulations for electronic waste and used batteries. Please review your local Battery recycling or management regulations or contact ECO-WO RTHY for more information.

X. Technical Support

1) Customer service email:

E-mail: customer. service@eco-worthy.com

2) Company address: USA/Germany

Address(US): 4411 East State Hwy D Suite C Springfield, Missouri 65809

Address(DE): ECO-Worthy Europe GmbH Otto-Hahn-Str. 20 61381 Friedrichsdorf - Köppern Germany

3) Customer service telephone numbers:

Tel(DE): +49 6175 6514 999

Tel(US&CA): 1-866-939-8222

Tel(UK): +44 7553 406988

Note:
Customer Service Hours:

US: Mon-Fri 8:3AM - 6:00 PM(CST)

UK: Mon-Fri 9 AM - 5 PM(GMT)

DE: Mon-Fri 9 AM - 5 PM(CET)

4) Official website address:

Web: https://www.eco-worthy.com/

5) Official social media:

Facebook: https://www.facebook.com/ecoworthy.store/

Youtube: @ecoworthy

Tiktok: https://www.tiktok.com/@eco_worthy

ECO-WORTHY