# **User Manual**



## CONTENT

1.	Introduction	1
	1.1 Brief Introduction	1
	1.2 Symbol Description	1
	1.3 Battery Handing Guide	1
	1.4 Response to Emergency Situations	2
	1.5 Installers	3
2.	Product introduction	3
	2.1 Package info	3
	2.2 Appearance	4
	2.3 Technical Data	5
3.	Installation	6
	3.1 Installation Precaution	6
	3.2 Installation Tool	6
	3.3 Installation Step	7
	3.4 ADD Settings	11
4.	LED Instructions	. 12
	4.1 SOC indicators	12
	4.2 Status indicators	12
5.	Operation	. 13
	5.1 Turn on	13
	5.2 Turn off	13
	5.3 Disassembly	13
6.	Troubleshooting	. 13
7.	Quality Promise	. 14

#### 1. Introduction

#### 1.1 Brief Introduction

This manual will provide detailed product information and installation. Please read it carefully before use this product, and store it in a place that is convenient for installation, operation, and maintenance personnel. The manual is subject to change without notice.

#### **1.2 Symbol Description**

Symbol	Description
$\bigwedge$	Caution, risk of electric shock
	Heavy enough may cause severe injure
$\bigotimes$	Keep the battery away from open flame or ignition sources
	Keep the battery away from children
X	Do not dispose of the product with household waste
ES .	Recycling
	Read this manual before installation and operation

#### 1.3 Battery Handing Guide

- Use the battery pack only as directed.
- If the battery defective, appears cracked, broken or otherwise damaged, or fails to operate, contact your distributor immediately.
- Do not attempt to open, disassemble, repair, tamper with, or modify the battery. The battery pack is not user serviceable.
- To protect the battery and its components from damage when transporting, handle with care.
- Do not subject it to any strong force.
- Do not insert foreign objects into any part of the battery pack.
- Do not use cleaning solvents to clean the battery.
- The battery shall not be connected directly to SELV circuit

#### 1.4 Response to Emergency Situations

The battery is designed with multiple safety strategies to prevent hazards resulting from failures.

#### 1.4.1 Leaking batteries

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. Electrolyte is corrosive and contact may cause skin irritation and chemical burns. If one is exposed to the leaked substance, do these actions:

**Inhalation**: Evacuate the contaminated area, and seek medical attention immediately. **Eyes contact**: Rinse eyes with flowing water for 15 minutes, and seek medical attention immediately.

**Skin contact**: Wash the affected area thoroughly with soap and water, and seek medical attention immediately.

Ingestion: Induce vomiting as soon as possible, and seek medical attention immediately.

#### 1.4.2 Fire

In case of a fire, make sure that an ABC or carbon dioxide extinguisher is nearby and does not use water to extinguish the fire.



#### WARNING

The battery pack may catch fire when heated above 130°C. If a fire breaks out where the battery is installed, do these actions:

1.Extinguish the fire before the battery catches fire.

2. If the battery has caught fire, do not try to extinguish the fire. Evacuate people immediately.

## 

If the battery catches fire, it will produce poisonous gases. Do not approach.

#### 1.4.3 Wet battery

If the battery is wet or submerged in water, do not try to access it. Contact your distributor for technical assistance.

#### 1.4.4 Damaged battery

If the battery damaged, please contact your distributor for help as soon as possible, because damaged battery is dangerous and must be handled with extreme caution. Damaged battery is not suit for use and may pose a danger to people or property. If the battery seems to be damaged, return it to your distributor.



#### WARNING

Damaged battery might export electrolyte or flammable gas, so contact your distributor for advice and information immediately we will deal with it within 48h.

#### 1.5 Installers

Energy Storage battery is suggested installing by skilled worker or electrician. A skilled worker is defined as a people who had been trained and qualified electrician or had all of the following skills and experience:

- Knowledge of the functional principles and operation of on-grid Energy Storage systems.
- Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.
- Knowledge of the installation of electrical devices
- Knowledge of and adherence to this manual and all safety precautions and best practices.

#### 2. Product introduction

#### 2.1 Package info

Please confirm product packaging is not damaged before unpacked, and product is good without accessories missing after unpacked, otherwise, please contact the supplier immediately.

NO.	Description	Quantity	Unit
1	Battery box	1	pcs
2	Power cable	2	pcs
3	Communication cable	1	pcs
4	Manual	1	pcs
5	Vertical bracket (optional)	4	pcs

#### Part list:

#### 2.2 Appearance



No.	Part	Remark		No.	Part		Remar	k	
1	SOC	Surplus capacity indica	ntor	$\overline{\mathcal{O}}$		Reset			
2	ALM	Alarm indicator		8		GND			
3	Run	Running indicator		9	Po	wer Switch			
4	ADD	Battery address settir	ng	(10	Batt	ery terminal			
5	CAN / RS485*	communicate with inve	erter	(11)		Hangers			
6	RS485*	communicate with bat	tery						
CAN /	CAN / RS485 <sup>*</sup> : Below is the interface definition.								
	Pin Definition								
				1、8		RS48	5-B		
		2、7		RS485-A		1			
		4		CAN	-H				
				5		CAN	I-L		
	(Pin sequence is	1 to 8 from right to left)		3、6 GN		D	]		
RS485	5 <sup>*</sup> : The port provid	les RS485 communication, bau	d rate is 19	200bps. <b>Pin</b>	Below	is the interface	definition.	1	
			1 0			- D	-		
			-	L、Ŏ		K3485	D-D	4	
				2、7		RS485	5-A		
				3、6		GN	D		
	(Pin sequence is :	1 to 8 from right to left)	2	4、5		NC (dan	gling)	1	

#### 2.3 Technical Data

	Item	Technical data	Remark
	Energy storage	4.8Kwh	
	Rated capacity	100Ah	0.5C/0.5C@25°C
	Rated voltage	48V	
Ň	Working voltage range	45V ~ 54.5V	3.0~3.6V per cell
Char	Suggested charge current	20A	
ge	Max. cont. charge current	100A	
Diash	Suggested charge current	20A	
Disch	Max. cont. charge current	100A	
arge	Peak discharge current	110A @1S	
	Communication	CAN/RS485	
	Ingress protection	IP20	
	Scalability	8pcs in parallel max	
	Marking topporture	0℃~55℃ (charge)	
	working temperature	-15℃~55℃ (discharge)	
	Storage temperature	0~40°C	
	Dimension (WxHxD)	436×140×427mm	
	Weight	Approx: 41.6±1 Kg	

### Diagram:



#### 3 Installation

#### **3.1 Installation Precaution**

Please make sure the installation site meets below conditions:

- Not in direct sunlight
- Not in areas where highly flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not near the television Antenna or antenna cable.
- Not higher than altitude of about 2000 meters above sea level.
- Not in environment of precipitation or humidity (>95%)
- Please AVOID direct sunlight, rain exposure, snow laying up during installation and operation.

#### 3.2 Installation Tools

NO.	Item
1	Screwdriver

#### 3.3 Installation Step

#### 3.3.1 Work with racks

#### 3.3.1.1

Plug batteries in rack one by one



#### 3.3.1.2 Cable Connection

Batteries support parallel connection only, connect battery positive to positive, negative to negative. And connect communication cable and ground cable.



Cable color Definition		Remark
Red	Positive power cable	
Green Negative power cable		
Blue	Communication cable	Communicate among batteries via RS485, communicate between battery and inverter/UPS etc via CAN/RS485
Yellow	Ground cable	

#### 3.3.2 Work with vertical bracket (optional)

#### 3.3.2.1 Installation



① Plug positioning plate through the upper hole of brackets;

② Fix brackets to battery box with screws;

③ Stack another battery box with brackets and bolts on the  $1^{st}$  battery box, let bolts of  $1^{st}$  battery pass through the lowest hole of bracket of  $2^{nd}$  battery box.

④ Lock bolt with circlip, then finish the installation.

#### 3.3.2.2 Cable Connection

Batteries support parallel connection only, connect battery positive to positive, negative to negative. And connect communication cable and ground cable.



Cable color Definition		Remark
Red	Positive power cable	
Green	Negative power cable	
Blue	Communication cable	Communicate among batteries via RS485, communicate between battery and inverter/UPS etc via CAN/RS485
Yellow	Ground cable	

#### 3.4 ADD Settings

Connect the parallel communication cable like the picture above, then set ADD. (Support 8pcs in parallel max by default, could extend to 16pcs max when required)



#### 3.4.1 Manual ADD Settings

The set include 2 parts. Bit  $1 \sim 4$  is used to set the dial address of battery modules, bit  $5 \sim 8$  is used to set in primary battery module only, showing the quantity of sub battery modules.

ماداسمم		ADD swite	h position		Description		
Address	#1	#2	#3	#4	Description		
0	OFF	OFF	OFF	OFF	Primary battery module		
1	ON	OFF	OFF	OFF	Sub battery module 1		
2	OFF	ON	OFF	OFF	Sub battery module 2		
3	ON	ON	OFF	OFF	Sub battery module 3		
4	OFF	OFF	ON	OFF	Sub battery module 4		
5	ON	OFF	ON	OFF	Sub battery module 5		
6	OFF	ON	ON	OFF	Sub battery module 6		
7	ON	ON	ON	OFF	Sub battery module 7		
8	OFF	OFF	OFF	ON	Sub battery module 8		
9	ON	OFF	OFF	ON	Sub battery module 9		
10	OFF	ON	OFF	ON	Sub battery module 10		
11	ON	ON	OFF	ON	Sub battery module 11		
12	OFF	OFF	ON	ON	Sub battery module 12		
13	ON	OFF	ON	ON	Sub battery module 13		
14	OFF	ON	ON	ON	Sub battery module 14		
15	ON	ON	ON	ON	Sub battery module 15		

#### Bit 1~4 settings

Bit 5~8 settings

O'the of modulos		ADD swite	Description		
Q ty of modules	#5	#6	#7	#8	Description
Without sub battery	OFF	OFF	OFF	OFF	Only 1 battery
2pcs in parallel	ON	OFF	OFF	OFF	1 primary + 1 sub
3pcs in parallel	OFF	ON	OFF	OFF	1 primary + 2 sub
4pcs in parallel	ON	ON	OFF	OFF	1 primary + 3 sub
5pcs in parallel	OFF	OFF	ON	OFF	1 primary + 4 sub
6pcs in parallel	ON	OFF	ON	OFF	1 primary + 5 sub
7pcs in parallel	OFF	ON	ON	OFF	1 primary + 6 sub
8pcs in parallel	ON	ON	ON	OFF	1 primary + 7 sub
9pcs in parallel	OFF	OFF	OFF	ON	1 primary + 8 sub
10pcs in parallel	ON	OFF	OFF	ON	1 primary + 9 sub
11pcs in parallel	OFF	ON	OFF	ON	1 primary + 10 sub
12pcs in parallel	ON	ON	OFF	ON	1 primary + 11 sub
13pcs in parallel	OFF	OFF	ON	ON	1 primary + 12 sub
14pcs in parallel	ON	OFF	ON	ON	1 primary + 13 sub
15pcs in parallel	OFF	ON	ON	ON	1 primary + 14 sub
16pcs in parallel	ON	ON	ON	ON	1 primary + 15 sub

Q'ty of modules		ADD switch position								
		1#	2#	3#	4#	#5	#6	#7	#8	
1pcs		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
2pcs in	Primary module	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	
parallel	Sub module 1st	ON	OFF							
2 non in	Primary module	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	
spcs in	Sub module 1st	ON	OFF							
parallel	Sub module 2nd	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	
I		1	I	1	1	1	1	I	l	
		1	l	1	1		1	l		
	Primary module	OFF	OFF	OFF	OFF	ON	ON	ON	ON	
	Sub module 1st	ON	OFF							
	Sub module 2nd	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	
	Sub module 3rd	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	
	Sub module 4th	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	
	Sub module 5th	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	
16000	Sub module 6th	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	
in	Sub module 7th	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	
narallol	Sub module 8th	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	
paraller	Sub module 9th	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	
	Sub module 10th	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	
	Sub module 11th	ON	ON	OFF	ON	OFF	OFF	OFF	OFF	
	Sub module 12th	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	
	Sub module 13th	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	
	Sub module 14th	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	
	Sub module 15th	ON	ON	ON	ON	OFF	OFF	OFF	OFF	

#### ADD Settings Example

#### 3.4.2 Automatically ADD Settings

Battery support to set ADD automatically when battery modules are connected like the picture.



#### 4 LED Instructions

Battery pack has 1 run indicator, 1 alarm indicator and 4 SOC indicators.

	٠	٠	•	
S	C		ALARM	RUN

#### 4.1 SOC indicators

SOC indicators show battery remaining capacity.

Status		Charge				Discharge			
SOC indicators		L4 🔵	L3 🔵	L2 🔵	L1 •	L4 🔵	L3 🔵	L2 🔵	L1•
Remaining capacity	0~25%	off	off	off	Flash 2	off	off	off	on
	25 ~ 50%	off	off	Flash 2	on	off	off	on	on
	50 ~ 75%	off	Flash 2	on	on	off	on	on	on
	≥75%	Flash 2	on	on	on	on	on	on	on
Run indicator 🛛 🗨		Always				Flash			

#### 4.2 Status indicators

SOC indicators show battery remaining capacity.

Suctor status	Dup status	RUN	ALM	SOC			
System status	Run status	٠	•	٠	٠	٠	٠
Off	Sleep	off	off	off	off	off	off
Standby	Normal	Flash 1*	off	off	off	off	off
	Alarm	Flash 1*	Flash 1*	off	off	off	off
Charging	Normal	on	off	As per SOC indicating			
	Over voltage alarm	on	off	As per SOC indicating			
	Over current alarm	on	Flash 2*	As per SOC indicating			
	Over voltage protection	Flash 1*	off	off	off	off	off
Discharging	Normal	Flash 3*	off	As par SOC indicating			
	Alarm	Flash 3*	Flash 3*	As per SOC indicating		iy	
	Over current, short circuit protection	off	on	off	off	off	off
	Under voltage protection	off	off	off	off	off	off
Temperature	Charging alarm	On	Flash 2	As par SOC indicating			
	Discharging alarm	Flash 3 Flash 3 As per SOC II			indicating		
	Protection	off	on	off	off	off	off

\* Definition of LED flash

Flash type	On	off
Flash 1	0.25s	3.75s
Flash 2	0.5s	0.5s
Flash 3	0.5s	1.5s

#### 5 Operation

#### 5.1 Boot

Turn the battery box "ON/OFF" to the "ON position";

#### 5.2 Turn off

Turn the "ON/OFF" of the battery box to the "OFF" position.

#### 5.3 Disassembly

- 5.3.1 Confirm that the inverter and battery are turned off;
- 5.3.2 Disconnect power cables and communication cable from inverter;

#### 6 Troubleshooting

Our products have been strictly tested before they leave the factory. If there are operating difficulties during installation and use, please read the relevant chapters of this manual. When a failure occurs, please inform our company and provide relevant information about the inverter. We will have professional after-sales service personnel will answer for you. The information you need to provide includes:

- Model
- LCD display information
- A short description of the problem
- Battery voltage
- Grid voltage and frequency
- Battery capacity
- Battery output voltage
- Battery purchase time

#### 7 Quality promise

For products that fail during the warranty period, our company will repair or replace them with new products free of charge.

Warranty products require that the company requires customers to provide invoices and dates for purchasing products during the warranty period. At the same time, the trademark on the product should be clearly visible, otherwise it has the right not to guarantee the quality. The replaced product will be handled by our company, and the customer should allow the company a certain amount of time to deal with the failure.

#### Exemption

The company reserves the right not to guarantee quality if the following situations occur:

- Beyond the free warranty period
- Incorrect installation, modification or use
- Operation beyond the very harsh environment described in this manual
- Machine failure or damage caused by unauthorized installation, repair, modification or disassembly
- Machine failure or damage caused by the use of non-standard components or software
- Anything beyond the scope of installation and use specified in relevant international standards
- Damage caused by abnormal natural environment

If the product fails due to the above situation, the customer requires maintenance service. After the judgment of the company's service organization, paid maintenance services can be provided.