

# LITHIUM-ION BATTERY PRODUCT

## USER MANUAL

**DS-512100-R01**



## REVISION RECORDS

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NO.	Revision	Author	Revision Of Content	Revision Time
1	V1.0		First Release	07-24-2022
2				
3				
4				
5				

# MANUAL EXPLANATION

## ► COTENT EXPLANATION

DS-512100-R01 series is Lithium-ion phosphate battery module which designed for residential energy storage applications. This battery module integrated with intelligent BMS inside, support communicate with ON/OFF grid solar power inverter, has big advantages on safety, cycle life, energy density, temperature range and environmental protection. This product user manual describes the parameters and installation details.

Chapters	Contents
1. Safety cautions	Safety rules and precautions
2. General information	Battery parameters
3. Panel features	Introduce the interface function
4. Packing list	Packing list
5. Installation	Installation and operation
6. Shipping, Storage, and Disposal	Shipping, Storage, Maintenance And Disposal

## ● BEFORE YOU START





Read all the safety information provided in this document prior to install and/or operate the equipment. Contact Customer Support immediately for a free consultation if you have any questions about the handling, operation and safe use of the battery.

To handle or operate with battery system:

- You must be qualified for electrical work;
- Before you operate the battery module, you should be better trained and read the manual carefully;
- Remove any possible metallic shorting risk of Jewel, Watches, Pens. Metal bars and frames;
- All tools must be insulated

# 1 SAFETY CAUTIONS

## SAFETY SYMBOLS

Symbol	Definition
	Important safety information will follow.
	DO NOT dispose of battery in a fire.
	Recycle or dispose of Lithium batteries in accordance with local Laws/regulations.
	DO NOT dispose of battery in the trash.

## PRECATIONS

Please read and comply with the following conditions of installation and use of the battery, incorrect installation using the battery may cause personal injury or damage to the product.

1. DO NOT throw the battery into water. Store batteries in cool and dry environment when not in use.
2. DO NOT put the battery into fire or heat the battery, so as to avoid explosion or other dangerous events.
3. When charge the battery, please choose specialized charging equipment, and follow the correct procedures, do not use unqualified chargers.
4. DO NOT reverse positive and negative terminals, do not connect the battery directly to AC power ,

avoid battery short circuit.

5. DO NOT using batteries from different manufacturers or different kinds, types together ,and do not mixed use old batteries and new batteries.
6. DO NOT use the battery when it becomes hot, bulges, deforms or leaks.
7. DO NOT puncture the battery by nail or other sharp objects; Do not throw, stamp on, impact or hit the battery.
8. DO NOT open or try to repair the battery when it is defective. Warranty invalid if the battery repaired or disassembled.
9. Batteries are half charged before shipment, Don't use the battery if it's hot, bulge, or smell abnormal and so on, and report to after-sale dept. immediately.
10. If you need storage the battery for a long time, please charge and discharge the battery every three months to ensure the best performance, and the best state of charge for storage is between 50%~60%.
11. Please use the battery in the temperature range which defined in the manual.
12. The state of charge of batteries is 50% before shipment, please charge the battery before using.

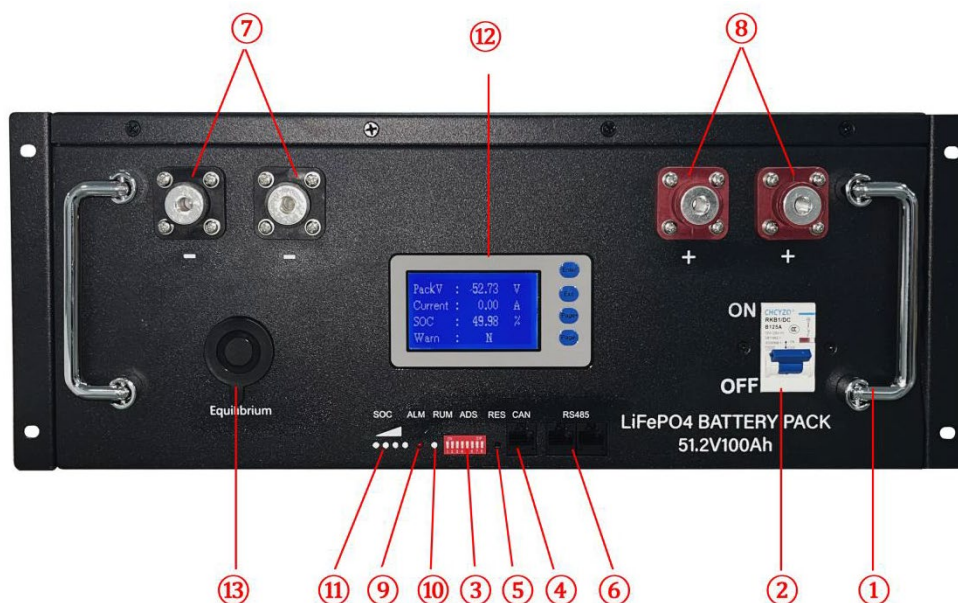


**Note:** If you have some special technical problems which not mentioned above, please contact technical staff.

## 2 GENERAL INFORMATION

Model/Parameters	DS-512100-R01
<b>Basic</b>	
Normal Voltage [V]	51.2
Normal Capacity [Ah]	100
Operating Voltage [V]	40-58.4
Rated energy [kWh]	5120
Battery Type	Li-ion (LiFePO4)
Ah Efficiency [%]	97
Wh Efficiency [%]	94
Standard Power [kW]	10
Recommended Charging current [A]	50
Maximum Discharging current [A]	100
<b>Dimension &amp; Weight</b>	
Dimension(L*W*H) [mm]	442*425*178
Weight [Kg]	≈45kg
<b>Communication</b>	
Battery to Inverter	CAN
Battery to Battery/BMS	RS485
Capacity Indicator	LCD screen
Switch ON/OFF	Button
<b>Environment</b>	
Operating Temperature [°C]	-10 to 55
Relative Humidity [%]	5 to 95
Altitude [m]	Below 4000
<b>Standard Comply</b>	
Safety	CE, ROHS
Hazardous Materials Classification	Class 9/UN3480
Transport Testing Requirement	UN38.3
Cycle Life [85% DOD]	≥ 5000
Warranty [Year]	3

### 3 PANEL FEATURES

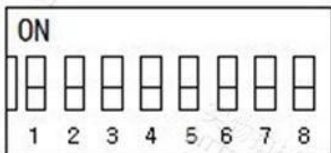


NO.	Name	Function	Remarks
1	Handle	For carrying, handling	
2	Power	DC-200A Air Switch	
3	ID	Assign address of every model	See Table 3.4
4	CAN	CAN Communication interface	
5	RESET	Power on for the first time Activate BMS	
6	Battery Comm RS485	Battery inter-comm when connect in parallel	
7	Terminals	Positive	
8	Terminals	Negative	
9	ALM	Alarming indicates LED	4 pcs green LED
10	RUN	Operating indicates LED	
11	SOC	The state of charge	
12	LED isplay	Four keystrokes	
13	Equilibrium		

## ID Arrangement

ID arrangement should be set when parallel use and steps shows below.

Maximum parallel of DS-512100/51200 is 16.

Code								Address	Assign	Remarks
1	2	3	4	5	6	7	8			
OFF	OFF	OFF	OFF	ON	ON	ON	ON	1	Model 1	
ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	2	Model 2	
OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	3	Model 3	
ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	4	Model 4	
OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	5	Model 5	
ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	6	Model 6	
OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	7	Model 7	
ON	ON	ON	OFF	OFF	OFF	OFF	OFF	8	Model 8	
OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	9	Model 9	
ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	10	Model 10	
OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	11	Model 11	
ON	ON	OFF	ON	OFF	OFF	OFF	OFF	12	Model 12	
OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	13	Model 13	
ON	OFF	ON	ON	OFF	OFF	OFF	OFF	14	Model 14	
OFF	ON	ON	ON	OFF	OFF	OFF	OFF	15	Model 15	
ON	ON	ON	ON	OFF	OFF	OFF	OFF	16	Model 16	

### Assignments of ID address

**Note:** In the table 1, code bits are in accordance with the control panel ID code corresponding to the binary digit, dial up stands for "OFF ", dial down stand for " ON ", the left dial is low digit, the right dial is high digit, encoding in the range of 1~16, which can support up to 16 modules cascade. All coded according to the table, followed by analogy. If you need more modules in parallel, please tell us, we will design it to meet your requirement.

BMS ID 01 is the master BMS.

If you use only single battery, please set the ID to be 01.

If you use battery modules in parallel, set one battery module to be 01, and other ID are different, and make sure each ID is unique in the string.



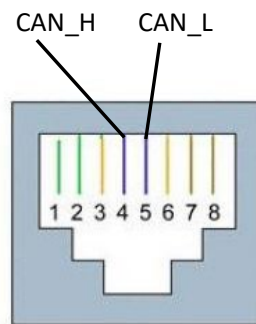
## Communication ports

CAN and RS485 are used for communication with inverter.

Battery comm used for battery in parallel ID arrangement.

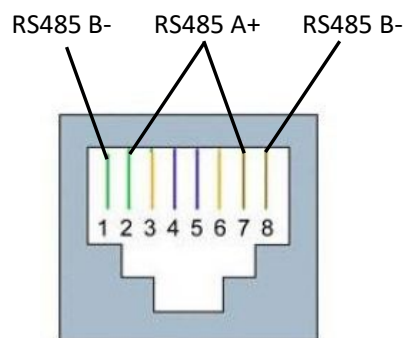
### CAN Communication interface definition

Pin-No.	Definition	Pin-No.	Definition
PIN-1	NC	PIN-5	CAN CAN_L
PIN-2	NC	PIN-6	NC
PIN-3	NC	PIN-7	NC
PIN-4	CAN CAN_H	PIN-8	NC



### RS485 Communication interface definition

Pin-No.	Definition	Pin-No.	Definition
PIN-1	RS485 B-(T/R-)	PIN-5	NC
PIN-2	RS485 B-(T/R-)	PIN-6	NC
PIN-3	NC	PIN-7	RS485 B-(T/R-)
PIN-4	NC	PIN-8	RS485 B-(T/R-)



## 4 PACKING LIST



Parts List		
Item	Item name	Qty
1	DS-512100-R01 battery module	1
2	Power cable between battery and Inverter (MPC 100A 600V-16mm <sup>2</sup> _1m)	2
3	Communication cable_1m	1
4	User manual	1
5	Carton	1

## 5 INSTALLATION

### Prepare to Install

The installation, operation and maintenance of DS-48200-F02 lithium-ion phosphate battery system must be performed by trained and qualified professional personnel. Before installation and use, please carefully read the product safety precautions and related operating rules. Strictly abide by the following safety rules and local safety regulations, otherwise may cause personal injury or damage to the product.

1. Make sure that the load equipment to be connected with the battery system is in good condition and free from defects;
2. Before installation, make sure that the power supply system is under shut down state, while the battery system is also under shut down state;
3. All the electricity cables must have corresponding grade of insulation, Please ensure that no exposed cables;
4. Make sure that the battery and power system are reliable grounding.

### Installation environment

The requirement of installation environment is shown in table.

Type	Requirement
Working Temperature	Working Range: -20℃ ~+60℃
Storage Temperature	-20℃ ~+60℃
Relative Humidity	<95%
Atmospheric Pressure	86kPa~106kPa
Site Requirements	No conductive dust and corrosive gas, no vibration. Keep away from heat and flame

## Tools and materials

May use the tools and information are shown in table.

Name	Name
User manual	Oblique mouth clamp
Screw driver	Multimeter
Wrench	Ammeter
Pincers	Insulating tape
Wire stripping pliers	Electrostatic prevention Bracelet
Wristband	

## Battery check

1. On the installation site, check the battery packaging to make sure it's intact;
2. Check battery box according to the packing list, make sure all the material is complete, if any damaged, please fill in the receipt;
3. Please be careful while handling batteries, avoid any damage.

## Installation

The battery is rack installed , steps shows below.

### CAUTIONS

When begin to install the battery system, you should pay attention to the following matters:

1. Installation space and load bearing. Make sure that there are sufficient fixed components to install the battery system, and to ensure that the battery mounting bracket or the cabinet be strong enough to bear the weight.
2. Cable specifications. To ensure that the use of the connection of the power supply line can match the maximum current requirements of equipment operation.

3. Project layout. Ensure the whole construction process of power equipment, batteries and other reasonable layout.
4. Wiring layout. Ensure that the wiring reasonable, orderly; and consider the moisture-proof, corrosion prevention.
5. The whole installation process should wear anti-static wristband.
6. The installation site should be at least two or more people to operate.



**CAUTION:** Please ensure the installation site safe before installation.



**Caution:** Single battery module is about 45kg. If without handling tools must have more than 2 men to carry it.

#### **Step1.** Connection Terminals and Interfaces Overview.

1. Connect to Inverter with power cable and communication cable.
2. More than one battery module to parallel, Set the ID following the ID arrangement table. Connect the power cable in parallel by power cables and connect communication cables in battery comm interface with communication cables . Connect the first or last battery module RS485/CAN interface to the PC monitor or SMPS or UPS controller.
3. Push the “ON/OFF” button to start the battery system.
4. Check the battery data and ensure the battery is on normal operation.



**Caution :** If you have any questions about the installation, please stop and contact technical support immediately. If the battery does not start or control panel ALM lights, please disconnect the power line inspection and re-install the start, if still cannot solve please contact technical support, avoid damage to equipment or cause accidents.

## 6 SHIPPING, STORAGE, AND DISPOSAL

### Shipping

According to the provisions of the product can be used in general means of conveyance, but should avoid throwing, rainfall, strong radiation and corrosion erosion. during transportation, please prevent the collision and strong vibration.

### Storage

Storage device in the indoor storage, the ambient air temperature is 0 °C to + 45°C, the average monthly relative humidity of not more than 90%, the ambient air without corrosive and flammable and explosive gas; storage warehouse should be ventilated, free of alkaline, acidic substances and other corrosive gases, without a strong mechanical vibration, shock, and without strong electromagnetic field and direct sunlight. Capacity was maintained at 50% to 60% stores, and charging the battery every 6 months.

### Troubleshooting

No.	Fault	Analysis	Solution
1	No DC output	Low voltage protection	Charge before use
2	No enough discharging time	No enough capacity or not charged to full	Confirm maintenance or replace battery
3	ALM always bright, cannot charge or discharge	Battery or BMS fail	Connect to Inverter/PC monitoring or check the data on LCD Screen and find the reason



**Caution:** If the battery cannot operate normally, please do not disassemble the battery without technical instructions.