

Phosphate-base Lithium-ion (LiFePO₄) Battery Pack Specification

MODEL: LFP500-48 (48V500Ah)

MERITSUN[®]
Lithium Energy Solution

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Chapter 1 Product Overview

1 Scope

This product specification only applies to the lithium iron phosphate-base Lithium-ion battery module that supplied by MeriTech Power Limited

2 Product model description

Product: Phosphate-base Lithium-ion Battery Pack with BMS control system.

Model: LFP500-48

LFP	–	500	–	48
Factory code	–	Capacity	–	Voltage

The LFP500-48 lithium iron phosphate battery pack indicates that the rated voltage and rated capacity of the battery pack is 48V and 500AH respectively.

The LFP500-48 system is composed of 10 standard LFP50-48 modules which connected in parallel.

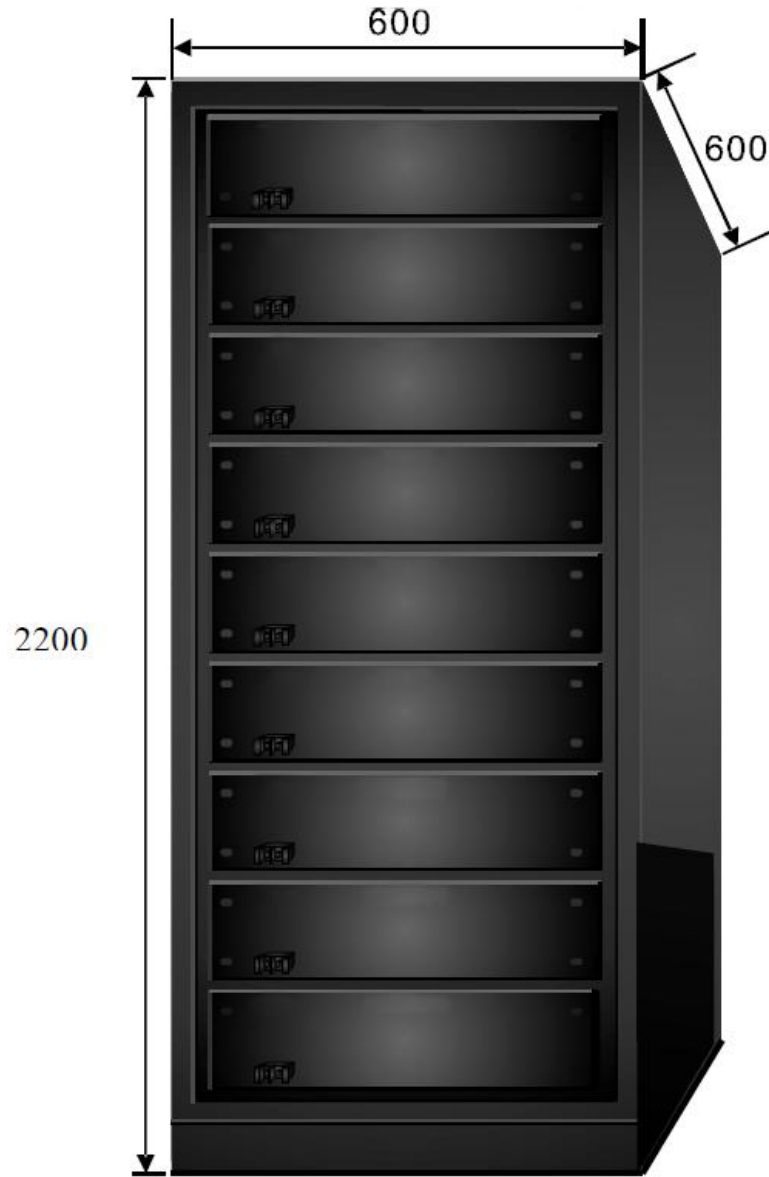
3 Normal operating conditions

- ◇ The ambient temperature for operation shall be between 0°C and 60°C;
- ◇ The average relative humidity shall not be higher than 80% both daily and monthly;
- ◇ The installation site must be free of shock, strong vibration or electromagnetic interference.
- ◇ The induced magnetization of any external magnetic field must be 0.5T or less;
- ◇ The installation tilt shall not be higher than 5% vertically;
- ◇ The operation site must be free of medium that poses explosive hazards. The ambient medium must contain no corroding metals, harmful gases that could damage insulation, conducting medium or mould.

4 Dimensional drawing

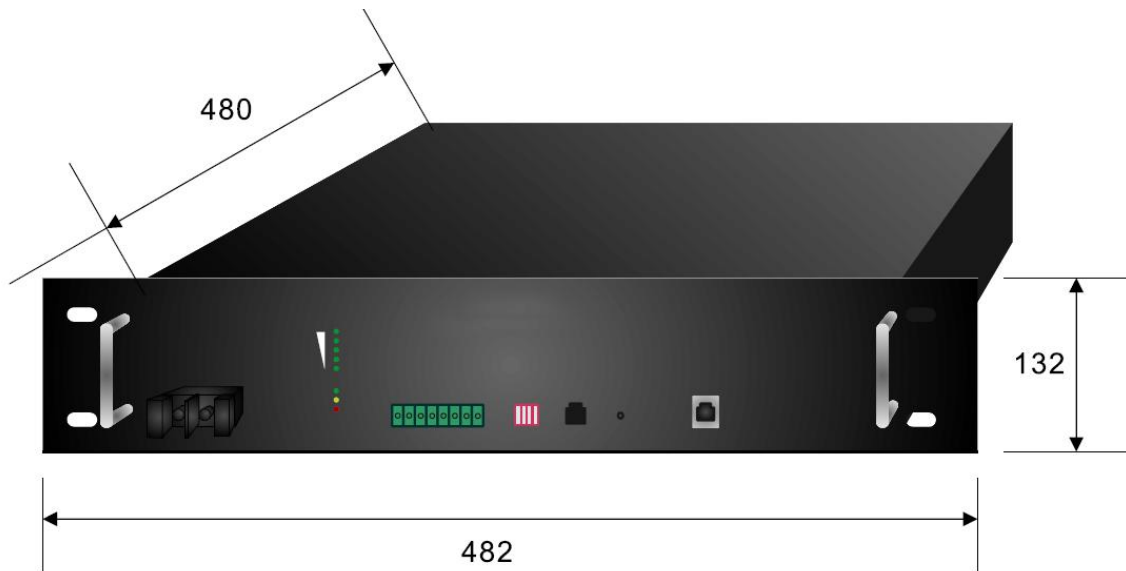
- **LFP500-48**

The dimensions of LFP500-48 are of the standard cabinet dimensions. The details are shown as below:



Battery pack dimension diagram

● LFP50-48 standard pack

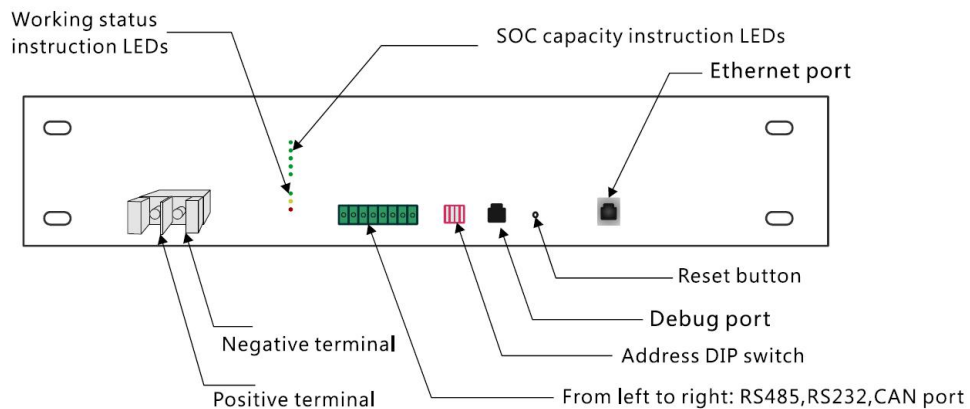




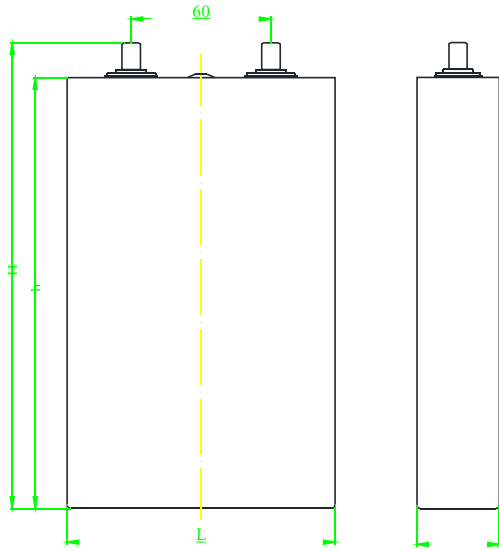
● Interface of LFP50-48 standard pack

Interface descriptions

Name	Function	Remark
Positive terminal	Input and output	Input & output in one port
Negative terminal	Input and output	Input & output in one port
Working status instruction LEDs	3 LED in green, yellow and red: Normal: green on Warning: green and yellow on protection: all three LED on	
SOC capacity instruction LEDs	1 LED on: 0 -20% capacity 2 LED on: 20 -40% capacity 3 LED on: 40 -60% capacity 4 LED on: 60 -80% capacity 5 LED on: 80 -100% capacity	
RS485 port	RS485 communication	
RS232 port	RS232 communication	
CAN port	Can communication	
Ethernet port	Ethernet communication	RJ45
Address DIP switch	Configure communication address	
Reset button	Reset the system	
Debug port	Debug the software of system	Only for authorized man



Chapter 2 Introduction to Lithium Iron Phosphate Battery



H:	200.0±1.0mm
h:	186.0±1.0mm
W:	36.5±0.5mm
L:	115.5±1.0mm
D:	60.0±1.0mm



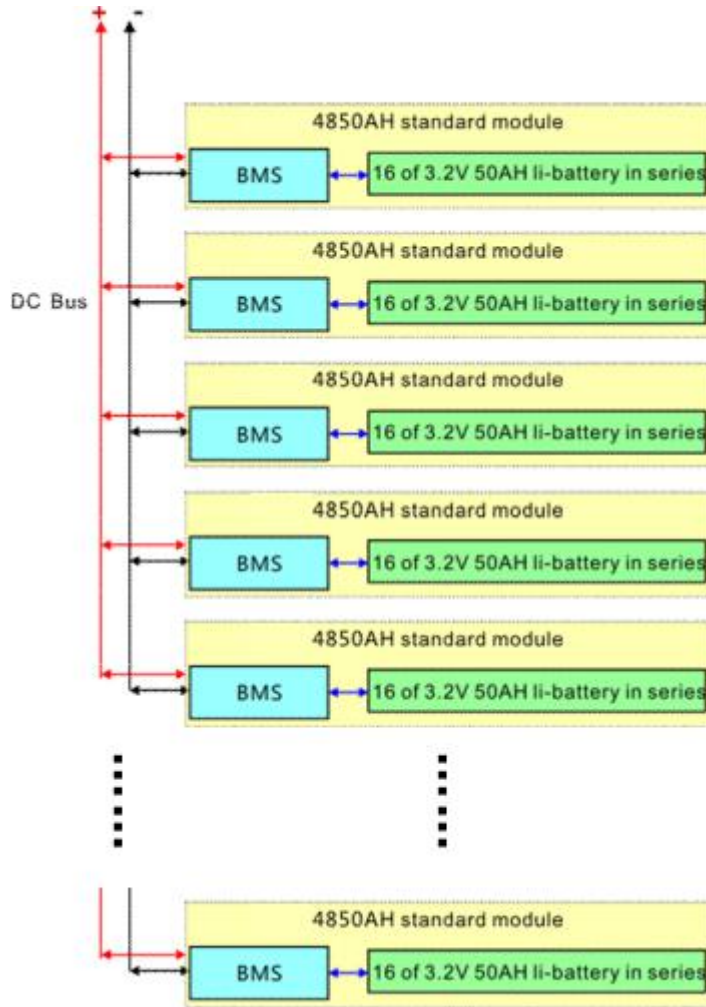
Chapter 3 Introduction to Battery Pack

3.1 Features of battery pack

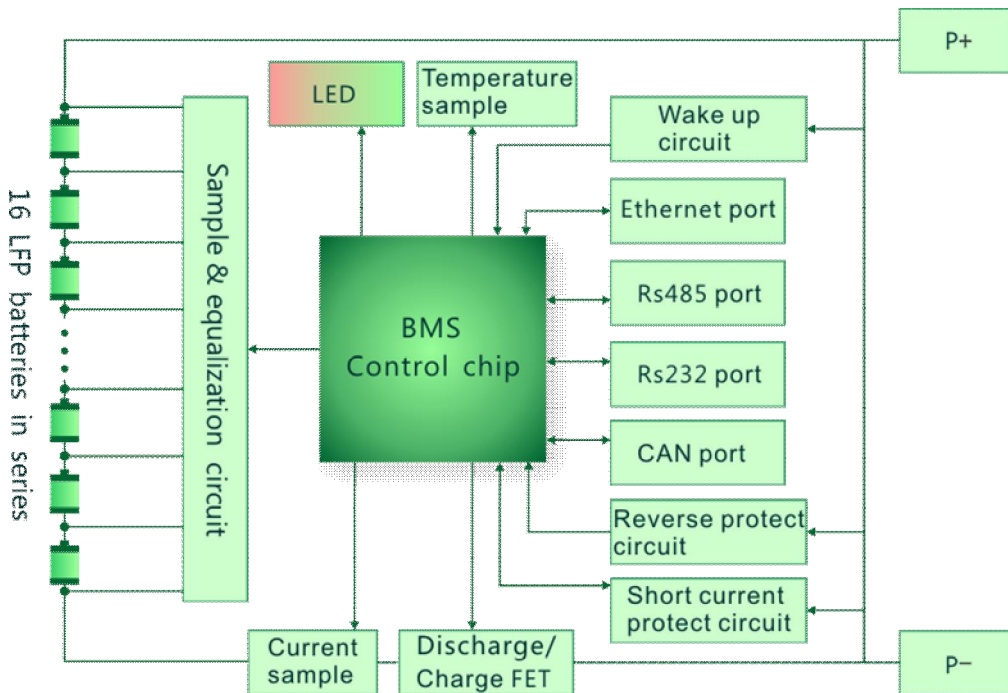
- Intelligent cell equalization management;
- Intelligent charge-discharge management and capacity auto learning;
- High precision voltage test (30mV/cell);
- High precision current detection (1A@<100A);
- Software and hardware protection against over voltage, low voltage, under voltage, over current, high and low temperature, and short circuit;
- EEPROM storage of manufacturing information and use history;
- LCD display screen and buzzer: capacity display and failure warning;
- RS232/RS485 port: can be used to read battery pack status and parameter information;
- Module dimensions fit with standard cabinet and thus easy to install;
- CAN port can be used for parallel communication between battery packs;
- Ethernet port can be easily used for network management;

3.2 Electrical schematic diagram of battery pack

Below is the electrical schematic diagram of lithium iron phosphate battery pack.



System diagram of LFP500-48



Electrical schematic diagram of standard LFP50-48 pack

3.3 Introduction to major functions

1) Protection function:

The battery module has complete and reliable protection functions as below:

- ◆ Protection against over and under voltage;
- ◆ Protection against over and under voltage of single battery;
- ◆ Protection against charge and discharge over current;
- ◆ Protection against charge and discharge temperature (high temperature, low temperature);
- ◆ Short circuit protection;
- ◆ Charge reverse polarity protection;

2) Battery equalization function: To ensure that the voltage of each single battery within the battery packs is identical by exercising balancing control based on the voltage of each battery;

3) External communication function: including RS232, RS485 ,CAN and Ethernet, etc.

4) Fan-based thermal control: When the temperature sensor detects over high temperature inside the battery module, the fan inside the module will operate automatically to reduce the temperature inside the module;

3.4 Technical parameters of the battery pack

1) Technical parameters of LFP500-48

Model	LFP500-12
Rated Voltage(V)	48
Typical Capacity(Ah)	500
Standard Charge Voltage(V)	57.6
Standard Charge Current(A)	100
Maximum Discharge Current(A)	100
Over-charge protection voltage (V)	57.6 (can be set)
Over-discharge protection voltage (V)	43.2 (can be set)
Over-discharge protection current (A)	110 (can be set)
Maximum Temperature Protect at Charge(°C)	60
Minimum Temperature Protect at Charge (°C)	-5
Maximum Temperature Protect at Discharge (°C)	70
Minimum Temperature Protect at Discharge (°C)	-30
Short Circuit Protect Recover(S)	60
Maximum Balanced Current(mA)	200
Dimension(mm)	600(W)*22000(H)*600(D)
Weight(kg)	500

2) Technical parameters of standard LFP50-48 module

Model	LFP50-48
Rated Voltage(V)	48
Typical Capacity(Ah)	50
Standard Charge Voltage(V)	57.6
Standard Charge Current(A)	50
Maximum Discharge Current(A)	50
Over-charge protection voltage (V)	57.6 (can be set)
Over-discharge protection voltage (V)	43.2 (can be set)
Over-discharge protection current (A)	55 (can be set)
Maximum Temperature Protect at Charge(°C)	60
Minimum Temperature Protect at Charge (°C)	-5
Maximum Temperature Protect at Discharge (°C)	70
Minimum Temperature Protect at Discharge (°C)	-30
Short Circuit Protect Recover(S)	60
Maximum Balanced Current(mA)	200
Dimension(mm)	482(W)*132(H)*480(D)
Weight(kg)	38.5

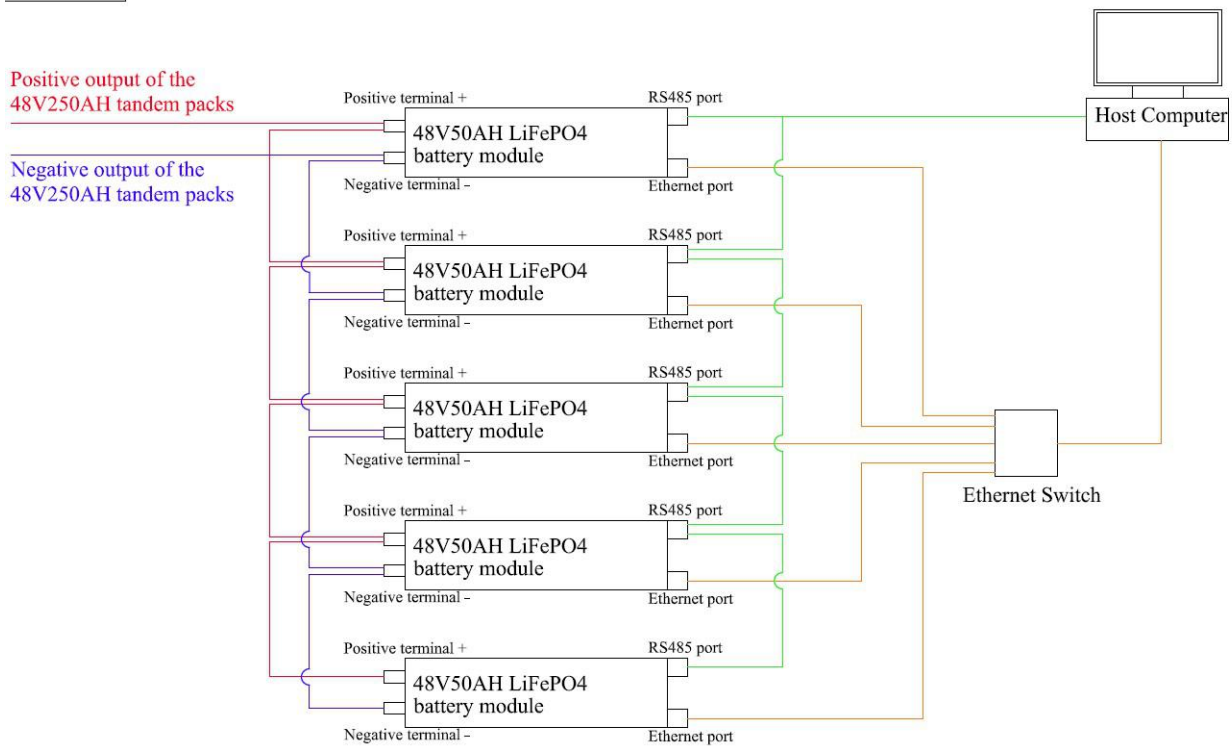
Chapter 4 Operating Instructions

4.1 Circuit Connection

Install the lithium iron phosphate battery pack onto the standard cabinet (with holes on the front panel for screw fixation) and connect it with cable (the sectional area of the cable shall not be less than 30 square millimeters) to the battery side of the telecommunication UPS equipment. The 48V power terminals on the backside of the battery pack, and the communication port on the front panel. for more details, please refer to Chapter 1.

The battery pack configures RS232, RS485 and Ethernet port, which can communicate with the host computer. The RS485 port can connect with the host computer by using RS485-RS232 converter, RS232 and Ethernet port can directly connect with the host computer.

The battery pack also configures CAN port, which can be used for parallel communication between packs.



To avoid equipment damage or other accident, the positive and negative terminals of the battery pack must be correctly connected to the terminals of the UPS equipment.

4.2 Start up operation

This model does not require any activation operation. The system will work automatically if you connect load or charger to it.

4.3 Shutdown operation

This model does not require any activation operation. The system will shut down automatically if no load or charger connect to it for 30min..

4.4 Charge operation

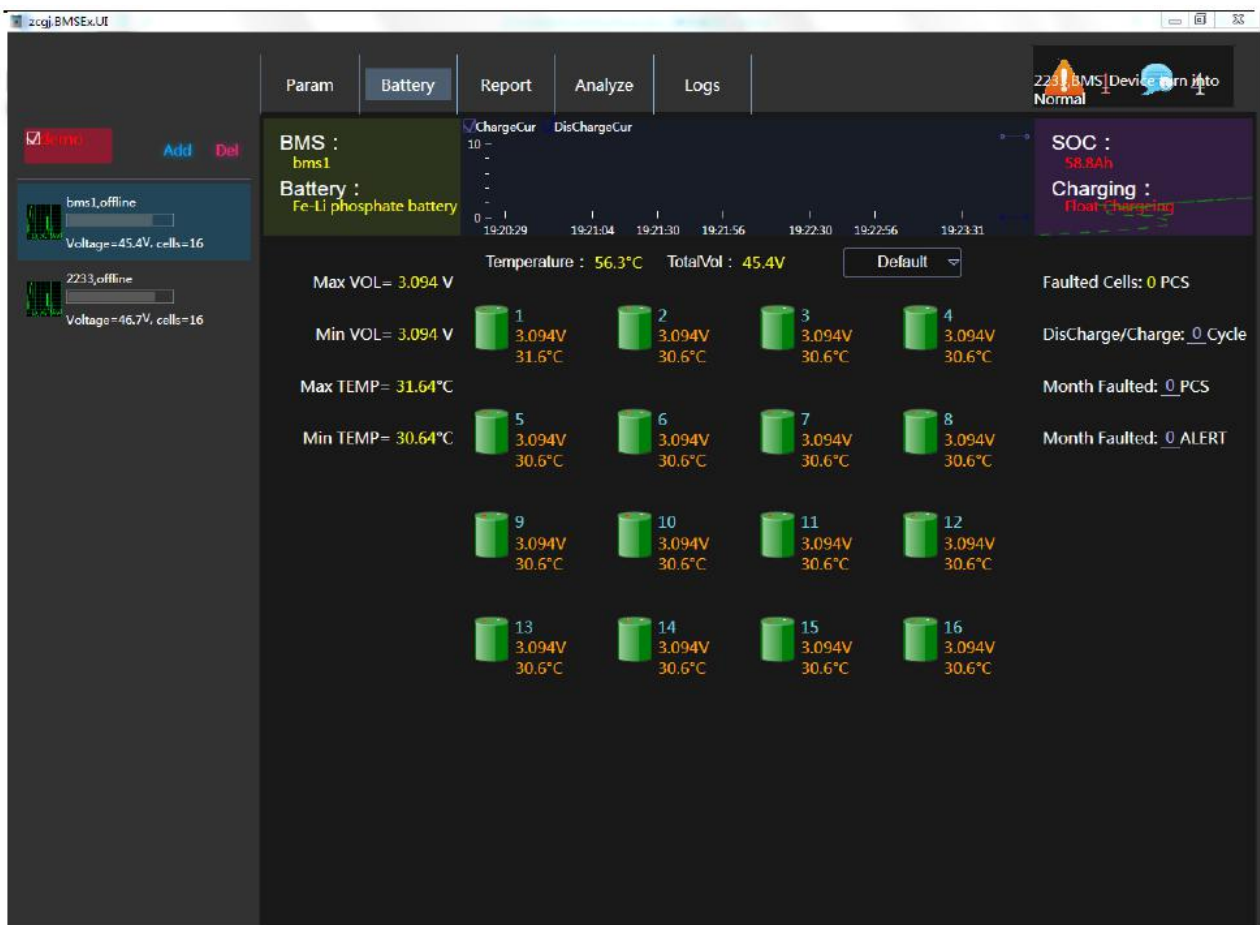
Set the UPS to charge the lithium iron phosphate battery pack, and the battery pack will switch to the charging status. For the maximum charge parameters, please refer to Chapter 3.3 of this Manual (*Technical Parameters of the Battery Pack*).

4.5 Discharge operation

Set the UPS to discharge the lithium iron phosphate battery pack, and the battery pack will enter the discharging status. For the maximum discharge parameters, please refer to Chapter 3.3 of this Manual (*Technical Parameters of the Battery Pack*).

4.6 Description of monitoring software

Connect the Ethernet port of the lithium iron phosphate battery pack directly to the Ethernet port of the host computer by using network cable. Open the associated monitoring software on the host computer, and then you can monitor various technical parameters of the lithium iron phosphate battery pack in real time (see below picture):



The monitoring software on the host computer will display the below information:

- Real time value of each cell's voltage;
- The total voltage of every module;
- Current of every module.
- Working status of every module (normal, warning, fault).

However, there are no monitoring board in this system, so each LFP50-48 module is isolated, you must communicate with each module to get its information.

Appendix I

The status of battery pack, "Status" explanation:

Single alarm display	Multiple alarms display abbr.	Status ok
Overvoltage	OV	OK
Undervoltage	UV	
Cell Overvoltage	COV	
Cell Undervoltage	CUV	
Over Temperature	OT	
Low Temperature	LT	
Communication Err	CE	
Over current	OC	
Short current	SC	
PN Reverse	PNERR	

Appendix II

Standard Configuration of the Lithium Iron Phosphate Battery Pack			
No.	Description	Quantity	Configuration type
1	Battery pack cabinet	1	standard
2	serial communication cable	1	standard
3	Communication converter	1	optional
4	5V adapter	1	optional
5	Network cable	1	standard
6	User manual	1	standard
7	Operation instruction of monitoring software	1	standard
8	Certificate of Inspection	1	standard
9	Packing List	1	standard

This Manual may subject to change without further notice.