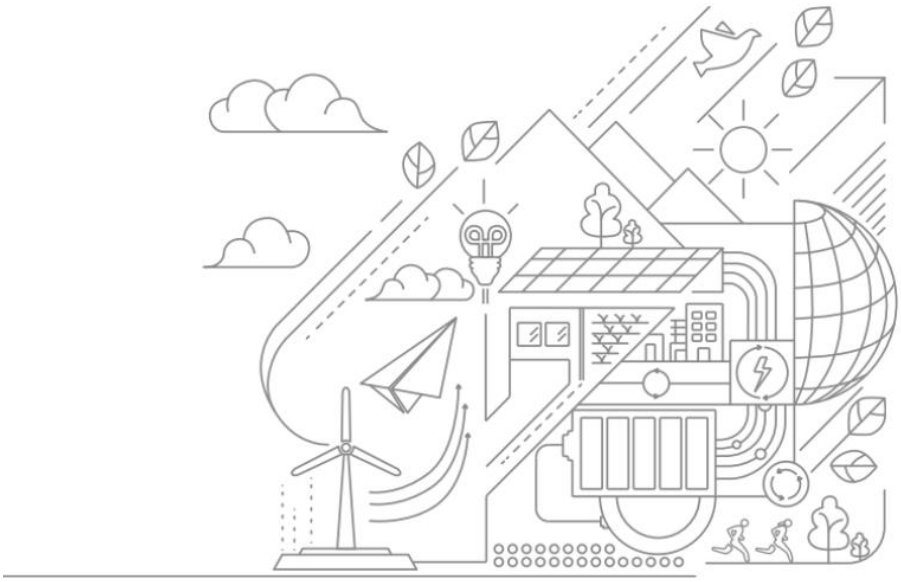
Manual on Floor Standing Li-ion Battery

Product Model	ZT-16F



Revision Record

NO.	Version	Context	Time
1	V1.0	First Edition	2025/12/1

Content

1. Security Instructions

Arrival inspection	⚠ Attention
	◆If system components are found to be damaged, do not proceed with the installation. Please communicate promptly with and confirm with the manufacturer in a timely manner, otherwise it may affect the project application. ◆ If it is found that the packing list does not match the physical name, communicate and confirm with the manufacturer in a timely manner, otherwise it may affect the project application.
Install	⚠ Attention
	◆ When handling and installing, please handle with care, otherwise it may cause system damage. ◆This system should be kept away from flammable and explosive materials and heat sources.
	⚠ Danger
	◆Installation must be guided by qualified electrical engineering personnel who are familiar with the system, otherwise there is a risk of electric shock or damage to the system.

Assembly wiring	◆ Before wiring, it is necessary to ensure that the power supply is disconnected, otherwise there is a risk of electric shock or fire.
	⚠ Attention
	◆ Confirm if the communication wiring is correct, otherwise it may cause abnormal operation ◆ Confirm whether the positive and negative pole connections of the power supply are correct, otherwise it may cause system damage.
Running	⚠ Danger
	◆ Only after proper connection can the power be turned on. It is strictly prohibited to plug and unplug the wiring harness when the power is on, otherwise there is a risk of electric shock. ◆Non system familiar professionals are not allowed to change the parameters of the upper computer settings page without authorization, otherwise it may cause system malfunctions or even accidents.
	⚠ Attention
	◆Before running, please confirm whether this system is within the allowable range of use, otherwise it may cause damage to the system.

	◆ Before operation, please confirm that the positive and negative wiring screws are tightened, otherwise it may cause system damage
Maintenance inspection	 Danger
	◆If you want to disassemble the casing, please ensure the power is disconnected, otherwise there will be a risk of electric shock. ◆Please designate qualified electrical engineering for maintenance, inspection, or replacement of components to prevent accidents.
Others	 Danger
	◆ Do not squeeze, puncture, drop, vibrate, heat or short-circuit, and keep away from corrosive substances. ◆ Do not disassemble the battery by yourself. Incorrect disassembly can cause short circuits and other problems such as fire, gas, and even explosion; ◆ Do not place the battery in a fire. Otherwise, it may cause very dangerous situations such as fire and explosion.
	 Attention
	◆If deformation, swelling, leakage or other issues are found, please do not use.

	◆ Do not place the battery in substances such as water or liquids.

2. ZT-16F Floor Standing battery basic function introduction

This is a Floor Standing lithium battery battery pack that can be used with an appropriate inverter to form a home energy storage system. AC power (or solar power formed by photovoltaic panels) is converted into DC power of the appropriate voltage range through the inverter to charge the battery pack and store the power for use when needed. During the use of the product, the power from the lithium battery pack is converted into AC power through the inverter (grid-connected or off-grid, depending on the user's needs and the function of the inverter) to supply power to the user's electrical equipment.

ZT-16F Floor Standing battery battery products appearance, as Figure 1

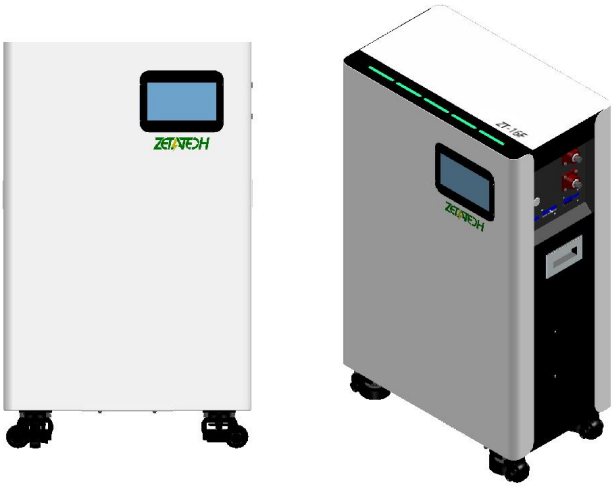


Figure 1.ZT-16F Floor Standing battery battery product profile

ZT-16F standard battery application scenario, as shown in Figure 2

Figure 2. ZT-16F standard battery application scenario

ZT-16F technical parameters：

Table 1: ZT-16F standard battery technical parameters

Type		ZT-16F
Product Specification		51V314Ah
Battery Parameter	Battery Type	LFP(LiFePO4)
	Rated Voltage（V)	51.2
	voltage range (V)	43.2-57.6
	equalizing charge (V)	57.6
	Charge-Down Current Turn-On Conditions	single voltage≥3.55V
	Charge current cut-off voltage（V）	57.6 or single current≥3.63
	Maximum charge/discharge current（A)	200/200
	Discharge cutoff voltage（V）	SOC≤5%，or
		total voltage≤46.2
		or single voltage≤2.7
	Rated Battery Capacity (Ah)	314AH

	Rated Battery Energy（KWh)	16
	Charge Temperature	0~55℃
	Discharge Temperature	-20~55℃
	Storage Temperature	-30℃~45℃（1 month）; -30℃~35℃（6 months）
General Characteristics	Size(W*D*H)±3mm	541.00*316*882.00
	Battery Pack Weight (kg）±3kg	139.5
*** The rated capacity indicates the current discharged by charging with 0.5C current to the cutoff under the condition of 25±5℃, and then discharging with 0.5C to the cutoff state after standing for 30min.**		

3. ZT-16F Description of the structure and function of the standard battery

The ZT-16F standard battery has a 7-inch touch screen on the front. SOC indicator band on the top, positive power terminal, negative power terminal, status indicator, dry contact connector, reset switch, manual toggle key, and parallel communication on the right side face. As shown in Figure 3, Table 2

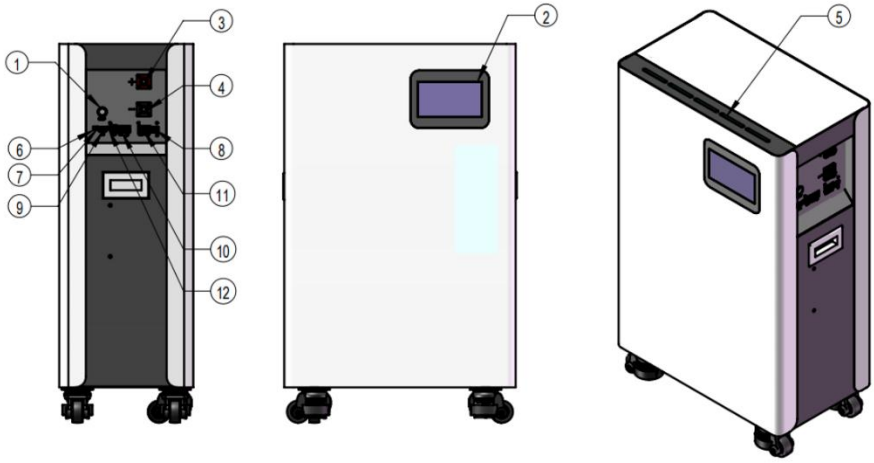


Figure 3 .floor model battery interface details

Table 2.ZT-16F Standard Battery Connection Details

No.	Connector	mark	Functional Description
1	Self-Locking Pushbutton Switch	On&Off	On&Off
2	Display	\	Display information such as battery operation and alarms
3	Positive power terminal	+	Positive battery output terminal
4	Negative power terminal	-	Battery negative output terminal
5	light	\	battery status
6	Reset	RST	Control of BMS startup and shutdown
7	manual dialing key	ADDR	Setting the RS485 communication address
8	parallel communication port	RS485A、RS485B	RS485A 、 RS485B For parallel communication

9	Dry contact connector	I/O	Output electrical signal (reserved)
10	communications port	CAN、RS485	CAN 、 RS232 、 RS485 For communication with the inverter
11	Host computer communication port	RS232	Communicate with the host computer
12	\	\	\

4. Battery installation and use instructions

4.1 Unpacking and Inspection

After unpacking the box, check whether the goods are complete in accordance with the packing list of goods in this document, check the appearance of the battery pack, confirm the integrity and correctness of the equipment; check whether the battery chassis is deformed or corroded.

ZT-16F Battery packing list：

(1)ZT-16F battery pack×1

(2)wiring × 1 set （ 50m² *1m Positive Connection Cable×1; 50m² *1m Negative Connection Cable×1;0.4m earth (cable)×1，0.8m network cable×1）

(3)Manual×1（this product）

4.2. Pre-Installation Precautions

（1）Before the battery module is installed, the open circuit voltage of the battery should be carefully checked to see if it is normal, and whether there is any shell breakage, liquid leakage and so on.

（2）Use insulated tools and gloves during installation, should remove the wrist watch bracelet and other conductors containing metal to prevent electric shock or cause positive and negative short circuit.

（3）Battery installation location should be far away from the heat source or easy to produce metal sparks, the safety distance of more than 0.5m.

（4） Batteries of different models, performances and manufacturers cannot be used together.

（5） Battery packs should be installed with the shortest possible connecting wires to prevent excessive line losses.

（6）Batteries should be protected from direct sunlight, not placed in a large amount of radioactivity, infrared radiation, organic solvents and corrosive gases in the environment, away from the windows, air conditioning, exhaust fans and so on.

4.3 Installation Procedure:

4.3.1 stand-alone application

(1) Before installing the battery, please make sure that the battery switch on the system side is OFF to prevent ignition when installing and wiring.

(2) Keeps the battery in a non-operational state (indicator light does not illuminate).

(3) Connect the negative terminal (P-) of the battery to be connected to the system negative bus (no battery-to-battery series wiring is allowed).

(4) Connect the positive terminal (P+) of the battery to be connected to the system positive bus (no battery-to-battery series wiring is allowed).

.

4.3.2 Parallel Application

(1)If connecting in parallel, before connecting in parallel, please check the voltage of each battery module, the voltage difference between the battery modules should be less than 2V, if it is more than this value, please adjust the voltage by charging and discharging in the same way and set aside for at least 15 minutes before operation.

(2)The product supports up to 15 units in parallel.

(3)arallel wiring as follows：

Power line parallel connection: use wires to connect one positive terminal of the battery to the positive terminal of the other unit, and the negative terminal to the negative terminal of the other unit, and prohibit series wiring between batteries;

Communication line cascade: connect the RS485A interface of the panel to the RS485B interface of the previous unit through the communication line.

(4) DIP switch setting

When the battery pack is used as parallel connection, different packs are distinguished by hardware dialing address, and the hardware address of each

PACK in the whole battery stack is unique, as follows, the hardware address is set by the dialing switch on the board, refer to the table below.

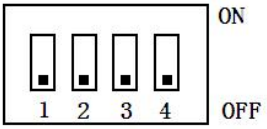


Table 3. DIP Switch Design Chart

Add.	DIP Switch Position				Instruction
	#1	#2	#3	#4	
1	ON	OFF	OFF	OFF	Host Pack0
2	OFF	ON	OFF	OFF	Pack1
3	ON	ON	OFF	OFF	Pack2
4	OFF	OFF	ON	OFF	Pack3
5	ON	OFF	ON	OFF	Pack4
6	OFF	ON	ON	OFF	Pack5
7	ON	ON	ON	OFF	Pack6
8	OFF	OFF	OFF	ON	Pack7
9	ON	OFF	OFF	ON	Pack8
10	OFF	ON	OFF	ON	Pack9
11	ON	ON	OFF	ON	Pack10
12	OFF	OFF	ON	ON	Pack11
13	ON	OFF	ON	ON	Pack12

14	OFF	ON	ON	ON	Pack13
15	ON	ON	ON	ON	Pack14

(5) After the battery system has been installed, pay attention to the insulation of the battery poles and put the insulation cover on it.

4.4 Switching and running

4.4.1 Power On/Start Up

When the BMS is in hibernation state, press the push button switch, the BMS is activated, and the LED indicators flash in sequence and then turn to normal working state.

4.4.2 Shutdown/Sleep

When the BMS is in standby or discharged state, press the button switch, the BMS is put to sleep, and the LEDs flash sequentially and then turn to sleep state. The BMS has no power consumption after hibernation.

4.4.3 status display

When the battery is in different operating modes, the LEDs on the panel will give different indications.

System Status	Operating Status	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Current Battery Status	Remarks
No Alarm or Only Low Battery Alarm	Standby	Solid Yellow										<10%	Low battery warning threshold < 10%
		Solid Green										10%~20%	
		Solid Green	Solid Green									20%~30%	
		Solid Green	Solid Green	Solid Green								30%~40%	
		Solid Green	Solid Green	Solid Green	Solid Green							40%~50%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green						50%~60%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green					60%~70%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green				70%~80%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green			80%~90%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green		90%~98%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	98%~100%	
	Charging	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	0%~10%	The flashing is in the form of a marquee light pattern, progressing from the indicator light corresponding to the lowest SOC level to the indicator light corresponding to the highest SOC level.
		Solid Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	10%~20%	
		Solid Green	Solid Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	20%~30%	
		Solid Green	Solid Green	Solid Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	30%~40%	
		Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	40%~50%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	50%~60%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	60%~70%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green	Flashing Green	Flashing Green	70%~80%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green	Flashing Green	80%~90%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green	90%~100%	
	Dis charging	Flashing Yellow										<10%	Low battery warning threshold < 10%;
		Solid Green	Flashing Green									10%~20%	1s on, 1s off
		Solid Green	Solid Green	Flashing Green								20%~30%	
		Solid Green	Solid Green	Solid Green	Flashing Green							30%~40%	
		Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green						40%~50%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green					50%~60%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green				60%~70%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green			70%~80%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green		80%~90%	
		Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green	90%~100%	

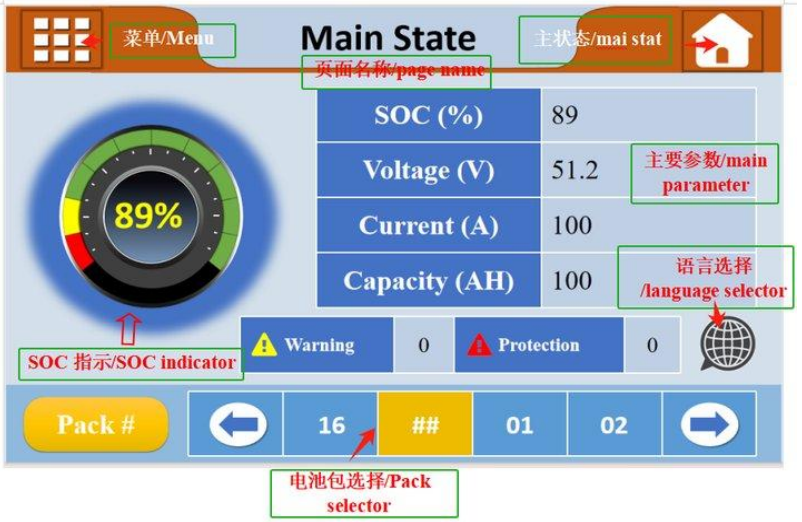
Alarm	Standby	Solid Yellow										<10%	
		Solid Yellow										10%~20%	
		Solid Yellow	Solid Green									20%~30%	
		Solid Yellow	Solid Green	Solid Green								30%~40%	
		Solid Yellow	Solid Green	Solid Green	Solid Green							40%~50%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green						50%~60%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green					60%~70%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green				70%~80%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green			80%~90%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green		90%~98%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	98%~100%	
	Charging	Flashing Yellow	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	0%~10%	Does not display the overcharge alarm state; the flashing is in the form of a marquee light pattern, progressing from the lowest SOC light to the highest SOC light.
		Solid Yellow	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	10%~20%	
		Solid Yellow	Solid Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	20%~30%	
		Solid Yellow	Solid Green	Solid Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	30%~40%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	40%~50%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	50%~60%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green	Flashing Green	Flashing Green	Flashing Green	60%~70%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green	Flashing Green	Flashing Green	70%~80%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green	Flashing Green	80%~90%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green	90%~100%	
	Dis charging	Flashing Yellow										<10%	1s on, 1s off
		Solid Yellow	Flashing Green									10%~20%	
		Solid Yellow	Solid Green	Flashing Green								20%~30%	
		Solid Yellow	Solid Green	Solid Green	Flashing Green							30%~40%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Flashing Green						40%~50%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green					50%~60%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green				60%~70%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green			70%~80%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green		80%~90%	
		Solid Yellow	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Flashing Green	90%~100%	
Protection	Protection	Flashing Red										<10%	During overcharge protection, if there is no AC power, the indicator light switches to standby status.
		Flashing Red	Flashing Red									10%~20%	
		Flashing Red	Flashing Red	Flashing Red								20%~30%	
		Flashing Red	Flashing Red	Flashing Red	Flashing Red							30%~40%	
		Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red						40%~50%	
		Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red					50%~60%	
		Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red				60%~70%	
		Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red			70%~80%	
		Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red		80%~90%	
		Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	Flashing Red	90%~100%	
Fault	Fault	Solid Red	Solid Red	Solid Red	Solid Red	Solid Red	Solid Red	Solid Red	Solid Red	Solid Red	Solid Red	/	
Sleep	Sleep	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	/	All off
Power On/Off	Power-on Self-Test												The RGB colors light up in sequence. After all lights are fully lit, they turn off completely before switching to the next color.
	Shutdown												Flowing light sequentially from left to right (on the PCB board, from SOC 100 to SOC 10), then all

5. On-screen operating instructions

5.1 Interface Introduction

Description: Welcome screen, displayed for 3 seconds at startup, used for program initialization and communication data exchange with the BMS motherboard; then it enters the main status screen.

- **Main Status Page**



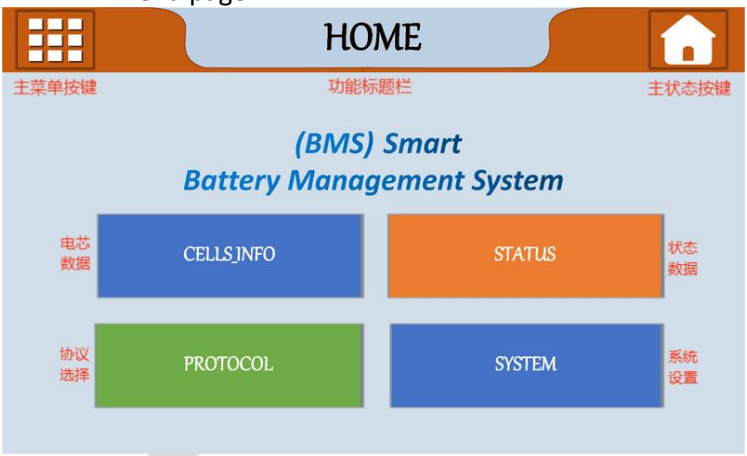
Note: The startup welcome screen will automatically proceed to this screen after 3 seconds; at any time, waking the screen from sleep will automatically go to this screen.

Icon Description:

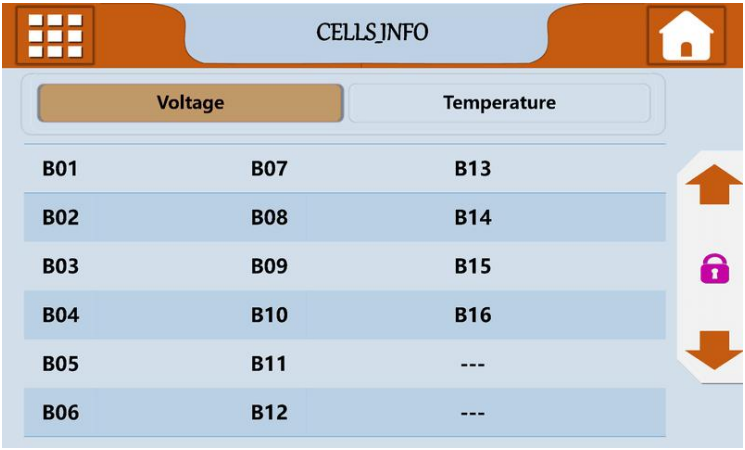
	Main menu icon, click to enter the main menu HOME screen
	Main status icon, click to enter the Main State interface

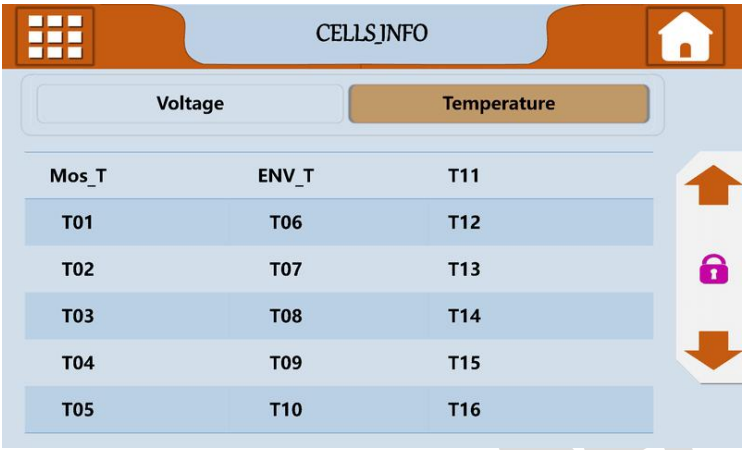
	System Settings / Language Selection

- Menu page

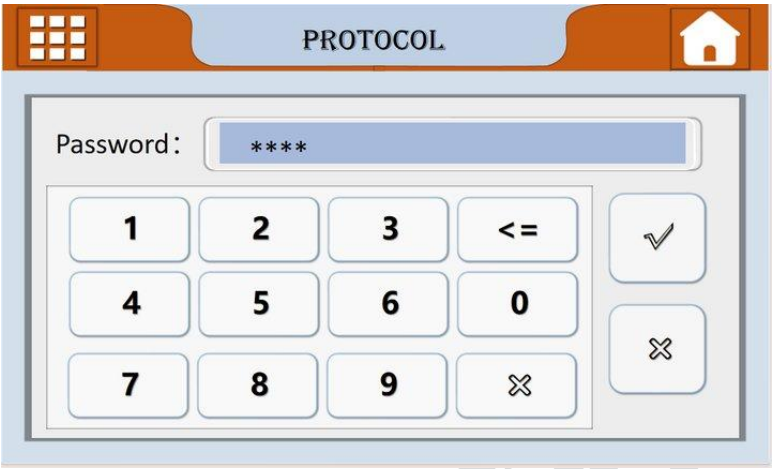


- cells info





- Protocol Selection Page



Note: Built-in unlock password 82993060

- System Settings Page

Menu Structure:

- Welcome Screen (3 seconds at startup, then enter the main status screen)
- min state page
  - SOC(Total)
  - Current
  - Voltage
  - warning
  - protection

- Parallel machine select pack selector
- Language selection icon, links to [System Settings]

- HOME （Menu）
  - cells Info
    - Voltage
      - Cell01 voltage
      - Cell02 voltage
      - .....
      - Cell16 voltage
    - Temperature
      - NT1
      - NT2
      - NT3
      - NT4
      - Mos_T
      - ENV_T
      - .....
  - BMS Status
  - Warning/Protect/Fault
- PROTOCOL
  - CAN
    - GOOD WE PROTOCOL
    - LV BMS Protocol(CAN) for Solar Inverter Family EN_V 1.5
    - PYLON PROTOCOL 2.0
    - Pylon CAN bus protocol V 2.0.420211122
    - SMA PROTOCOL
    - SMAFSS-Connecting Bat-TI-en-20W
    - GROW ATT_PROTOCOL
    - Growatt BMS CAN-Bus-protocol-low-voltage
  - RS485
    - USER_485_VOLTRON
    - Voltronic Inverter and BMS 485 communication protocol 20200325(1)
    - PYLON
    - RS485-protocol-pylon-low-voltag
    - Luxpowertek Battery Protocol RS 485_V 01
  - SYSTEM

- Language select（English、Chinese, Russian, etc.）
- system No.
  - LCD version
  - BMS version
  - PACK SN
  - BLUETOOTH SN

Note: The protocol list is read from the BMS motherboard. The following is an example; the built-in list of each BMS motherboard shall prevail. To change the protocol for the first time, you need to enter the access password. The initial password is 82993060. After exiting the protocol interface, the permission takes effect. To modify the protocol again, you need to verify the permission once more.

5.2 Sleep/Shut Down

Under normal operating conditions, if no key is pressed for 3 minutes, the system will enter sleep/shutdown mode. In the shutdown/sleep state, clicking anywhere on the color screen will activate the display and enter the main interface, while simultaneously resetting the authorization.

5.3 Permission Description

Permissions are divided into three levels:

- No Permission: Can view the welcome screen and main status screen; access to other battery cell details and fault alarm details is restricted;
- Operator permissions: Can browse all interfaces and select language options, but cannot set or modify protocols;
- Administrator privileges: can browse all interfaces, can choose language options, and can set and modify policies;
- Protocol Permission Security: Re-entering the protocol settings interface requires re-entering the administrator password, and any password entered will be cleared upon exiting the protocol interface.

- Password: Administrator password, 82993060; Operator password, 87654321.

6. Storage Instructions

(1) Batteries need to be stored with SOC 30～40%;

(2) Battery storage location needs to be dry and away from the source of goods in the environment;

(3) If the battery is to be stored for a long period of time, the battery should be recharged at least once every three months;

7. Disclaimer

(1) The contents of this document may be updated from time to time due to product version upgrades or other reasons. Unless otherwise agreed, this document is intended as a guide for use only, and all statements, information and recommendations contained herein do not constitute any warranty, express or implied.

(2) Before installing the equipment, please read the user's manual for product information and safety precautions.

(3) All installation and operation of the equipment must be carried out by trained and specialized electrical technicians. The operator must wear personal protective equipment.

(4) Before installing the equipment, please check whether the delivered parts are complete and free from any visible external damage according to the Packing List. If any items are missing or any damage exists, please contact your dealer.

(5) Damage to the equipment caused by failure to follow the documentation is not covered by the equipment warranty.

(6) The cable colors covered in this document are for reference only, and the cables should be selected in accordance with local cable standards.

Company Abbreviation：ZETATECH
Company Address：No.88. Gunan Street, High-tech Zone, Chengdu City, Sichuan Province
After-sales Email：support@zetatech-energy.com
Company Email：info@zetatech-energy.com
Company website：https://www.zetatech-energy.com