Chengdu Jikong Technology Co., Ltd.

Energy Storage Lithium Battery Protection Board Specification

Model: JK-PB2A16S20P

Configuration Table

Log Storage	☐None ☑1000 items
Charge Current Limit	10A (Definition: Charging current exceeds charge protection current, limit enabled)
Balancing Current	☐0.4A ☐0.6A ☐1A ☑2A
Maximum Current	☐40A ☐80A ☐100A ☐150A ☑200A
Display	☑None ☐3.2" Color LCD
Dry Contact	☑Yes ☐No (Definition: Dry Contact 1-PIN1 to PIN2: Normally open, closed for fault/protection; Dry Contact 2-PIN3 to PIN4: Normally open, closed for low battery warning)
Heating Function	☑Yes ☐No (Definition: During charging, if cell temperature is below -20°C, heating is enabled until -10°C (temperature can be configured))
Reverse Polarity Protection	☑Yes ☐No
Weak Power Switch	☑Yes ☐No
Buzzer	☑Yes ☐No
Positioning Function	☐Yes ☑No
Sampling Socket	Upright
DIP Switch	4 bit, for RS485 communication address selection
LED	☐None ☑ALM ☑RUN ☑ON/OFF ☑SOC 6 LEDs
Current Detection Resistor	☑10 ☐20
Cell Capacity	Configurable
Barcode	2D Barcode
Communication Interface	☑RS232 ☑RS485 ☑Parallel RS485 ☑CAN
Upgrade Method	☑RS232 ☐RS485
Bluetooth	Yes
Communication Protocol	Deye, GoodWe, Growatt, Invt, Must, Pylon, SMA, SRNE, Victron, Voltronic

Contents

1. Overview

With the rapid growth of the renewable energy storage market, the demand for battery management systems is increasing. This product is an intelligent lithium battery protection board for energy storage applications. It adopts precise detection technology to protect the energy storage battery from overcharge, overdischarge, overcurrent, etc., ensuring safe and reliable operation of the energy storage system. It also integrates advanced active voltage balancing functionality, allowing real-time monitoring of each battery cell's voltage and improving the battery pack's service life through active balancing management. This product provides an intelligent battery protection solution for a wide range of energy storage applications.

2. Features

- Active balancing function
- Remote operation via APP
- PC software monitoring
- Information screen display
- High precision voltage sampling
- High precision current sampling
- Isolated power circuit
- 4-channel temperature protection
- LED status indication
- Overvoltage and overcurrent protection
- Information screen display
- Supports RS485/CAN/RS232 communication
- Battery capacity estimation
- Precise time-stamped logs
- Short circuit protection
- MOS temperature protection

3. Functional Block Diagram

[A functional block diagram is shown]

4. Operating Environment Conditions

Test Item	Parameter	Unit
Operating Temperature:	-30~70	°C
Storage Temperature:	-30~70	°C
Operating Humidity:	10~80	%RH
Storage Humidity:	10~85	%RH
Supply Voltage:	20~70	V
Operating Power Consumption:	19mA@58V	

5. Specifications

No.	Item	Factory Default	Configurable	Remarks
1	Supported Battery Types	LiFePO4, NMC, LTO	Yes	All parameters are for LiFePO4
	Supported Series	8~16, 7~16, 14~16	Yes	
	Balancing Trigger Voltage	10mV	Yes	
2	Single Cell Overcharge Protection Overcharge Voltage	3600mV	Yes	
	Overcharge Recovery Voltage	3550mV	Yes	
3	Single Cell Undercurrent Protection Undervoltage Protection	2600mV	Yes	
	Undervoltage Recovery	2650mV	Yes	
	Auto Shutdown Undervoltage	2500mV	Yes	
4	Active Balancing Balancing Trigger Voltage	10mV	Yes	
	Balancing Start Voltage	3000mV	Yes	
	Maximum Balancing Current	1A	Yes	
5	Pack Overcharge Protection Maximum Charge Current	25A	Yes	
	Charge Overcurrent Delay	2s	Yes	
	Charge Overcurrent Recovery	60s	Yes	
	Charge Overcurrent Limit	10A	No	
6	Pack Overdischarge Protection Maximum Discharge Current	150A	Yes	
	Discharge Overcurrent Delay	300s	Yes	
	Discharge Overcurrent Recovery	60s	Yes	
7	Short Circuit Protection Short Circuit Current	300A	No	
	Short Circuit Delay	20us	Yes	
	Short Circuit Recovery	60s	Yes	
8	Temperature Protection Charge Over Temperature	70°C	Yes	
	Charge Recovery Temperature	60°C	Yes	
	Discharge Over Temperature	70°C	Yes	
	Discharge Recovery Temperature	60°C	Yes	
	Charge Low Temperature	-20°C	Yes	
	Charge Low Temp Recovery	-10°C	Yes	

	MOS Over Temperature	100°C	Yes	
	MOS Recovery Temperature	80°C	Yes	
	Battery Warning Temperature	60°C	Yes	
	Battery Warning Recovery	50°C	Yes	

6. LED Indicators

LED Operating Status Indication

Status	Normal/Warning/Protection	ON/OFF	RUN	ALM	SOC Indicator
Off	Normal	OFF	OFF	OFF	OFF OFF OFF OFF OFF
Balancing	Normal	ON	ON	OFF	Indicates SOC
Charging	Normal	ON	ON	OFF	Indicates SOC
	Overcurrent/Overtemp/Overvoltage/Charge Fail	ON	ON	Blinking	Indicates SOC
Discharging	Normal	ON	ON	OFF	Indicates SOC
	Overcurrent/Overtemp/Undervoltage/Discharge Fail	ON	ON	Blinking	Indicates SOC
Other Warnings	Password Not Changed/Short Circuit/Temp Abnormal	ON	ON	Blinking	Indicates SOC

SOC Indicator Description

Status	Charging						Discharging					
	L6	L5	L4	L3	L2	L1	L6	L5	L4	L3	L2	L1
0~16.6%	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON
16.6~33.2%	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	ON	ON
33.2~49.8%	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	ON	ON	ON
49.8~66.4%	OFF	OFF	ON	ON	ON	ON	OFF	OFF	ON	ON	ON	ON
66.4~83.0%	OFF	ON	ON	ON	ON	ON	OFF	ON	ON	ON	ON	ON
83.0~100%	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON

7. Power On/Off Instructions

Power on/off can be done via the button. In the off state, press the button to power on. In the on state, press and hold the button for 3s to power off.

8. Communication Instructions

8.1. RS232 Communication

The BMS can communicate with a host computer via the RS232 interface to monitor various battery information, including voltage, current, temperature, status, and production info. Default baud rate 9600bps.

8.2. CAN Communication

CAN default communication rate 250k.

8.3. RS485 Communication

There are two RS485 communication interfaces, one is a parallel output with two ports for viewing battery pack information. Default baud rate 115200. By setting the DIP switch, a communication address can be assigned from 0~15 to poll data from multiple battery packs.

8.4 DIP Switch Settings

When multiple battery packs are connected in parallel, each pack must be assigned a different address via the DIP switch for normal operation. The DIP switch address table is shown below.

Address DIP Switch Position

Address	DIP Switch Position
	1 2 3 4
0	OFF OFF OFF OFF
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

9. Interface Definitions

Dry Contact Interface Definition

Pin No.	Definition	Note
1	COM1	S1 and COM1 conduct for alarm state
2	S1	
3	COM2	S2 and COM2 conduct for low battery
4	S2	

CAN and RS485-1 Interface Definition

RS485 - 8P8C Upright RJ45 Socket

Pin No.	Definition
1, 8	RS485-B1
2, 7	RS485-A1
3, 6	GND
4, 5	NC

CAN - 8P8C Upright RJ45 Socket

Pin No.	Definition
9, 10, 11, 14, 16	NC
12	CANL
13	CANH
15	GND

RS232 Interface Definition

RS232 - 6P6C Upright RJ11 Socket

Pin No.	Definition	Note
1, 2, 6	NC	
3	RS232_TX	
4	RS232_RX	
5	GND	

RS485-2 Parallel Interface Definition

RS485 - 8P8C Upright RJ45 Socket

Pin No.	Definition
1, 8	RS485-B2
2, 7	RS485-A2
3, 6	GND
4, 5	NC

RS485 - 8P8C Upright RJ45 Socket

Pin No.	Definition
9, 16	RS485-B2
10, 15	RS485-A2
11, 14	GND
12, 13	NC

Battery Interface Definition

Interface	Definition
BAT+	Connect to battery pack positive, supplies power to BMS
B-	Connect to battery pack negative
P-	Battery pack negative, also charge/discharge negative (shared)
NT1	Connect NTC1 temp probe
GND	Connect NTC1 temp GND
B0	Cell string 1 negative
B1	Cell string 1 positive
...	...
B16	Cell string 16 positive
NTC2	Connect NTC2 temp probe
GND	Connect NTC2 temp GND
NT3	Connect NTC3 temp probe
GND	Connect NTC3 temp GND
NC	NC

10. Wiring Diagram

There is a strict order for powering on the protection board. First solder B-, P-, then connect B+, P+. Then connect the cell sampling line connectors from low to high order. After power on, the button needs to be pressed to activate. Only after all connections are made can the load or charger be connected. To remove, first disconnect the charger or load, then remove the cell sampling connectors from high to low order, and finally remove B+, P+, B-, P-.

11. Dimensions

[A dimensions diagram is shown]