BMS SPECIFICATION

Series	:	DXB30
BMS Model	:	DXB30A-1030BU-1001
Writer	:	李如意
Audit	:	王磊
Approve	:	王磊

Client confirm：	Date：
Remark： Please sign back this file after the product passes the test. **The later batch will be made according to this file!**	

Change history

Date	Version	Describe	Hardware version	Software version
2020.03.27	V0.1	Specification preparation	V1.5	V2.07
2020.05.26	V0.2	The program version number from V2.07 to adapt to the new 2.12 PC new test software	V1.5	V2.12
2020.8.12	V0.3	V0.2 bug Correction MOS number changed from 5 to 4. Configuration Change The absolute value of the sleep current is changed from 120 to 200	V1.5	V2.12
2020.10.29	V0.4	The charge balance turn-off current is changed from 100mA to 20000mA	V1.5	V2.12

Product features

- Support UART communication
- Support Bootloader to facilitate program upgrade and maintenance.
- Accurate residual capacity estimation (SOC), mainly dynamic coulombs, static open circuit voltage compensation to ensure more accurate capacity.
- Lithium cycles statistics.
- Record the longest time of uncharged.
- Clock function (RTC)
- Perfect battery protection mechanism.
- Low power design, automatic sleep function.
- Built-in balance function.
- Smart LED plate with the functions of soft-switch and error indication.

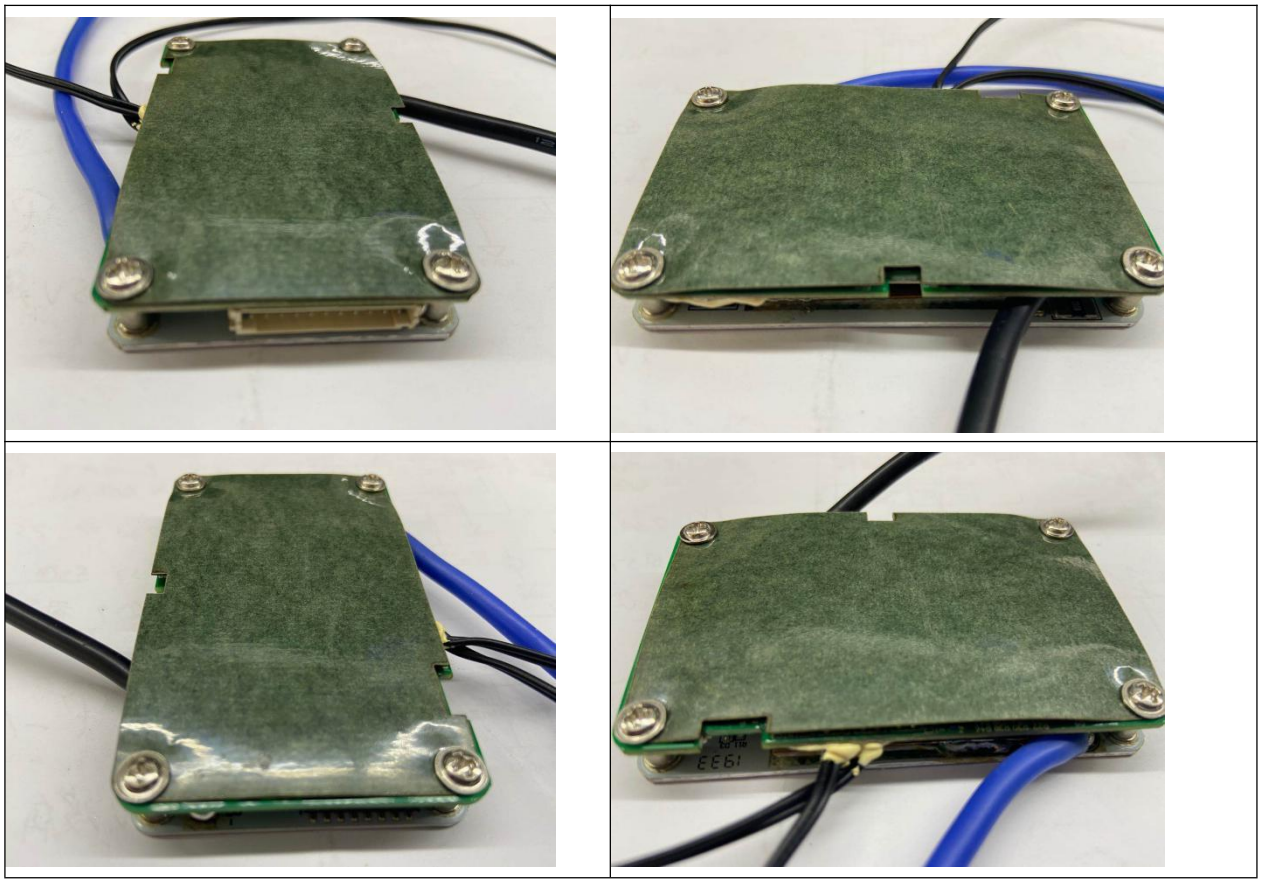
Catalogue

Product feature

- Supports UART communication.
- Support Bootloader, convenient program upgrade maintenance.
- Accurate Residual capacity estimation (SOC), dynamic based on coulombmeter, static open circuit voltage compensation to ensure more accurate capacity.
- Lithium battery cycle count.
- Record the longest uncharged time.
- Support clock (RTC)
- Perfect battery protection mechanism.
- Low power design, automatic sleep function.
- Supports the balancing function.

1、Product size and wiring

1.1Product physical drawing



1.2Product size

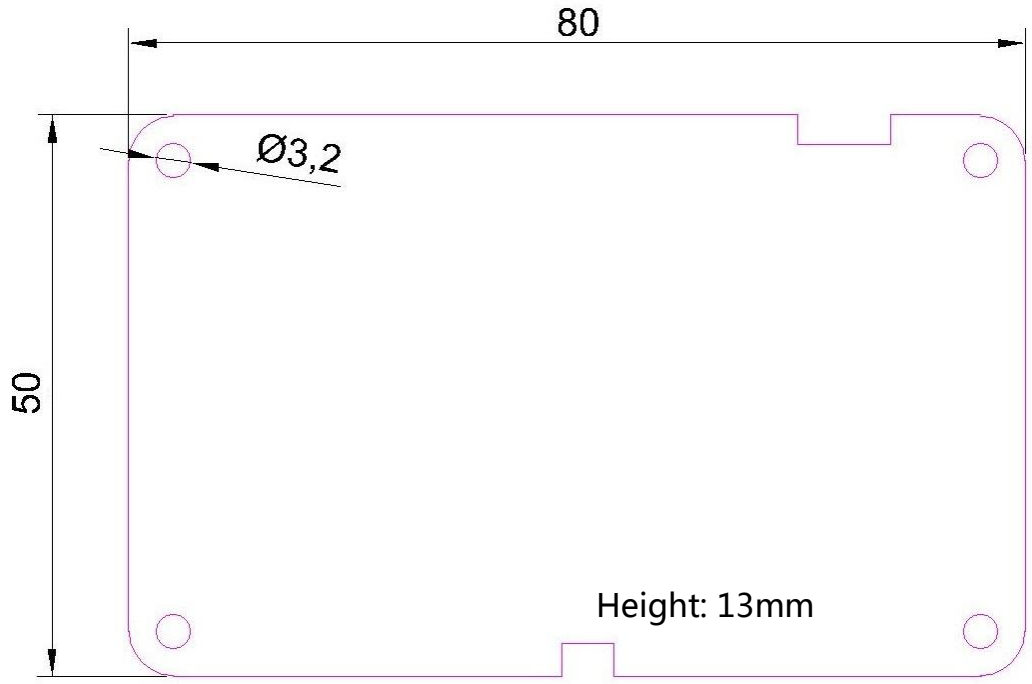


Fig 1-1 Size of DXB30A Series（mm）

Product dimension tolerance is 0.5mm.

1.3 Product assembly diagram

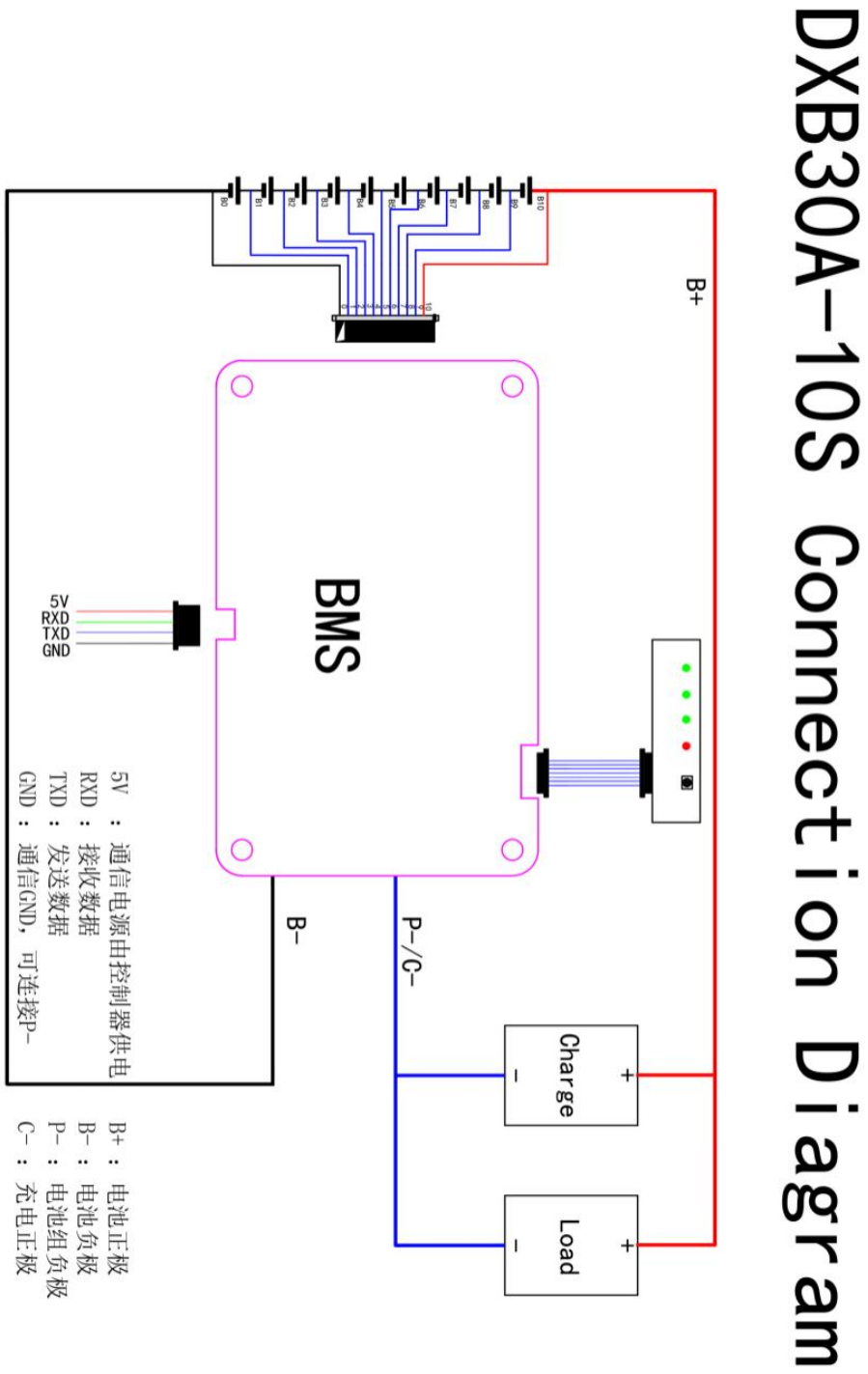


Fig 1-3 System assembly diagram(10S)

2、 Electrical properties of products

project		The numerical	unit
Battery pack form		10	S
Rated discharge current		30	A
Fit the type of cell		Ternary lithium	
Charging voltage		42.3	V
Charging current		<20	A
Balance current		<60	mA
No communication working current		<10	mA
Sleep current		<60	uA
Internal resistance		2.8	mΩ
Precision	Single section voltage error	<20	mv
	Total voltage error	<0.1	v
	The current error	<3	%
	The temperature error	<2	℃
	Accuracy of SOC	<5	%

Communication mode	V-in	Response latency	Note
CAN-bus	+5V		Netable, +5V/TXD/RXD/GND
Bluetooth			point-to-point

Item		Value	Unit	Recovery
Voltage protection	Overvoltage protection voltage	4230	mv	Automatic recovery of voltage drop delay
	Overvoltage recovery voltage	4100	mv	
	Overvoltage protection delay	1	S	
	Overvoltage recovery delay	1	mS	
	Under-voltage protection voltage	2800	mV	Automatic recovery of voltage recovery delay
	Under-voltage recovery voltage	3000	mv	
	Under-voltage protection delay	1	S	
	Under-voltage recovery delay	1	mS	
	Balance voltage	3900	mv	

Current protection	Discharge over current 1 protection	35	A	Self-recovery。
	Discharge-overcurrent protection delay	1	S	
	Discharge over current 2 protection	80	A	Self-recovery.
	Discharge overcurrent 2 delay	320	mS	
	Charge overcurrent protection	20	A	Remove charger after 500mS
	Charge overcurrent protection delay	250	mS	
	Short circuit protection	100	A	Remove charge, press buttons, load and reclosure
	Short circuit protection delay	100	uS	
Temperature protection	Discharge high temperature protection	65	℃	Automatic recovery after delay
	Discharge high temperature recovery	60	℃	
	Discharge high temperature protection delay	5	S	
	Discharge high temperature recovery delay	5	S	
	Charging high temperature protection	55	℃	Automatic recovery after delay
	Charging high temperature recovery	50	℃	
	Charging high temperature protection delay	5	S	
	Charging high temperature recovery delay	5	S	
	Charging low temperature protection	0	℃	Automatic recovery after delay
	Charging low temperature recovery	5	℃	
	Charging low temperature protection delay	5	S	
	Low temperature charging recovery delay	5	S	

3、LED display specification

Order individually.

4、Operating instructions

4.1Power on and off

Boot mode		Shutdown mode	
Item	Describe	Item	Describe
Charging	In the case of shutdown, connect the charger to automatically turn on.	Under-voltage protection	Keep the battery under voltage for 1 minute and then shut it off
Communication	In the case of a shutdown, UART communication wakes up the battery to power on	Short-circuit protection	The battery automatically shuts down after short circuit protection.
		Automatically sleep	When the battery current is less than 200mA, no communication, 60 minutes after the shutdown.

4.2 Safety of Battery

- BMS installation should pay attention to electrostatic protection.
- Make sure the battery series is consistent with BMS before BMS installation.

- During the installation process, the total negative electrode of the battery should be connected first, and the PACK wire should be connected to the battery and confirm the correct sequence before plugging in the BMS.
- After the completion of battery installation, it shall be communicated firstly to confirm the correct battery assembly before charging and discharging, and a full charge and a full discharge shall be guaranteed.
- In order to ensure the stability of the system, the key indicator light between the small board and the main board of the wire should not be greater than 50cm.
- Please do not modify the configuration of BMS parameters by yourself. Please contact the manufacturer if necessary.
- All protection parameters should be configured strictly according to the actual conditions of the battery, or it may cause danger. Please pay attention to the following：

  1、If short circuit current setting is too large, because of the battery capacity is small, discharge rate is small, the battery internal resistance is large and other reasons, even if the positive and negative poles of the complete short circuit cannot reach the short circuit protection current, resulting in battery damage。

  2、If overvoltage protection parameters are too high, the battery will cause unrecoverable damage due to overpressure, serious will lead to battery damage。

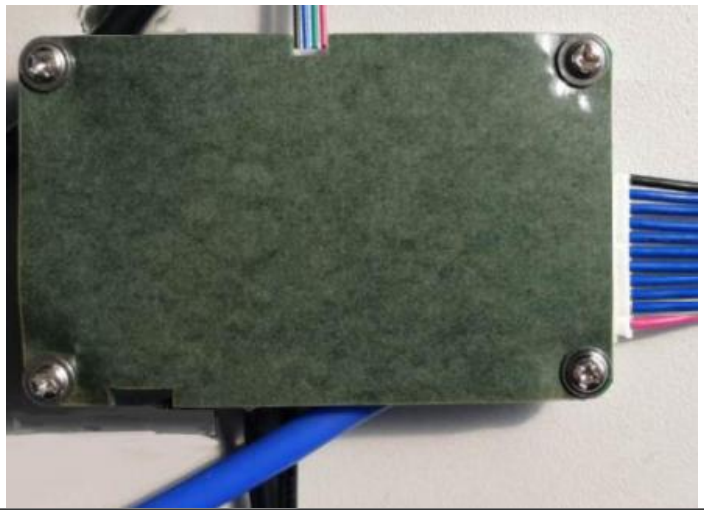
3、If under voltage protection parameters are too low, the battery due to over discharge lead to irreversible damage。

4、If the configuration parameter exceeds the limit parameter of protective plate, BMS and battery will be damaged.

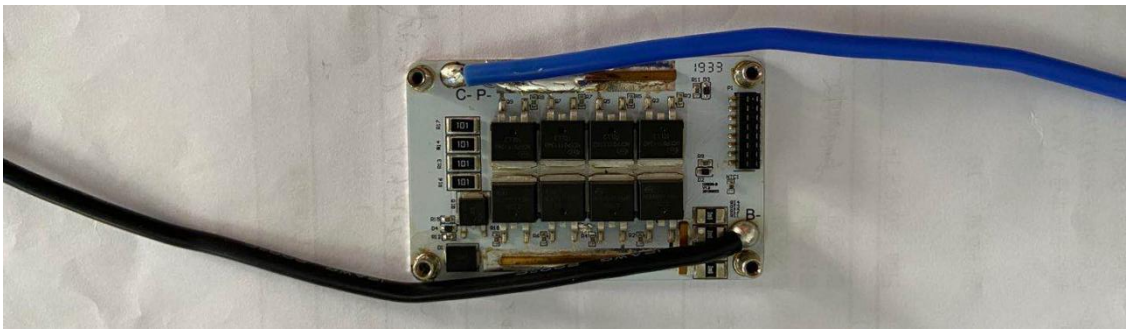
5、Actual state of product

5.1 Product physical drawing

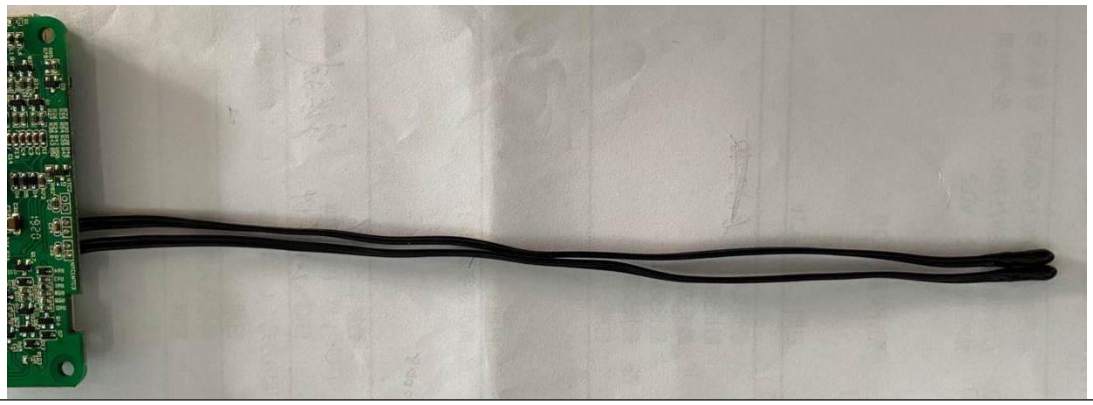
Overall picture with cables



Base plate factory wiring harness: B-12AWG, 300mm ；P-C-12AWG, 300mm

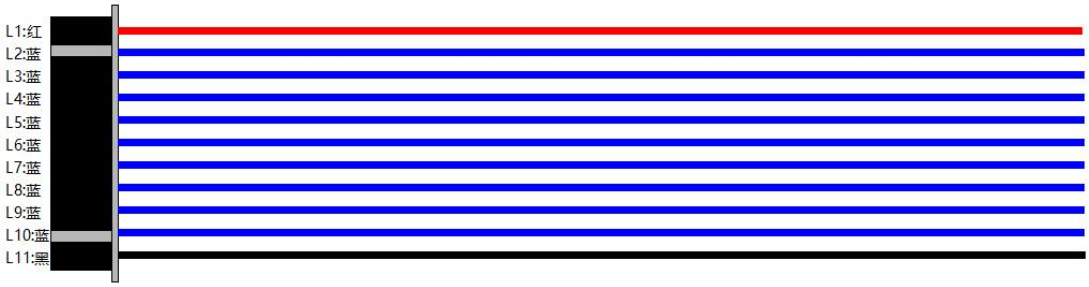


Top plate with temperature sensor picture (length 200mm)



Voltage sampling line drawings and CAD drawings (length 500mm)

DXL11P2.0-1101-24-500



5.2 Confirm the hardware version of the product

DXB30-TV1.5

DXB30-BV1.5

Main device model and quantity

Name	Model	Quantity
Discharge MOS	NCEPO1T12D	4
Charge MOS	NCEPO1T12D	4
Sampling resistor	2mR	4

5.3 Product validation program version

BMS firmware：DXB30A-1440BU-1003V0212.hex

PC software version：BMS Studio V0.8.8

5.4 Product parameter settings

DXB30A-1030BU-1001_20201029.xml

5.5 Protocol

D-powercore BMS customer communication protocol

Command	Directive Title	Request command	Command response	Valid data	Data physical value	Test result
0x01	Alarm Status	3a 16 01 00 17 00 0d 0a	3A 16 01 01 00 18 00 0D 0A	00	00	OK
0x06	BMS MOS Temp	3a 16 06 00 1c 00 0d 0a	3A 16 06 02 80 0B A9 00 0D 0A	80 0B	294.4K = 21.3℃	OK
0x07	Minimum battery temperature	3a 16 07 00 1d 00 0d 0a	3A 16 07 02 60 0B 8A 00 0D 0A	60 0B	291.2K=18.1℃	OK
0x08	Maximum battery temperature	3a 16 08 00 1e 00 0d 0a	3A 16 08 02 67 0B 92 00 0D 0A	67 0B	291.9K=18.8℃	OK
0x0a	Current	3a 16 0a 00 20 00 0d 0a	3A 16 0A 04 00 00 00 00 24 00 0D 0A	00 00 00 00	00mA	OK
0x0f	SOC	3a 16 0f 00 25 00 0d 0a	3A 16 0F 04 A0 32 00 00 FB 00 0D 0A	A0 32 00 00	12960mAH	OK
0x10	Full Charge Capacity	3a 16 10 00 26 00 0d 0a	3A 16 10 04 78 69 00 00 0B 01 0D 0A	78 69 00 00	27000mAH	OK
0x17	Cycle time	3a 16 17 00 2d 00 0d 0a	3A 16 17 02 00 00 2F 00 0D 0A	00 00	00	OK
0x48	Uncharged time	3a 16 48 00 5e 00 0d 0a	3A 16 48 02 3D 00 E8 00 0D 0A	3D 00	61	OK
0x50	Battery Series	3a 16 50 00 66 00 0d 0a	3A 16 50 01 14 6E 00 0D 0A	14	14	OK

5.6 Product packaging

The attachment：

Packing pictures：

FCC Caution.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may

cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

*RF warning for Mobile device:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.