

Lithium power BMS manual

—— GTBMS005A-MC8

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1 Product intro and system setting

1.1 composition and function of products

GTBMS 005A battery management is made up of a GTBMS 005A-MC8 management host、 two GTBMS005-VCT voltage/current/temperature module, can measuring all voltage of single batteries, total current of pile, environment temperature.. Detailed performance as follows:

1. Management host consists of black and white LCD and management calculator, first page displays of battery group total voltage and total current、max voltage and battery number、 min voltage and battery number; second page displays capacity(adds while is charging, subtract while is discharging, save while power cut, clear)、 consume Walt-hour、 ,max temperature of all measuring points and min temperature; press key display every battery voltage;
2. Sampling module adopts master-slave mode. Master sampling module manages ten batteries、 one current and one temperature, slave sampling module manages ten batteries and one temperature.
3. Master sampling module provides one sampling current, current sensor is current hall sensor.
4. The number of batteries that is managed by sampling module can be set from 1~N ($N \leq 10$) through management host, connection mode adopts N+1.
5. Management host has two alarm interfaces, switch of voltage upper limit、 aural and visual alarm, high temperature switch、 aural and visual alarm, switch of high temperature、 aural and visual alarm, switch of over current、 aural and visual alarm. Max voltage alarm and high temperature alarm share the same group interface, voltage lower limit alarm and over current alarm share the same group interface.
6. Host has two keys: “first” and “set”. Select “first”, screen displays first page information, press “set” key you can search all information except that of the first page; under the first page state, keep pressing “first ” key for five seconds to get into parameter set menu; under the first page state, keep pressing “set” key for five seconds to get into running parameter set menu. Get into the second page, keep pressing “first” key for five seconds to clear capacity value ,keep pressing “set” key

for five seconds to clear watt value ; When the system gets into alarm state, it will provide flashing light、 buzzer and a group of relay contacts to alarm. System running parameters include: the number of batteries that each sampling module manages、 voltage upper /lower limit、 voltage cut lower limit、 temperature cut upper limit.etc.



Figure1-1-1 Manage host



Figure1-1-2 module

1.2 main Technical parameters

·voltage measuring range	0~+5V
·voltage measuring accuracy	$\pm (0.3\%RD+0.2\%FS)$
·voltage display accuracy	1mV
·temperature measuring range	-10~+85℃
·temperature measuring accuracy	$\pm 1^{\circ}C$
·minimum sample cycle (voltage)	0.5s
·accumulated capacity cycle	0.5s
·capacity display accuracy.....	1Ah
·capacity measuring upper limit.....	$\leq 999Ah$

·alarm contacts index

Maximum switch voltage 30Vdc

Maximum switch current 1A

·LCD

Black and white screen,

white back lighting Display region47mm x 26mm

1.3 system setting

VCT sampling module set

Address set: When the battery number is no more than ten, only one VCT module is enough, and this module is master module, master module can manage less than ten batteries, and provide a loop of temperature and current.

.When the number of batteries is more than ten, the system will need two VCT modules, one is master module (not need to be set) and another is set as slave module. Master module can manage less than ten batteries, and provide a loop of temperature and current. Slave module can manage no more than ten batteries, and provide a loop of temperature. There cannot be two slave sampling modules in the system at the same time.

Master module is connected from high position of battery group, detailed connection method and slave set method see attach page.

Main controller has two press keys, FIRST key and SET key; a ALARM indicator light

Man controller orthoptic diagram as follows:

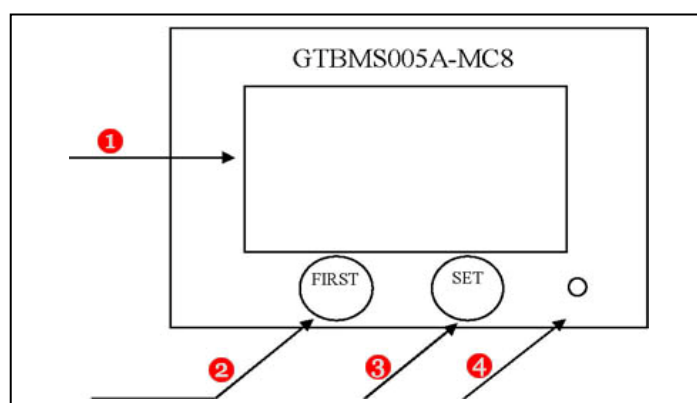


Figure 1-3-1 key intro

display region -----①

first page key -----②

function key -----③

alarm light -----④

1. **First page key:** display first page information, includes: total voltage、total current、single battery max voltage and its number、single battery min voltage and its number.
2. **Set key:** display all information except first page information, includes capacity, consumed watt-hour, max temperature and its number, min temperature and its number, voltage of each battery.
3. **Alarm light:** flashes while alarms.

a) System parameter setting

Under the first page state, keep pressing “SET” key for five seconds to get into system running parameter set menu. Enter the password before getting into this menu, customer's password is marked at the main controller back. System parameter include: the number of batteries that each sampling module manages, voltage upper limit、voltage lower limit , voltage cut lower limit, temperature cut upper limit, current cut upper, etc.

System parameter should be set once after being installed and will save parameter automatically, and will monitor and alarm according to parameter that is set.

System running parameters diagram as follows: :

SYSTEM SET	
MODULE	BATTERY
# 1	<div style="background-color: black; color: white; padding: 2px;">0</div>
# 2	0

Figure 1-3-2 system parameters

MODULE : GTBMS005A-VCT sampling module address; #1 master module, #2 is slave module。

BATTERY : the number of battery. If the number of batteries is less than ten ,#2 must set as “0”.

Black frame is current editing content, “SET” key add 1, “FIRST” key is “ok”; Press “FIRST” key, black frame will automatically move below. After setting #2 value, press “FIRST” key to confirm, press “FIRST” key and “SET” key simultaneity to get into next menu。Diagram as follows:

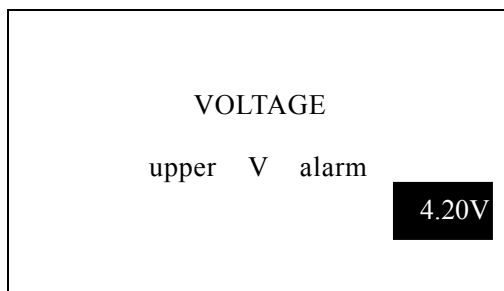


Figure 1-3-3

upper V alarm : When any battery voltage is larger than the value, system lightens the LCD and provides a group of relay contacts to alarm. Normally , relay common contracts are 5 switched on with N.C. contacts and cut off with N.O. contacts. When it's alarming, common contracts are switched on with N.O. contacts and cut off with N.C. contacts. If the largest cell voltage drop and is 15mv lower than the value, the alarm will stop. Press “SET” to add 1, press “FIRST” to subtract 1; if press “FIRST” and “SET” key at the same time to get into the next menu. Diagram as follows:

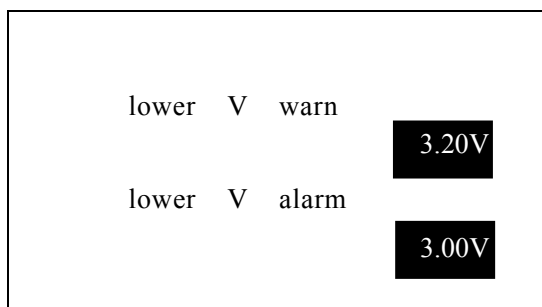


Figure 1-3-4system parameter

lower V warn: If any cell voltage is lower than the value, system will lighten the LCD and buzzer to alarm. If the largest cell voltage drops and is 15mv lower than the value, the alarm will stop.

lower V alarm : If any cell voltage is lower than the value, system will lighten the LCD、buzzer and provide a group of relay contacts to alarm. Normally , relay common contracts are switched on with N.C. contacts and cut off with N.O. contacts. When it's alarming, common contracts are switched on with N.O. contacts and cut off with N.C. contacts. The alarm won't stop unless shut off the power. Press SET” keyto 1, press “FIRST ”key to subtract 1; Simultaneity press “FIRST” key and “SET”key get into next menu. Diagram as follows:

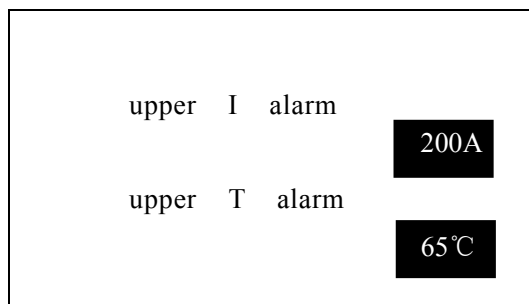


Figure 1-3-5 system parameter

upper I alarm : When total current is larger than the value, system will lighten the LCD、buzzer and provide a group of contacts to alarm. The alarm and “lower V alarm” share with the same group of relay contacts.

upper T alarm : When the nodes temperature is higher than the value, system will lighten the LCD、buzzer and provide a group of contacts to alarm. When the highest temperature drops and is 5°C lower than the value, the alarm will stop. The alarm and “lower V alarm” share with the same group of relay contacts. Press “SET” key to add 1, press “FIRST” key to subtract 1; simultaneously press “FIRST” key and “SET” key back to home page .

b) System initialization settings notice:

You must setup system running parameter once before using. System will memory it automatically, without the need of set when you use it next time. But if you change the main controller, you need to set the parameter again.

System will display first page information after being switched with the power, press “set” key get into the next page, the information includes capacity, consumed watt-hour, max temperature and its number, min temperature and its number, voltage of each battery, press “FIRST” key back to first page.

2 Connection with chargers and motor controller

2.1 interface and connection

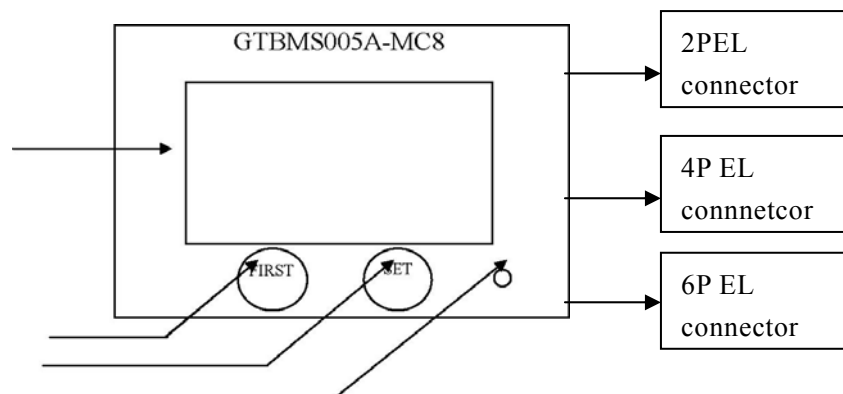


Figure 2-1-1 wiring diagram

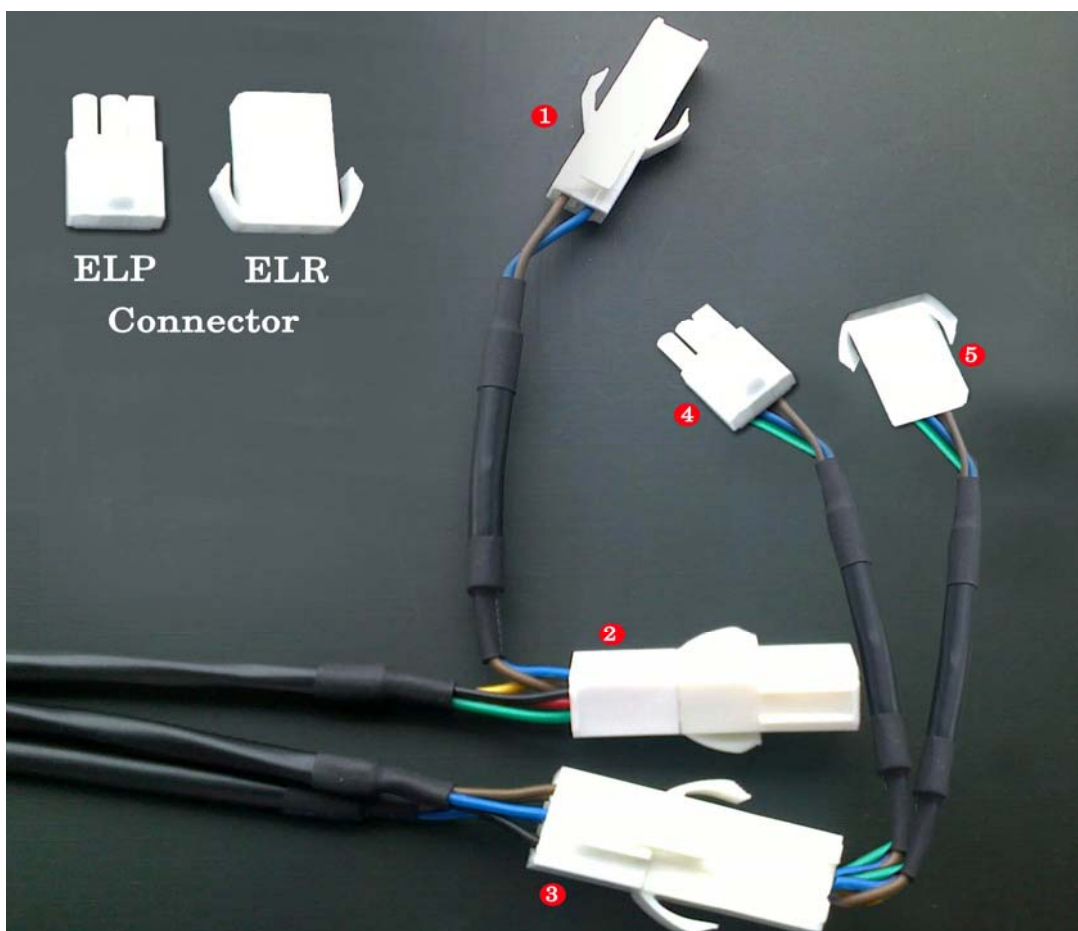


Figure 2-1-2 interface diagram

①2P EL interface connect with DC power。

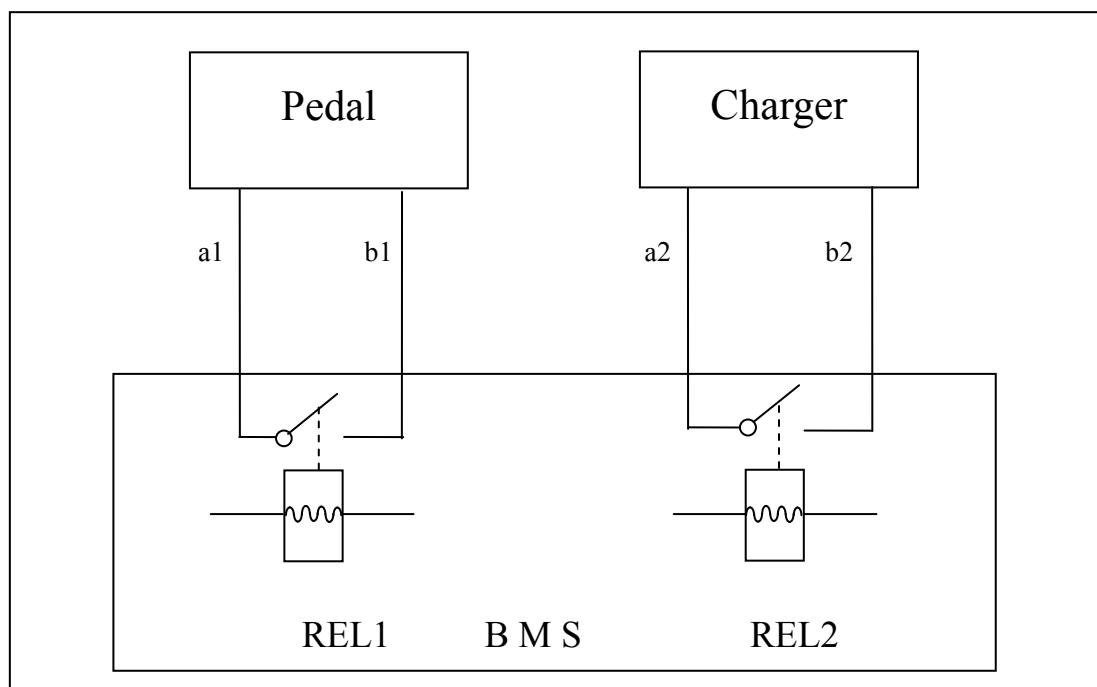
- ②4P EL connect with data collection modules.
- ③6P EL separated two interfaces 3P ④⑤, connect with chargers and motor controller.
- ④connect with charger
- ⑤connect with motor controller

Notice: (we make wires according to battery distribution) we provide users with ELP , ELR connector。 Motor controller , chargers, must use the same way of relay .

2.2 System working principle

BMS-MC8 adopts relay switch to connect with circuit. When the voltage, current, temperature, etc. reach the value set. Relay protects the battery through connection and disconnection.

BMS (MC8) Management strategy



如图 1

BMS(MC8) can provide two relay node (no source) as alarm output.

When charging, one cell reaches upper limit voltage alarm value (can set), BMS control REL2 to shut. a2 and b2 connect, chargers can identify the signal. Then, chargers begin to adjust output current to reduce the current. With reduced current, voltage drops. When BMS detects all battery voltage less than upper limit alarm voltage, BMS controls REL2 cut. Chargers can detect the signal. Chargers don't finish current then with the current goes on charging. Cycling the process until chargers stop output. Through the way, BMS can protect battery from over charging. But, charges must can

identify the switch signal.

When discharging, we connect another replay with pedal circuit. BMS judges battery group status, if normal, REL1 shut. A1 and b1 connect, electric vehicle can run. When running, single cell voltage lower than lower limit alarm voltage (can set, Lithium iron phosphate battery suggest 2.8V). BMS screen alarm light can gleam and beep. Drivers should reduce speed (minish battery current output). If the speed is not high, we should charge battery. With the speed lower, voltage will rise again. When BMS detect all battery voltage higher than lower limit alarm voltage (can set), alarm stops. When BMS alarms, drivers don't take steps, it will make battery below lower limit alarm voltage sostenuto, BMS will cut REL1. a1 and b1 will disconnect. Throttle will stop working. The electric vehicle can't run. The alarms can't stop until we cut down the BMS power.

3 Notice and Contact

3.1 Notice

A. System initialization settings notice:

You must setup system running parameter once before using. System will memory it automatically, without the need of set when you use it next time. But if you change the main controller, you need to set the parameter again.

System will display first page information after being switched with the power, press “set” key get into the next page, the information includes capacity, consumed watt-hour, max temperature and its number, min temperature and its number, voltage of each battery, press “FIRST” key back to first page.

B. Connect wires notice:

(we make wires according to battery distribution) we provide users with ELP , ELR connector。 Motor controller , chargers, must use the same way of relay.They can connect with BMS.So that BMS protects batteries when charging and discharging.

Notice the connecting wires.According to stall definition of Figure strictly.

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