



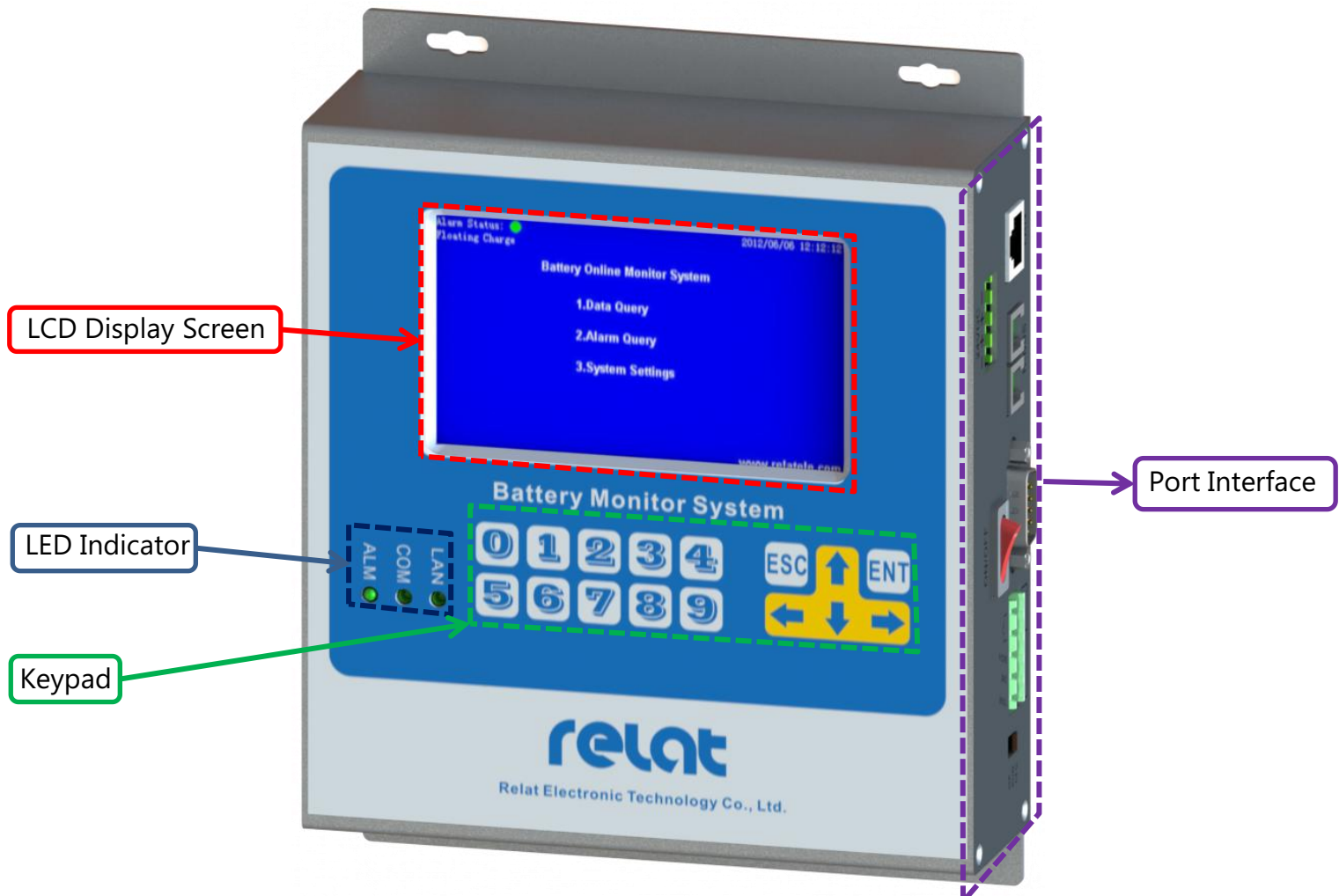
Operation Manual

Control Module BM00CS

1. Control Module Overview

The local operation of battery monitoring control module is purpose for user on-site viewing and basic setting operation.

2. Controller Appearance



2.1 LED Indicator

ALM(Green or Red): Indicate the status of power supply and alarm

- Green - Power on and no alarm
- Red - Power on and alarm detected
- OFF - Power off

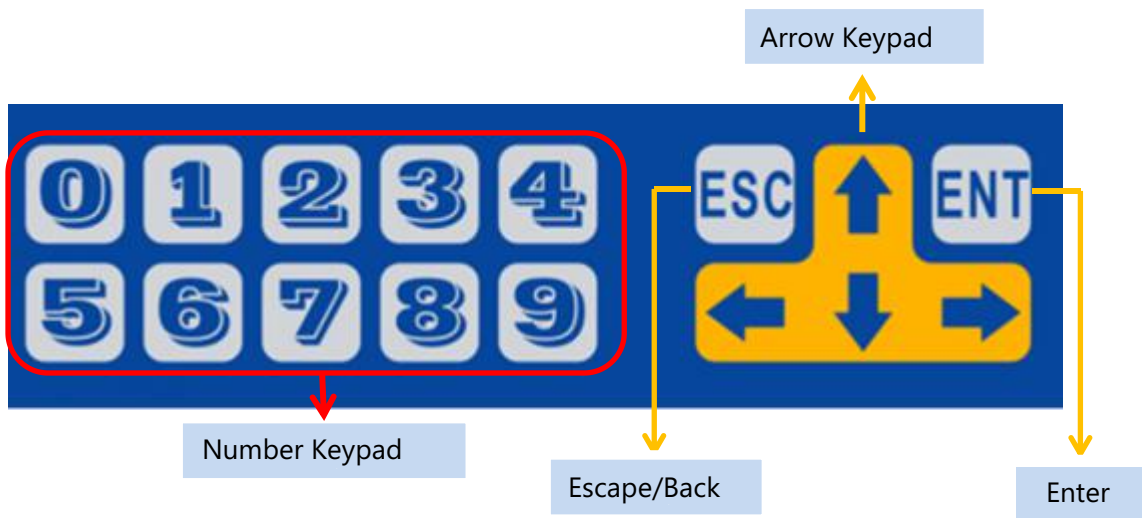
COM(Green): Indicate the status of R-bus interface

- ON - No data send and receive
- Flash - Sending and receiving data

LAN(Green): Indicate the status of LAN interface

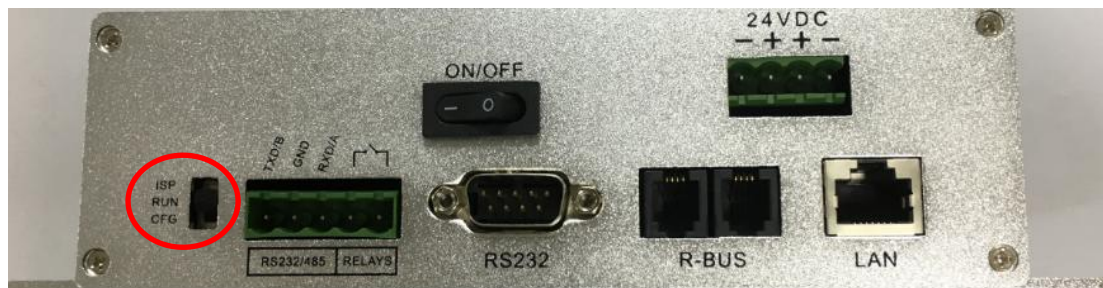
- OFF - Disconnect
- ON - Connect
- Flash - Sending and receiving data

2.2 Keypad



Number Keypad (0 ~ 9): Select function and input box use
 ENT: Confirm to enter keypad
 ESC: Return keypad
 Arrow keypad: Flip function and move the cursor

2.3 Controller Interface



There have three toggle switch "ISP", "RUN", "CFG" from above red area.

ISP: Burning application toggle switch, use for upgrade the system program by the manufacturer of RELAT Technology.

RUN: System running toggle switch, use for system normal running.

CFG: System configuration toggle switch, use for modify the key system criteria and export the data.

ON/OFF: Power on/ off button

24VDC: Power supply 24VDC relay for connecting a power supply.

RS232/485: RS232/RS485 relay for connecting 3rd party monitoring software or BMS software.

RELAYS: Volts free contact to output alarm

RS232: RS232 serial Port for connecting a local laptop PC, the laptop PC may be connected temporarily to the BMS unit on battery site for programming, calibration and viewing purposes.

R-BUS: Daisy chain R-BUS cable from sensors to controller

LAN: TCP/IP communication port for connecting BMS Software

3. Control Module Operation

All typical data can be monitored, displayed and query by control module BM00CS.

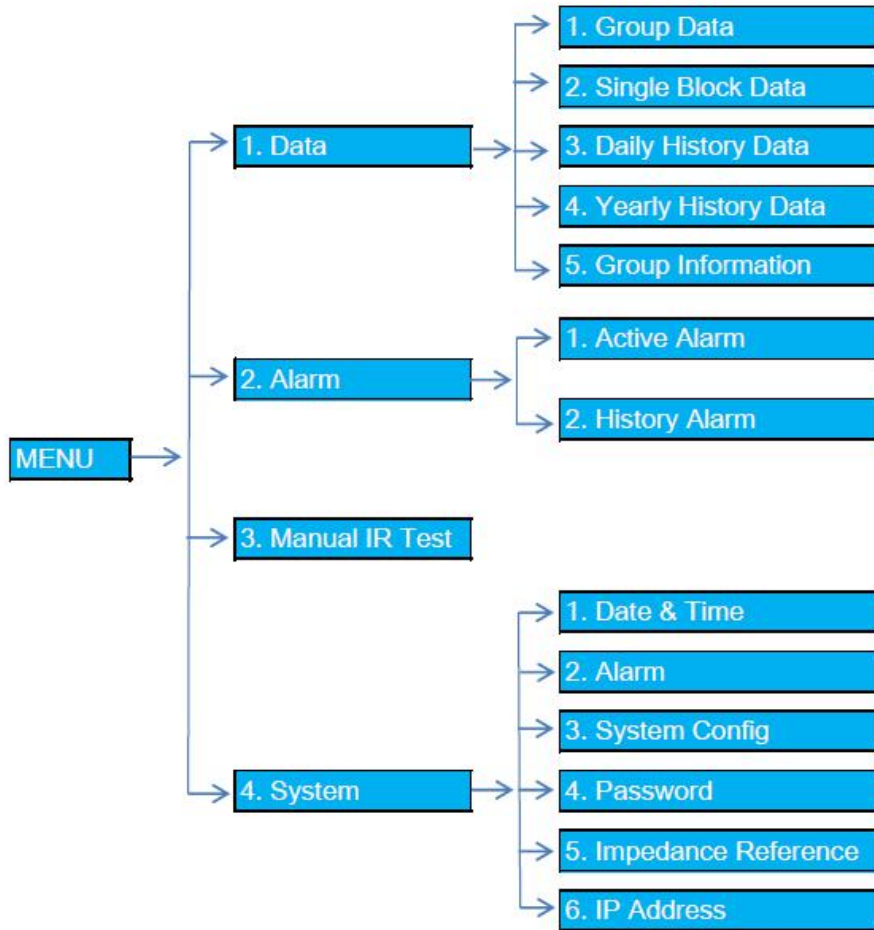
Typical Monitoring Data as following,

a. Individual cell/block voltage

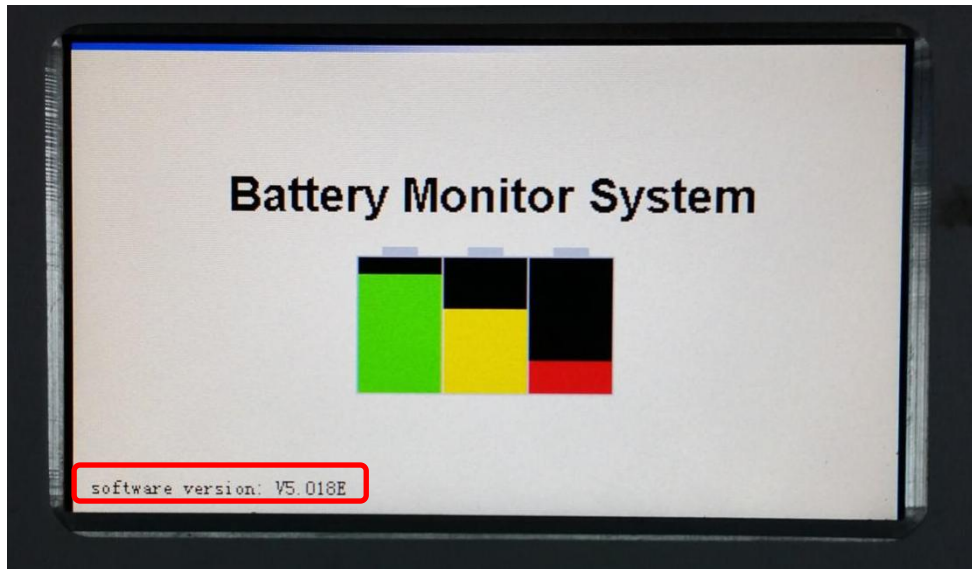
- b. Individual cell/block impedance
- c. Individual cell/block temperature
- d. String Current during charge, discharge and float.
- e. String Voltage & Total voltage
- f. Ambient temperature

The BMS will record all battery parameters specified above at the remote central computer. The system will automatically display, sound-ling alarm of all alarm conditions that is outside the user defined pre-set limits. All the alarm can be pre-set from control moduel.

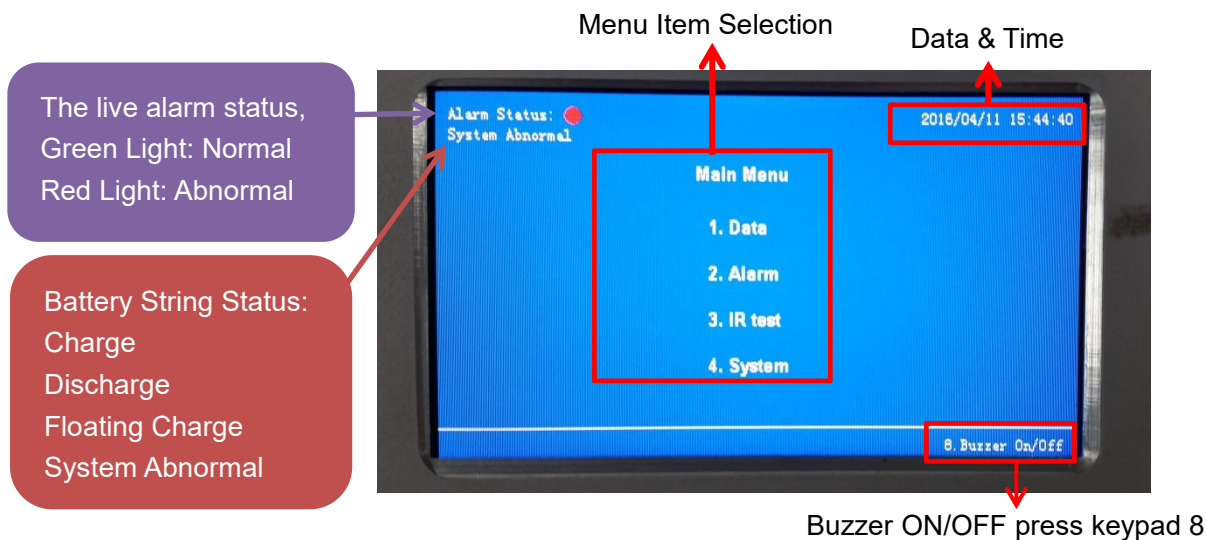
LCD DISPLAY MENU TREE



Press Power ON/OFF button, the LCD screen will show up the control module software version at the bottom left of the screen.



The screen will continue to the main menu as following picture.



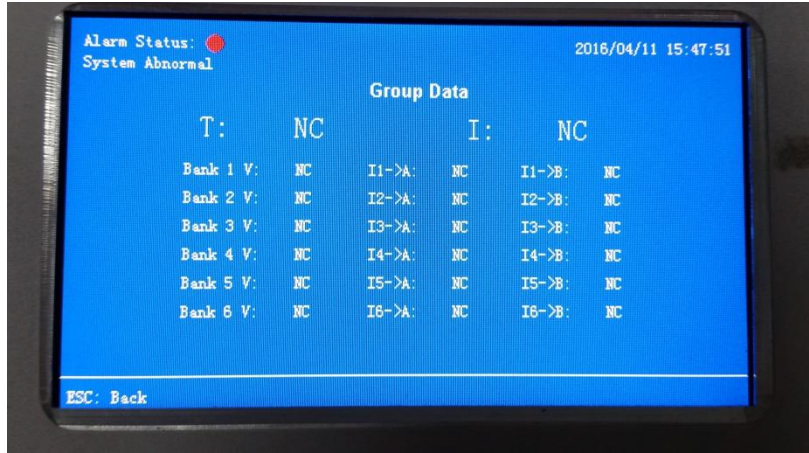
3.1 Query Live Data & History Data

Press Number keypad '1' from Main Menu to query all the live data & history data
 Press ESC Button will return to previous menu.



a) Query the Group Data

Press Number key 1 from Data Menu to query the group data
 Show up ambient temperature T, total current I, string voltage and string current show up by list.
 Press ESC Button return to previous menu



b) Query the Single Block Live Data

Press Number key 2 from Data Menu to query individual block live data
 Show up live data for individual block voltage, impedance, temperature and alarm status with stamped battery NO. and R-Sensor NO.

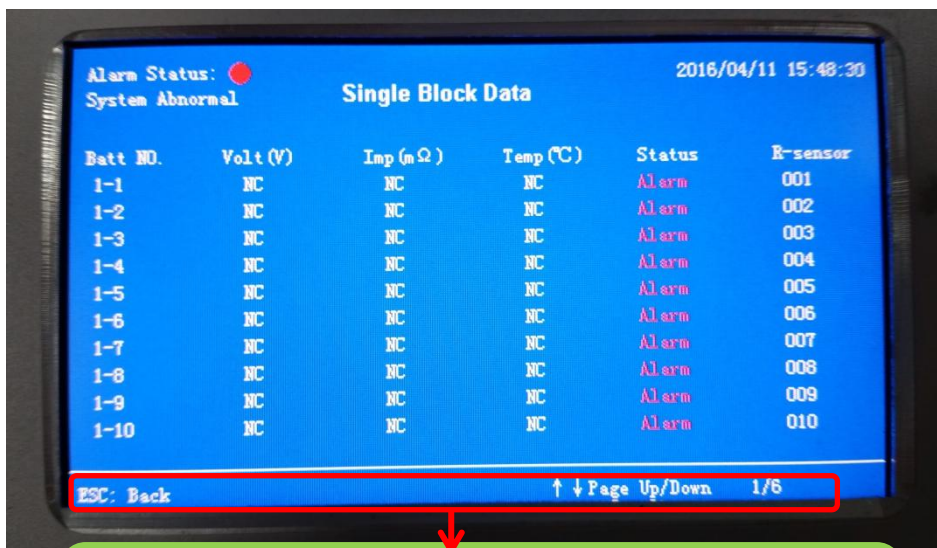
Battery NO.: Defined all battery NO. from your battery setup.
 Example, there have 4 string x 34 block x 1 set UPS.

Battery NO. of String 1 will defined in order from 1-1 to 1-34,
 Battery NO. of String 2 will defined in order from 2-1 to 2-34,
 Battery NO. of String 3 will defined in order from 3-1 to 3-34,
 Battery NO. of String 4 will defined in order from 4-1 to 4-34.

R-Sensor NO.: All R-Sensor from the same control module will defined the number in order.

Status: Show up Alarm or Normal.
 Normal is running well.

Alarm point out one of individual voltage, impedance or temperature is out of pre-set limit



ESC, press ESC button return to previous page
 Page Up/Down, press arrow keypad up or down to return page.
 1/6 claims there are total 6 pages, current page is page 1.

c) Query Daily history data

Press Number key 3 from Data Menu to query daily history data

Press the menu item to query 24 hours history data of individual block voltage, temperature, impedance and string current

Press ESC button back to the previous menu



Press number keypad 4 from daily history data menu to query the daily string current data.

Press Arrow Keypad left and right to viewing the string current at any time in 24 hours.

Press ESC button back to the previous menu



d) Query Yearly History Data

Press Number key 4 from Data Menu to query daily history data

Press the menu item to query yearly history data of individual block voltage, temperature, impedance and string current every day.

Press ESC button back to the previous menu



e) Query Group Information

Press Number key 5 to enter Group Information from Data Menu

Press ESC button back to Main Menu



3.2 Query Active & History Alarm Data

Press Number key 2 from Main Menu to query all alarm

a) Query Active Alarm Data

Press Number key 1 from Alarm Menu to query the active alarm data

Press number key 8 to on/off the buzzer voice.

Press ESC button back to previous menu

There have 14 variety alarms to the system, kindly check the details from alarm setting menu.



b) Query History Alarm Data

Press Number key 2 from Main Menu to query all alarm

Press Number key 2 from Alarm Menu to query all history alarm data

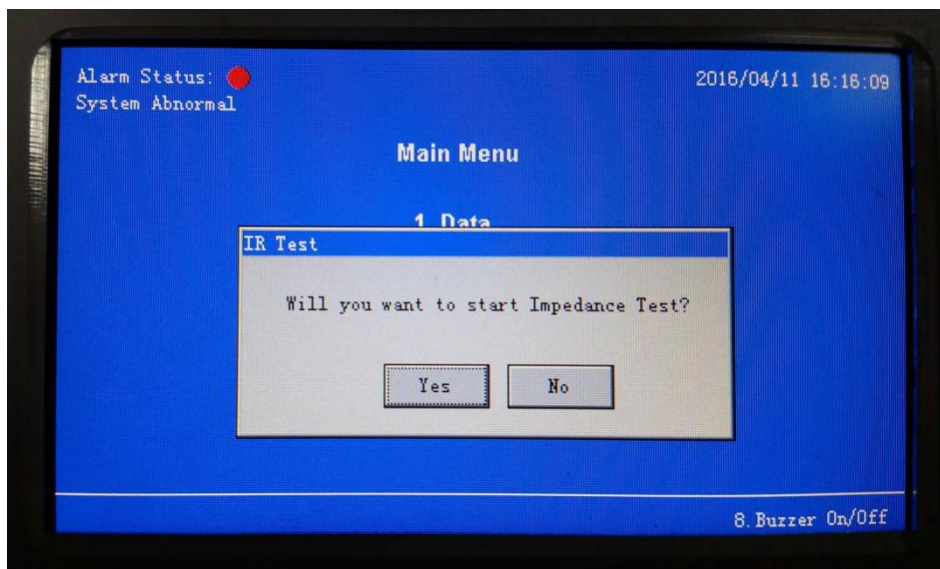
Press ESC button back to previous menu

When an alarm occurs, it will display in active alarm menu. After process, this alarm will be deleted from the active alarm menu and record in the history alarm menu stamped with alarm start time and end time.



3.3 Manual IR(Internal Resistance) Test.

Press Number keypad '3' to run a impedance (internal resistance) test manually, press arrow keypad to select 'yes' or 'no', the selected item will show up virtual frame as following picture, double press 'ENT' to confirm.



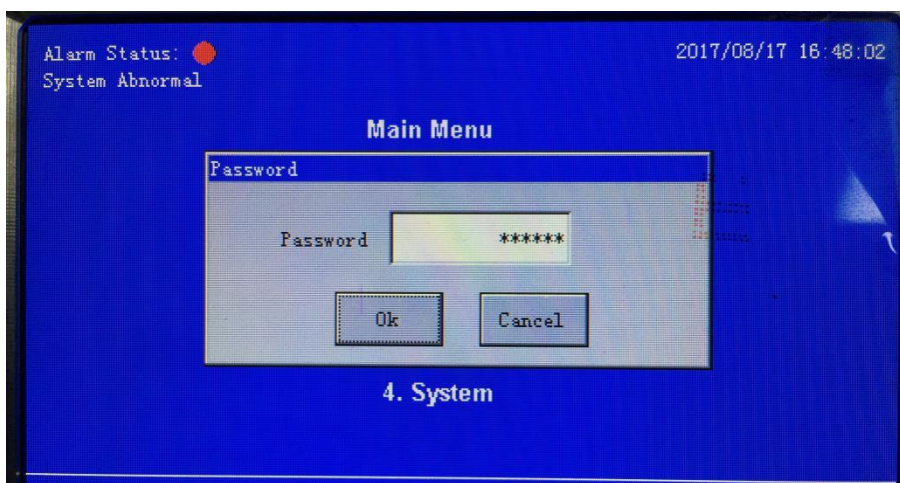
3.4 System Setting

Press number keypad 4 from Main Menu to system menu.

Input the original password: 000000

Or input the super password: 122478

Press arrow keypad to select 'yes' or 'no', the selected item will show up virtual frame as following picture, double press 'ENT' to confirm.



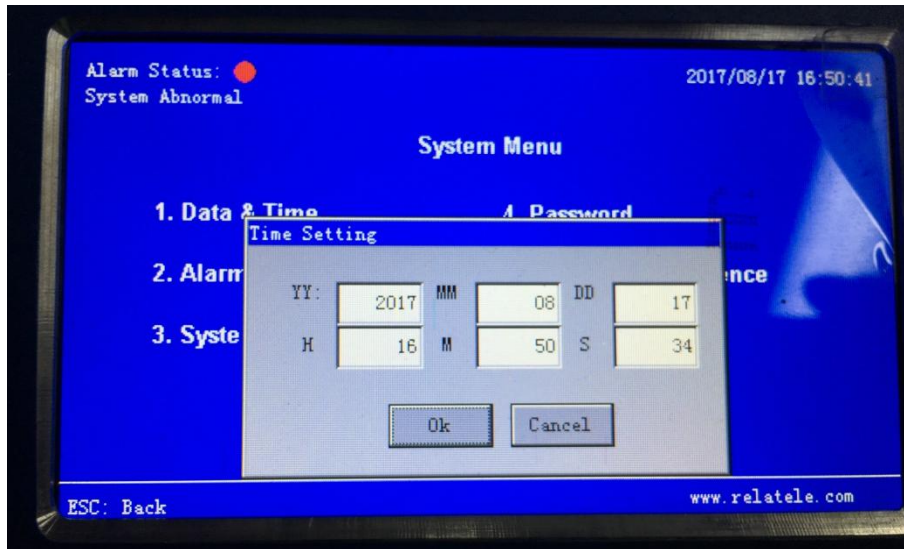
a) Date & Time Setting

Press number keypad 1 from System Menu.

Input the proper date for year, month and day

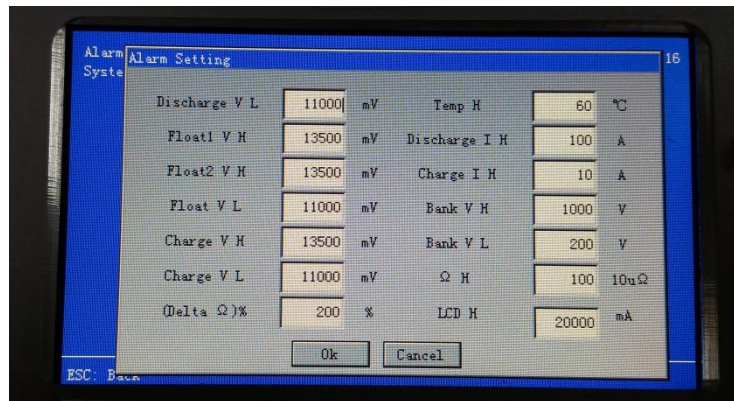
Input the proper time for hour, minute and second

Press arrow keypad to select 'yes' or 'no', the selected item will show up virtual frame as following picture, double press 'ENT' to confirm.



b) Alarm Setting

Press Number Key 2 from System Menu to enter the alarm setting page.



There are total 14 types of alarms from BM3000 Battery Monitoring System.

- 1) **Discharge V(Voltage) L(Low) Limit:** The Control Module will automatically display and sound-ling alarm when individual block battery discharge voltage is lower than the pre-set limit.
- 2) **Float1 V(Voltage) H(High) Limit:** The Control Module will automatically display, sound-ling alarm when individual block nominal floating voltage is higher than the pre-set limit.
- 3) **Float2 V(Voltage) H(High) Limit:** The Control Module will automatically display, sound-ling alarm when individual block floating voltage is higher than the pre-set limit.
- 4) **Float V(Voltage) L(Low) Limit:** The Control Module will automatically display, sound-ling alarm when individual block floating voltage is lower than the pre-set limit.
- 5) **Charge V(Voltage) H(High) Limit:** The Control Module will automatically display, sound-ling alarm when individual block charge voltage is higher than the pre-set limit.

- 6) **Charge V(Voltage) L(Low) Limit:** The Control Module will automatically display, sound-ling alarm when individual block charge voltage is lower than the pre-set limit.
- 7) **(Delta IR)% Limit:** The Control Module will automatically display, sound-ling alarm when individual block internal resistance percentage variation is higher than the pre-set limit.
The basic value of internal resistance should be save in the control module. Press key number 5 from impedance reference menu to save the currently value of internal resistance.
- 8) **Temp(Temperature) H(High) Limit:** The Control Module will automatically display, sound-ling alarm when individual block temperature is higher than the pre-set limit.
- 9) **Discharge I(Current) H(High) Limit:** The Control Module will automatically display, sound-ling alarm when bank discharge current is higher than the pre-set limit.
- 10) **Charge I(Current) H(High) Limit:** The Control Module will automatically display, sound-ling alarm when the bank charge current is higher than the pre-set limit.
- 11) **Bank V(Voltage) H(High) Limit:** The Control Module will automatically display, sound-ling alarm when bank voltage is higher than the pre-set limit.
- 12) **Bank V(Voltage) L(Low) Limit:** The Control Module will automatically display, sound-ling alarm when the bank voltage is lower than the pre-set limit.
- 13) **Ω (Internal Resistance) H(High) Limit:** The Control Module will automatically display, sound-ling alarm when individual block internal resistance is higher than the pre-set limit.
- 14) **LCD(Leakage Current Detection) H(High) Limit:** This alarm will require for install 2 set of Current Detector of each battery bank.
The Control Module will automatically display, sound-ling alarm when the different value of the 2 set Current Detector is higher than the pre-set limit.
Please set the LCD H Limit is 0 if there's only 1 set of current detector of each bank

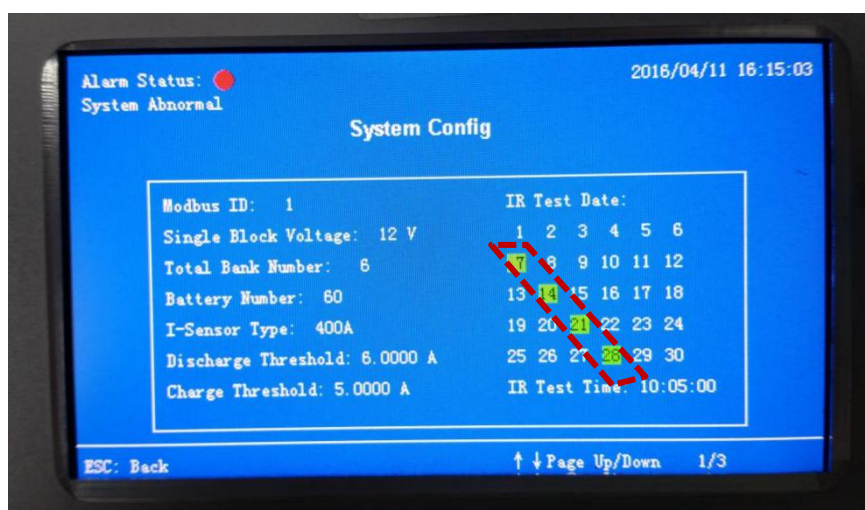
c) Query System Configure Info

Press Number Key 3 from System Menu to query the system config info.

Input the original password:000000

Or input the super password: 122478

Press arrow keypad up or down to review the system config, alarm limit setting, TCP/IP communication port info.



The system basic info can be setting under CFG MODE(Config Menu), kindly check the details on next section.

Modbus ID: The physical address of control module for communicating with PC Software, the ID will set to num 1,2,3... all the ID cannot setting duplication.

I-Sensor Type: Range of I-Sensor and CT are based on the battery capacity. e.g.100 AH Current Detector will equip with 100 AH CT for 100 ah capacity battery.

The charge threshold and discharge threshold are judge to charge, discharge or floating status of the battery bank.

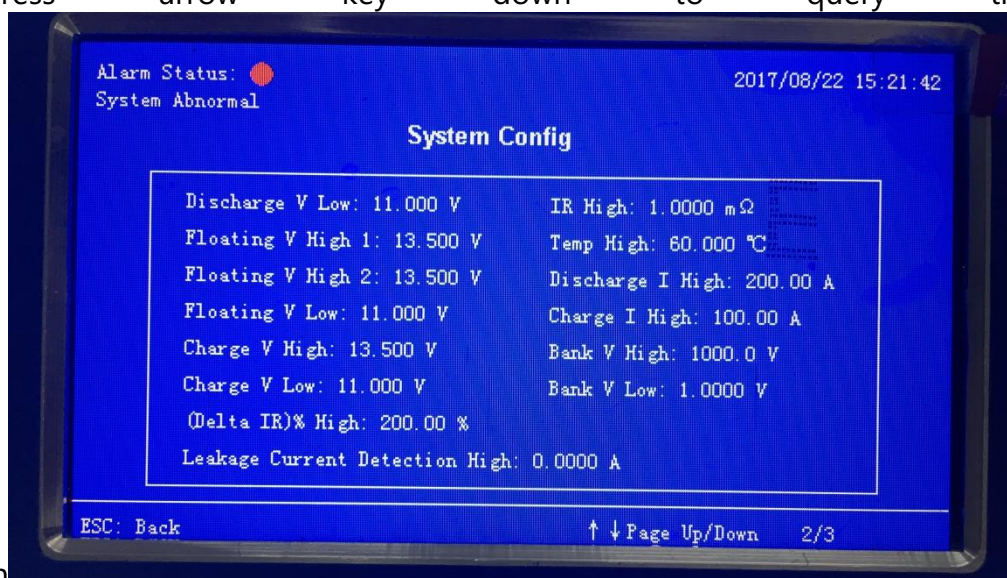
Discharge Threshold: Control Module will judge to discharge status when the bank current is lower than the pre-set threshold. Discharge status is negative current.

Charge Threshold: Control Module will judge to charge status when the bank current is higher than the pre-set threshold. Charge status is positive current.

Control Module will judge to floating status when the bank current is between from the discharge threshold and charge threshold.

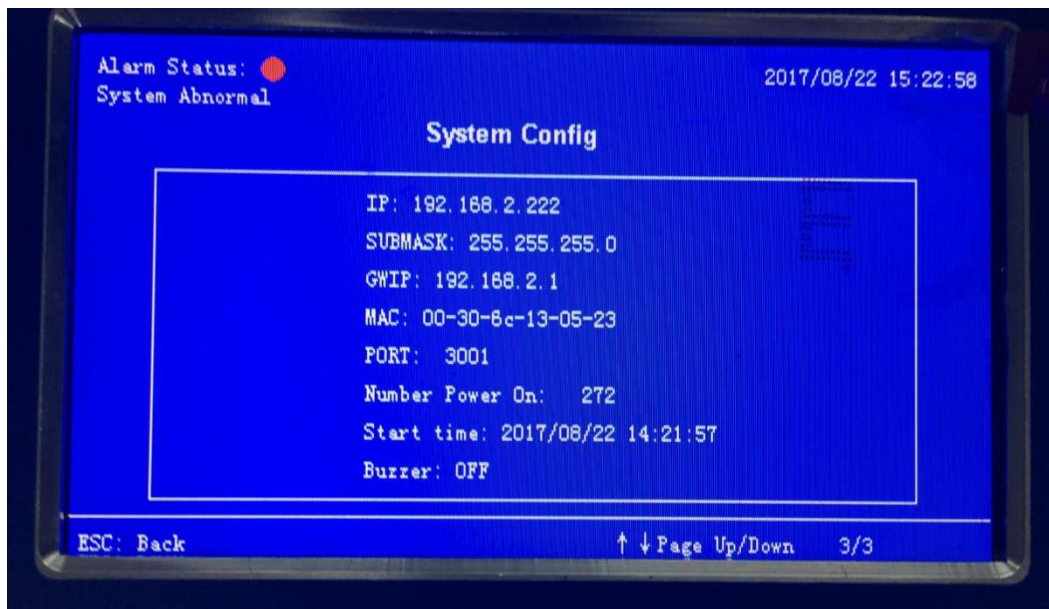
IR Test Date: The control module will automatically run a IR(Internal Resistance) Test on the setting date, the setting date will show up green background as the picture. If the date is 7,14,21,28 of each month, the system will automatically ran a internal resistance test on each battery.

Press arrow key down to query the alarm limit



in fo as below.

Press arrow key down to query the TCP/IP communication port info.



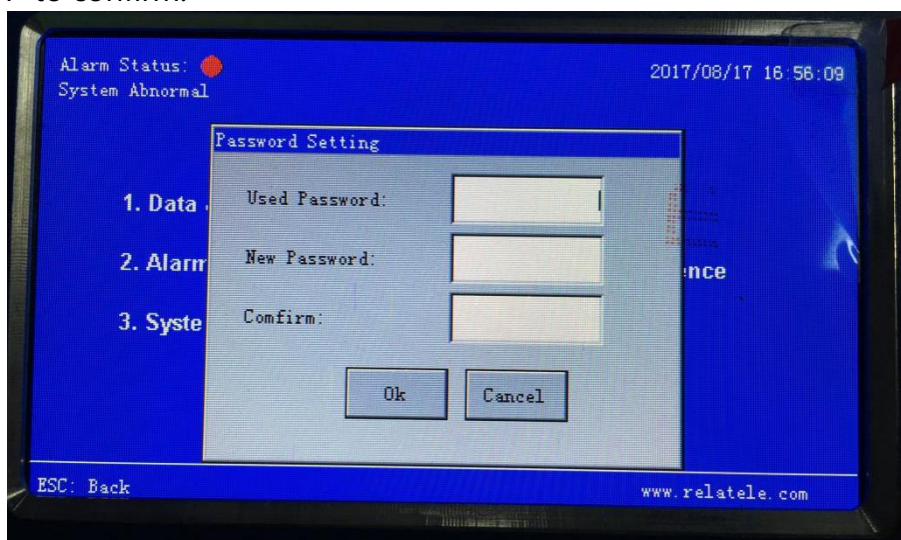
The buzzer can be set disable from CFG Mode.

d) Password Setting

Press number keypad 4 from system menu.

Input 6 figure used password and new password and comfirm the new password.

Press arrow keypad to select 'OK' or 'Cancel', the selected item will show up virtual frame, and double press 'ENT' to confirm.



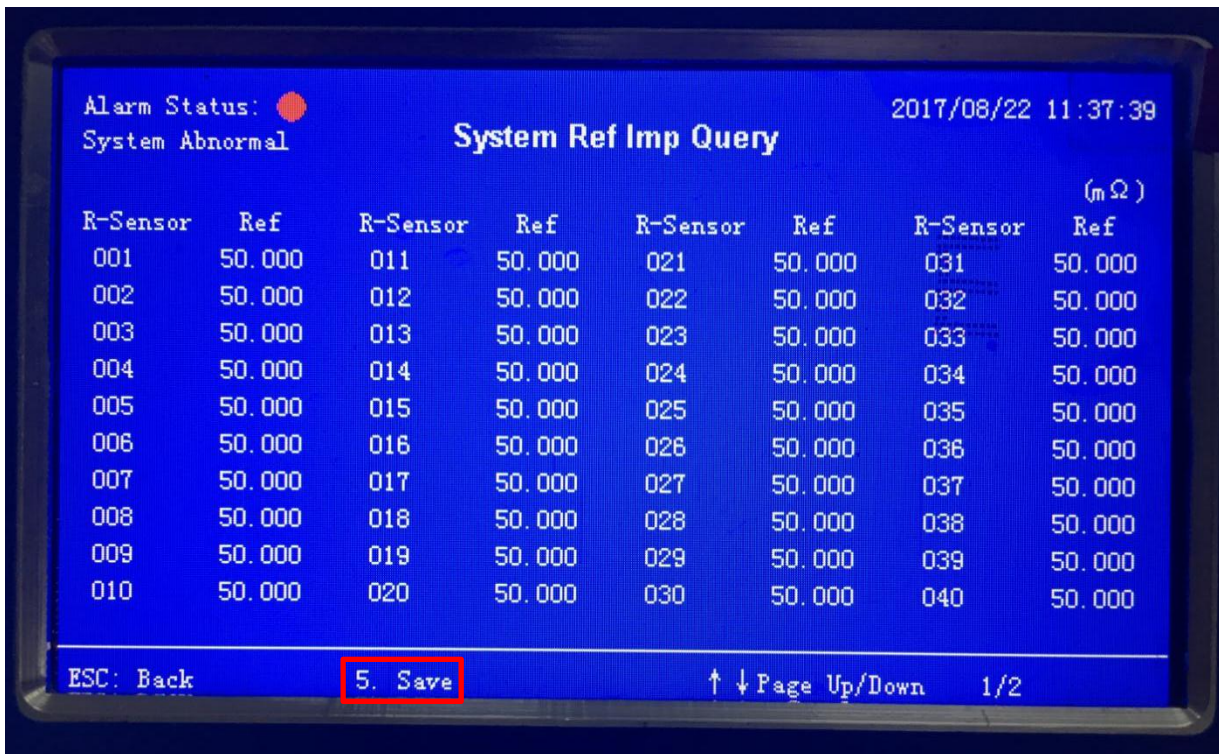
e) Query Impedance Reference Value

After install and commission the battery monitoring system, please save the internal resistance value at the first time running the IR test, these are reference value to compare the internal resistance percentage variation.

Press number key 5 from the System Ref Imp Query page to save the currently internal resistance value. Kindly check the red frame below.

Press ESC button go back to the system menu.

Press number keypad 5 from system menu to query the stored impedanc reference value. Found the reference value will be refresh.



f) IP Address Setting

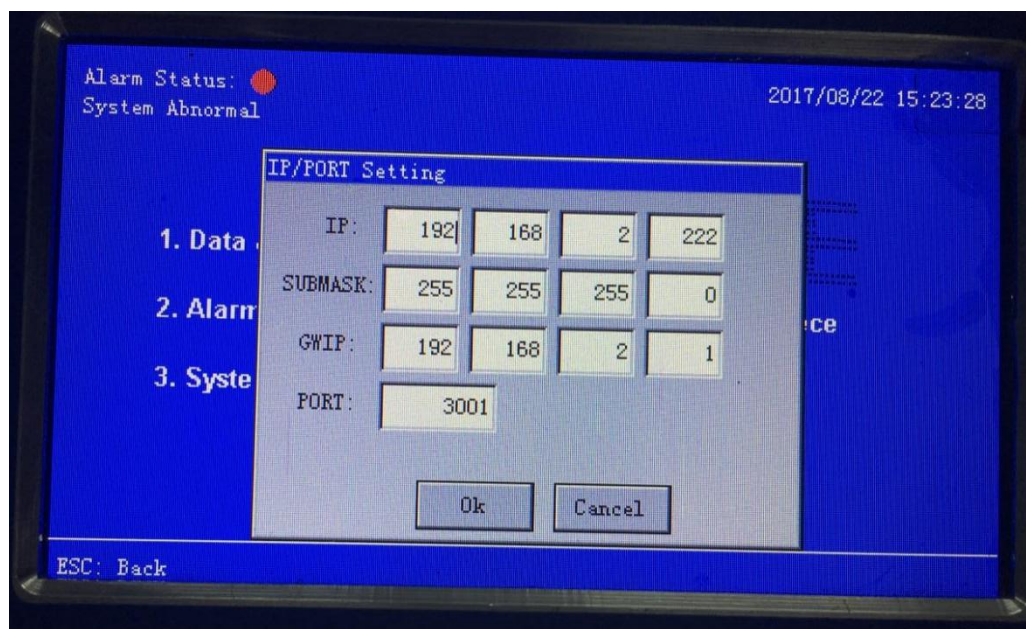
Setting the IP address of Control Module for connecting a PC software.

Connect ethernet cable to the TCP/IP interface of control module.

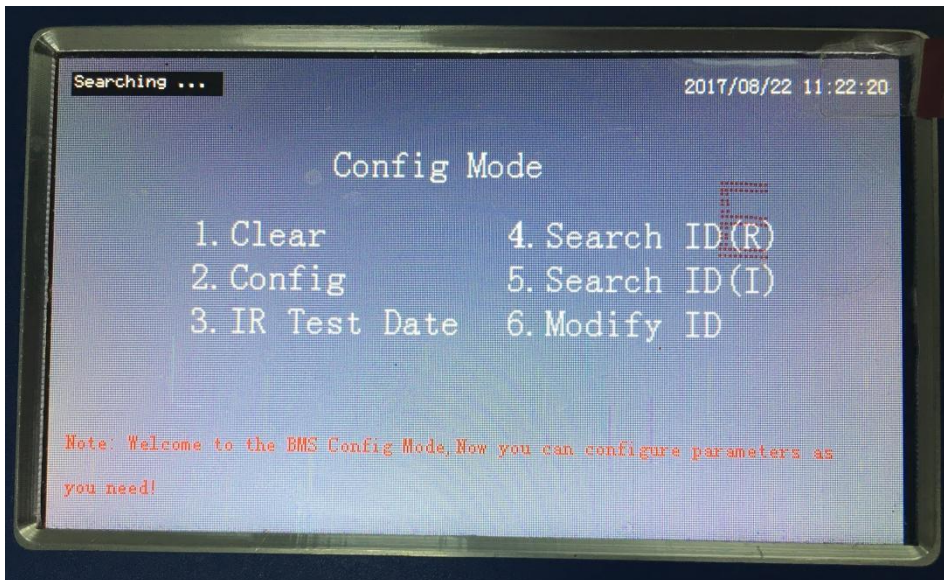
Press Number Keypad 6 from System Menu.

Input the proper IP address, Subnet mask, Gateway IP and the port number. The default port number is **3001**.

Press arrow keypad to select 'OK' or 'Cancel', the selected item will show up virtual frame, and double press 'ENT' to confirm.



4. CFG Interface

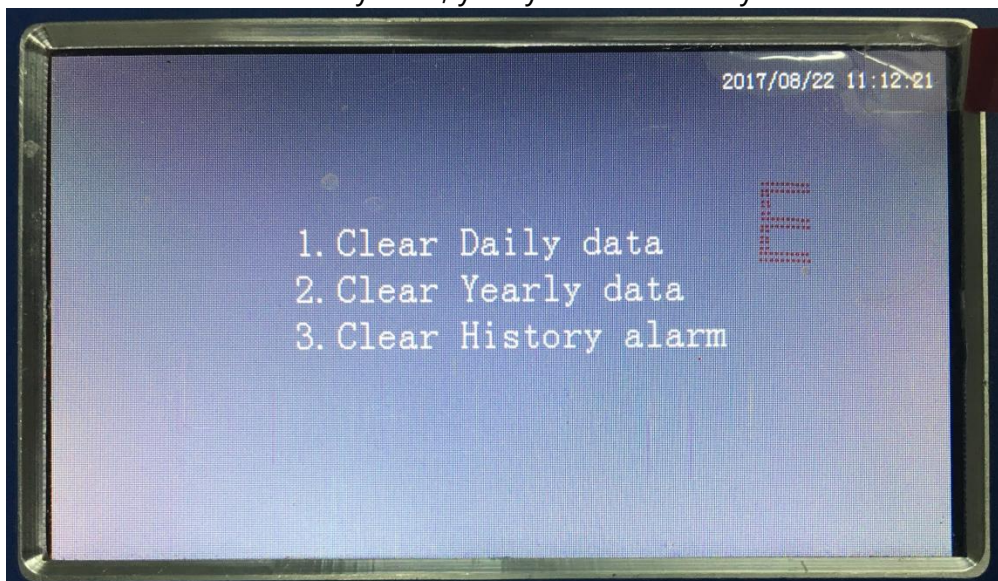


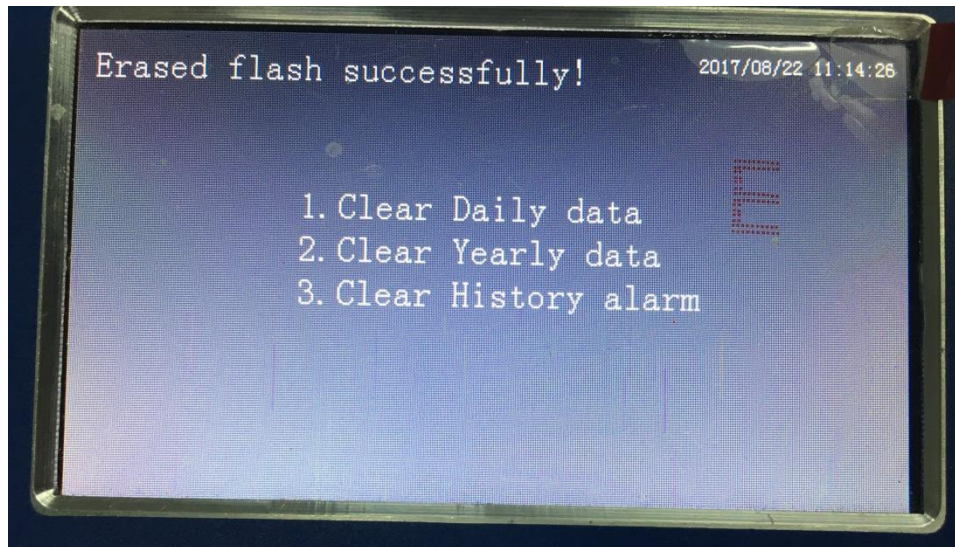
How to go CNF interface? Please follow the steps below.

- a) Press ON/OFF to power off the control module
- b) Find the Toggle Switch 'ISP/ RUN / CFG' at the side of control module
- c) Toggle switch to CNF mode
- d) Press ON/OFF to power on the control module.

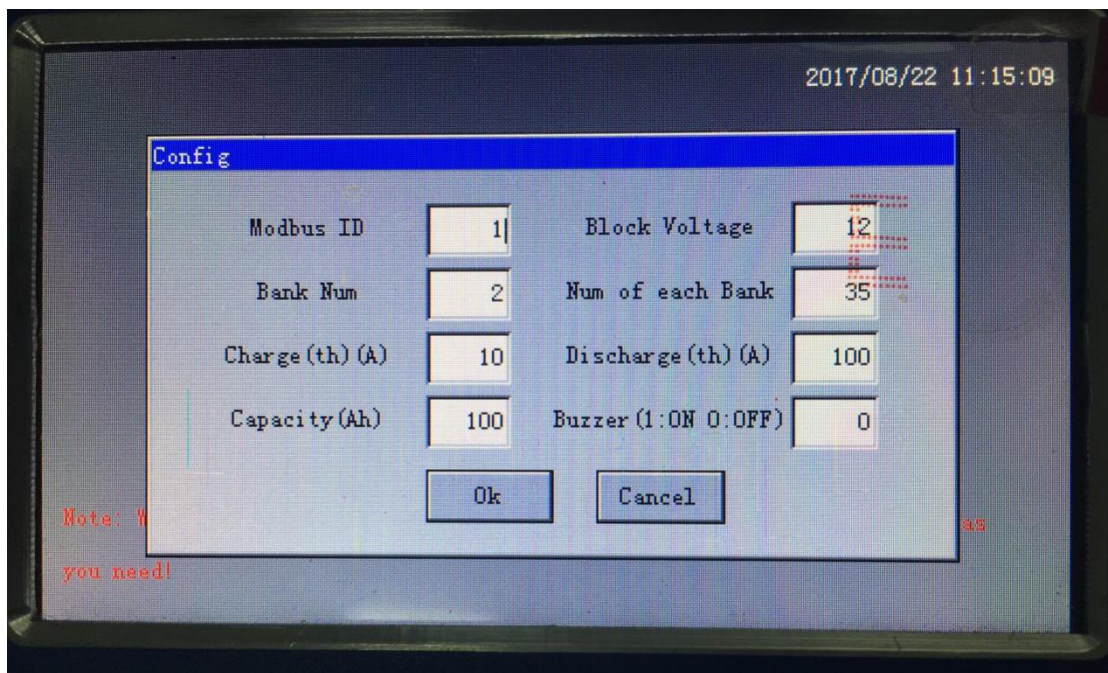
Function Description

- 1) Clear: Clear up the stored historical data from control module.
 - a) Press number key 1 from config mode page,
 - b) Enter the a menu to clear the daily data, yearly data or history alarm.



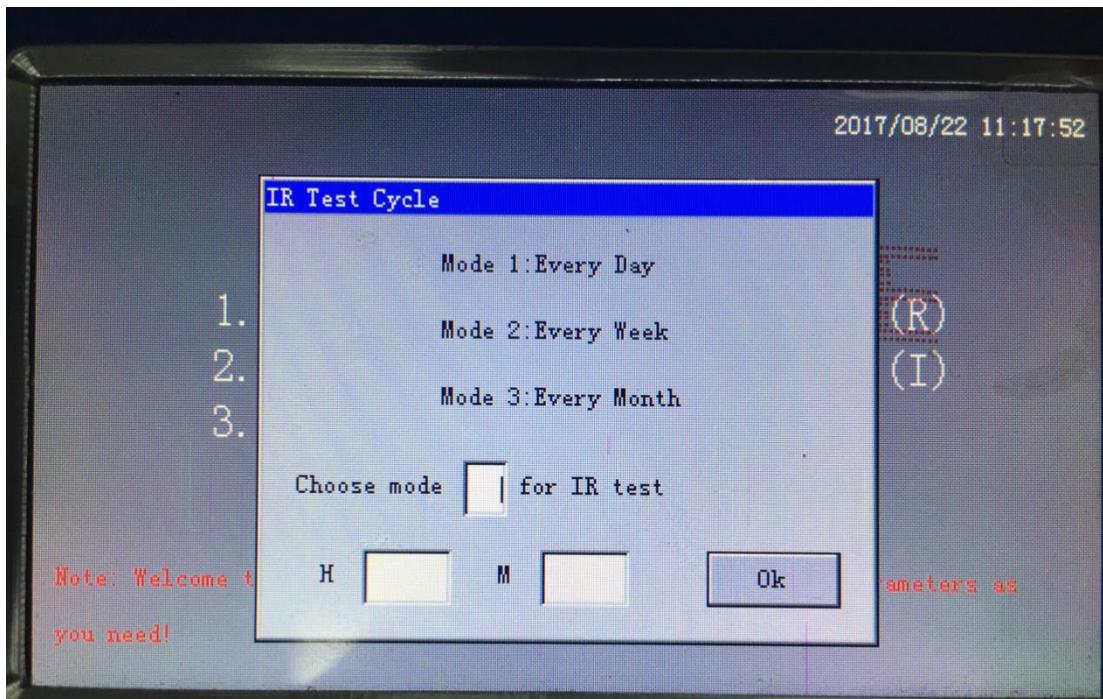


- 2) Config: Modify the system parameters of control module.
 - a) Press number key 2 from config mode page,
 - b) Enter the config menu to modify the parameter.
 - c) Press arrow keypad and press ENT to confirm

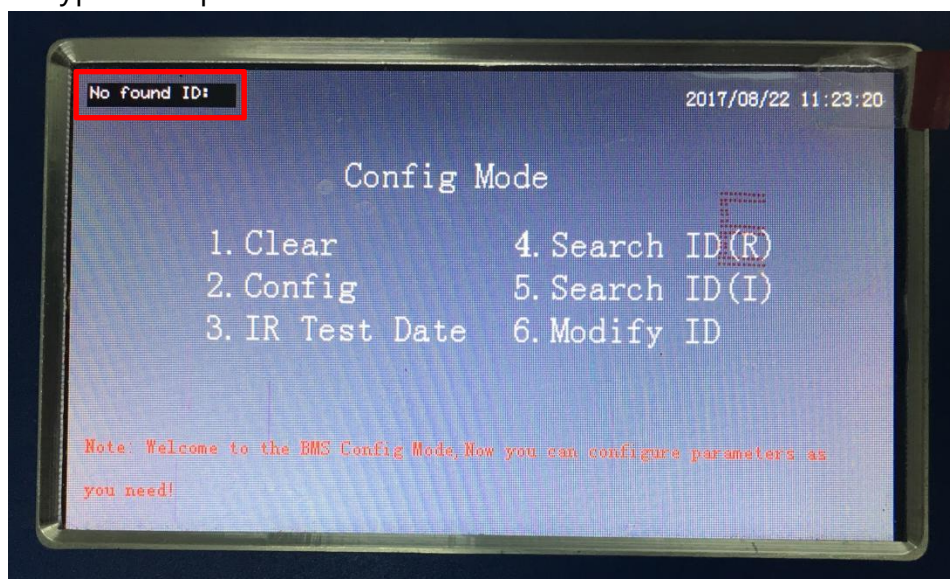


Modbus ID:

- 3) IR Test Date: Modify the date of automatic IR testing.
 - a) Press number key 3 from config mode page,
 - b) Enter the IR Test Date to modify the parameter.
 - c) Choose Mode 1/2/3 for automatic daily/weekly/monthly IR test
 - d) Input the time Hour and Minute to automatically IR test.

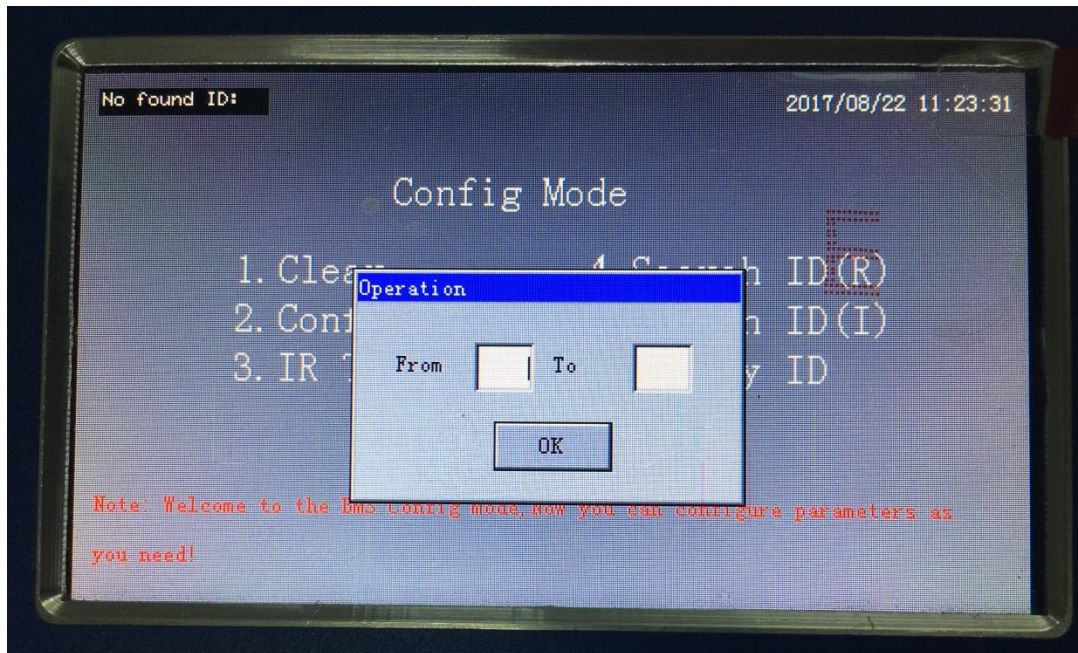


- 4) Search ID (R) of R-Sensor: Automatically search the battery sensor ID which need to modify the ID
 - a) Connect R-bus cable from the battery sensor (need to modify ID) to control module
 - b) Press number key 4 from config mode page,
 - c) Enter the Search ID (R)
 - d) The search result will show up at left top of the screen.
 - e) Press arrow keypad and press ENT to confirm



- 5) Search ID (I) of I-Sensor: Automatically search the current sensor ID need to modify ID
 - a) Directly connect 1 piece R-bus cable from the current sensor (need to modify ID) to control module
 - b) Press number key 5 from config mode page,
 - c) Enter the Search ID (I)
 - d) The search result will show up at left top of the screen.
- 6) Modify ID: Modify the sensor ID

- a) Directly connect 1 piece R-bus cable from the sensor (which need to modify ID) to control module
- b) Enter the sensor ID number
- c) Modify to the ID number
- d) Press arrow keypad and press ENT to confirm



5. BMS Setting

Here will present a live sample to setting battery monitoring system by CM Config Tool.

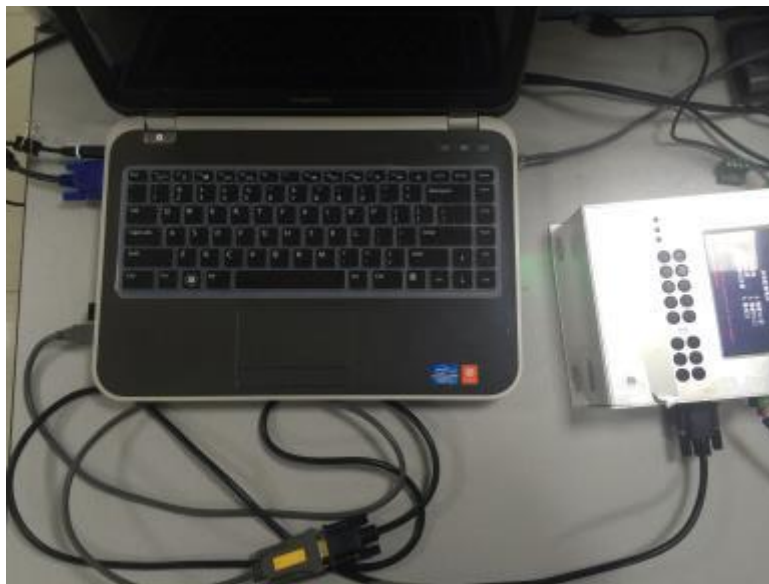
a. Connect from control module to PC

Step 1, Prepare a USB to Serial Adapter Cable as Picture 1,



Picture 1

Step 2, Use the cable connect from CM to Computer, Connection as Picture 2



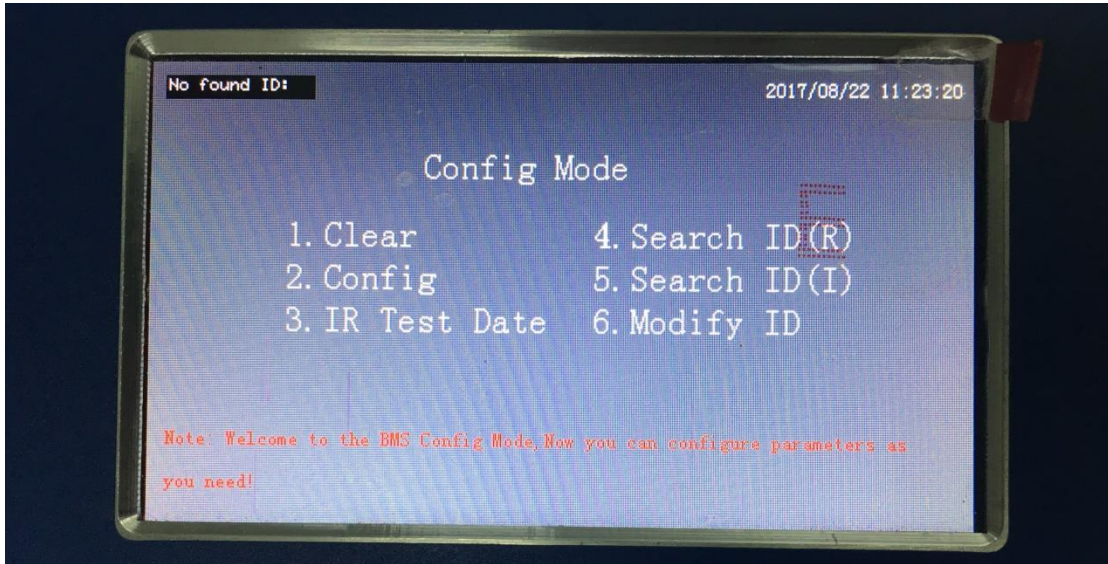
Picture 2

b. Go into CNF Mode

- 1) Press ON/OFF to power off the control module
- 2) Find the Toggle Switch 'ISP/ RUN / CFG' at the side of control module, kindly check picture 3.
- 3) Toggle switch to CNF mode
- 4) Press ON/OFF to power on the control module.
- 5) Go into CNF Interface as picture 4.



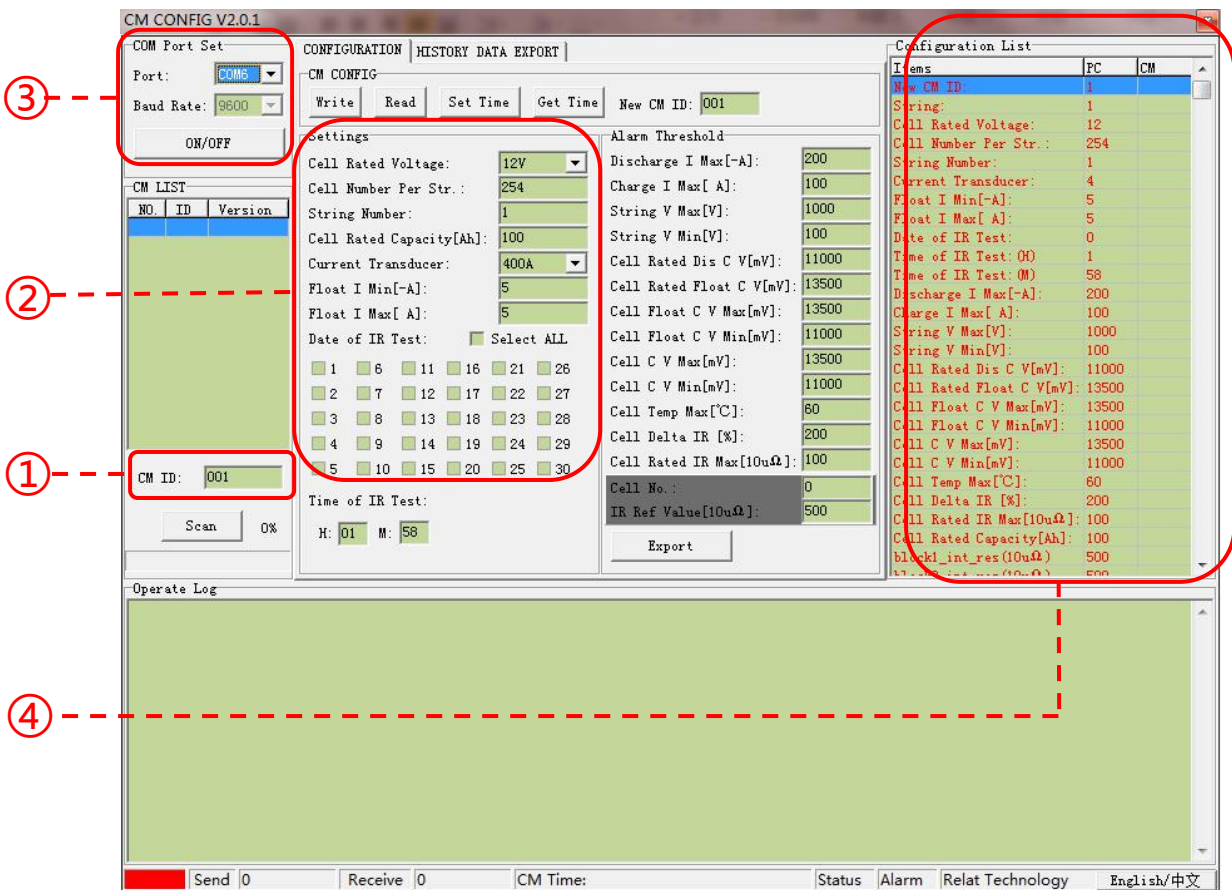
Picture 3



Picture 4

6) Open CM Config Tool

Step 1, Click and open CM Configuration Tool Package 'CMcfgV2.0.0.1', kindly find the window as Picture



Picture 5

①Com Port Set: Select a serial port number of connected PC.

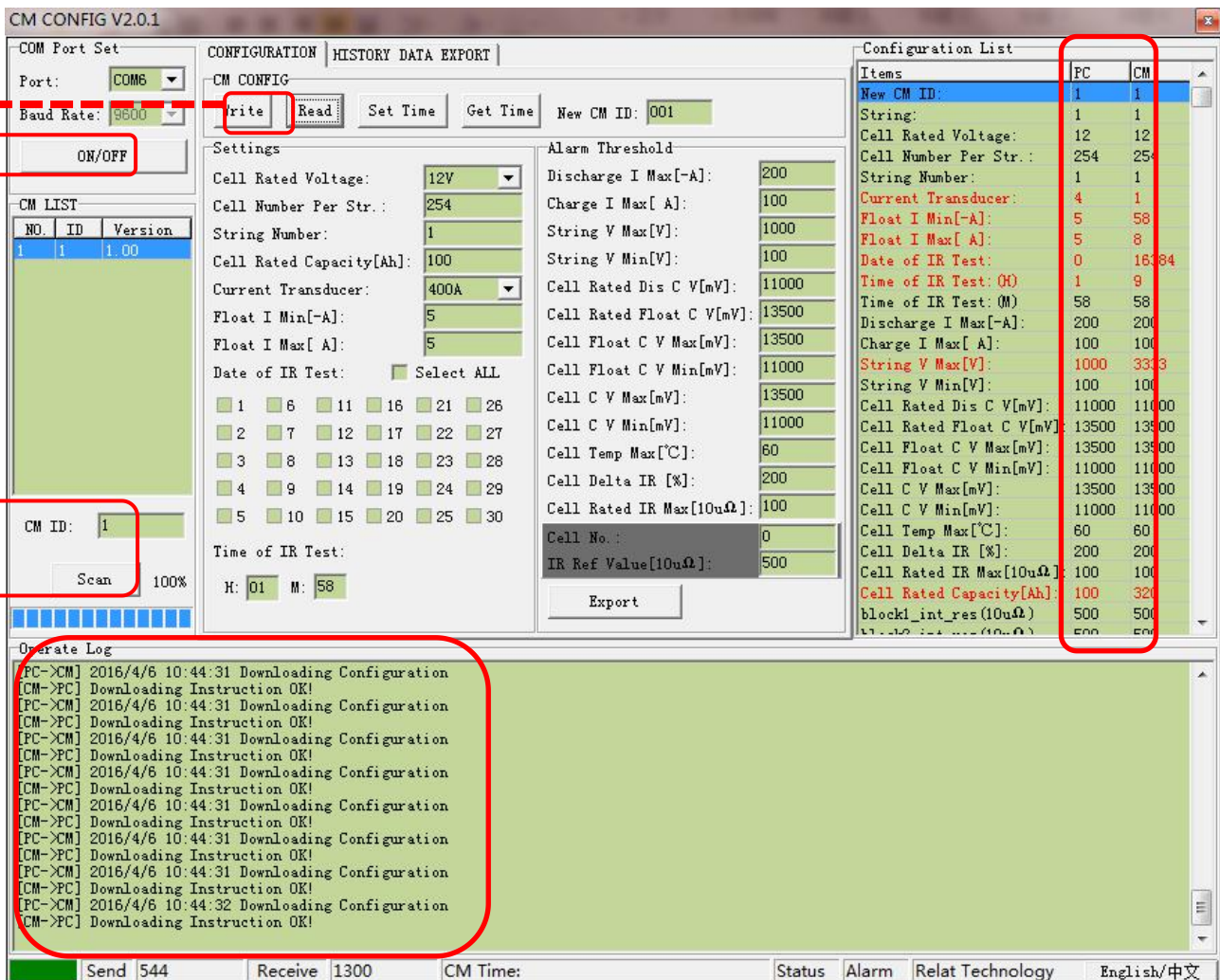
②CM ID: Modbus ID address of control module

③Setting: Setting basic parameter and alarm threshold of control module, which will follow to the UPS battery setup.

④Configuration list: Alarm setting List from PC and CM by list, the reading alarm setting will show up in CM List, and new writing alarm setting will show up in PC list

7) Reading Configuration List

1. Click 'ON/OFF' to turn on the tool
2. Click 'Scan' to search CM ID
3. Click 'Read' to read configuration information, the information will show up in CM List of the Configuration List. If reading fail, the prompt message will show up from the operate Log at the bottom of the window.



Picture 6

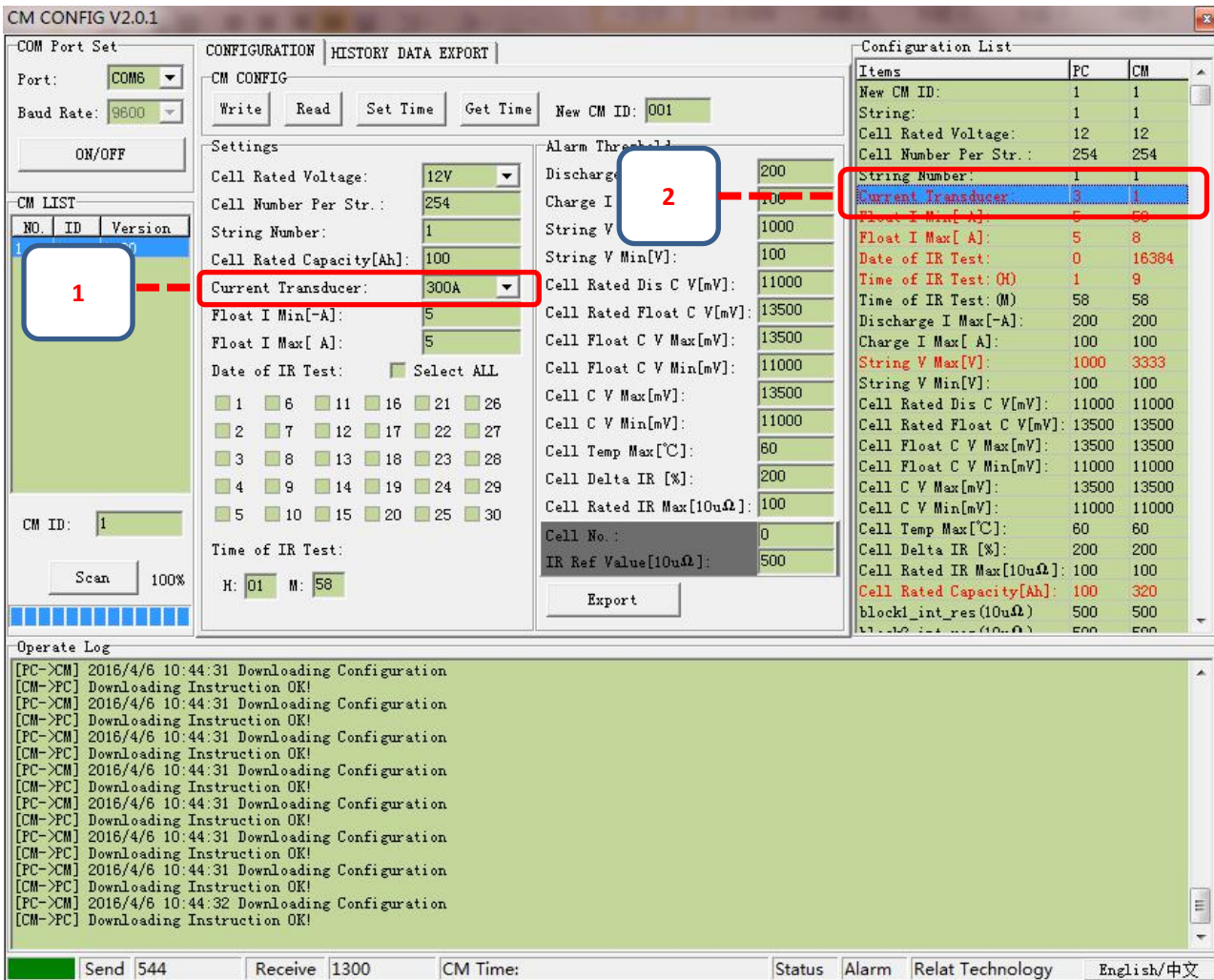
8) Writing Configuration List

If you need to modify the system configuration or alarm, please follow up the steps in red.

For example, we need to modify the parameter 300 ah of Current Transducer, kindly check Picture 7

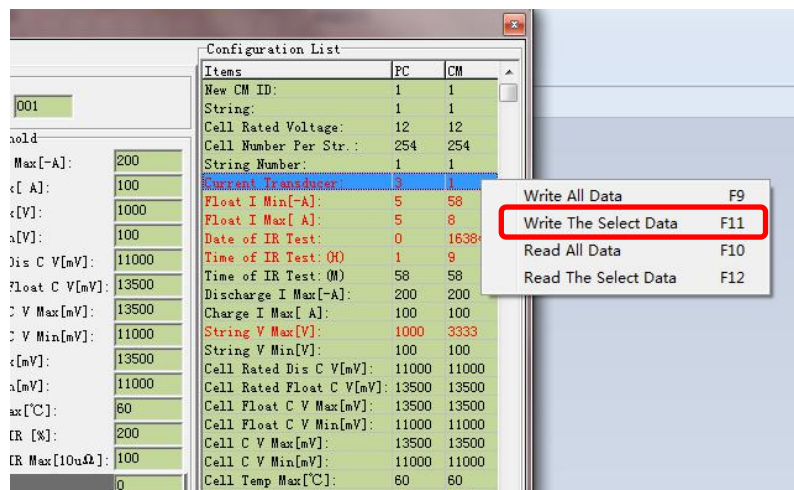
1. Choose the proper ah rating value from the select box on 'Current Transducer'

2. Left mouse click and select 'Current Transducer' from Configuration List



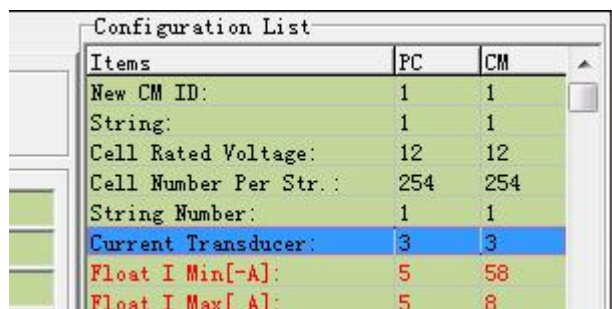
Picture 7

3. And right mouse click the select item of 'Current Transducer', choose 'Write the Select Data' in the pop-up menu. Kindly check Picture 8 and Picture 9



Picture 8

If Successful write the data, the parameter 'Current Transducer is 3 from CM list '



Items	PC	CM
New CM ID:	1	1
String:	1	1
Cell Rated Voltage:	12	12
Cell Number Per Str.:	254	254
String Number:	1	1
Current Transducer:	3	3
Float I Min[-A]:	5	58
Float I Max[A]:	5	8

Picture 9

Turn off CM, and make toggle switch to 'RUN' position, and restart CM, kindly check the I-Sensor Type is modify to 300A,



Picture 10

