User Manual

BM3000 Battery Monitoring System

Content

1. Product Overview

1.1. Functions

BM3000 Battery Monitoring System(BMS) is a multi-channel online-automatic battery test and monitoring system, which is a newest generation of monitoring systems based on new research on battery characteristics of battery industry and new technologies of industrial electronic monitoring equipment. And compared to the conventional DC discharge performance test system for batteries, which have the following features:

- ✓ Process by AC test technology, further effectively reveals the battery performance characteristics and aging trends;
- ✓ Much smaller discharge current, no damage on battery;
- ✓ No effect on battery pack assembling and operation environment;
- ✓ Optical isolation technology and multiple level safety protection;
- ✓ Real-Time monitoring individual block impedance, voltage, temperature and current
- ✓ Automatic inspection, maintenance-free, high speed, reliable;
- ✓ Internal resistance can be reported every day or even every hour as needed;
- ✓ Diversified event management and alarm criteria for setting;
- ✓ Detailed historical data record for maintenance analysis of the facts;
- ✓ Ethernet network management is conducive to expansion and centralized monitoring;
- ✓ Optional wireless alarms, use of cell phones and other mobile devices for maintenance;
- ✓ Designed to allow IEEE1188 best practice
- ✓ MODBUS TCP/IP Protocol for communication
- ✓ The system have been properly tested and proved by CE certification.
- ✓ Provide battery management software for measure, record and report, can display the analysis graphs.

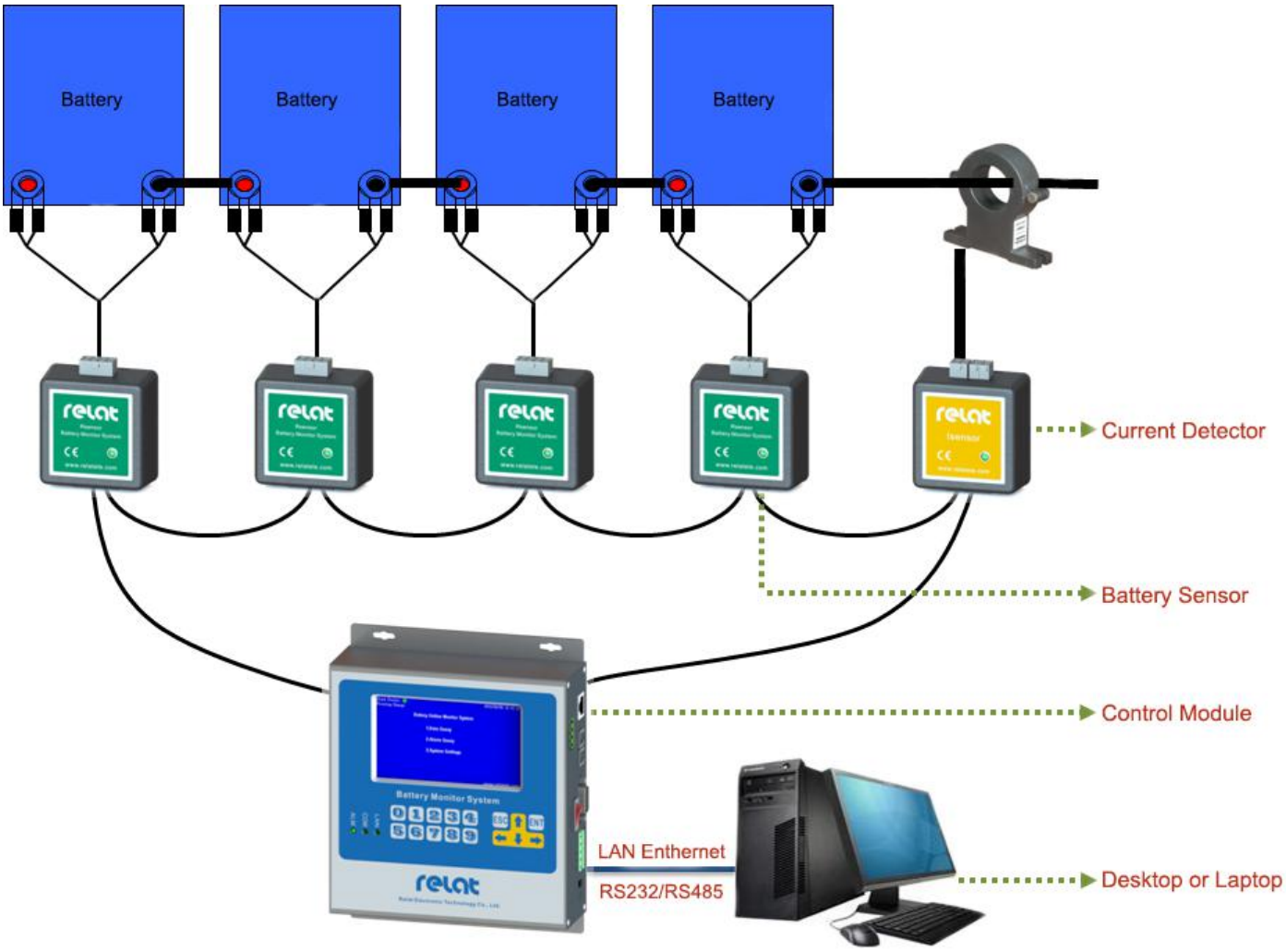
1.2. Range of Application

BM3000 Battery Monitoring system can monitor the standard of 2V, 6V, 12V battery, battery capacity is up to 3000Ah, battery total voltage can reach 48V,110V,220V,400 and various voltage, it meets the requirements of most users.

BM3000 Battery Monitoring System is using advanced testing technology, test internal resistance of battery each day/week, can effectively reflect the performance of battery, comply with IEEE1188 Standard recommendations, therefor especially suitable for high reliability requirements of UPS Users such as Medical, Railway, Aviation, Telecom, Bank, Electricity and etc...

2. BMS System Description

BM3000 Monitoring system using distributed modular designed, which is easy for the installation and expansion. Product system configuration as below:



The Relat Battery Monitoring System(BMS) is composed of the control module, current detector and the battery sensor. Please check the BMS Component List below,

Table 1. BMS Component List

No.	Product Picture	Product Name	Description
1		Control Module BM00CS	One UPS require one CM

2		Battery Sensor BM3KRS	One block battery require one R-Sensor
3		Current Detector BM00IS	One string batteries require one I-Sensor
4		Current Transformer 100A – 1000A	One string batteries require one current transformer
5		MEAN WELL Power Supply 24VDC	Accessory of BM00CS
6		Power Input Cable for 24VDC power adapter	
7		Battery Cable with temperature sensor	Accessory of R-Sensor
8		R-bus Communication Cable	Accessory of R-Sensor and I-Sensor
9		Communication Cable of Current Sensor	Accessory of I-Sensor
10		Kelvin Washer	One block battery require 2 pcs Kelvin Washer
11		Power Cable of I-Sensor	Accessory of I-Sensor

`

2.1. Control Module(CM) BM00CS

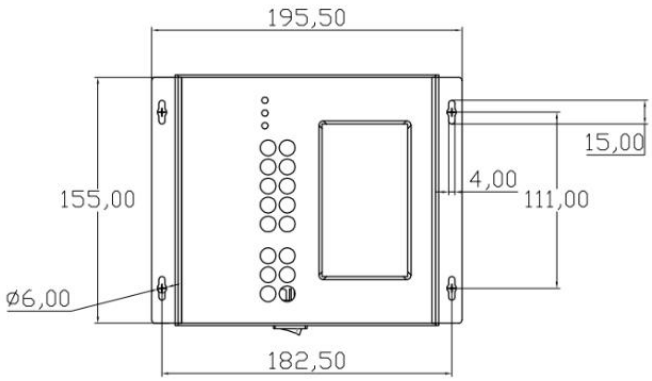
Control Module (BM00CS) is the core component of BMS, one Control Module required per UPS and Battery System.

- Designed to receive transmitted signals from the Battery Sensor and Current Detector. Continuously monitors, analyzes, and stores battery measurements.
- Equipped with a LCD color display for access to all battery measurements and most BMS settings.
- Provides RS-232 and Ethernet communication for remote monitoring.

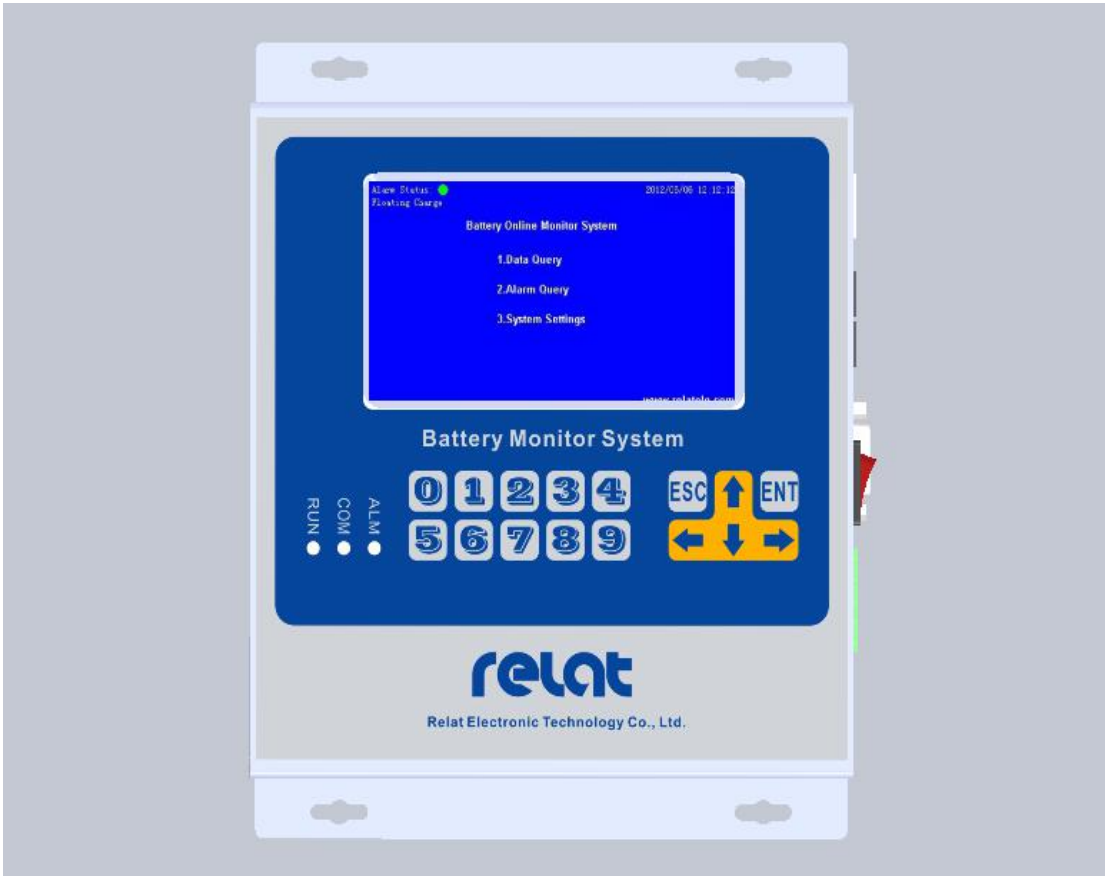
Table 2. Control Module (BM00CS) Specifications

Model	BM00CS
Operating Temperature	0 - 50°C
Relative Humidity	≤ 95%
Input Power Supply	24 VDC / 48 VDC
Power Consumption	Maximum 5 W
Communication Ports	Ethernet x 1 RS-232 x 1 Output Dry Contact Port x 1
Monitoring Nodes/Battery	Maximum 254 nodes/batteries and 6 strings of battery per system
Display Type	LCD 4.3" TFT Screen
Communication Protocol	Modbus TCP/IP
Dimensions (H x W x D)	195.5 x 155 x 50mm
Weight	795 g

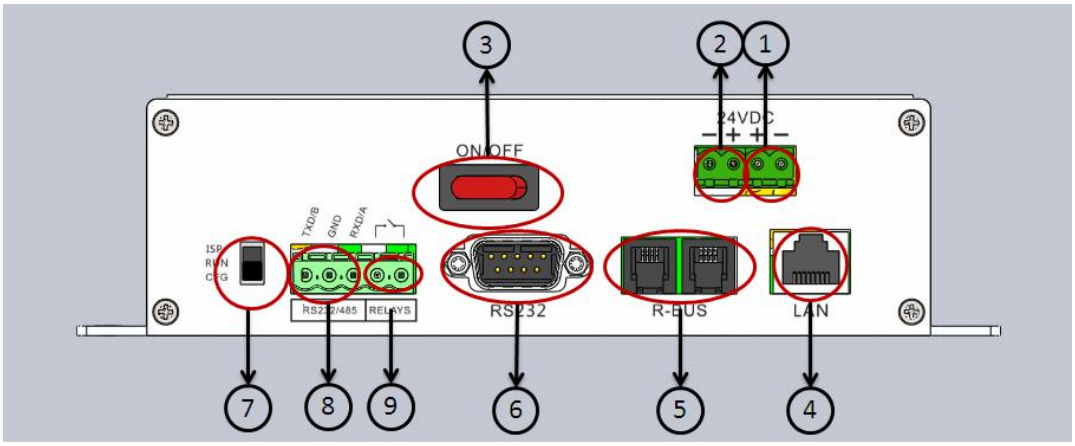
Detailed Drawings:



3D Drawings:



Interface Description



① **24VDC:** DC 24V power input and output

② **24VDC:** DC 24V power input and output

③ **ON/OFF:** Power switch

④ **LAN:** Ethernet port, connect to computer or network switch

⑤ **R-bus:** Connect Battery Sensor BM3KRS and Current Sensor BM00IS.

⑥ **RS232:** CM loading interface, to initialize all CM parameters.

⑦ **Function Switch：**

ISP	loading the software of control module
RUN	Normal
CFG	CM configuration

⑧ **RS232/485:** Extensible RS232/485 interface

⑨ **RELAYS:** Dry contact output, rated Load: 0.5A @125VAC, 1A@24VDC

System On & Status OK – Contact closed.
System On & Status Error – Contact open.
System Off – Contact open.

LED Description

- **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

2.2. Battery Sensor(R-Sensor) BM3KRS

Battery sensor(R-Sensor) BM3KRS can measure the battery cell voltage, temperature and internal resistance, and transmit the measurement to the Control Module for analysis and storage.

Table 3. Battery Sensor BM3KRS Specifications

Model	BM3KRS-LV	BM3KRS-HV
Cell Voltage	2V/3.7V	6V/12V
Cell Voltage Measurement Range	1.5 - 5V	5 - 16V
Accuracy	±0.2% Full Scale	
Internal Resistance Measurement Range	0.01 - 40mΩ	0.1 - 80mΩ
Internal Resistance Repeat Accuracy	±2%	
Temperature Measurement Range	-10 - 70°C	
Accuracy	± 1 °C	
Operating Temperature	0 - 50°C	
Humidity	≤ 95%	
Power Consumption	< 0.4 W	
Isolation Characteristic	Input /Output > 4kV	
Communication Interface	RJ10	
Communication Protocol	R-bus	
Dimensions (H x W x D)	60x59x28mm	
Weight	50g	

2.3. Current Detector (I-Sensor) BM00IS

The Current Detector(I-Sensor) BM00IS could be connected to a current transformer to measure the battery string current, and transmit the data transmit the measurement to the Control Module for analysis and storage.

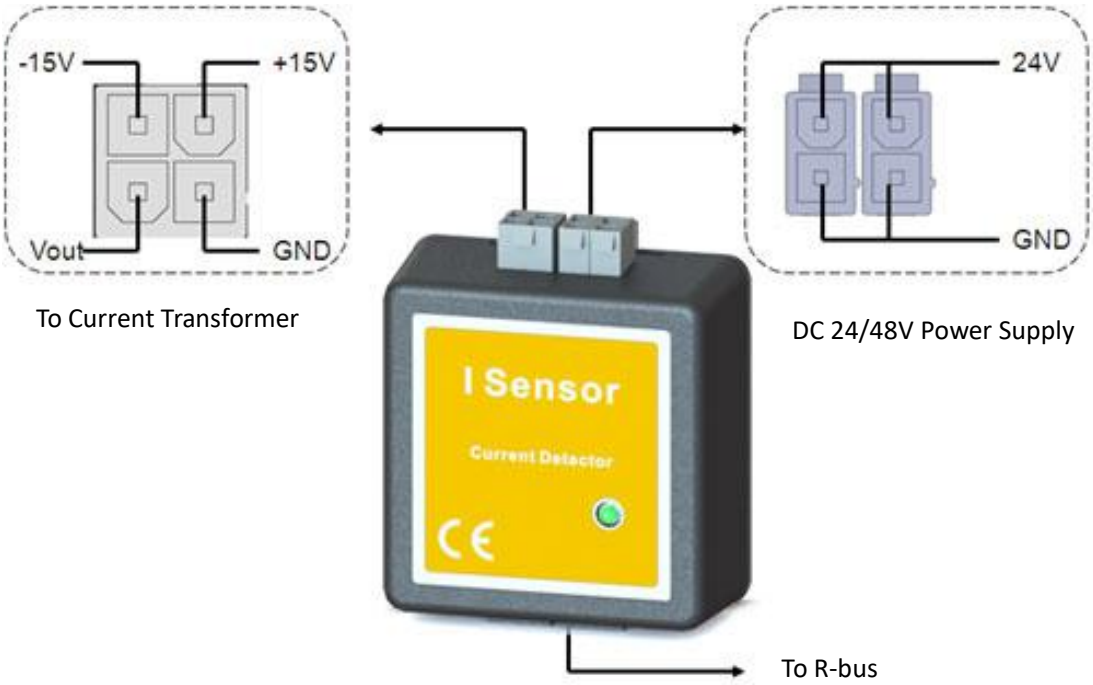


Table 4. Current Detector BM00IS Specifications

Model	IS-100/200/300/400/1000
Current Measurement Range*	0~100/200/300/400/1000A
Accuracy	±1% Full Scale
Operating Temperature	0-50°C
Humidity	≤ 95%
Power Supply	DC 24/48V
Power Consumption	< 1.6 W
Communication Interface	RJ10
Communication Protocol	R-bus
Dimensions (H x W x D)	60x59x28mm
Weight	56g

*The current measurement range depend on the current transformer.

3.Preparation for Installation

3.1. Preparation Work

Installation drawing and BMS layout should be completed before installation, all anticipating technician should familiar with all the installation procedure, make sure all component mounting position and the wiring methods. All the installation process should follow with the installation guide.

3.2. Resource from Client

Kindly check and confirm the following resource is ready,

a. AC 100V/110V/220V/230V input power supply
b. Assign the IP address for each set of control module
c. Confirm the enclosure of control module mounting position

3.3. Required Tools & Accessories

All required tools & accessories should be ready before installation.

Kindly find the tool list below,

Item	Tool	Picture	Description
1	Ratchet wrench		Loose or tight the battery terminal bolts and nuts, insulating treatment
2	Electric screwdriver		Loose or tight the battery terminal bolts and nuts, insulating treatment
3	Adjustable wrench		Mounting the panel box, insulating treatment
4	Multimeter		Measure voltage, current, and resistance. After MC annual verification.
5	Network cable tester		Verify the electrical connections in a RJ45/RJ11 network cable

6	Internal resistance tester		Measure battery internal resistance. After MC annual verification.
7	Current clamp		Measure the current, and check the UPS status. After MC annual verification.
8	Electrical outlets		Access AC power for installation jobs
9	Laptop		Testing and Commission
10	Diagonal pliers		Cutting wire
11	Needle-nose pliers		Used to bend, re-position and snip wire
12	Wire stripper		Used to strip the electrical insulation from electric wires.
13	Crimping Tool		Makes crimping RJ45/RJ11 network cables
14	Slot Head/Cross Head Screwdriver		Settle the control module,current transformer
15	AC Electric Voltage Detector		Electrical testing

Kindly find the accessory list below,

Item	Accessory	Description
1	RJ45/RJ11 Connector	Makes communication cable (Relat Supply)
2	2 pair/4 core telephone cable	Long communication cable between the control module and sensors.(Relat Supply)
3	Nylon cable tie	Tie the cable
4	Cable trunking	Cable wiring
5	Label for battery	Identify the number to all the battery (Relat Supply)
6	Insulating tape	Used to insulate electrical wires/battery terminal
7	Clean Rag	Clean battery surface and the battery rack

3.4. Checking the Product Package

Step 1, Appearance Inspection
Open the package, please check and confirm all the inner & outer packages and the components are intact, confirmed all packages are no damage, moisture and deformation.
Step 2, Quantity Inspection
Please check and confirm the quantity of the equipment, cables and accessories if in conformity with the product list!

3.5. Quick Installation Guide

Step 1, Cut off all the battery breaker from the battery bank to the UPS
Step 2, Cut off and segment the batteries connected in serial
Step 3, Stick all the battery labels on visible place of each cell/block
Step 4, Mounted all kelvin washers in accordance with specification
Step 5, Mounted all battery cable and make sure all red wires are post in positive terminal and blacks post in negative.
Step 6, Positioned all R-Sensors in accordance with specification
Step 7, Positioned all CT and I-Sensors in accordance with specification
Step 8, Mounted the communication cable from CT to I-Sensors and mounted their power cable in serial.
Step 9, Wall/Rack mounted all control module and the power supply in accordance with specification
Step 10, Mounted all fixed length communication cable to all R-Sensors and I-Sensors and connecting in serial.
Step 11, Handed make and mounted the fittest long distance communication cable from sensors to the control module
Step 12, Handed make and mounted the fittest long distance communication cable from different tier of the battery rack.

Step 13, Power on the Control module and inquiry and verify the reading of block voltage and temperature if correct.
Step 14, Manual performance An Internal Resistance Test and verify the reading of block impedance if correct.
Step 15, Revised the impedance high limit(the impedance reading plus 1.5 times)
Step 16, Save the Impedance Reference.
Step 17, Connected RJ45 cable from the control module to the Laptop computer and install the BMS Software.

4.Safety Information

Batteries are potentially dangerous, and proper precautions must be observed in handling and maintenance of batteries and monitoring systems. Maintenance shall be done only by personnel with knowledge of batteries and the monitoring system and trained in the safety precautions involved. Properly insulated tools and adequate personal protective equipment should be used when working with batteries.

The following precautions shall be observed when installing or servicing a battery:

a) Prohibit smoking and open flames in the immediate vicinity of the battery.
b) Avoid wearing metallic objects, such as jewelry.
c) Keep the top of the battery clear of tools and other foreign objects.
d) Provide unobstructed egress from the battery area.
e) Verify that the battery area and/or cabinet ventilation is operable.
f) Neutralize static buildup just before working on the battery by having personnel contact the nearest effectively grounded surface.

It is recommended that a battery disconnection means be used to isolate a battery from the system. If a battery disconnect is not provided, use extreme caution when removing the battery from the system. The entire string voltage will appear across any two open points when the string is disconnected from the system. Arcing will occur when the circuit is opened or closed if the charger/rectifier is not capable of supporting the existing loads. This also will occur if the battery voltage and the system voltage are not properly matched prior to the opening or closing action. For example, if the terminals are opened at the individual cell level while the string is connected to a load, lethal voltages may be present across the open circuit that is created by removing one side of the connection. Specialized training is required to perform work on live battery systems

Electrical Hazard: Risk of electric shock: battery cabinets contain potentially lethal voltages! A short-circuit can result in injury or death. Do not work alone.

Caution: Only qualified personnel, trained in battery operation and safety, may install the harnesses. Keep unauthorized personnel away from the batteries.

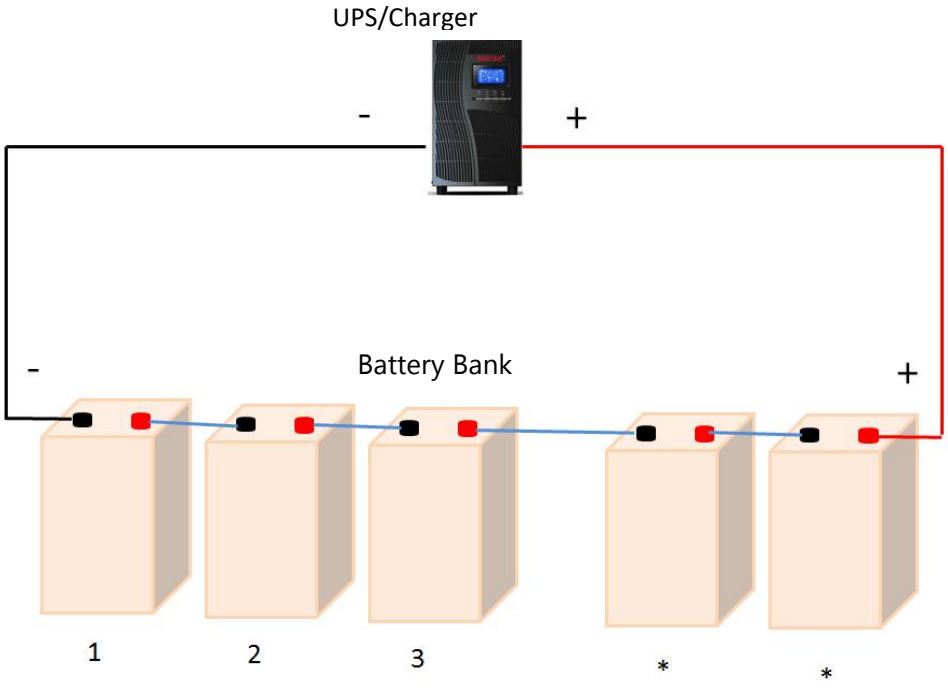
5. Installation Guide

5.1. Personal Protective Equipment

The following personal protective equipment shall be available to personnel who perform battery maintenance work: goggles and face shields, acid-resistant gloves, protective aprons, portable or stationary water facilities for rinsing eyes and skin in case of contact with electrolyte, class C fire extinguisher, acid or alkaline neutralizer, and adequately insulated tools. Personnel shall wear protective equipment suitable for the voltage of the battery when installing or servicing a battery.

5.2. Step 1: Determine battery numbers

Designate a battery number for each battery in the system. Before connecting the Battery Sensor BM3KRS to the batteries, the batteries should be numbered and labeled correctly by using a label to paste on the surface of the battery where the labels are easy to be seen. The first battery, or, battery NO.1 must be the first one on the string negative terminal, the NO.2 is the battery following the NO.1 battery, and so on. The last battery is the one attached closest to the string positive terminal. The batteries should be numbered in accordance with this method.

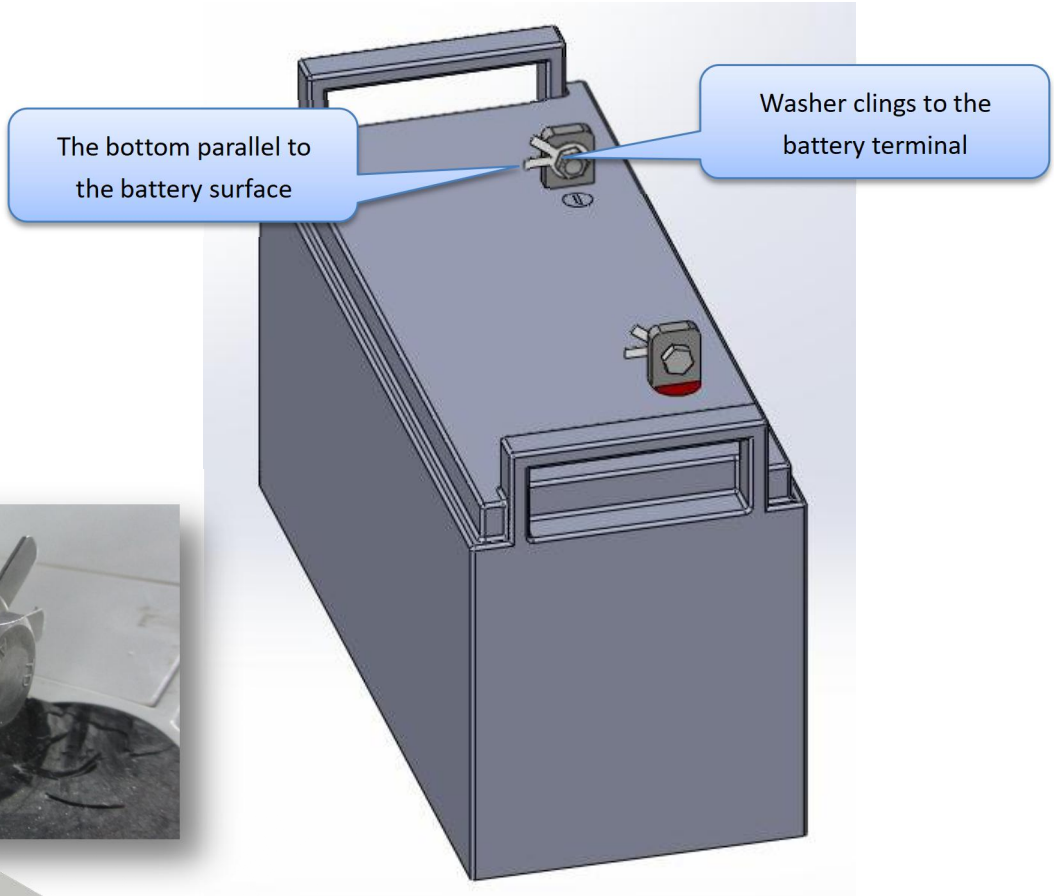


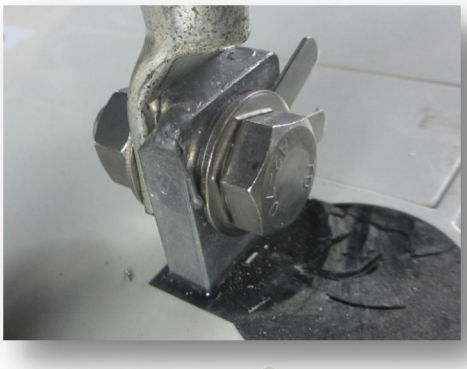
5.3. Step 2: Install the Kelvin washers

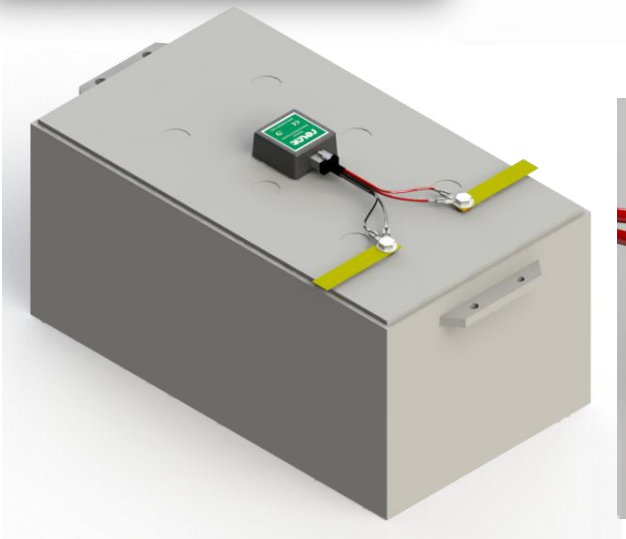
Electrical Hazard: A short-circuit can result in injury or death. Do not work alone.

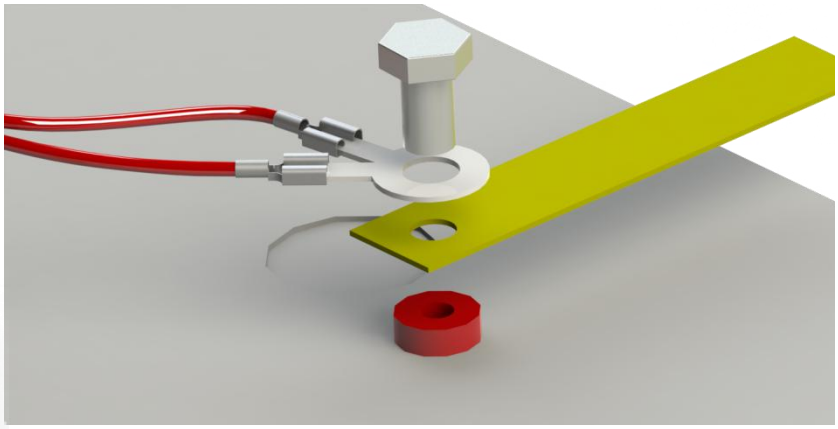
Perform a battery disconnection from the UPS system. Use Multimeter measures and confirms there's no voltage difference between battery and battery rack.

1) Remove the bolt from a battery;
2) Place the Kelvin Washer above the existing battery connection, behind the hex-head of the bolt.
3) Replace the bolt in the battery, and adjust its torque according to the specifications of the battery manufacturer.



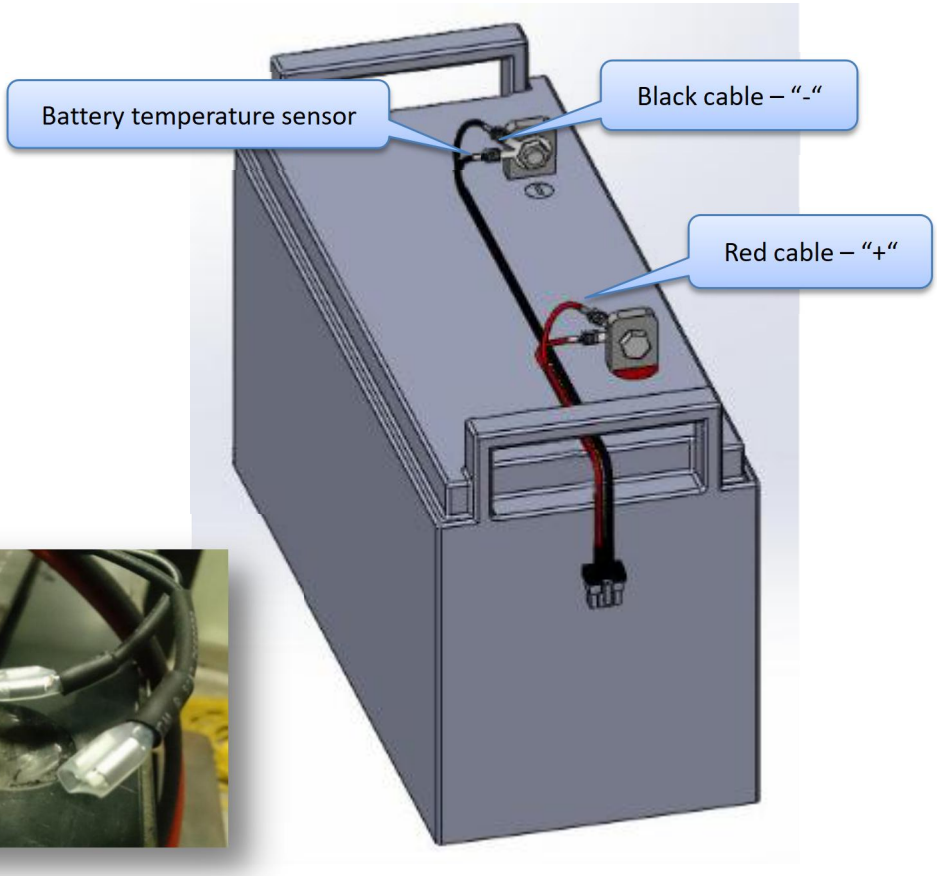


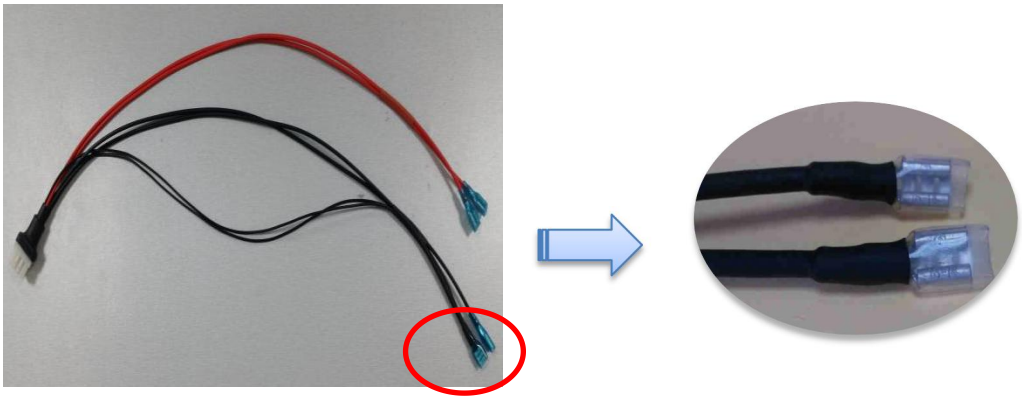




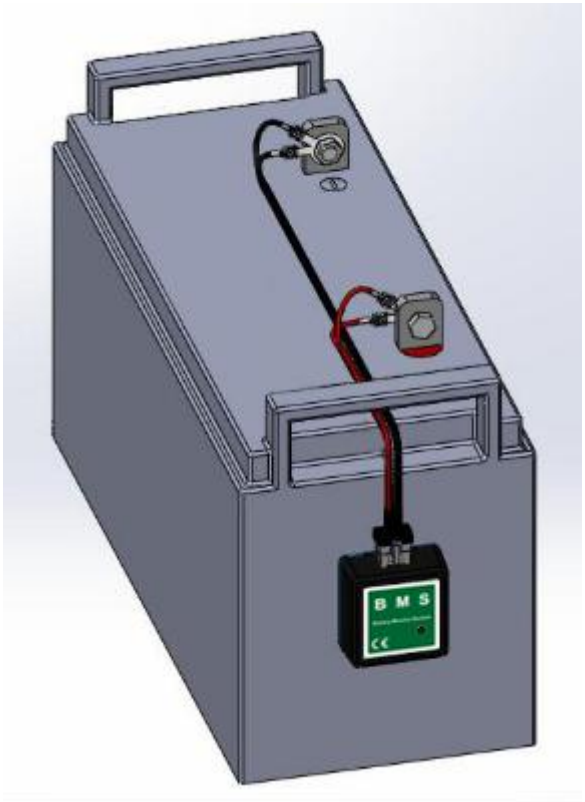
5.4. Step 3: Connect the battery cables

1) Use an insulated pair of pliers **(Important: Do not use your bare hands!)** to slide the receptor end of each cable over the tab portion on the washers that you installed on the positive and negative terminals of each battery.
2) Remove the backing from the adhesive patches on the temperature sensor then position and mount it onto the top or side of the battery block **(Important: Make sure the surface is clean!)**.





5.5. Step 4: Install battery sensor BM3KRS



1) Find the correct ID of Battery Sensor BM3KRS according to the battery number, then insert the 8 pin connector on battery cable to BM3KRS.

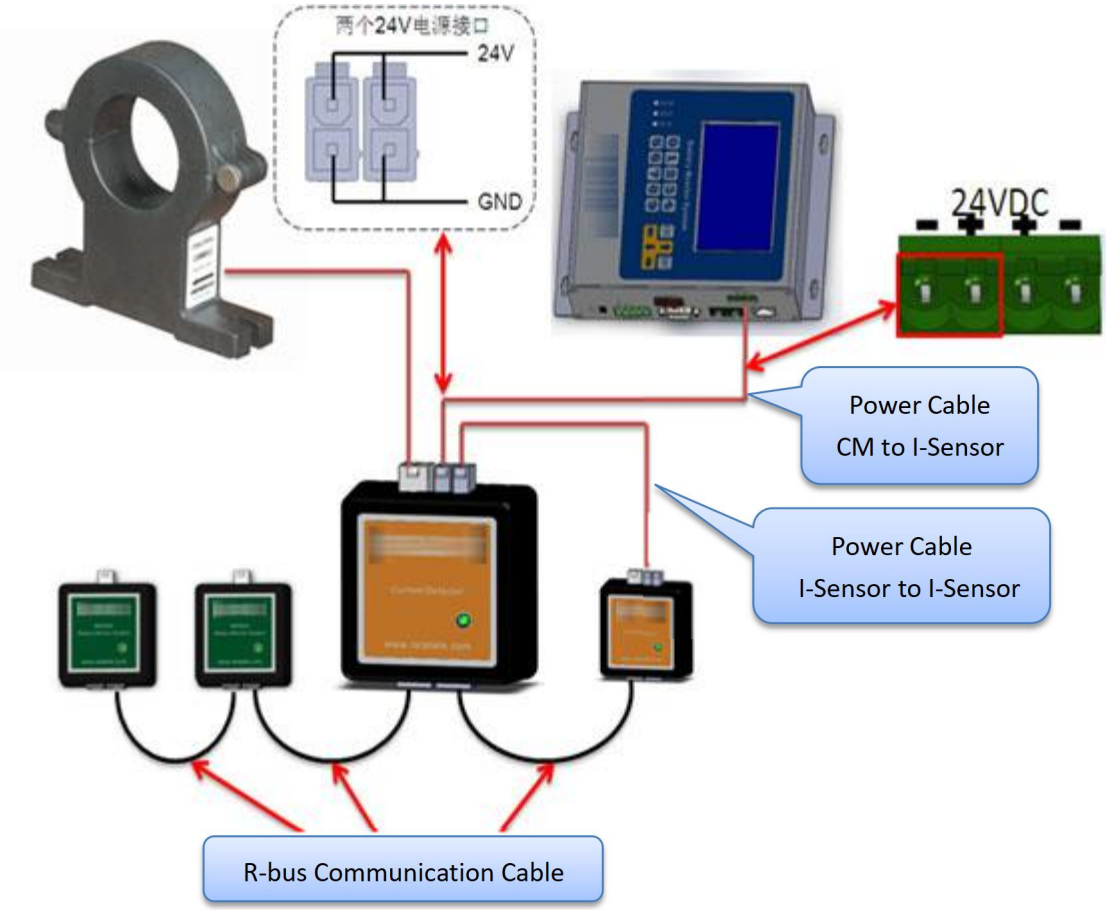
2) Place a horizontal reference line to make the sensors look neat.

3) Remove the backing from the adhesive patches on the battery sensor then position and mount it onto the top or side of the battery block **(Important: Make sure the surface is clean!)**.

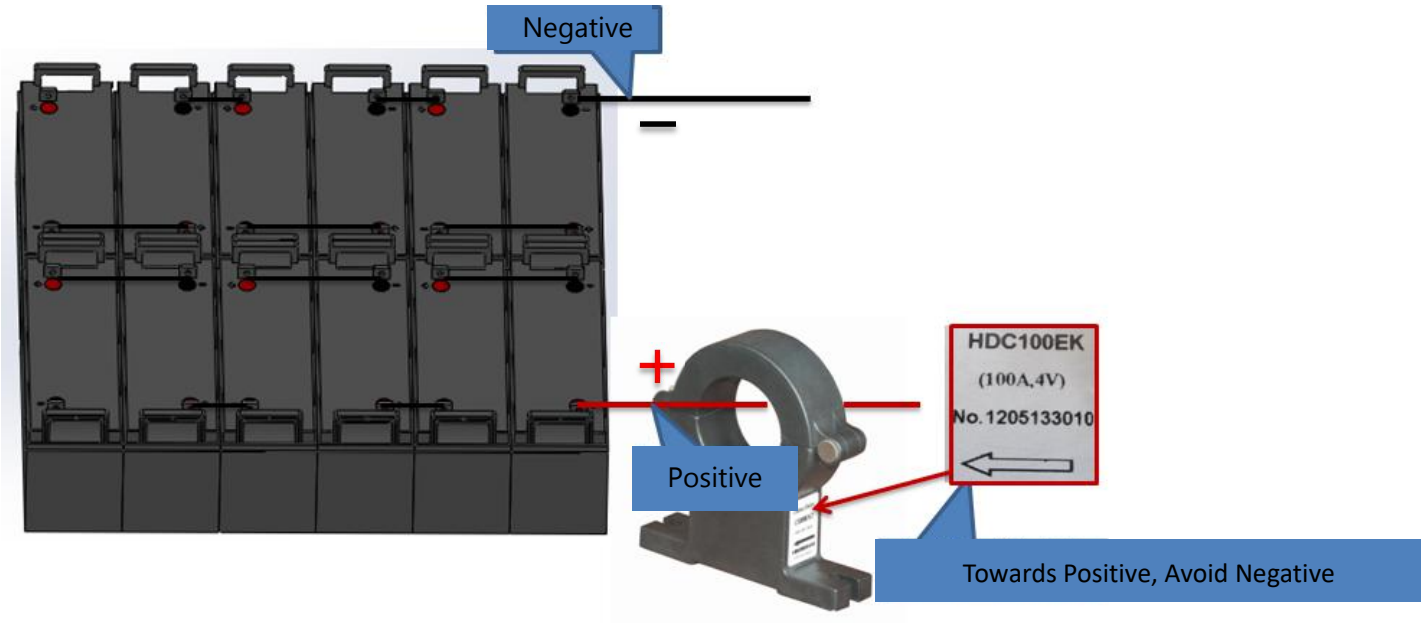
5.6. Step 5: Install Current Detector BM00IS

Remove the backing from the adhesive patches on the I-Sensor then position and mount it onto the top or side of the battery block, or on the battery rack **(Important: Make sure the surface is clean!)**.

Connect all the cables as below.



Make sure the current transformer is in correct direction.



5.7. Step 6: Connect R-bus communication cable

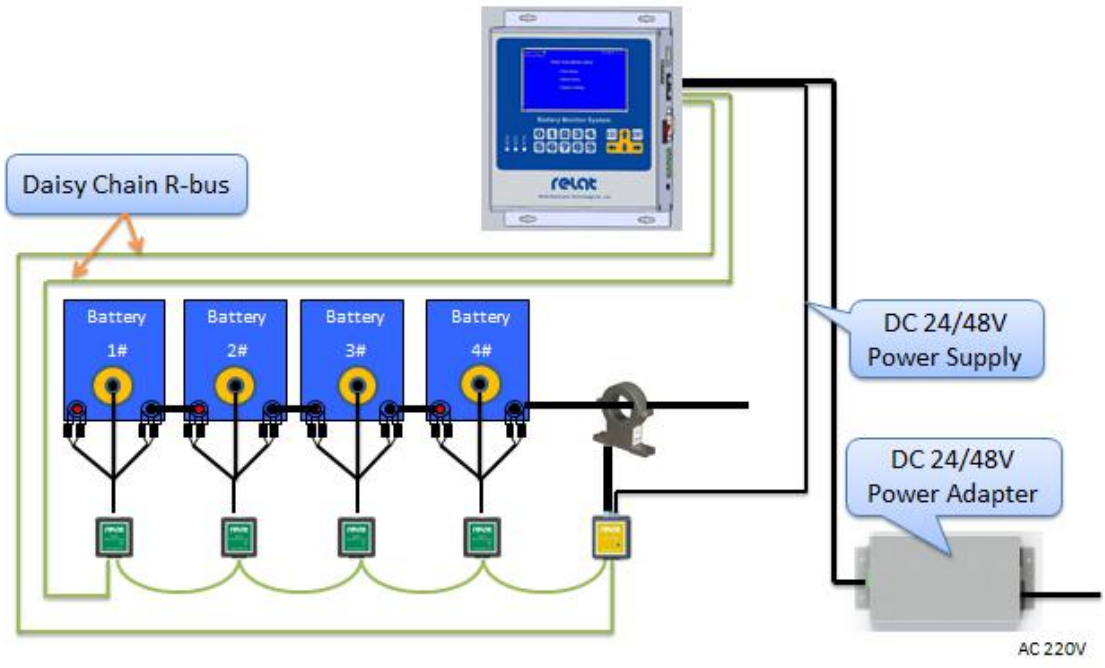
Connect all R-bus communication cables of battery sensor BM3KRS and BM00IS.

5.8. Step 7: Install Control Module

The control module should be mounted at a wall,enclosure or battery rack.

Enclosure Mounted at the wall or battery rack.

Connect all the cables to the Control Module as below picture: All Control module, battery sensors and the current detectors are daisy chain R-BUS connection from R-Bus Port1 back to R-Bus Port 2 as a closed loop. There have 2 R-bus Ports at the side of each control module, closed loop wiring will enhance the communication ability. Control module and current detectors are feeds DC24v power supply.



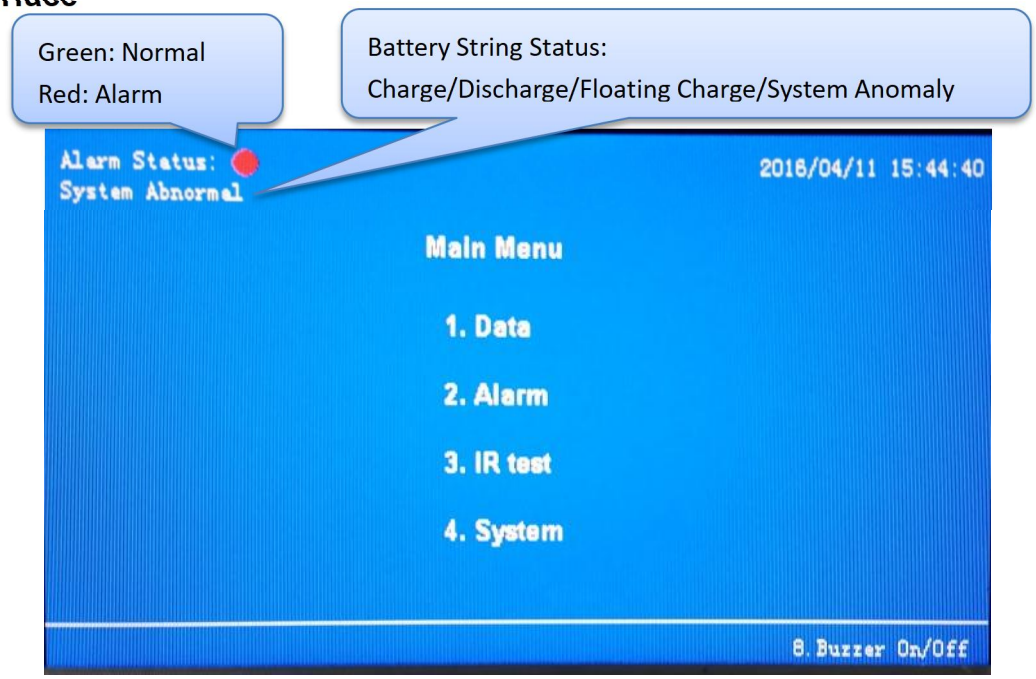
Till now, all the installations is complete. Check all the connections of battery sensor, I-Sensor and Control Module, to make sure all are correct, especially the positive and negative terminal of batteries and power, before power on them.

If required wiring from the floor or the bridge,please check with the user if need to installation of PVC trunking, to ensure safe and neat in the battery room.

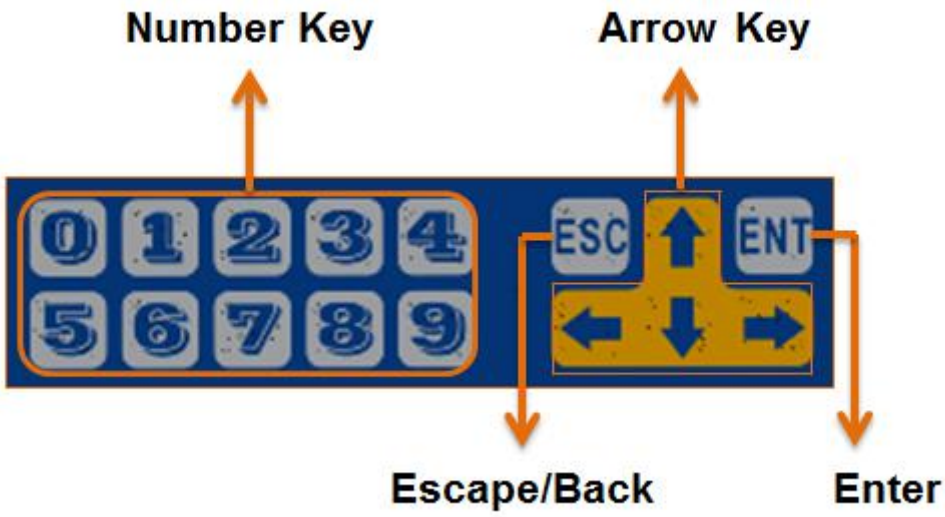
6. Query and Setting

Control Module BM00CS has a 4.3" TFT LCD and keyboard, most of settings, data and alarm query can be obtained on CM.

Main interface

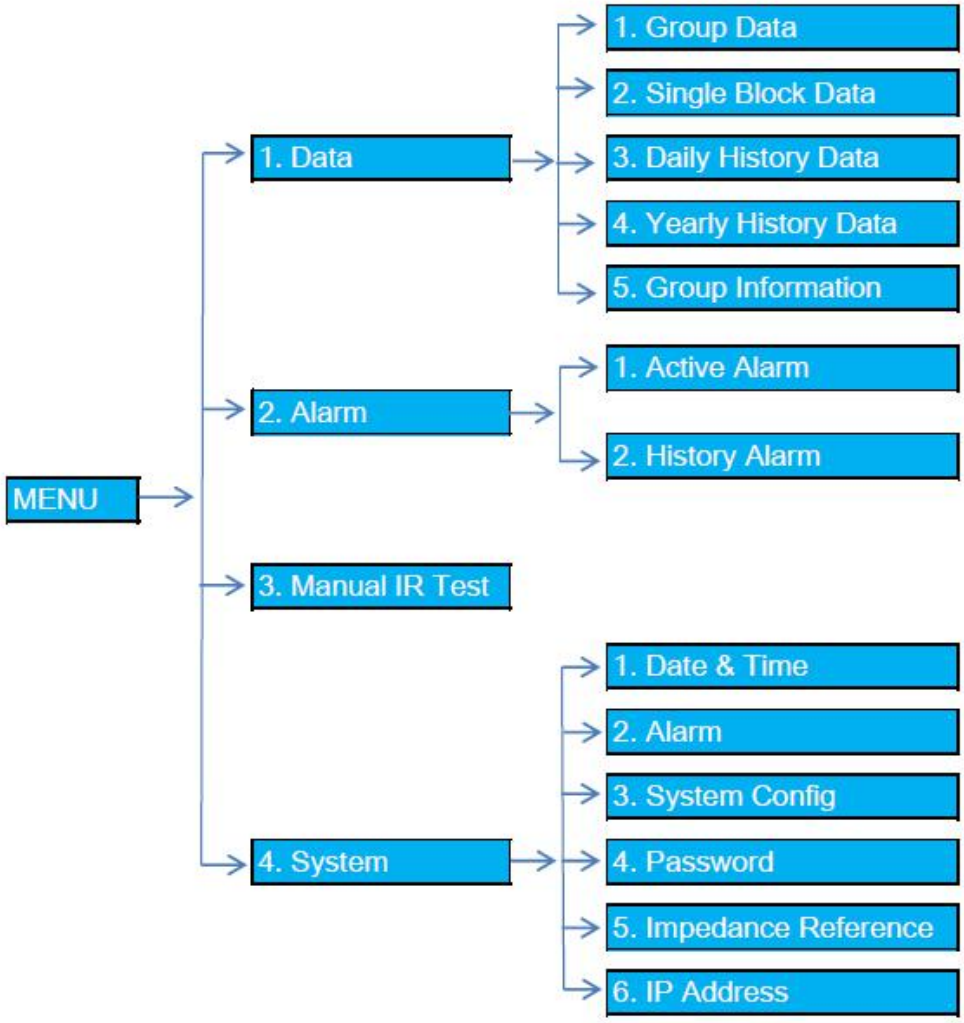


Keyboard



MENU TREE

From Menu, press Number Key to enter different menu item, to query data or alarm. For example, to get "Single battery block data", main menu →press Key "1" → press Key "2", then all single battery online data will be shown on the LCD screen, each page will show 10 pcs battery, press Arrow Key up or down to turn page.



6.1. Checking All Data If Correct

After all connection have been done, power on the Control Module BM00CS. The BM00CS will automatically start to monitor battery internal resistance, voltage and temperature. Usually, the module requires one or two minutes to collect the battery live data at the initial setup and then you may enter menu to check if all the data is correct.

From main interface, press '1' to enter '***1.Data***' menu, and press '1' to enter '***1. Group Data***" menu, please check all the group data if correct.

From main interface, press '1' to enter '***1.Data***' menu, and press '2' to enter "***2. Single Block Data***"menu, please check all batteries data if correct.

6.2. Checking Alarm

It's able to query the detailed alarm info from Control Module(BM00CS)

From main interface, press '2' to enter '***2.Alarm***' menu, and press '1' to enter "***1. Live Alarm***"menu, please check what alarm is happening now.

From main interface, press '2' to enter '***2.Alarm***' menu, and press '2' to enter "***2. History Alarm***"menu, please check the detailed history alarm.

6.3. Perform A 'Manual IR Test'

As default, the control module will automatic measure battery internal resistance once a month/week/day, but it also can be done manually. Normally it requires perform a 'Manual IR Test' after installation, then we can read the internal resistance value at once.

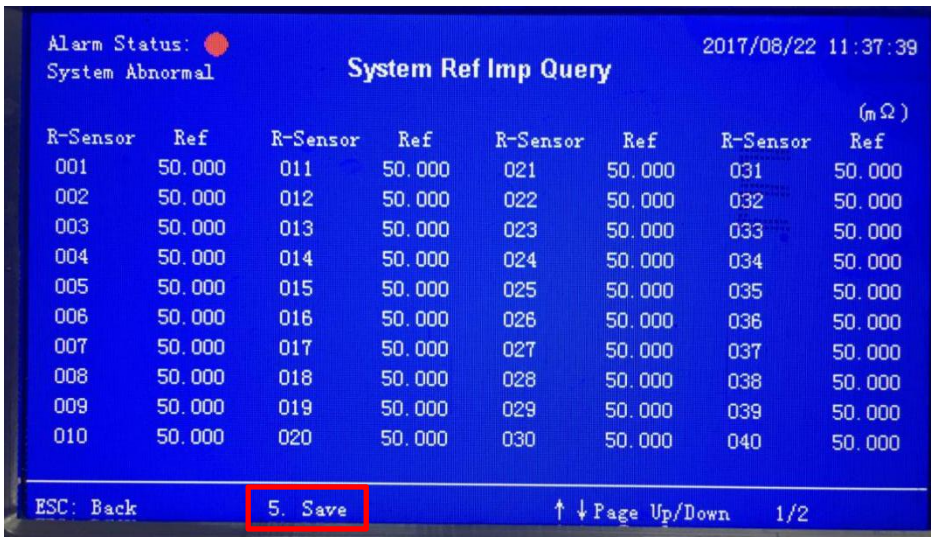
From main interface, Press Key "3" to enter "***3. Manual IR Test***" to perform resistance test, all the internal resistance data will be refresh and display soon.

Note: The default user password is "000000". Supervisor Password is '122478'.

6.4. Save Impedance Reference

It requires to save the impedance reference as save the impedance basic valve. When time past, the impedance will be increased, the impedance basic valve will be important reference valve.

From main interface, After the first time resistance test performed, press "5" to enter "***5. System***", then press "5" to enter '***5. Impedance Reference*** ', press '5' to save the impedance reference valve, then the Ref valve will be refresh and display soon. (Password: 000000")



7.Advanced Setting

7.1. Alarm Setting

From main interface, press 4 to enter '***4.System***' menu, press 2 to enter '***2.Alarm***' menu.
← left key is delete the valve, ↓ down key is switch to next one alarm setting

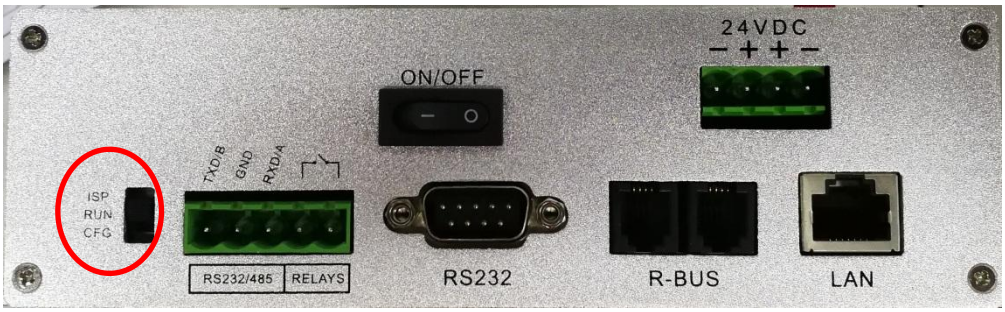
7.2. Impedance Setting

♦ Modify Impedance High Limit
From main interface, press 4 to enter '***4.System***' menu, select the 'Ω H Limit', the unit is 10μΩ, example if modify 8 mΩ, input 800 into the input box.

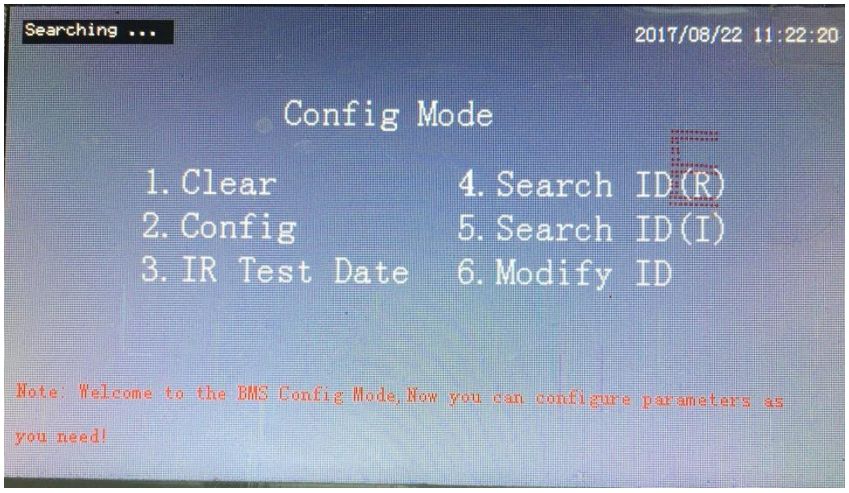
♦ Modify (Delta IR)% High Limit, it's the impedance change percentage high limit. When time past, the impedance will be increased, it display how much percentage of the basic impedance valve.
From main interface, press 4 to enter ***'4.System***' menu, select the ' (Delta IR)% High Limit',

♦ Modify Impedance Automatic Test Date
Please turn to Menu 7.3 for reference

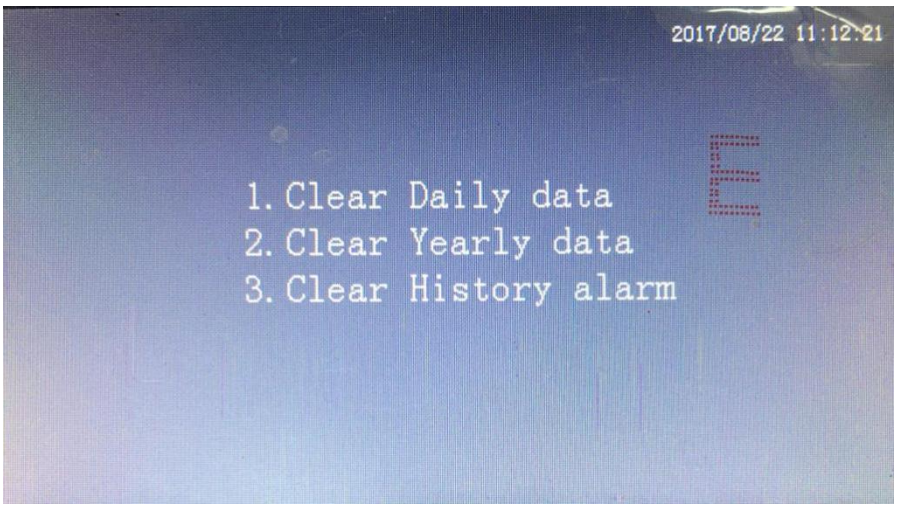
7.3. System setting



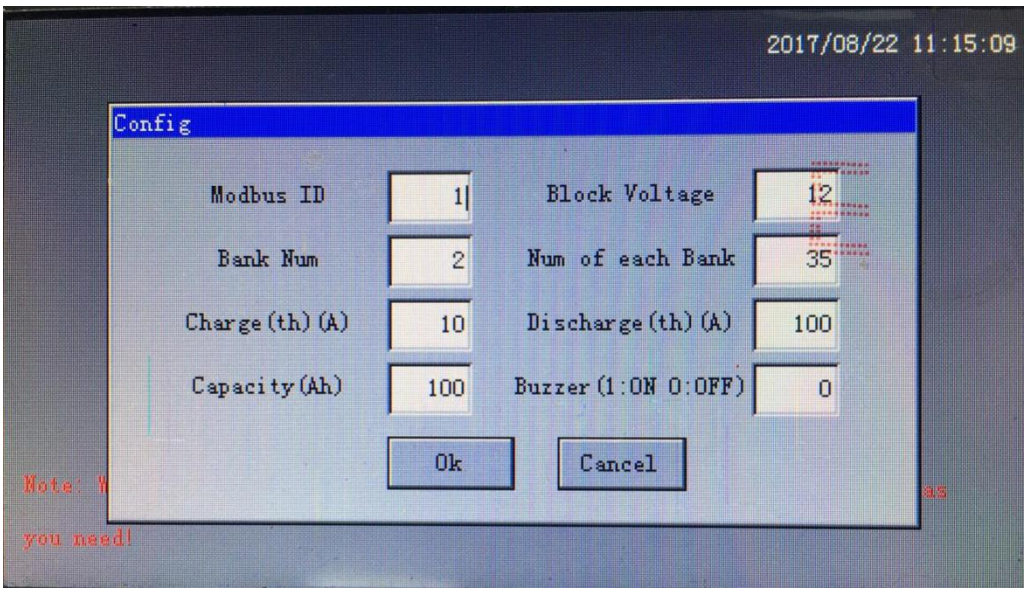
How to go to the system setting interface?
Press ON/OFF to power off the control module, kindly check the toggle switch at the side of control module. Make sure the toggle switch is in "CFG" position. Press ON/OFF to power on the control module.



1. When enter the '***1. Clear***' menu, the Daily Data, Yearly data or history alarm can be clear away. Before clear, please confirm that these data if available for you.



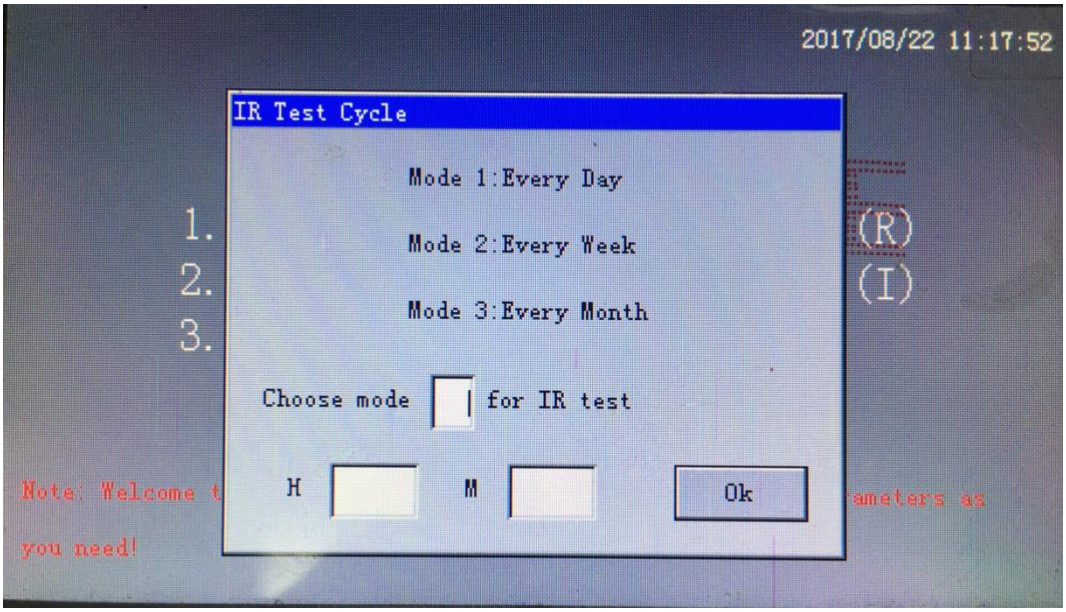
2. When enter '***2. config*** ' menu, it is able to configure the system info.



Modbus ID: If connected with multiple sets of control module, the modbus ID of each control module cannot be repeated, it requires to modify the Modbus ID from here.
Block Voltage: The system support 2V, 6V or 12V battery, please input one of them
Bank Num: the quantity of battery bank/string which connect in parallel from 1 set of UPS
Num of each Bank: the quantity of battery of each battery bank/string from 1 set of UPS
Charge (th)(A): Charge Threshold, 5A multiply by string number.(Charge Current will display '-A')
Discharge (th)(A): Discharge Threshold, 5A multiply by string number. (Charge Current will display '+A')
Capacity(Ah): Battery Ah from battery specification.
Buzzer(1:ON 0:OFF): Input 1 or 0. (1:ON 0:OFF)

Example: 1 set of UPS with 35 blocks of 12V 100 AH battery per string x 2 string.
Block Voltage: 12 Bank Num:2 Num of each Bank:35
Charge (th)(A):10 Discharge (th)(A):10 Capacity(Ah):100

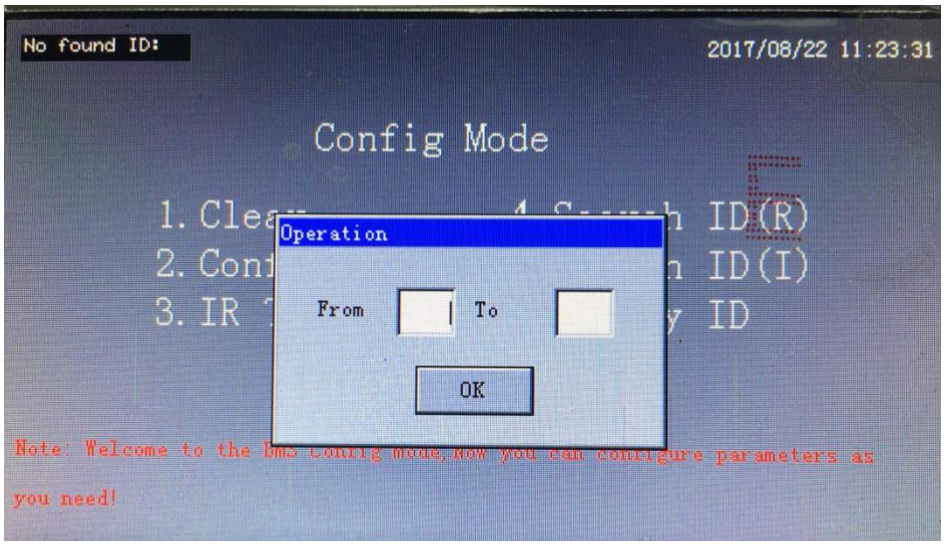
3. When enter '***3. Impedance Test Date'*** menu, the internal resistance can be automatically measure from daily, weekly or monthly, please select the three mode, input the number in the input box. Input the time hour and min to measure impedance. Example: We advise to test impedance every week, test time is in the morning at 9 o'clock. Choose mode 2 every week for IR test, H:09 M:00



4. When enter '***4.Search ID (R)***' menu, please confirm there is only connected 1 pcs of R Sensor from the control module. Disconnect the R-BUS Port 1 and R-BUS Port 2, use another R-Bus cable directly connect from battery sensor to the control module, and press 4 to enter '4.Search ID (R)' then the result will found on the left top of the interface.

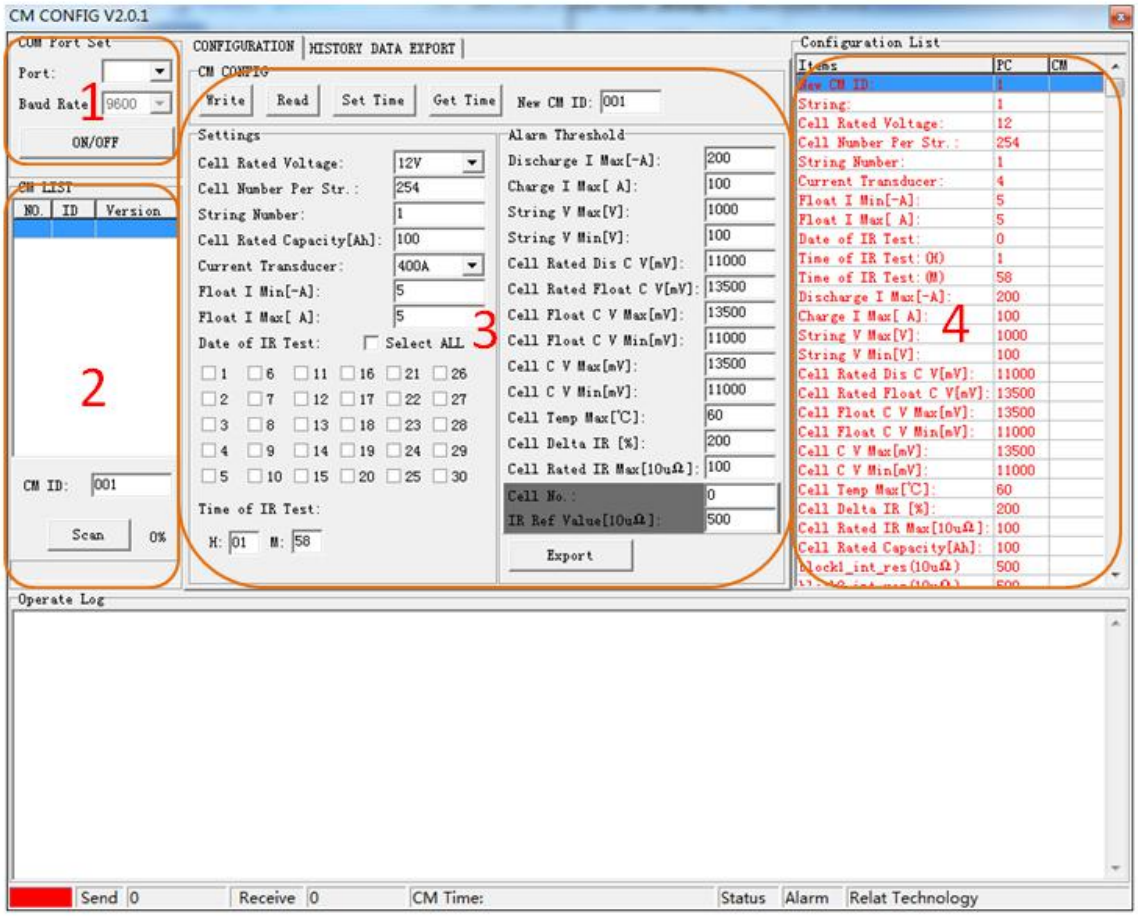
5. When enter '***5.Search ID (I)***' menu, please confirm there is only connected 1 pcs of I Sensor from the control module. Disconnect the R-BUS Port 1 and R-BUS Port 2, use another R-Bus cable directly connect from current detector to the control module, and press 5 to enter '5.Search ID (I)' then the result will found on the left top of the interface.

6. When enter '***6. Modify ID***' menu, please confirm there is only connected 1 pcs of R Sensor OR I Sensor from the control module. Disconnect the R-BUS Port 1 and R-BUS Port 2, use another R-Bus cable directly connect from sensor to the control module, and press 6 to enter '***6. Modify ID***', input the original ID number and the New ID number. Example, we want to modify the ID:1 to ID:5, From 1 to 5, click OK to finish



8. System Configuration

Connect Control Module BM00CS to computer through RS232 interface.
Kindly check the toggle switch at the side of control module.Make sure the toggle switch is in “CFG” position.
Restart CM.(Power off and Power on)
Open software “CM CONFIG V2.0.1.exe”.
Take the following steps to configure all settings.



Step 1: Select COM Port and press ON/OFF, the status will show green color instead of red, when the connection has been established.

Step 2: Press button “Scan” to find the CM module, then fill in the CM ID No. after CM is found.

Step 3: Press button “Read” to get the original setting of CM.

Alarm Threshold:

Discharge I Max: the maximum of discharge current

Charge I Max: the maximum of charge current

String V Max: the maximum of battery string voltage

String V Min: the minimum of battery string voltage

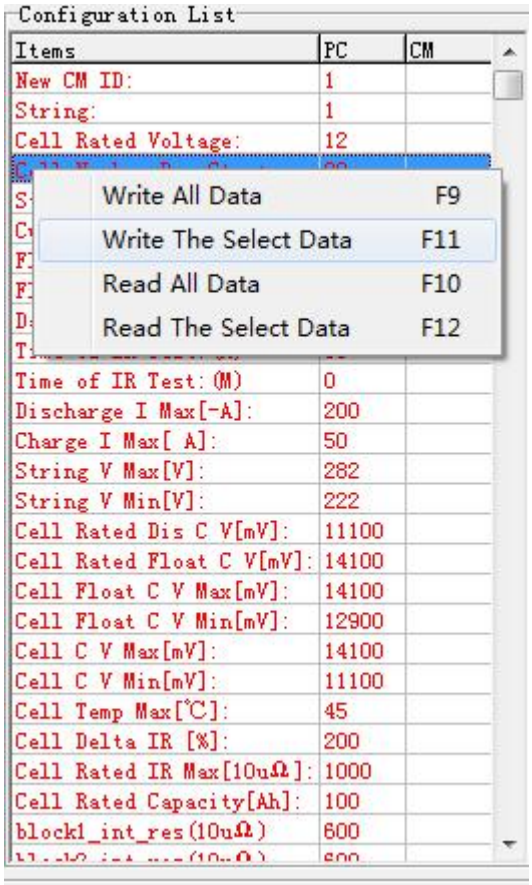
Cell Rated Dis C V: the rated battery discharge voltage

Cell Rated Float C V: the rated battery floating charge voltage

Cell Float C V Max: the maximum of battery floating charge voltage

Cell Float C V Min: the minimum of battery floating charge voltage
Cell C V Max: the maximum of battery charge voltage
Cell C V Min: the minimum of battery charge voltage
Cell Temp Max: the maximum battery temperature
Cell Delta IR: the battery Internal Resistance change rate
Cell Rated IR Max: the rated maximum battery internal resistance
Cell No.: battery number, when it's "000", all battery IR Ref will be changed
IR ref Value: battery internal resistance reference

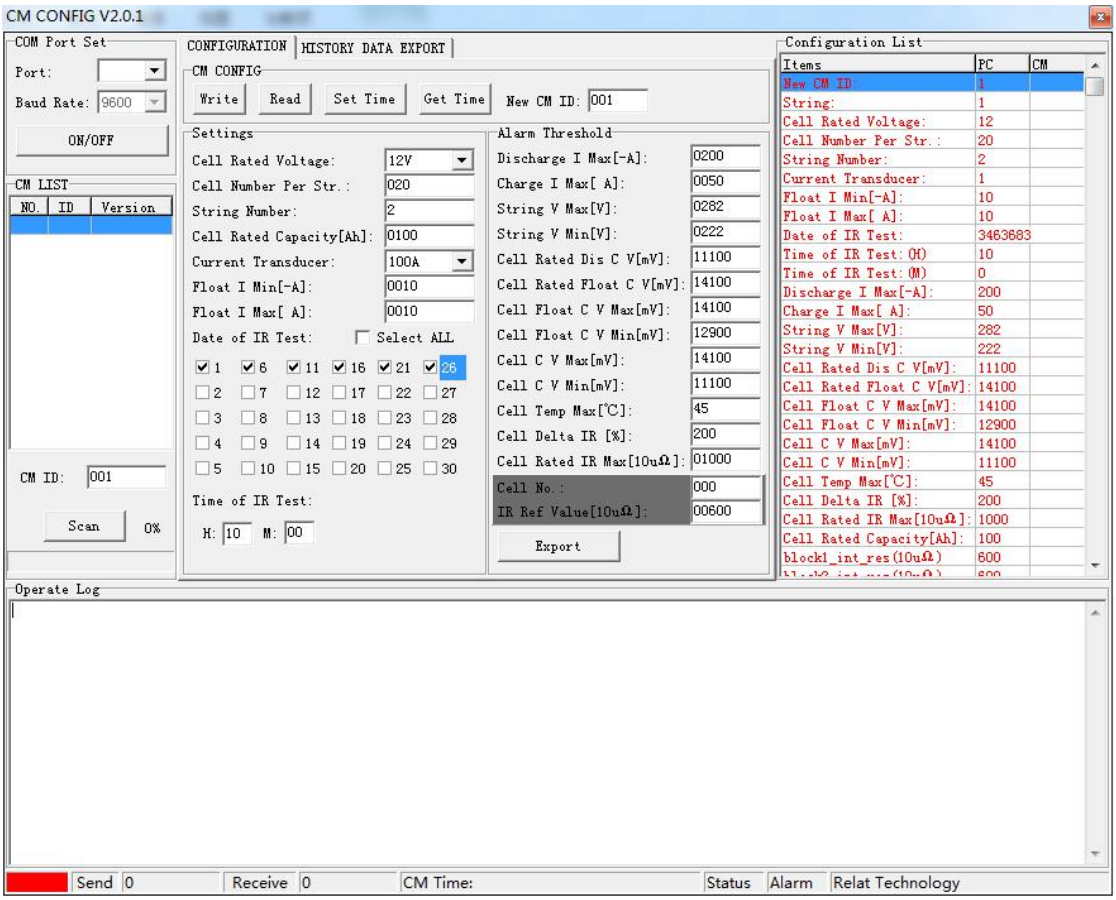
Step 4: Compare all the settings between PC and CM, the different setting items will be shown as red color in Configuration List, then press button "Write" and save all settings to CM. If you just need to change some of items, select the items in Configuration List and click right, select "Write The Select Data", then the select item will be saved and the others remain unchanged.



Example of configuration:

Battery: 12V 100Ah

2 Stings, each string 20 blocks battery



9.Alarm Setting Form

Alarm Type \ Block Voltage	2 V	6 V	12 V
Discharge Voltage Low Limit	1850 mv	5550 mv	11100 mv
Float 1 Voltage High Limit	2350 mv	7050 mv	14100 mv
Float 2 Voltage High Limit	2350 mv	7050 mv	14100 mv
Float Voltage Low Limit	2150 mv	6450 mv	12900 mv
Charge Voltage High Limit	2350 mv	7050 mv	14100 mv
Charge Voltage Low Limit	1850 mv	5550 mv	11100 mv
(Delta Ω)%	200%	200%	200%
Temp H	45 °C	45 °C	45 °C

String/ Bank Alarm Setting Method as below,

Discharge I (Current) H (High) Limit: Battery Nominal Capacity 1C multiply by string/bank number.(C stand for battery capacity)

Example: battery setup is 1 set of UPS x 2 Bank x 32 Block 12V 100 Ah battery,

1x100 Ah x 2 bank = 200 A

Charge I (Current) H (High) Limit: Battery Nominal Capacity 0.25C multiply string/bank number. (C stand for battery capacity)

Example. battery setup is 1 set of UPS x 2 Bank x 32 Block 12V 100 Ah battery, 0.25 x 100 Ah x 2 Bank=50 A

Bank V (Voltage) H (High) Limit: Charge V H limit multiply battery quantity of each bank

Example. battery setup is 1 set of UPS x 2 Bank x 32 Block 12V 100 Amp battery,

14.1 V x 32 block = 451.2 V ≈ 452 V (It should input an integer)

Bank V (Voltage) L (Low) Limit: Charge V L limit multiply battery quantity of each bank

Example. battery setup is 1 set of UPS x 2 Bank x 32 Block 12V 100 Amp battery,

11.1 V x 32 block = 355.2 V ≈ 356 V (It should input an integer)

Ω (Internal Resistance) H (High) Limit: Battery internal resistance value from battery specification multiply by 2 times or the average value of battery internal resistance test at site multiply by 2 times.

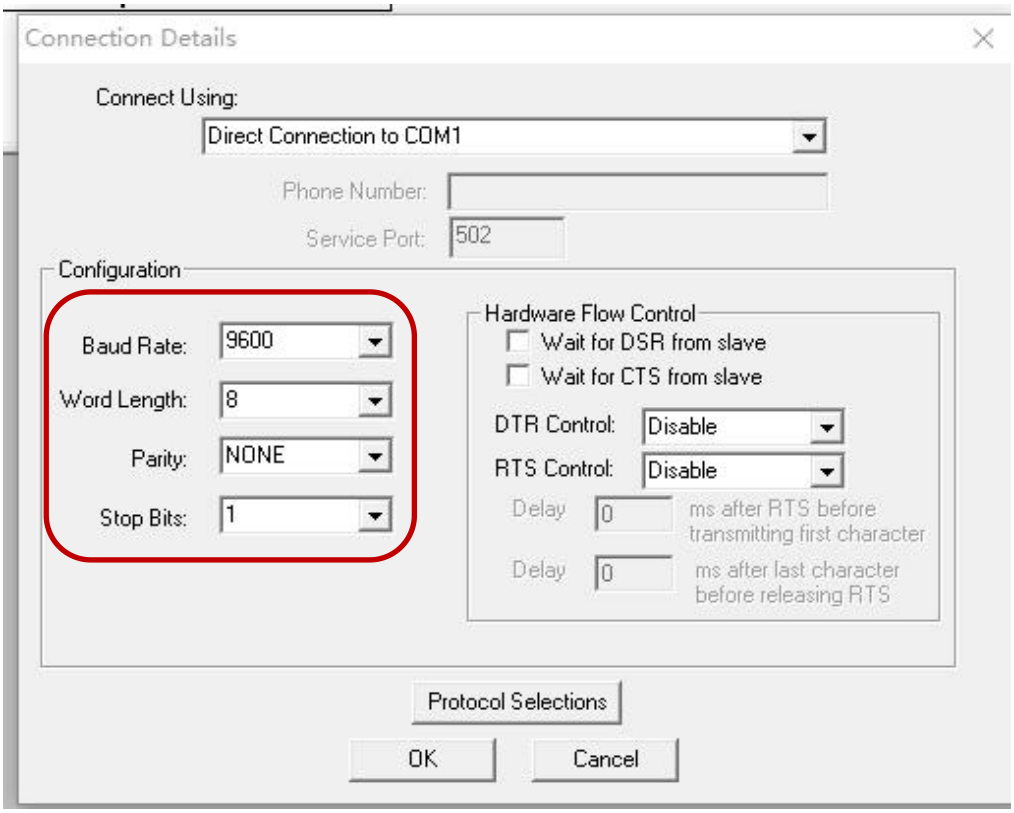
LCD (Leakage Current Detection) H (High) Limit: The leakage current detection function is require to installed two unit of Current detector for each bank/string, default setting is 5000 mA. If the system installed 1 unit of Current detector per bank, Default setting is 0.

10. Integrated to the 3rd party software

10.1. RS485 Port

Control module have RS232/RS485 Port, it support MODBUS RTU Protocol,it's able to use RS485 port to integrated to the 3rd party software,please find our Modbus Register Map for reference.

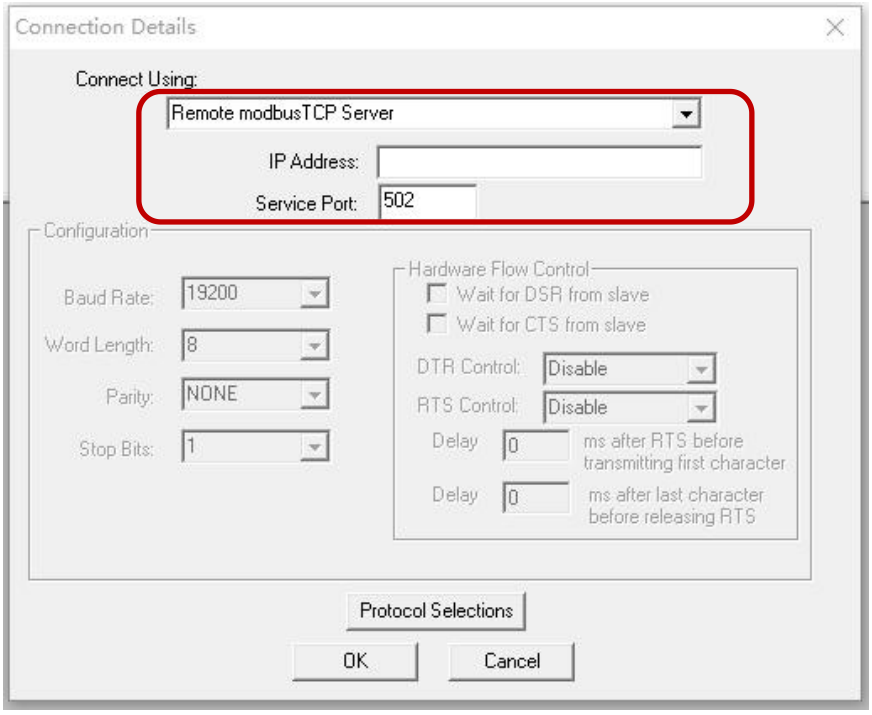
If connect Using direct connection to COM 1, please configuration the info the same with the red box below.



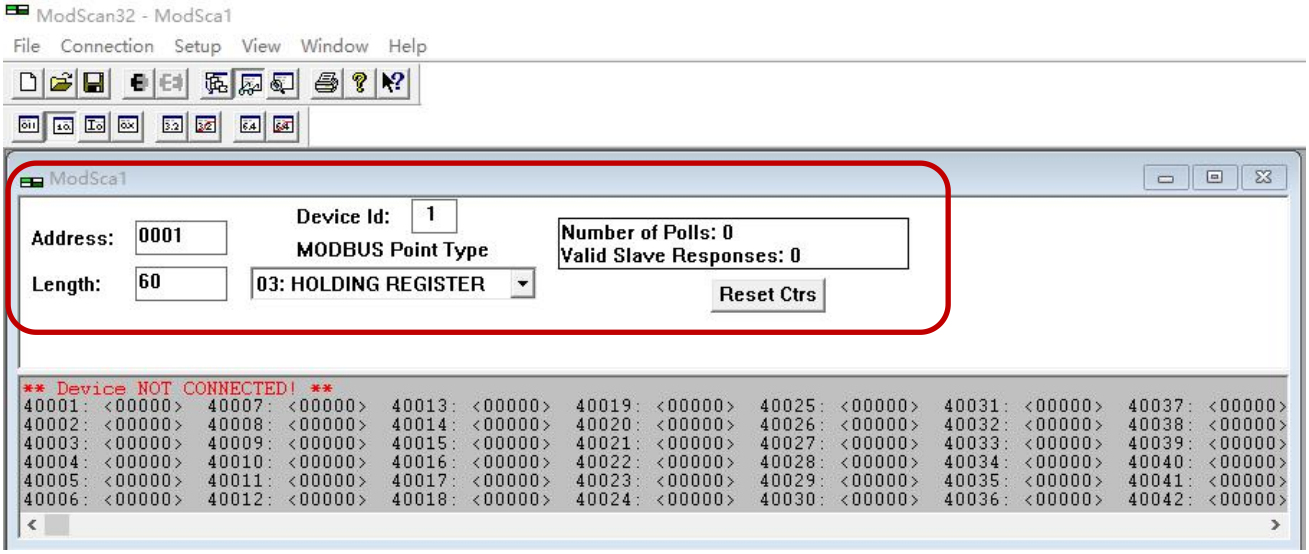
10.2. Ethernet Port

Control module have Ethernet Port, it support MODBUS TCP/IP Protocol,it's able to use Ethernet port to integrated to the 3rd party software,please find our Modbus Register Map for reference.

If connect Using direct connection to Ethernet port, please select 'Remote Modbus TCP Server' from the Modscan tool. please confirm the IP address and Service Port are same with the Control Module.



If it's success to get Modbus TCP connection from control module, please set as below to polling the measurement data.



<The End>

Shenzhen Relat Electronic Technology Co., Ltd.
Add: Suite A602, Huachuangda Centre, Xinhua No.1 Rd, Bao'an District, Shenzhen, 518101
Tel: +86-755- 2956 3743 Fax: +86-755- 2976 9341