



IBMU Battery Monitoring Unit

Installation & Commissioning Manual

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Special Declaration

Personnel Safety

1. This product must be installed and commissioned by professional engineers of the manufacturer or its authorized agent. Failure to observe this could result in product malfunction or personnel safety risk.
2. Take the time to read this product manual and the safety precaution thoroughly before installing and commissioning this product. Failure to observe this could result in product malfunction or personnel safety risk.
3. This product is not intended for life support device application.

Product Safety

1. If this product will be stored or remain de-energized for a long period, it must be placed in a dry and clean environment within specified temperature range.
2. This product should be used in an appropriate operating environment. For details, refer to the section on the environmental requirement in this manual.
3. This product is not designed for application in an environment:
 - Where the temperature and relative humidity are outside the specifications
 - Subject to vibrations or shocks
 - Where conductive dusts, corrosive gases, salts, or flammable gases are present
 - Near heat sources or strong electromagnetic interferences

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Vertiv disclaims any and all responsibility or liability for the defects or malfunction caused by:

- Application range or operating environment outside the specifications
- Unauthorized modification, improper installation or operation
- Force majeure
- Other actions not in compliance with the instructions in this manual

Revision Information

V1.0 (December 27, 2018)

Initial release.

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Chapter 1 Overview

The IBMU battery monitoring system generally consists of Single cell detection (TA) module, Current detection module (TC) module, and Battery controller module. The Battery controller module is equipped with LCD display and can upload data through RS485 or network port. For remote monitoring, one computer can be connected to the battery monitoring device through the network or the serial port. Monitoring software should be installed on the computer to view the battery parameters remotely. The site-specific circumstances may require installation of cabinets.

1.1 Appearance



Figure 1-1 IBMU battery monitoring Unit

1.2 Functions

The standard configuration has the following functions:

- Monitors the real-time data of battery block voltage, battery internal resistance, temperature, battery string voltage, charge/discharge current, and ambient temperature of single battery cell.
- Triggers Alarm automatically when exceeding the predefined threshold points & time.
- On-site display function.
- Data storage function. Data can be uploaded via RS485 or net port.
- Built-in output dry contacts
- Touch screen 5.7-inch LCD display (optional).
- Communication converter module to convert from UART to RS485 protocol (optional).

Chapter 2 System Composition And Module Description

This chapter summarizes the system configuration and module description of the IBMU battery monitoring unit.

2.1 System Composition

The main components of standard configuration are shown in Table 2-1.

Table 2-1 Main components of standard configuration

No.	Image	Name
1		Single Cell Detection (TA) module
2		Battery Controller module
3		Current Detection (TC) module
4		Current Transformer (CT)
5		TA test cable
6		TC test cable
7		IBMU communication cable

8		Power cable
9		Display Unit
10		Converter communication module

The Single cell detection (TA) module collects the voltage, internal resistance, and temperature of each battery, while the current detection (TC) module collects the charging & discharging current and ambient temperature of the battery string. After interconnecting through the UART bus, they are connected to the battery controller module, and the Battery controller module is connected to the hosting server through the serial port or network port to realize remote centralized monitoring & management. The system topology diagram is as follows.

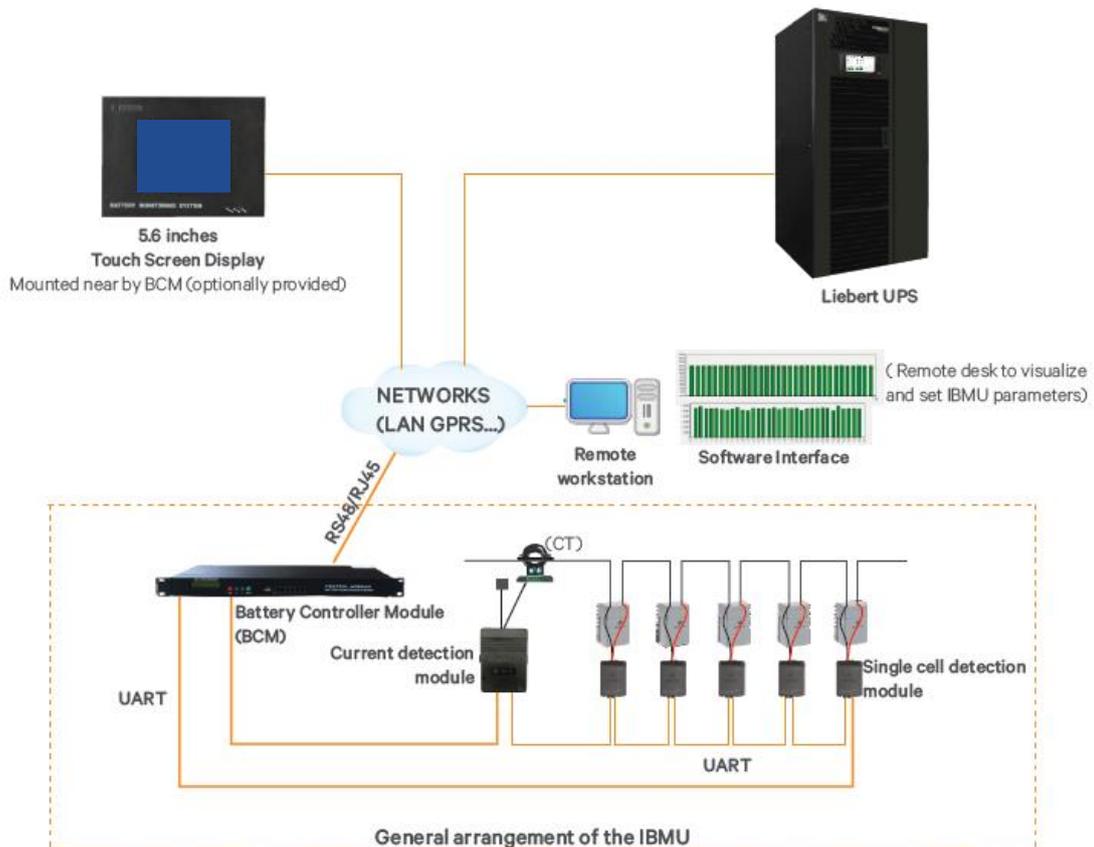


Figure 2-1 Topology diagram

2.2 Single Cell Detection (TA) Module

TA module can monitor the voltage, internal resistance and temperature of a single battery, and transmit the data to the Battery controller module through the communication port. TA module does not have the function of warning and judgment. TA module is powered by the battery. When 2V module is working normally, the absorption current is 7mA, not greater than 13mA; when 6V and 12V modules are working normally, the absorption current is 3mA, not greater than 7mA. It should be noted that the 2V module can only be used on the battery monitoring of 2V. The same is true for 6V and 12V. Otherwise, the module will be damaged.

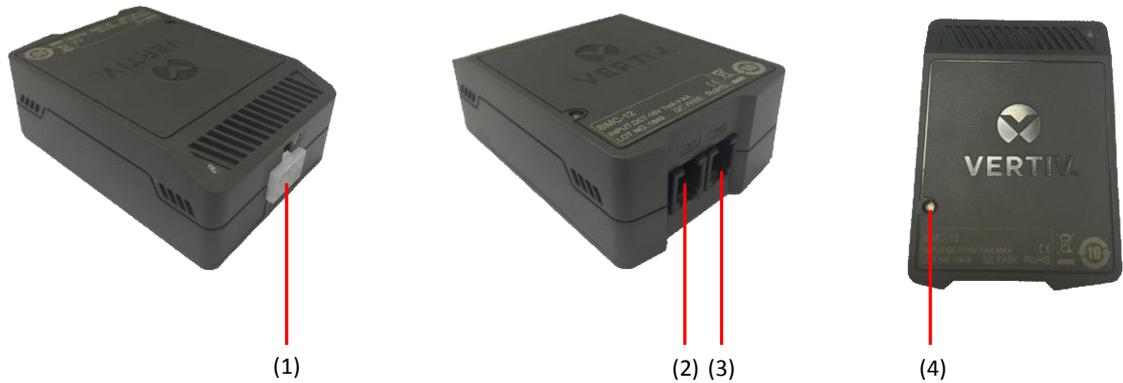


Figure 2-2 TA module

No.	Name	Description
(1)	J1 port	To battery positive and negative poles
(2), (3)	COM1/COM2 port	The internal parallel UART port for communication cascade between TA modules
(4)	Indicator	Green for power indicator, red for communication indicator

2.3 Battery controller Module

The Battery controller module can read the voltage, internal resistance and temperature value one by one from the TA module, and analyze, process and display them. A battery controller module can monitor up to six groups of batteries, with specific functions as follows:

- a) Reads the measured battery voltage, internal resistance and temperature of each TA module
- b) LCD display to inquire real-time monitoring data and historical alarm record
- c) Define upper & lower limit values of operation parameters
- d) Automatic alarm function: when alarm, LED indicator is on and buzzer is sounded, and at the same time, dry contact is closed
- e) With an RS485 port and a network port, IBMU can be connected to the host computer.

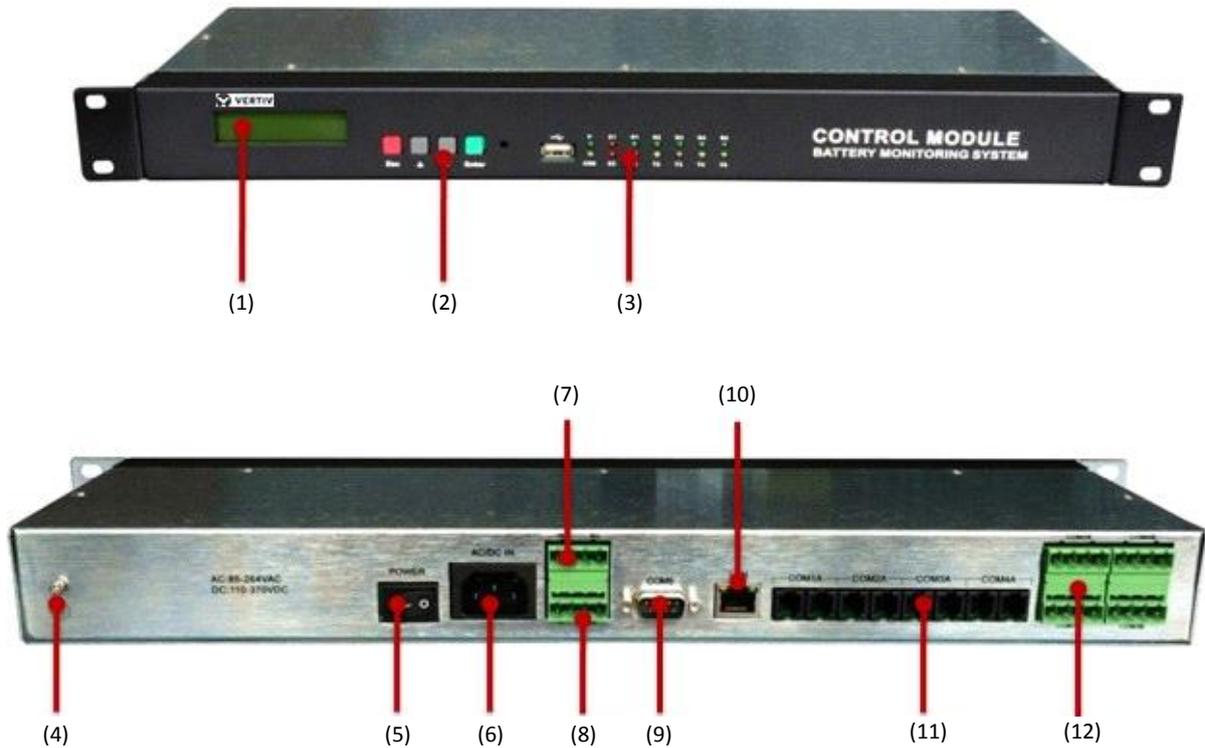


Figure 2-3 Battery controller module

No.	Name	Description
(1)	LCD screen	Two lines of English display, 122*32
(2)	Button	Totally four buttons. 'Esc' for exit; '▲' and '▼' for page up and down; 'Enter' for confirmation
(3)	Indicator	P is the power indicator, which is always on when energized. When USB is on, the device is faulty; when E1 is on, there is communication failure; when E2 is on, battery alarm generated. R1/T1 is the data transceiver indicator of COM1. When receiving data, R1 is on; when sending data, T1 is on; R2/T2, R3/T3, R4/T4 and R5/T5 correspond to COM2, COM3, COM4 and COM5, respectively
(4)	Earthing point	Connected to electrical room earthing bus bar
(5)	Power switch	Control the power input of battery controller module
(6)	Power input port	85~264Vac input. Module power consumption is less than 15W
(7)	Digital quantity input port	Two are available: IN1, IN2
(8)	Dry contact	J1 for device or communication alarm, J2 for battery alarm, 220Vdc/1A
(9)	COM5 port	Data upload port to connect host computer, RS485, Pin5 is positive while Pin is negative, and baudrate is 19200bps
(10)	LAN port	Can be directly connected to LAN network; support Modbus/TCP and SNMP protocol
(11)	COM1A~COM4A ports	Connected to TA module and TC module. One port supports at most 240 modules, totally 960 modules at most
(12)	COM1B~COM4B ports	12V power output port, Pin3 is positive while Pin4 is negative, Pin1 and Pin2 are unavailable

2.4 Current Detection (TC) Module

Current detection (TC) module can monitor the charging and discharging current of a battery string and an ambient temperature. It can communicate with the battery controller module through the UART port. Each battery string needs one TC module, the port description is as follows.

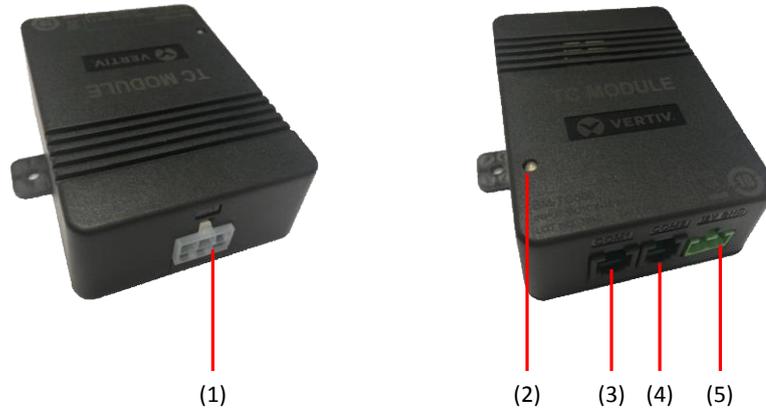


Figure 2-4 TC module

No.	Name	Description
(1)	J1 port	To CT and ambient temperature sensor
(2)	Indicator	Green for power indicator, yellow for communication indicator
(3), (4)	COM1/COM2 port	The internal parallel UART port for communication cascade between TA module and converter
(5)	VIN port	Power input port, DC8~13V, left is positive while right is negative. Powered by battery controller module, and the maximum power is less than 1W

2.5 Communication Converter Module

The communication converter module is only used when TA module is directly connected to the third-party system without battery controller module, and the function is to convert UART port to RS485 port.

Generally, a communication converter module needs to be configured for each 130 TA modules. The port description is as follows.

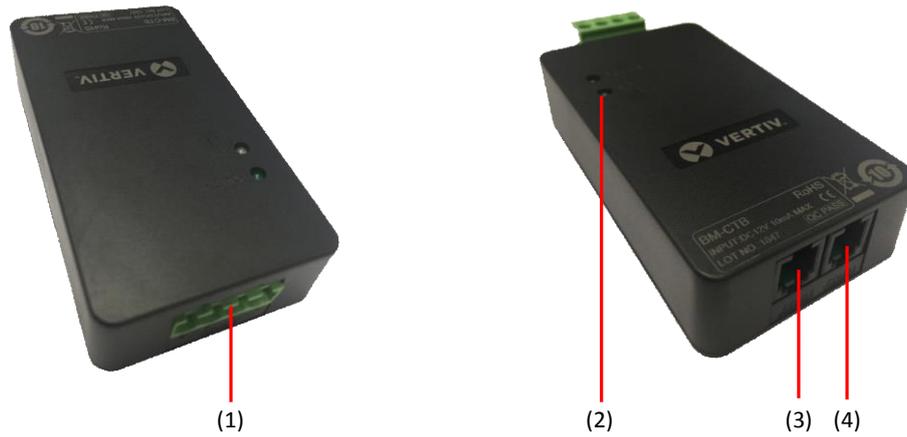


Figure 2-5 Converter

No.	Name	Description
(1)	Communication power port	Four cores, connected with the convergence module's COM1 or COM2 port, from left to right are B, A, +, -. B is RS485 -, A is RS485 +, baudrate is 9600bps, +/- is the positive and negative input of 12Vdc power supply, and the maximum consumption power is 0.3W
(2)	Indicator	Green for power indicator, red for communication indicator
(3), (4)	COM1/COM2 port	The internal parallel UART port for communication cascade between TA module and COM1/COM2 port

Chapter 3 Installation

This section provides a brief introduction to the installation procedures.

3.1 Tools For Installation&Commissioning

No.	Image	Name
Tools for installation		
1		Ratchet wrench 12902 Socket head 12307/309/311
2		Multimeter VC9807A+
3		Clamp meter VC3266D
4		Wire stripper 91108
5		Large cross insulated screwdriver 61213

6		Small slotted insulated screwdriver 61311
7		Small cross insulated screwdriver 61211
8		Sharp-nose pliers 70124A
9		Diagonal cutting pliers 70221A
10		Multi-function cable clamp CP-376TR
11		Electrician scissors 03131

12		Adjustable wrench 47222
Tools for commissioning		
13		Portable computer
14		485 converter and cable

3.2 Procedures For Installation&Commissioning

According to the general situation of the site, Vertiv will provide users with corresponding construction plans, engineering drawings, including device configuration, wiring methods and wiring diagram. The specific steps of installation and debugging are as follows:

1. Check the device and accessories against the packing list.
2. Description of construction scheme. Determine device installation location, routing method, etc. according to engineering drawings and site conditions, and explain to users and obtain their approval.
3. Place the device.
4. The wiring.
5. Power-on commissioning.
6. Check and accept.
7. Training.

The above will be explained in detail below.

3.3 Installation

3.3.1 Numbering Batteries

Before installing the TA module on the battery, you need to number the battery. The first battery at the positive end of each battery group is No. 1 battery, the second battery is No. 2 battery, and so on. The first battery at the negative end of the battery group is listed as the last battery, strictly follow this method. Number the corresponding label on the battery case to identify the exact location.

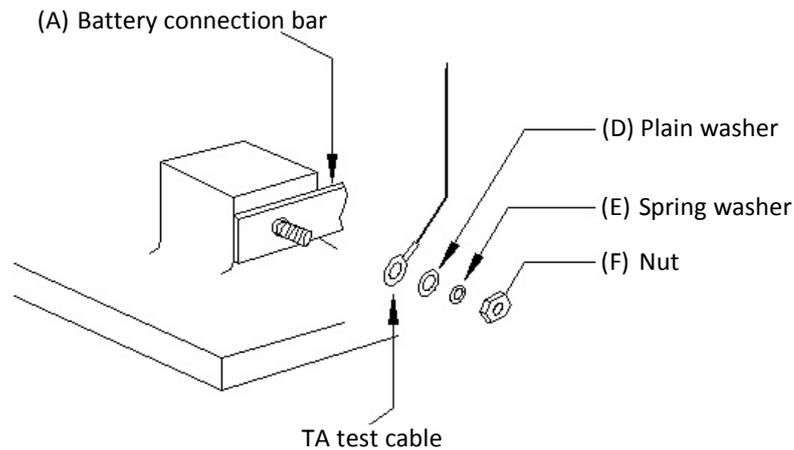


Figure 3-4 How to connect TA test cable

Please be sure to check and mark the tightness of each battery pole screw at the end of all installation and commissioning as follows:

Try to turn the sampling terminal on the battery pole by hand, make sure it is firmly tightened and mark the screw with an oil marker as shown below.

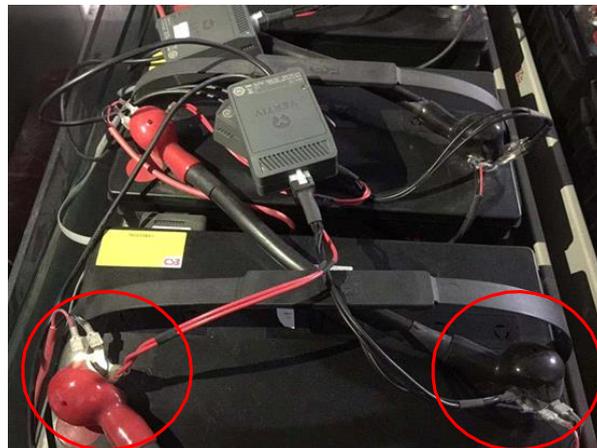


Figure 3-5 Check and mark the tightness of each battery pole screw

3.3.3 Installation of TA Module

Select the appropriate location on the battery to install TA module. Generally, it is directly attached to the side or front of the battery through the double-sided adhesive tape provided on the back of TA module. Note that it cannot be attached to the safety valve when installed on the front (as shown in position (1) below). Plug TA test cable into J1 port of TA module, connect one end of TA communication cable to port COM2 of TA module, and another end to port COM1 port of the next TA module after setting the address (as shown in position (2) below). At this time, the TA module has been powered ON and the green light should stay ON.

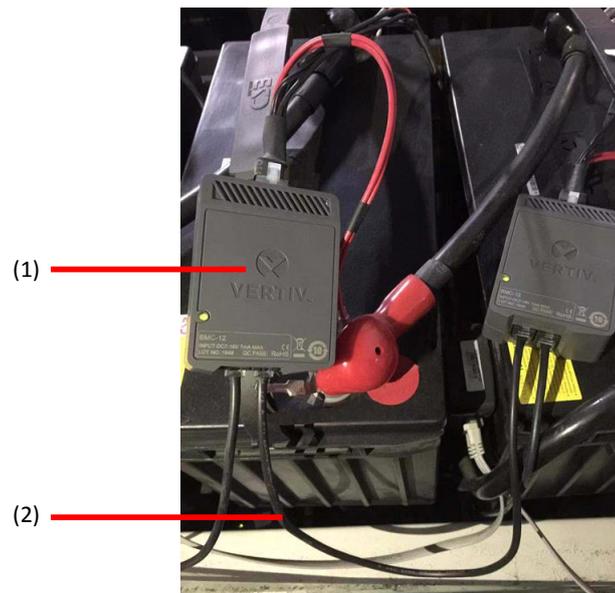


Figure 3-6 Connecting TA module

Although the TA module only consumes a very small amount of current, it is recommended to unplug the TA test cable from J1 if the battery is not recharged for a long time (more than one month) after installation.

3.3.4 Setting of TA Module Address

Method 1: Modify the addresses of TA and TC modules with TA address modifier.

Take the 32-block of each group as an example, the first group's TA address is set as: 1 ~ 32, and the TC address is set as: 241 (TA, TC default addresses are all 1), TA address of group 2 is set as: 1 ~ 32, TC address is set as: 241. After the address modification, group 1 is received to port COM1A of battery controller module and group 2 to port COM2A.

Modify the address of TA module

Switch on the side switch → connect TA module with a communication cable → press '▲▼' to set the address → press 'Enter' to confirm the modification → the status light turns green to indicate successful modification and turns red to indicate failure of modification.

Modify the address of TC module

Switch on the side switch → connect TC module with the communication cable → press the 'ESC' key, set the address by pressing '▲▼' key → press the 'Enter' key to 'H-A' interface → press the '▲▼' key to 'H-C' interface → press the 'Enter' key to '96' interface → press the 'Enter' key to the address interface → press the 'Enter' key to confirm the modification.

Note:

1. 'H-A' means to modify TA address, switch on the side power switch, and modify TA address by default.
2. 'H-C' refers to the modification of TC address, which needs to be modified into TC address mode according to the above operations.
3. '96' is the baud rate, and the baud rate of TA and TC addresses is 9600.
4. Each TA and TC module needs to have a separate address, which is 1 before delivery.



Figure 3-7 Modifying module address

TA and TC module addresses can be modified more conveniently and quickly by using TA address modifier, especially in mass modification. If you need TA address modifier, you can contact us directly to buy it.

Method 2: Modify the addresses of TA and TC modules with Battery controller module.

Take 32-block of each group as an example, the first group TA address is set as: 1-32, the TC address is set as: 241 (the default addresses of TA and TC are all 1), the second group TA address is set as: 1-32, the TC address is set as: 241. After the address is modified, the first group is sent to the battery controller module COM1A port, and the second group to the port COM2A port.

When changing the addresses of TA and TC modules, only one TA or TC module can be connected to the COM1A port of each battery controller module, and only one module's address can be changed at a time.

First connect one TA module to the positive and negative pole of the battery, and then connect the port of TA module to the port of battery controller module COM1A, and modify it by following the steps:

ESC → C parameter setting (password: 2022) → 4 special correction → 4.3 module address.

B. Alarm inquiry
 C. Parameter setting

Please enter password:
 2022

3. System information
 4. Special correction

4.2. Continuous view
 4.3. Module address

COM1, H3G-TA, 1

COM1, H3G-TA, 002

COM1, H3G-TA, 003,
 H3G-TA, 1 → 2

Note: Module type is HG-TA, and the specified address is 2.

Note: 1 → 2 means the address is modified successfully, and the address is changed from 1 to 2.

After the address changes successfully, you can change the next module, press Enter, and continue to modify it.

Change the address of TC module to TA module, just change the module type single cell detection (TA) module to TC module.

Method 3: Modify the addresses of TA and TC modules with 'IBMU commissioning tool'.

1) Without TA address modifier or control module, you can use a computer to modify the address of the TA,TC module.Steps: Firstly, connecting the TA module to the positive and negative electrode of the battery, and wiringas the following connection. Only one TA or TC module at a time.

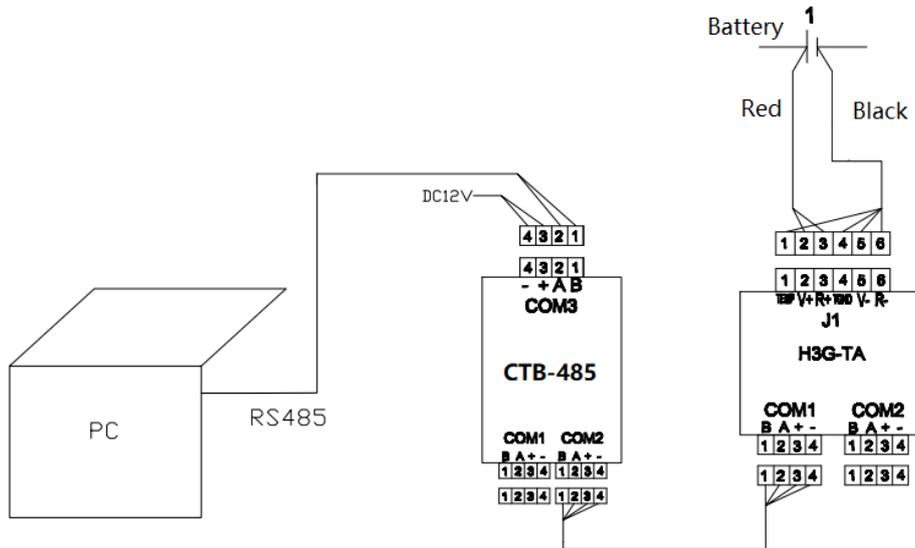


Figure 3-8 Connection

2) Opening file"H3G-TA Tool" after connection, and setting the corresponding port and baud rate correctly, then clicking "Open Port" to confirm.

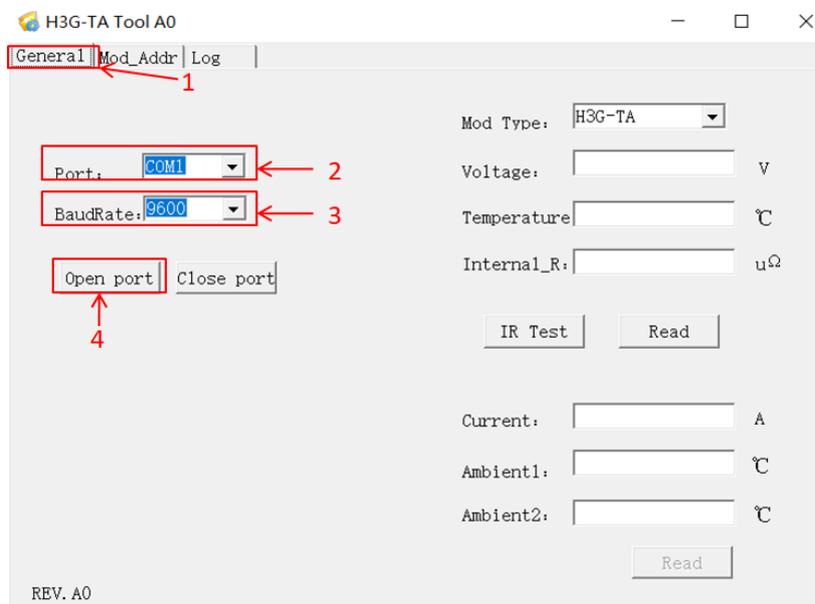


Figure 3-9 Clicking the 'Open Port' button

3) Click on the page "Mod_Addr", select the module type "H3G-TA" or "H3G-TC"and new address item to be the required number, then click "Write" to complete, if the change is successful, prompt "OK". Otherwise, the modification fails.

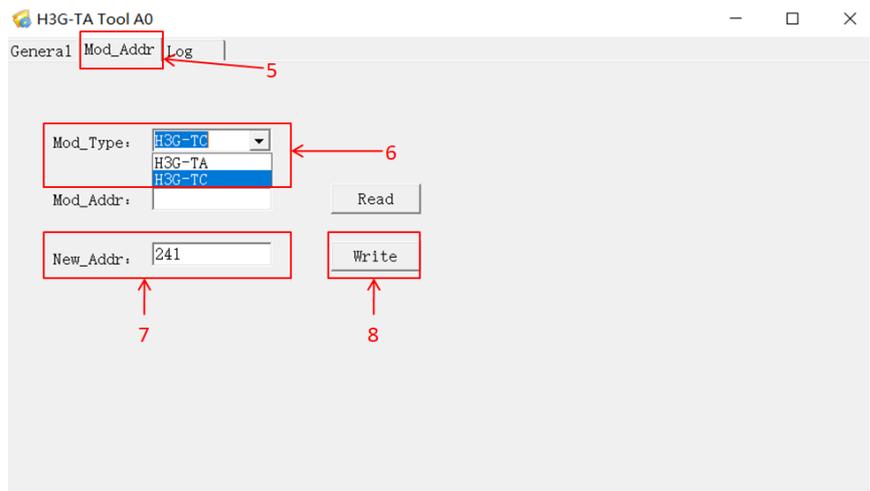


Figure 3-10 Modifying module address

3.3.5 Installation, Connection And Address Setting Of CT And TC Module

The current transformer (CT) can be embedded in the cable of the positive terminal of the battery group and fixed with a cable tie.



Figure 3-11 Connection of CT

The direction indicated on the CT should be consistent with the charging current of the battery, as shown in Figure 3-12.

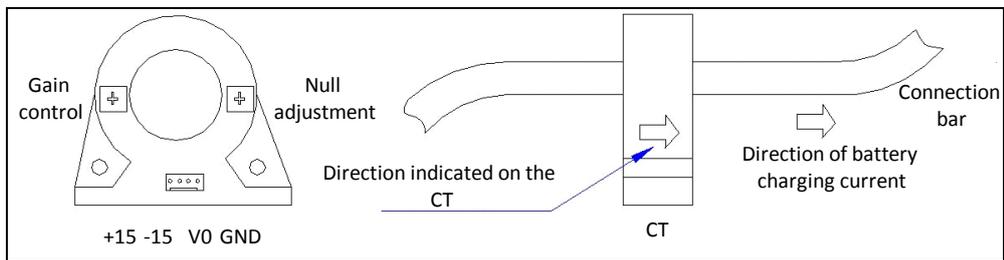


Figure 3-12 Direction indicated on the CT

TC module can be directly installed on the battery rack, close to CT. Test cable (1) connected to CT, communication cable (2) connected to the first TA module, communication cable (3) connected to COM port of the battery controller module, power cable (4) connected to Pin3, Pin4 of COM1B of the battery controller module, and then power the TC module.

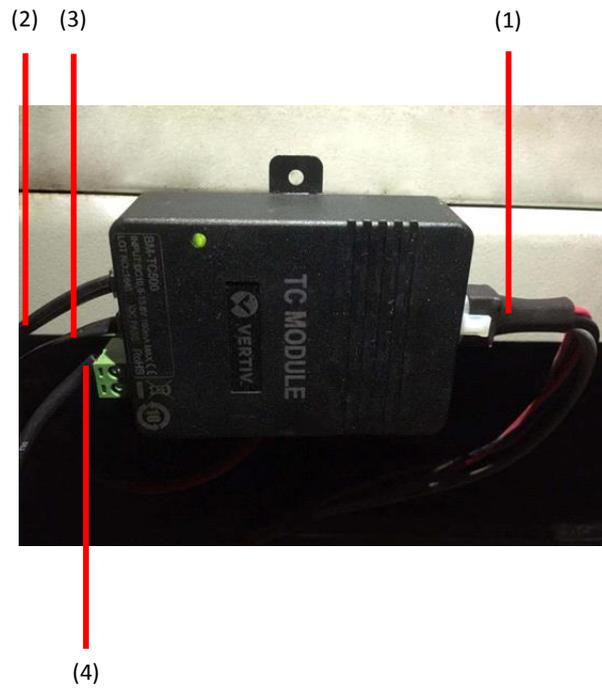


Figure 3-13 Installing TC module on battery rack

The default address of TC module is 1, which can be modified through address modifier or battery controller module. The method is the same as that of TA module. Please refer to 3.3.4 *Setting Of TA Module Address* for details.

3.3.6 Installation Of Battery Controller Module And Connection Of TA And TC Modules

The battery controller module can be fixed to the standard 19-inch cabinet or installed directly on the battery rack, as shown in the figure below:



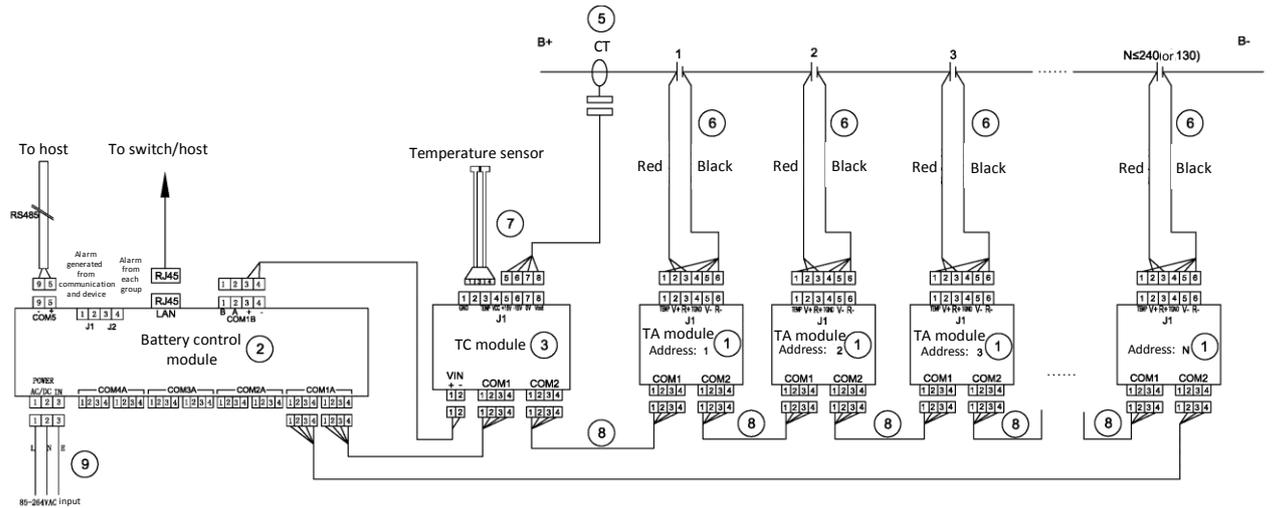
19-inch cabinet inside



On battery rack

Figure 3-14 Installation of convergence module

The battery controller module communicates with TA and TC modules through COM1A, COM2A, COM3A, COM4A, and uses TA communication cable to connect each TA module to TC module and then to COM port of Battery controller module. Generally, one COM port of battery controller module is connected to TA and TC modules of one set of batteries, and each COM port has two four-core interfaces, which are parallel inside. The other spare port is connected to the COM2 port of the last TA module to form a communication loop, to ensure that any point break in the communication line can still communicate normally. In addition, a power cable should be drawn from the Pin 3 OR 4 of COM1B port of battery controller module to the VIN port of TC module to supply power to the TC module.



The battery controller module needs external power supply. The power input range is 85V ~ 264Vac or 110V ~ 370Vdc. The power cables have been prepared before delivery.

3.3.7 Wiring Layout

The field wiring should be clear and beautiful: the part close to the battery should not be disordered (the direction should be the same when installing the collection ring).

If there is a place to thread the wire from the trench, we should ask the user if we need to add the wire harness to PVC pipe.

Chapter 4 Start-up

Before the normal operation of the system, the battery controller module should be set first. Turn on the power switch on the back side of the battery controller module, and the module will automatically enter the main interface to display the status of each battery. 1# is the first battery group, and n# is the n battery group, up to six groups.

```
1#: OK  2#: --  3#: --
4#: --  5#: --  6#: --
```

4.1 Quick Setup

It is strongly recommended to configure various operation parameters through 'Quick Setup' when the new device is first set up. Through simple parameter setting, the rest will be automatically configured.

In the state of the main interface, press 'Esc' → 'C. Parameter Setting' → input password 2022 → '1 Quick Setting', input the number of battery groups to be monitored, and the maximum number cannot exceed 6 groups.

```
Set → Battery group number
      1
```

Input the battery type, Ah and battery cell number of the first battery group.

```
S1→Type, number
    12V, 300AH, 40-block
```

Press 'Enter' to automatically set the remaining parameters. If it is larger than a set of batteries, automatically enter the second group.

For quick setup, each group is automatically assigned to a different COM ports. The first group is on COM1A, the second group is on COM2A, and so on. Therefore, the TA module and TC module of the corresponding battery group must also be connected to this port. The address automatically assigned to TC module on battery controller module is 241, and TC module needs to be modified to this address. After all the settings, back to the main interface and enter the menu to query the monitoring data. For the setting of internal resistance reference value, please refer to 'Manual internal resistance test and reference value setting'.

4.2 Realtime Data Query

The monitoring data such as voltage, internal resistance, temperature and current can be inquired directly on the battery controller module.

Enter menu 'A: real-time query' → select battery group 'S1'..., then display:

```
S1 realtime voltage time:
    2014-02-11 15: 04
```

The time indicates the latest time of existing voltage data, press ▼ to page down:

```
S1 latest internal resistance
time:
```

The time indicates the latest time of existing internal resistance data, press ▼ to page down for displaying group voltage and current:

```
S1 group voltage and current:
352.5V +0.1A
```

Press ▼ to page down for displaying the temperature, voltage and internal resistance of the first battery:

```
S1-001#: +23.5 °C
13.235V 3256 uΩ
```

Continuous to press ▼ to page down for displaying the monitoring data of each battery, and the last page displays the ambient temperature:

```
Ambient temperature:
+23.5°C +23.5 °C
```

4.3 Alarm Query

The main interface will display the symbol of  if there is an alarm generated.

```
1#:  2#: OK      3#: --
4#: --   5#: --   6#: --
```

Press 'Enter' to display the specified alarms:

```
S1 battery voltage alarm
S1 battery internal resistance
alarm
```

S1 represents the first battery. If you wish to furtherly view which battery generates an alarm, just enter the menu 'B. alarm query' → 'B. 1 real-time alarm' → select battery number → display the specific content of current alarm after confirmation.

To check for alarms that have occurred in the past and are now restored, the most recent 100 records can be found in the 'B. 2 alarm record' menu.

When there is an alarm, the battery controller module will trigger alarm sound. You can press Enter key twice to choose to silence the sound (only when there is an alarm) at the main interface, or you can turn off the alarm sound from the menu '5 system tools' → '5.5 sound control'.

When there is an alarm, the LED indicator on the front panel of the battery controller module will be ON; when USB is ON, it means a fault of the device; when E1 is ON, it means a communication fault; when E2 is ON, it means a battery alarm.

4.4 Manual Internal Resistance Test And Reference Value

By default, the battery controller module will automatically test the internal resistance once a month. When the new device is first put into operation, it needs to test the internal resistance once manually to obtain the reference value of internal resistance. After selecting the battery number to be tested in the menu '2 internal resistance test', the test will be started. After the test is completed, it will exit to the main interface automatically, and the battery controller module will be powered off and then restarted to interrupt the internal resistance test.

After the first operation, the internal resistance reference value is set. For the newly installed battery and the battery already in service, the setting method is as follows:

Newly installed battery

This data can be used as a longitudinal reference value after the internal resistance of the newly installed battery is measured. '3.8 reference reset' → select the battery group and confirm, the internal resistance value measured recently is used as the battery's reference value. When the internal resistance of the battery is 50% higher than the reference value, the battery controller module will generate an alarm.

Battery already in service

The average value of the latest internal resistance is used as a reference value for the battery in operation.

In the menu '3.7 internal resistance baseline' → select battery group, press ▲ and turn to 'ALL' page, press Enter to input the average value. When the battery's internal resistance is higher than 50% of the average value, the battery controller module will generate an alarm.

4.5 Method For Checking Temperature Accuracy Of Voltage Internal Resistance

Voltage and temperature can be checked by high-precision voltage and temperature meter. During the check, each of the five highest and five lowest values can be checked with the meter to confirm whether the error is within the allowable range. It is important to note that the precision of the voltmeter used to calibrate must be 5-digit meters or more.

As different internal resistance testing methods have different values of internal resistance, there is no unified standard in the world at present, so it is impossible to check the accuracy of internal resistance with some internal resistance instruments. In the actual application process, the internal resistance is judged by the resistance value comparison in different time periods, so the repeated accuracy of the device internal resistance is generally confirmed. Repeat accuracy confirmation method is as follows: Measure the internal resistance once every 10 minutes or so, measure three times in total, average the three times, divide the maximum deviation from the average value by the average value, that is, repeat accuracy of internal resistance.

Chapter 5 Access Third-party Monitoring System

5.1 Access Through Serial Port

The COM5 port of Battery controller module is the upload port, which is specially used for accessing to third-party system. The communication protocol is MODBUS/RTU protocol. The specific parameters are as follows:

Communication mode: RS-485/2 line;

Baud rate: default is 19200BPS;

Digit: 1-bit starting bit, 8-bit data bit, 1-bit ending bit;

Wiring method: pin9 of COM5 is -, pin5 is + and pin1 is ground;

See other file for the specific communication protocol.

The default device address of battery controller module is 1. If multiple battery controller modules are connected to the same bus, they need to be modified into different addresses, which can be modified from '3.3 overall parameters' → 'local address' page of battery controller module menu.

5.2 Access Through Net Port

The LAN port at the back of the battery controller module is the network port to support MODBUS/TCP, SNMP and other protocols. See other files for the specific communication protocols. The network port IP address and other parameters should be set before access.

The default IP address is 192.168.0.105. From the battery controller module menu '3 system information' → '3.3 overall parameters' to scroll down to the IP address page for setting, and at the same time, sub-code mask and gateway are set on this page.

5.3 Access Through Dry Contact

The battery controller module has two normally open dry contacts, the rear side J1 for device or communication alarm, J2 for battery alarm, the dry contact maximum voltage is 220Vdc, and the maximum allowable passing current is 1A.

Chapter 6 Advanced Settings

6.1 Modification Of Alarm Upper And Lower Limit

'3 system information' → '3.5 parameters per group' → scroll page to upper and lower limit for modification.

6.2 Setting Of Internal Resistance

Modify the internal resistance alarm multiple

By default, when the internal resistance value is more than 1.5 times of the reference value, the battery controller module will automatically trigger an alarm. The multiple can be modified from '3 system information' → '3.5 parameters per group' → 'internal resistance alarm' page.

Internal resistance test cycle

By default, when the number of cells in a group is less than 60, the number of internal resistance cycles is the actual number of cells, and the number of internal resistance cycles is 60 when the number is greater than 60. The cycle number can be modified from '3 system information' → '3.5 parameters per group' → 'internal resistance circulation' page, but the cycle number should be set to be greater than 10.

Internal resistance test interval

By default, internal resistance is measured once a month, which can be modified from '3 system information' → '3.3 overall parameters' → page turning to 'internal resistance interval'. The minimum limit can be set to test the internal resistance once a day, or it can be specified to test the internal resistance once a certain day every month.

6.3 Multiple TA Modules Connected To Same COM Port

TA modules on different battery groups are automatically allocated to different COM ports on the battery controller module in the quick setup. Sometimes, TA modules on multiple batteries will be connected to a COM port for easy connection. At this time, the following modifications shall be made on the battery controller module.

Modified from '3 system information' → '3.5 parameters of each group' → select the battery group → turn the page to the page of 'single voltage first address':

Change → S1 → single voltage first address COM1, 1
--

'COM1' denotes the port number of battery controller module received by TA module of this group. If it is connected to port COM2A, it should be changed to 'COM2', and '1' denotes the address of the first TA module of this group.

6.4 On-line Program Upgrading

The battery controller module supports online upgrading through the net port. The computer is connected to the LAN port of battery controller module directly through the network cable or connected to the same network, and the IE address bar is used to input the battery controller module IP address.



Figure 6-1 Inputting convergence module IP address

If you have been unable to access the page, you can do the following methods:

- (1) Turn off the power of battery controller module first, press and hold ESC key and turn on the power switch at the same time, until the battery controller module LCD displays 'IAP over Ethernet', release the ESC key and start the above step again to go to the web page.
- (2) If the remote upgrade program is required, use the UDP tool to send the Modbus command to change the register 401955 to 0xF0F0.

Start the above step again and re-enter the page.

After normal access, enter the password '2022' and submit:



Figure 6-2 Entering web page

Click 'Reset BMS':



Figure 6-3 BMS reset done

Refresh this page:



Figure 6-4 Login

Enter the user ID (admin) and password (2022), and click 'Login':



Figure 6-5 Uploading file

After clicking 'Browser', select the BIN file to be updated, and then click 'Upload' to automatically upload file.

6.5 Enable Capacity Estimation Function (Optional)

The capacity estimation function is optional. At present, the estimated capacity value of this function is only for reference. Some models of IBMU do not have this function. Before delivery, the function is disabled. The function can be opened through the battery controller module menu. The method is as follows:

From '3 system information' → '3.4 system functions' → 'B1 system functions', press Enter, and then press Enter to the page of 'capacity estimation'. Press ▼ to select the function and then press Enter to the page of 'C1 display content'. Then press Enter to the page of 'capacity estimation' and ▼ to select the function.

6.6 Setting Method For Each Group Over 200-block

When the number of cells in a single battery group is more than 200, the TA module should be evenly distributed to two COM ports.

And the setting is as follows:

(1) Address allocation, TA address allocation: COM1A :1 ~ X/2, COM2A:1 ~ X/2 (X is the cell number of battery group)

TC address allocation: COM1A: 241

(2) Modify the maximum address number of COM port in the following way:

C parameters setting (Password: 2022) → 4 Special modification → 4 Special modification →

S1: 400000	Query
HEX	H: 00 L: 00

Change 400000 to 464426, press Enter, the cursor will skip to HEX, and press ▼ to change 'HEX' to 'BCD-2T'.

S1: 464426	Query
BCD-2T VAL: 240	

Press Enter, the cursor will skip to 'Query'. Press ▼ to change 'Query' to 'Modification', then press Enter to change 240 to X/2 (X is the cell number of battery group). Finally, press Enter to make cursor skip to S1.

S1	:	464426
Modification		

Only through the restart operation can the above changes be effective.

Chapter 7 Description Of Overall Menus

Menu	Function
A. Realtime query	View real-time data such as voltage, internal resistance, current and temperature
B. Alarm query	View recent alarms about 100pcs
B.1 Realtime alarm	Display the alarm still exists
B.2 Alarm record	Display the alarm has been restored
C. Parameter settings	Set all the operation parameters
1 Quick setup	Set the number of battery group and type according to tips, then other parameters will be automatically set
2 Internal resistance test	Manually test the battery internal resistance
3 System information	
3.1 Event view	View recent event logs about 50pcs
3.2 Alarm view	View recent event logs about 100pcs
3.3 Overall parameters	All operation parameters can be viewed and modified, including 'system version', 'current time', 'battery group number', 'collection interval', 'local address', 'local language', 'IP address', 'subnet mask', 'default gateway', 'port No.', 'LAN setting', 'Com5 setting', 'internal resistance interval'
3.4 System function	Product type and functions to be monitored can be set, including 'device type', 'cell voltage', 'string voltage', 'cell internal resistance', 'battery temperature', and 'capacity estimation'
3.5 Parameters of each group	The parameters of each battery can be set, including 'type quantity', 'single voltage first address', 'boost charging voltage', 'boost charging group voltage', 'internal resistance cycle', 'internal resistance alarm', 'battery temperature rise'
3.6 Module parameter	Module address and working mode can be modified
3.7 Internal resistance reference	Internal resistance longitudinal reference values can be set and checked
3.8 Reference reset	The last internal resistance value can be used as longitudinal reference for internal resistance
4 Special modification	
4.1 Special modification	View or modify the register median value
4.2 Special view	Continuously view the register median value
4.3 Module address	Modify module addresses such as TA, TC
4.4 Batch address	Batch modify TA address
5 System tool	
5.1 Clear data	Clear the events and alarm records
5.2 Factory reset	Restore all parameters to the factory set value
5.3 Default reset	Restore all parameters to their default values
5.4 Default storage	Saves the currently set parameters as default parameters
5.5 Sound control	Control ON/OFF of the alarm sound
6 System restart	Automatically restart the system

Appendix 1 Ah And Internal Resistance Matching Table Of VRLA Battery

Capacity (Ah)	2V (mΩ)	6V (mΩ)	12V (mΩ)
100	1.55	4.65	9.30
150	1.15	3.45	6.90
200	0.85	2.55	5.10
320	0.57	1.71	---
410	0.39	1.17	---
510	0.32	0.96	---
750	0.25	---	---
1000	0.21	---	---
1680	0.16	---	---
2175	0.11	---	---

Note:

1. This table refers to the data made by BATTCON annual conference for reference only.
2. There may be differences in internal resistance of products of the same manufacturer and the same batch. Therefore, the actual measured internal resistance ratio in the table does not necessarily mean that the battery performance changes.

Appendix 2 Hazardous Substances And Content

Parts	Hazardous substances					
	Plumbum	Hydrargyru	Cadmium	Chrome ⁶⁺	PBB	PBDE
	Pb	Hg	Cd	Cr (VI)	PBB	PBDE
IBMU	×	○	○	○	○	○
IBMU test cable	×	○	○	○	○	○
IBMU binaural sampling head	×	○	○	○	○	○
IBMU communication cable	×	○	○	○	○	○
<p>This table is made following the regulation of SJ/T 11364.</p> <p>○: Means the content of the hazardous substances in all the average quality materials of the parts is within the limits specified in GB/T 26572</p> <p>×: Means the content of the hazardous substances in at least one of the average quality materials of the parts is outside the limits specified in GB/T 26572</p>						
Applicable scope: IBMU						



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