

EXAGATE BATTERY MONITORING SYSTEM



Software Manual

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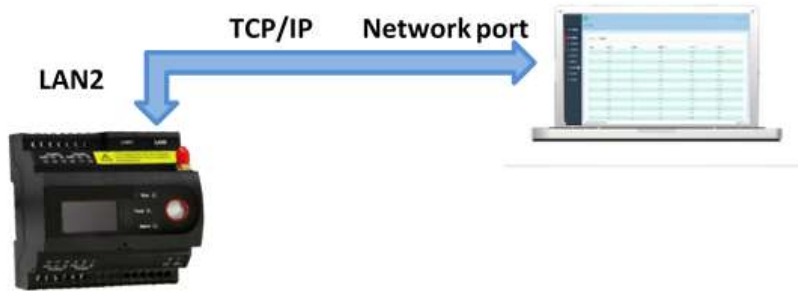
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1. Setting Up

1. Connect the LAN2 port of the intelligent gateway to the computer network port by using a network cable.

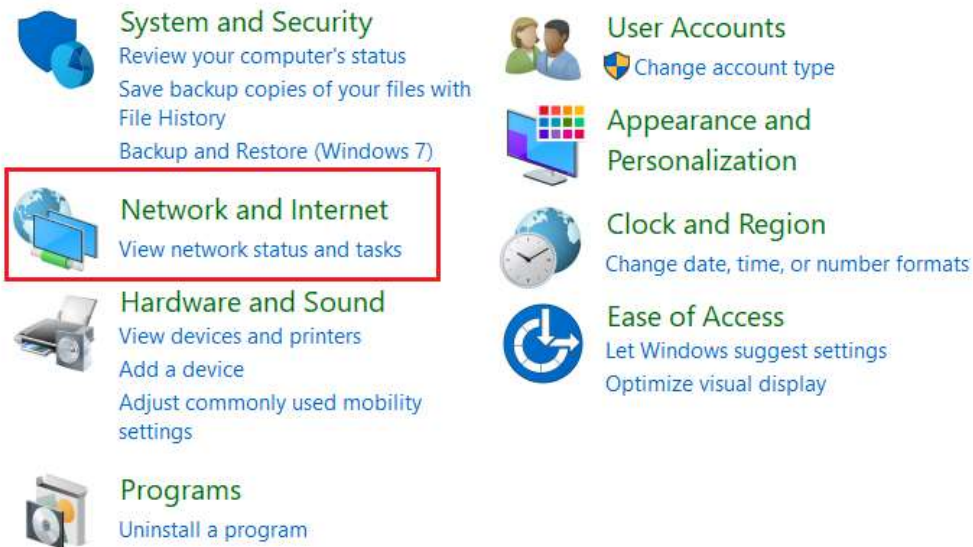


2. Enter “ Control Panel ” →Open “ Network and Sharing Center ” →Click “Ethernet”



Adjust your computer's settings

View by: **Category** ▾



- System and Security**
Review your computer's status
Save backup copies of your files with File History
Backup and Restore (Windows 7)
- Network and Internet** (highlighted)
View network status and tasks
- Hardware and Sound**
View devices and printers
Add a device
Adjust commonly used mobility settings
- Programs**
Uninstall a program
- User Accounts**
Change account type
- Appearance and Personalization**
- Clock and Region**
Change date, time, or number formats
- Ease of Access**
Let Windows suggest settings
Optimize visual display

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Network and Internet

Control Panel > Network and Internet

Control Panel Home

System and Security

- **Network and Internet**

Hardware and Sound


Programs


User Accounts


Appearance and Personalization

Clock and Region

Ease of Access

**Network and Sharing Center**
View network status and tasks | Connect to a network | View network computers and devices

**Internet Options**
Change your homepage | Manage browser add-ons | Delete browsing history and cookies

**Infrared**
Send or receive a file

View your basic network information and set up connections

View your active networks

4
Public network

Access type: Internet
Connections: Ethernet

Change your networking settings



Set up a new connection or network

Set up a broadband, dial-up, or VPN connection; or set up a router or access point.



Troubleshoot problems

Diagnose and repair network problems, or get troubleshooting information.

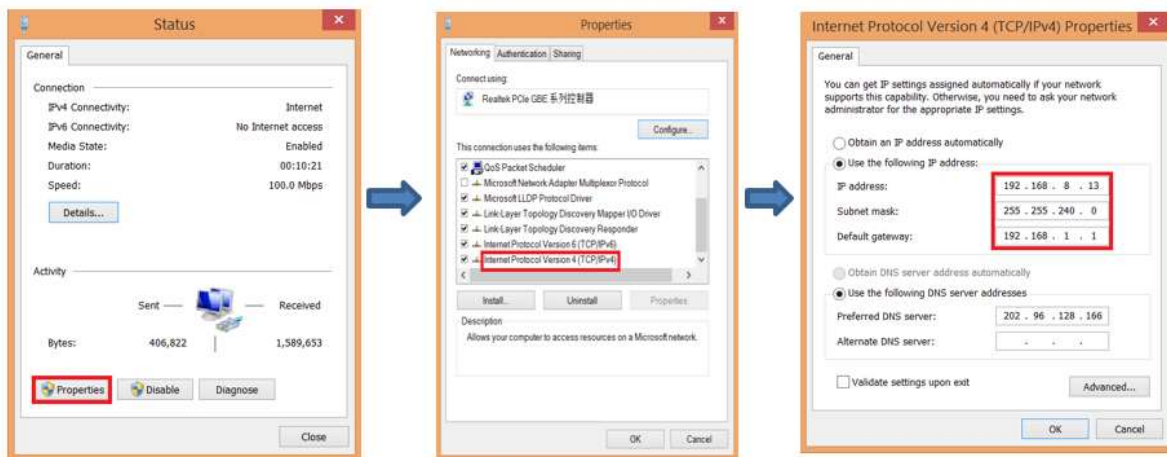
3. Click “Properties” → “Internet Protocol Version 4 (TCP/IPv4)” → “Use the following IP address”

Modify IP address : 192.168.16.X

Subnet mask : 255.255.255.0

Default gateway : 192.168.1.1

Note: The modified IP address should not be the same as the network address of the battery gateway , it is not allowed to change the IP address to 192.168.16.2,subnet mask and default gateway address can be modified for local area network.



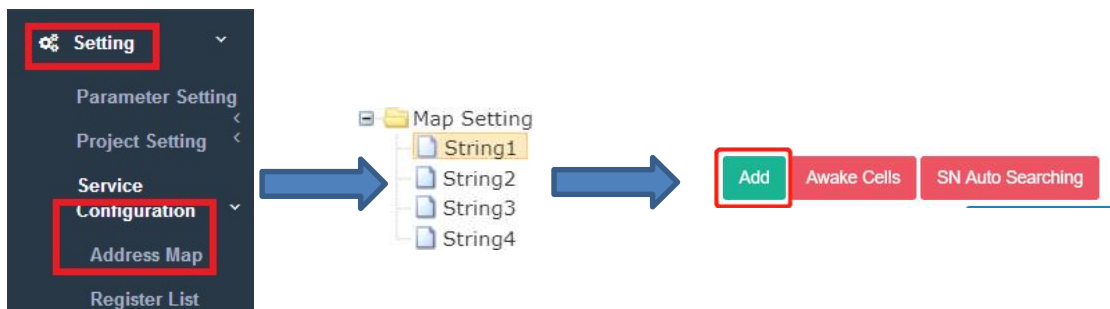
4. Download Google Chrome , enter the address “192.168.16.2” after opening ,enter the login screen . Default username: admin , password: admin , choose a language : Chinese/English , click “Login”.





5. Select the left menu "Setting" → "Configuration" → "Address Map" Make communication setting.

The COM1 to COM4 of the Map Setting is corresponding to the four interfaces "RS485A/B/C/D" of intelligent gateway, and corresponding to battery1 to battery4.



6. Add device name: BatteryGateway1, then click "OK" → "Confirm Config" → waiting for BatteryGateway1 Status : **Connected**, show that connected completed.

ADD DEVICE

Name:

Device Address:

COM1 Connect Number:

COM2 Connect Number:

Battery Number:



Add **Awake Cells** **SN Auto Searching**

Device Status:

Device SN:

Add **Awake Cells** **SN Auto Searching**

Device Status:

Device SN:

7. After Gateway is connected , click "SN Auto Searching"

Add **Awake Cells** **SN Auto Searching**

Device Status:

Device SN:

Click "Confirm"




Message

It Will Take About One Second per Cell,You Should Check the Connection First

Searching for address



Message

 Searching...
COM1: 28
COM2: 15

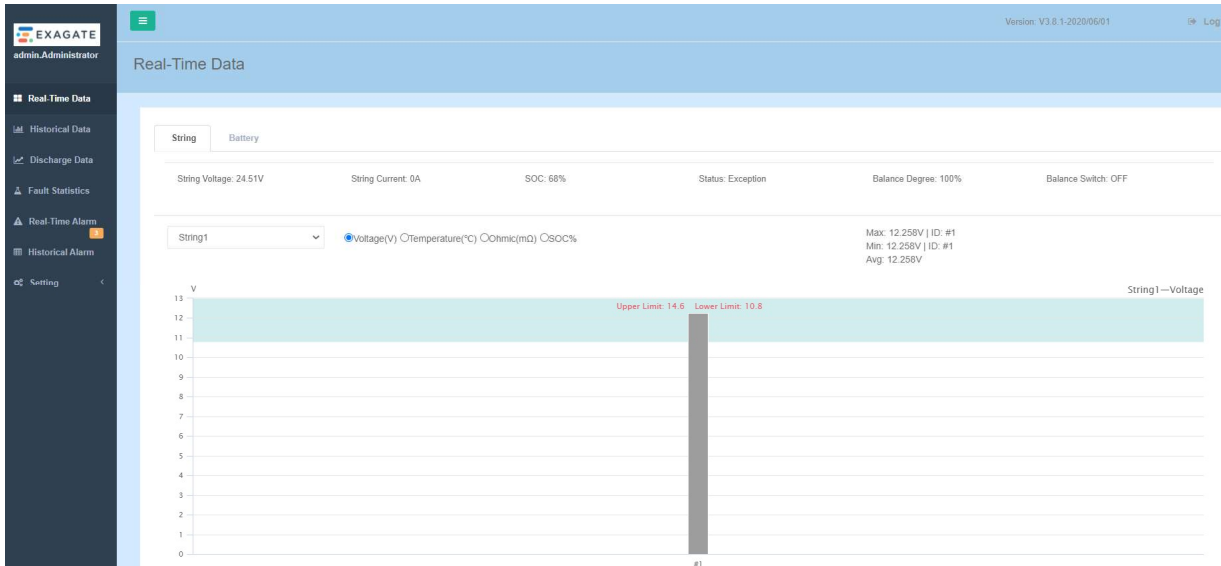
Timer: 24

Click "OK" → "OK"



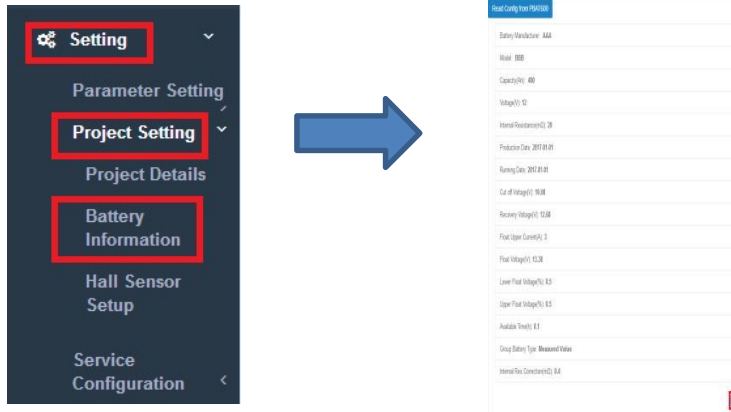
Name	String No.	Channel No.	Device Address	1st Cell Node	Node
60	1	1	1	32	String
61/62	1	1	1705030021	1	Cell Device-COM1
61/62	1	1	1705030027	2	Cell Device-COM1
61/62	1	1	1705030044	3	Cell Device-COM1
61/62	1	1	1705030010	4	Cell Device-COM1
61/62	1	1	1705030019	5	Cell Device-COM1
61/62	1	1	1705030002	6	Cell Device-COM1
61/62	1	1	1705030033	7	Cell Device-COM1
61/62	1	1	1705030020	8	Cell Device-COM1
61/62	1	1	1705030028	9	Cell Device-COM1
61/62	1	1	1708220141	10	Cell Device-COM1

8. Click "OK", return to real-time data interface



2. Battery information setting

1. Select the left menu “Setting” → “Project Setting” → “Battery Information” ;
2. Click “Modify ” in the lower right corner ;



3. Fill in the information on the surface of the battery , and click “Confirm” ;
4. After the gateway is restarted , pop-up connection completed and click “Confirm” Note:
 - Battery information is for reference only , please contact the battery manufacturer for details.
 - If using the recommended value , please select the correct capacity , voltage , the remaining information will have a recommended value
 - String voltage measuring mode : select battery cell sensor accumulation , we can calculation string voltage by battery cell sensor without wiring. Select measuring value Gateway Device connects the positive and negative pulse of the entire battery pack for measurement.
 - Internal resistance correction : Select the type of wire used , it will correct the internal resistance data automatically, making more accurate.

STRING INFORMATION

Battery Manufacturer:	AAA
Model:	BBB
Capacity(AH):	400
Voltage(V):	12
Internal Resistance(mΩ):	20
Production Date:	2017-01-01
Running Date:	2017-01-01
Cut off Voltage(V):	10.08
Recovery Voltage(V):	12.68
Float Upper Current(A):	3
Float Voltage(V):	13.38
Lower Float Voltage(%)	0.5
Upper Float Voltage(%)	0.5
Available Time(h):	0.1
Show Available Time:	No
Group Battery Type:	Measured Value
Internal Res Correction:	0.4

One drag One PliersLine
One drag One WasherLine
One drag Two PliersLine
One drag Two WasherLine



Message

Save successfully

OK



Message

Are you sure you want to write config files to PBAT 600? It will take a few minutes.

Confirm Cancel



Message

Completed Connection

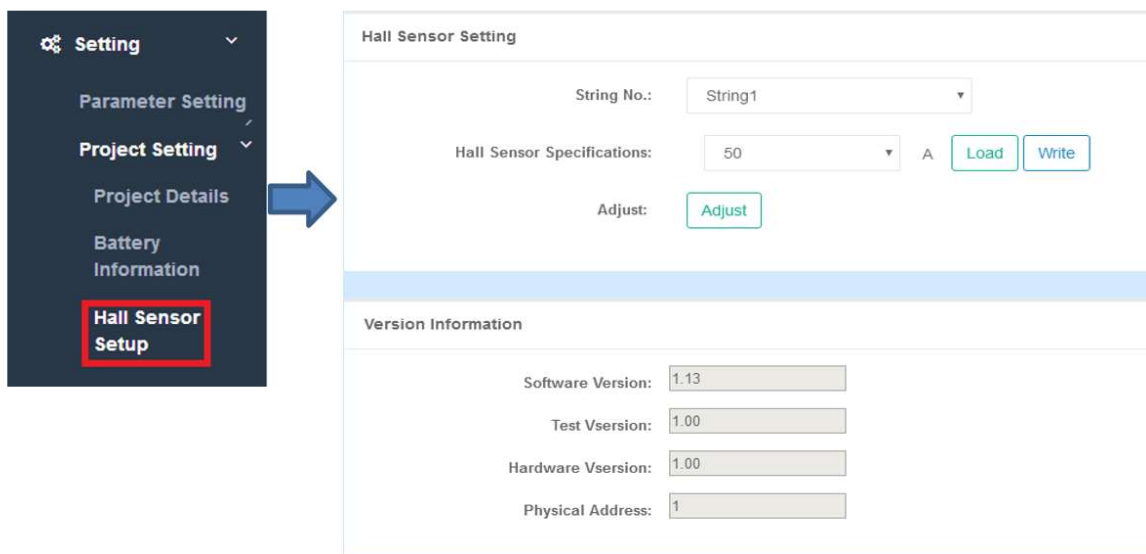
Confirm Cancel

3. Hall sensor setup

1. Select the left menu “Setting” → “Project Setting” → “Hall Sensor Setup” ;
2. Select string NO., select Hall sensor specifications:50/100/200/300/400/500A,and then click “Write” ;You can click “Load” to confirm whether the setting is successful.

Note:

- The adjust function is only used when the group current data error is very large , use with caution.
- When calibrating , please make sure the current across the Hall’s cable is zero.



Setting

- Parameter Setting
- Project Setting**
- Project Details
- Battery Information
- Hall Sensor Setup**

Hall Sensor Setting

String No.: String1

Hall Sensor Specifications: 50 A

Adjust:

Version Information

Software Version: 1.13

Test Vserion: 1.00

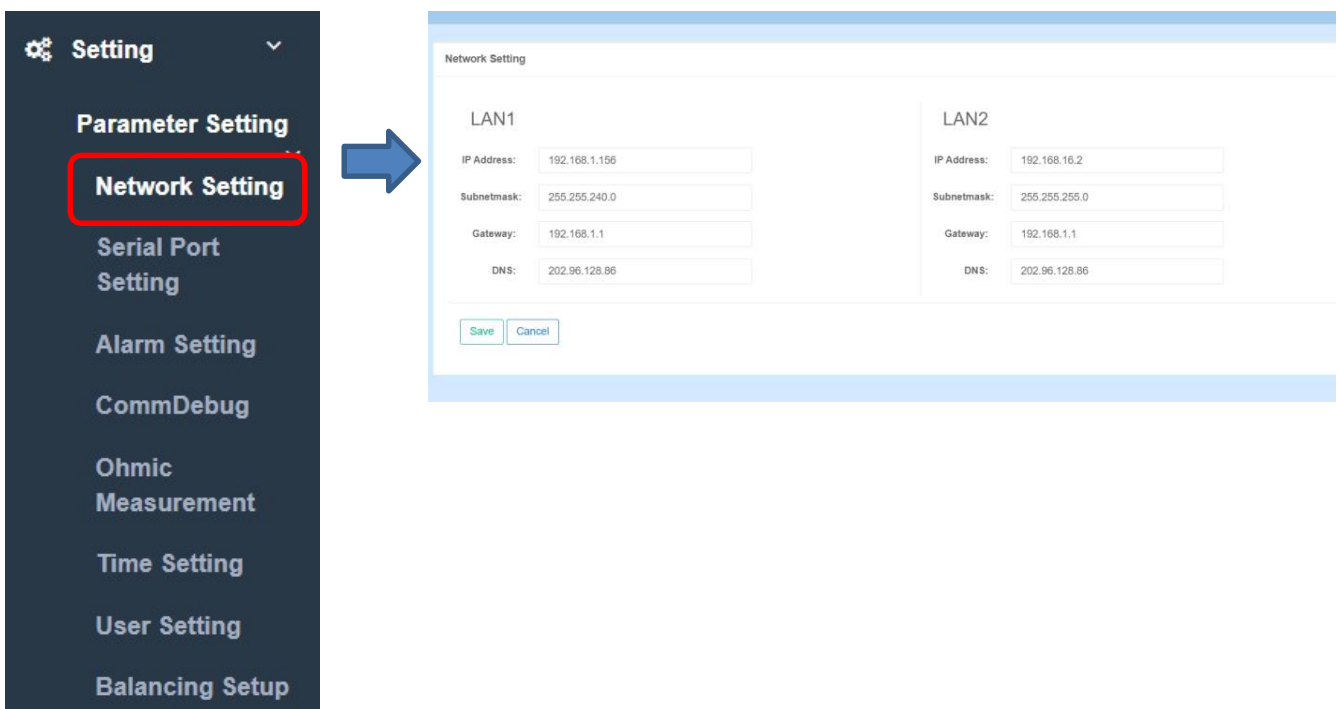
Hardware Vserion: 1.00

Physical Address: 1

4. Network setting

1. Select the left menu “Setting” → “Parameter Setting” → “Network setting” ;
2. The network port configuration can be configured with the IP address, subnet mask, gateway, and DNS information of the dual NIC. Please follow the correct network parameters for configuration.

Note: The network segment of the dual NIC is not allowed to be the same!



Setting

- Parameter Setting
 - Network Setting**
 - Serial Port Setting
 - Alarm Setting
 - CommDebug
 - Ohmic Measurement
 - Time Setting
 - User Setting
 - Balancing Setup

Network Setting

LAN1

IP Address: 192.168.1.156

Subnetmask: 255.255.240.0

Gateway: 192.168.1.1

DNS: 202.96.128.86

LAN2

IP Address: 192.168.16.2

Subnetmask: 255.255.255.0

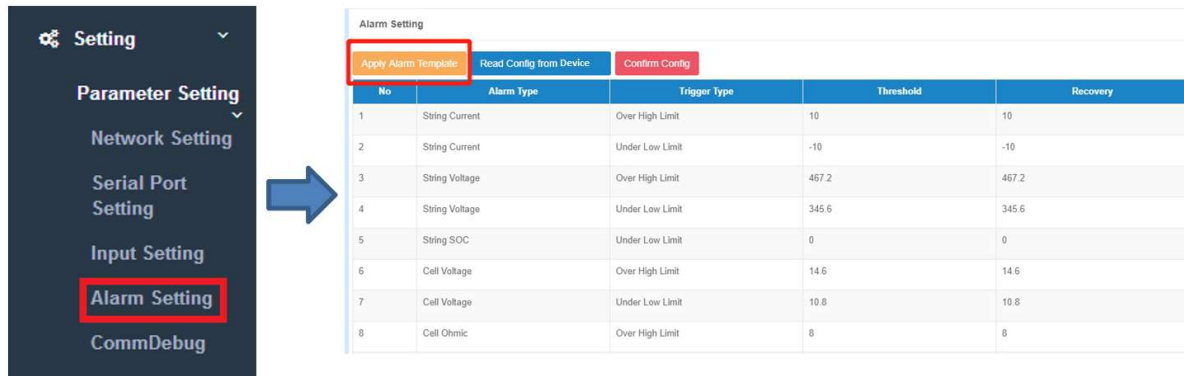
Gateway: 192.168.1.1

DNS: 202.96.128.86

Save Cancel

5. Quick alarm setting

- 1: Select the left menu “Setting” → “Parameter Setting” → “Alarm Setting” ;
- 2: Select “Apply Alert Template”;



The first screenshot shows the 'Setting' menu with 'Alarm Setting' highlighted in a red box. The second screenshot shows the 'Alarm Setting' interface with the 'Apply Alarm Template' button highlighted in a red box. Below the button is a table with the following data:

No	Alarm Type	Trigger Type	Threshold	Recovery
1	String Current	Over High Limit	10	10
2	String Current	Under Low Limit	-10	-10
3	String Voltage	Over High Limit	467.2	467.2
4	String Voltage	Under Low Limit	345.6	345.6
5	String SOC	Under Low Limit	0	0
6	Cell Voltage	Over High Limit	14.6	14.6
7	Cell Voltage	Under Low Limit	10.8	10.8
8	Cell Ohmic	Over High Limit	8	8

3. Voltage type :select the correct voltage type,2V or 12V ;

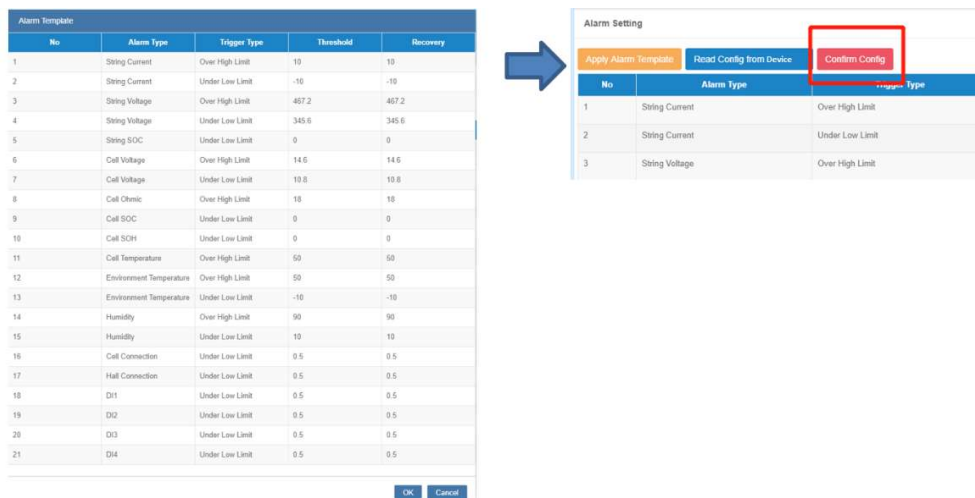
Battery count : enter the battery count in the current set of batteries ;

Enter Hall sensor specifications and internal resistance reference(It will obtain battery information automatically and the Hall setting of Hall sensor) ;

Click “OK”

4. Pop-up alarm parameter list , confirm that the set threshold and recovery are correct or not ; Click “OK” in the lower right corner.

5. Finally,in the lower right corner of the alarm settings ,click the red “Confirm Configuration” to complete the simple alarm setting.



The first screenshot shows the 'Alarm Template' table with the following data:

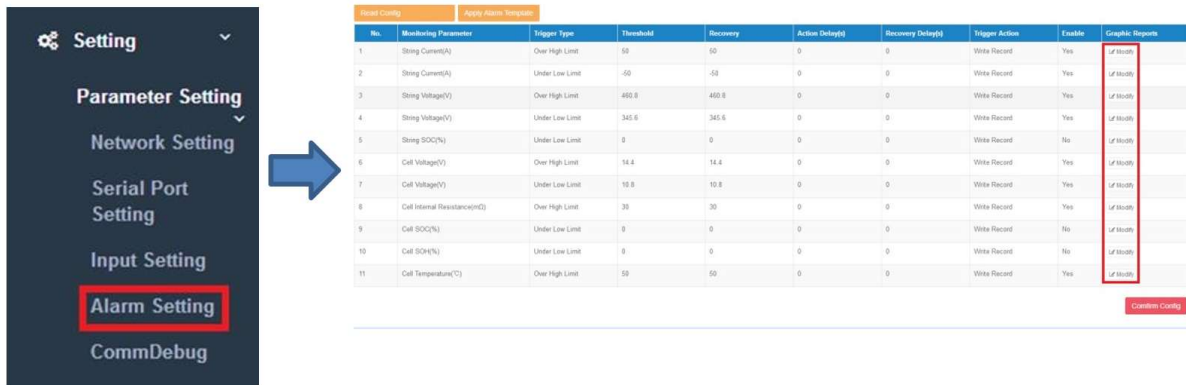
No	Alarm Type	Trigger Type	Threshold	Recovery
1	String Current	Over High Limit	10	10
2	String Current	Under Low Limit	-10	-10
3	String Voltage	Over High Limit	467.2	467.2
4	String Voltage	Under Low Limit	345.6	345.6
5	String SOC	Under Low Limit	0	0
6	Cell Voltage	Over High Limit	14.6	14.6
7	Cell Voltage	Under Low Limit	10.8	10.8
8	Cell Ohmic	Over High Limit	18	18
9	Cell SOC	Under Low Limit	0	0
10	Cell SOH	Under Low Limit	0	0
11	Cell Temperature	Over High Limit	50	50
12	Environment Temperature	Over High Limit	50	50
13	Environment Temperature	Under Low Limit	-10	-10
14	Humidity	Over High Limit	90	90
15	Humidity	Under Low Limit	10	10
16	Cell Connection	Under Low Limit	0.5	0.5
17	Hall Connection	Under Low Limit	0.5	0.5
18	D11	Under Low Limit	0.5	0.5
19	D2	Under Low Limit	0.5	0.5
20	D3	Under Low Limit	0.5	0.5
21	D4	Under Low Limit	0.5	0.5

The second screenshot shows the 'Alarm Setting' interface with the 'Confirm Config' button highlighted in a red box. Below the button is a table with the following data:

No	Alarm Type	Trigger Type
1	String Current	Over High Limit
2	String Current	Under Low Limit
3	String Voltage	Over High Limit

6. Full Alarm setting

1. Select the left menu “Setting” → “Parameter Setting” → “Alarm Setting” ;
2. Select the alarm parameters you want to set , then click “Modify” on the right side of the system;



The screenshot shows the 'Setting' menu on the left with 'Alarm Setting' highlighted. A blue arrow points to a table of monitoring parameters. The table has columns for No., Monitoring Parameter, Trigger Type, Threshold, Recovery, Action Delay(s), Recovery Delay(s), Trigger Action, Enable, and Graphic Reports. A red box highlights the 'Graphic Reports' column, and a red button labeled 'Confirm Config' is visible at the bottom right of the table.

No.	Monitoring Parameter	Trigger Type	Threshold	Recovery	Action Delay(s)	Recovery Delay(s)	Trigger Action	Enable	Graphic Reports
1	String Current(A)	Over High Limit	50	50	0	0	Write Record	Yes	√/NoData
2	String Current(A)	Under Low Limit	-50	-50	0	0	Write Record	Yes	√/NoData
3	String Voltage(V)	Over High Limit	480.0	480.0	0	0	Write Record	Yes	√/NoData
4	String Voltage(V)	Under Low Limit	345.6	345.6	0	0	Write Record	Yes	√/NoData
5	String SOC(%)	Under Low Limit	0	0	0	0	Write Record	No	√/NoData
6	Cut Voltage(V)	Over High Limit	14.4	14.4	0	0	Write Record	Yes	√/NoData
7	Cut Voltage(V)	Under Low Limit	10.8	10.8	0	0	Write Record	Yes	√/NoData
8	Cut Internal Resistance(mΩ)	Over High Limit	30	30	0	0	Write Record	Yes	√/NoData
9	Cut SOC(%)	Under Low Limit	0	0	0	0	Write Record	No	√/NoData
10	Cut SOH(%)	Under Low Limit	0	0	0	0	Write Record	No	√/NoData
11	Cut Temperature(°C)	Over High Limit	50	50	0	0	Write Record	Yes	√/NoData

3. Select “Yes” in enable ,enter the alarm threshold and recovery , and then click

“OK”

4. Pop-up “ Save successfully” , click “OK”;

5. After confirming that all alarm configurations are correct , click the red “Confirm Configuration” in the lower right corner of the alarm settings page.

Note: When the trigger type is upper-limit ,the threshold value is greater than the hysteresis value;
When the trigger type is lower-limit ,the threshold value is less than the hysteresis value

Threshold and hysteresis value please refer to the attached page : Alarm setting recommendation table.

ALARM SETTING ✕

Enable: Yes No

Monitoring Parameter: String Current(A)

Trigger Type: Over High Limit

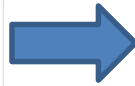
Threshold: 50

Recovery: 50

Action Delay(s): 0

Recovery Delay(s): 0

Trigger Action: DO/Write Record



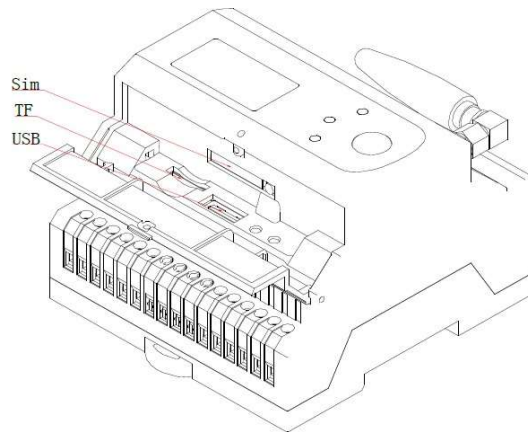
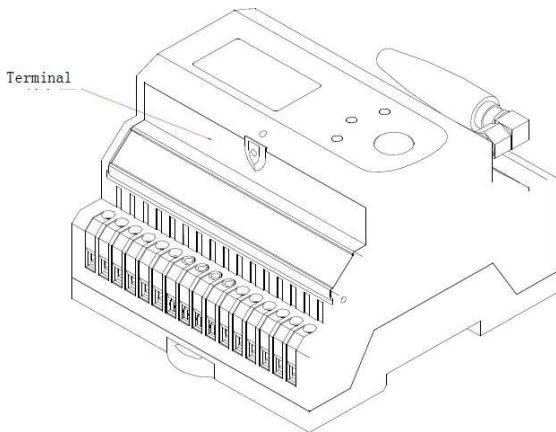
Message ✕

Save successfully



No.	Monitoring Parameter	Trigger Type	Threshold	Recovery	Action Delay(s)	Recovery Delay(s)	Trigger Action	Scale	Graphic Report
1	String Current(A)	Over High Limit	50	50	0	0	Write Record	Yes	12 Hours
2	String Current(A)	Under Low Limit	20	20	0	0	Write Record	Yes	12 Hours
3	String Voltage(V)	Over High Limit	10.8	10.8	0	0	Write Record	Yes	12 Hours
4	String Voltage(V)	Under Low Limit	17.6	17.6	0	0	Write Record	Yes	12 Hours
5	String SOC(%)	Under Low Limit	0	0	0	0	Write Record	No	12 Hours
6	Cell Voltage(V)	Over High Limit	2.4	2.4	0	0	Write Record	Yes	12 Hours
7	Cell Voltage(V)	Under Low Limit	1.8	1.8	0	0	Write Record	Yes	12 Hours
8	Cell Voltage-Batteries(V)	Over High Limit	30	30	0	0	Write Record	Yes	12 Hours
9	Cell SOC(%)	Under Low Limit	0	0	0	0	Write Record	No	12 Hours
10	Cell SOC(%)	Under Low Limit	0	0	0	0	Write Record	No	12 Hours
11	Cell Temperature(°C)	Over High Limit	60	60	0	0	Write Record	Yes	12 Hours

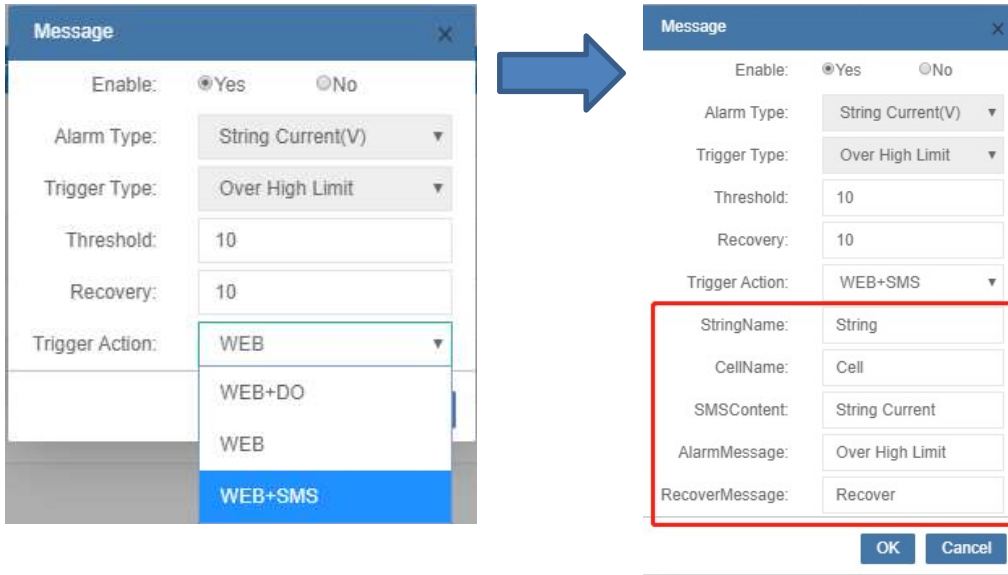
7. SMS Alarm setting



1. Select the left menu "Setting" → "Parameter Setting" → "Alarm Setting" ;
2. Select the alarm parameters you want to set , then click "Modify" on the right side of the system;
3. Confirm fill in the Sim card, and check the signal is ok.



4. Tigger Action select: “WEB+SMS”, and set the message content.
5. Pop-up “ Save successfully” , click “OK”;
6. After confirming that all alarm configurations are correct , click the red “Confirm Configuration” in the top bar of the alarm settings page.



The image shows two screenshots of a 'Message' configuration dialog. The left screenshot shows the 'Trigger Action' dropdown menu with 'WEB+SMS' selected. A blue arrow points to the right screenshot, which shows the 'Trigger Action' set to 'WEB+SMS' and a red box highlighting the message content fields: StringName (String), CellName (Cell), SMSContent (String Current), AlarmMessage (Over High Limit), and RecoverMessage (Recover). The 'OK' and 'Cancel' buttons are visible at the bottom.

8. Ohmic Measurement setting

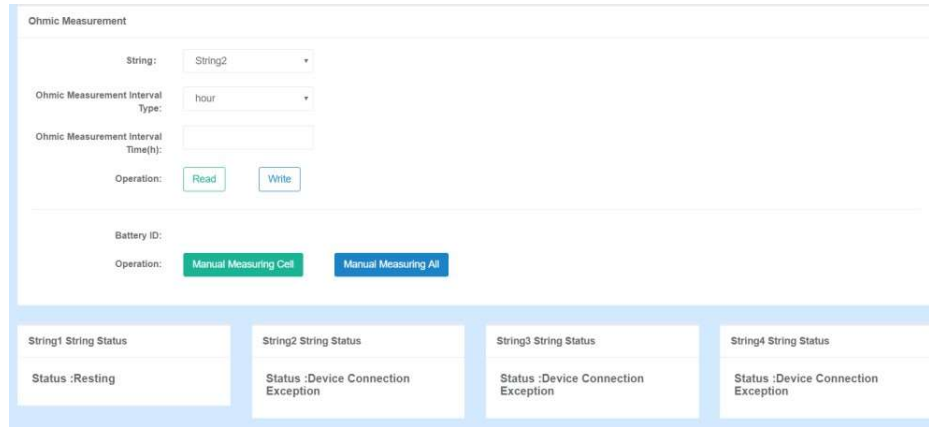
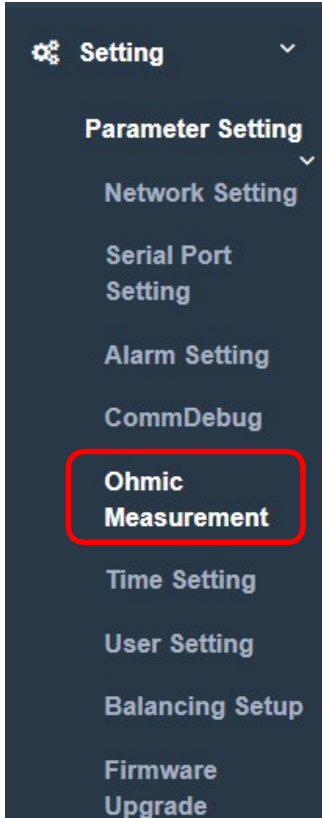
Select the internal resistance test interval as needed

Test (all): Perform internal resistance test on all groups of batteries, and it takes a long time to complete one round of testing;

Test (single): Select a certain battery of a certain group for internal resistance test;

Note: The automatic internal resistance is automatically controlled by the Device.

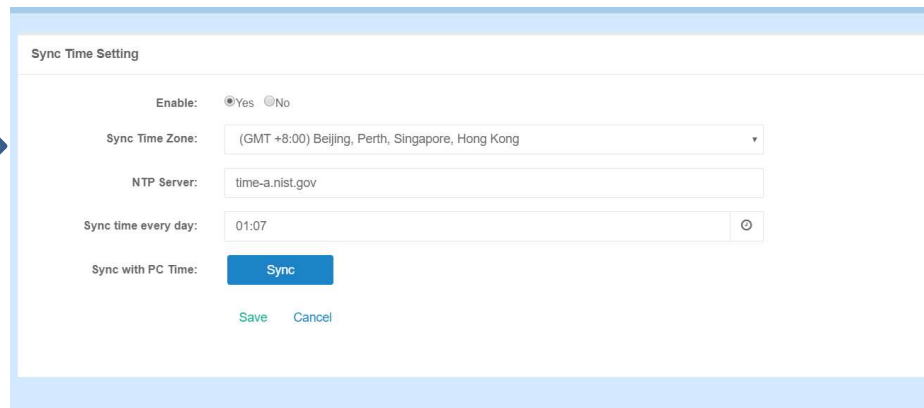
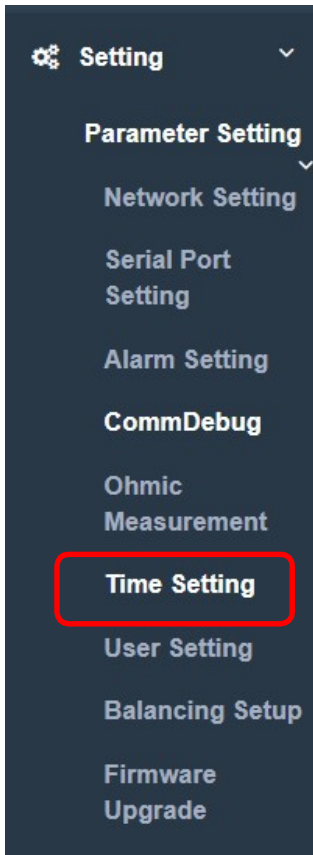
If the system has no Ohmic data, please make sure in float status, then try manual test



The screenshot shows the 'Ohmic Measurement' configuration page. It includes a 'String' dropdown menu set to 'String2', an 'Ohmic Measurement Interval Type' dropdown set to 'hour', and an 'Ohmic Measurement Interval Time(h):' input field. Below these are 'Read' and 'Write' buttons. A 'Battery ID:' field is also present. At the bottom, there are two buttons: 'Manual Measuring Cell' (green) and 'Manual Measuring All' (blue). Below the main configuration area, there are four status boxes for 'String1 String Status', 'String2 String Status', 'String3 String Status', and 'String4 String Status'. The 'String2 String Status' box shows a status of ':Device Connection Exception'.

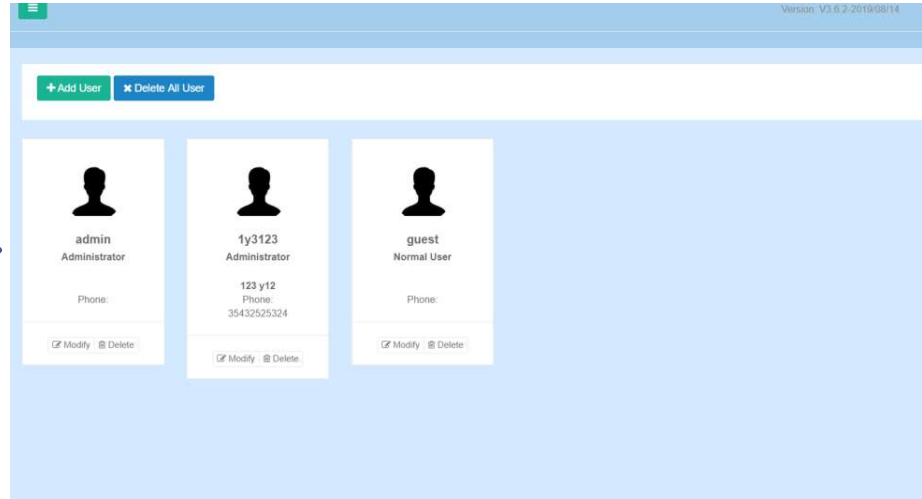
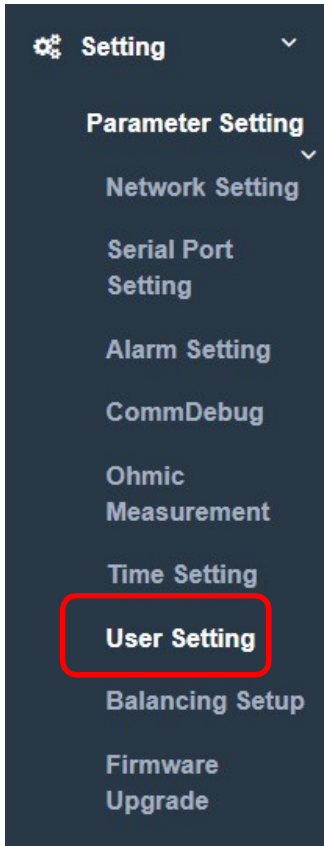
9. Sync Time setting

1. Select the left menu "Setting" → "Parameter Setting" → "Time Setting";
2. Select time zone,
3. The time server can be the domain name or IP address of the NTP server, such as: time-a.nist.gov
4. The gateway will connect to the NTP server at the time to perform automatic calibration.
5. Click the "Sync" button to synchronize the gateway with the computer time.



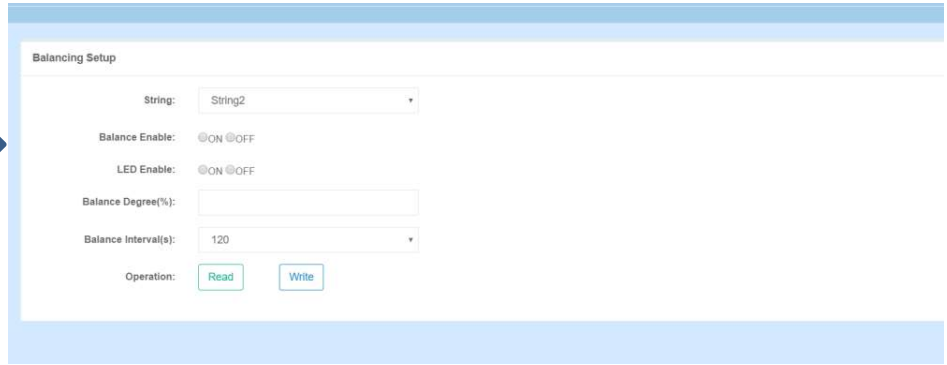
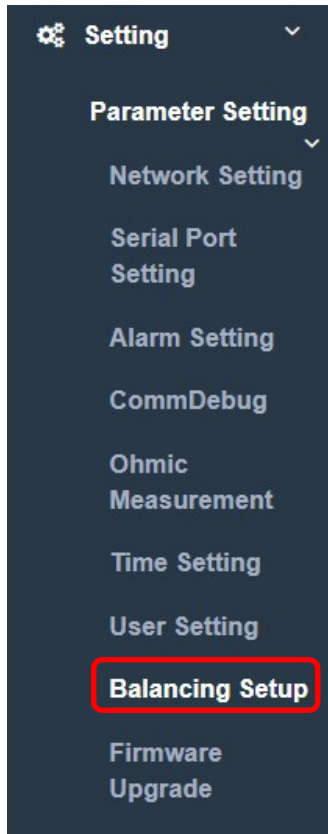
10. User setting

1. Select the left menu "Setting" → "Parameter Setting" → "User Setting";
2. Click Add User to add a user. User parameters include user name, password, user identity, contact information, SMS alert.
3. Click Delete all users to delete all users, and you will be prompted to delete them before deleting. (use with caution).
4. Click the Modify button below the user page to modify a single defined user.
5. Click the delete button at the bottom of the user page to delete a single user. If you delete it, you will be prompted to delete it.



11. Balancing Setup

1. Select the left menu "Setting" → "Parameter Setting" → "Balance Setup";
2. Set the equalization when the equilibrium is lower than the set value (if 90% means that the equalization is lower than 90%, turn on the equalization function) ;
3. Set the equalization interval, the minimum interval between each equalization function to prevent damage battery;
4. The balance can be set to a maximum of 99.5%;
5. Control light enable: control the switching status of gateway device and single lamp



Balancing Setup

String: String2

Balance Enable: ON OFF

LED Enable: ON OFF

Balance Degree(%):

Balance Interval(s): 120

Operation:

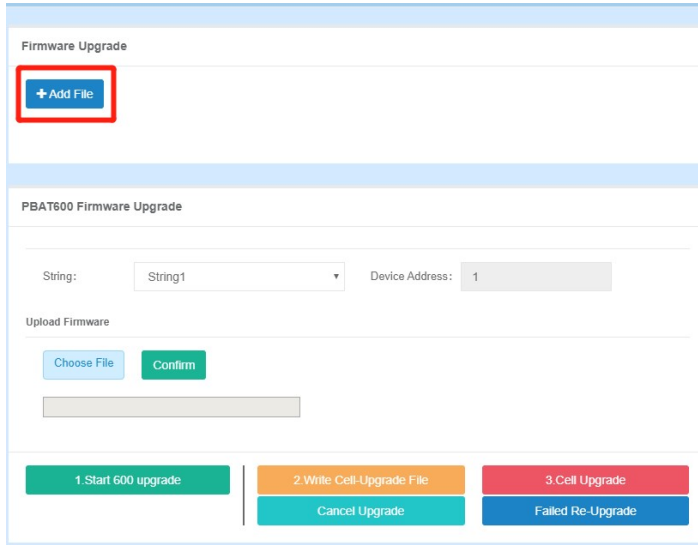
12. Firmware Upgrade

1. Select the left menu "Setting" → "Parameter Setting" → "Firmware Upgrade";
2. Before upgrading, please confirm whether to open or log in multiple webpages at the same time, close other webpages, and make sure to keep only one page, then upgrade.
3. Select the gateway upgrade file
4. After the file upload is completed, the gateway will start to upgrade. During the upgrade process, it is forbidden to log in to the gateway for related configuration operations. The upgrade time lasts for about 5 minutes. After the upgrade is completed, the gateway will automatically restart and restart. Re-login to webpage operation
5. After the upgrade is complete, you must first clear the browser cache (Google Chrome shortcut: Ctrl+Shift+Delete, clear options include at least 3 basic items: browsing history, cookies, and other site data, cached images, and text), update the webpage data in time, and then log in to the gateway again.

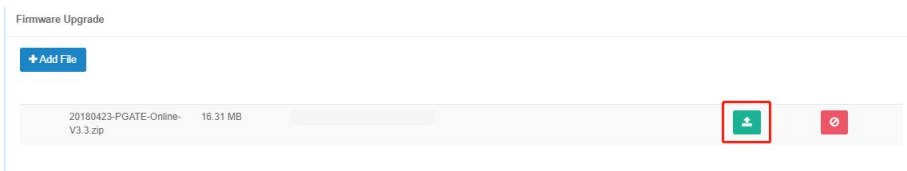
Note: 1. Before upgrading the gateway version of Gate3.4, you need to manually restart the gateway (press the gateway button "Service" button for more than 10 seconds and then release the button. The

gateway displays the word “Reboot”, indicating that the operation is successful and the gateway will restart). After the gateway restarts, the firmware upgrade is performed. The online upgrade of Gate 3.4 and later versions does not need to be restarted.

Do not modify the online upgrade package file name. If the same name upgrade package already exists in the same directory, the system automatically replaces the filename after the copy upgrade package appears (the file name may contain special characters, such as (), <>, etc.) In case, you must correct the file name before upgrading. The file name cannot contain special fonts.

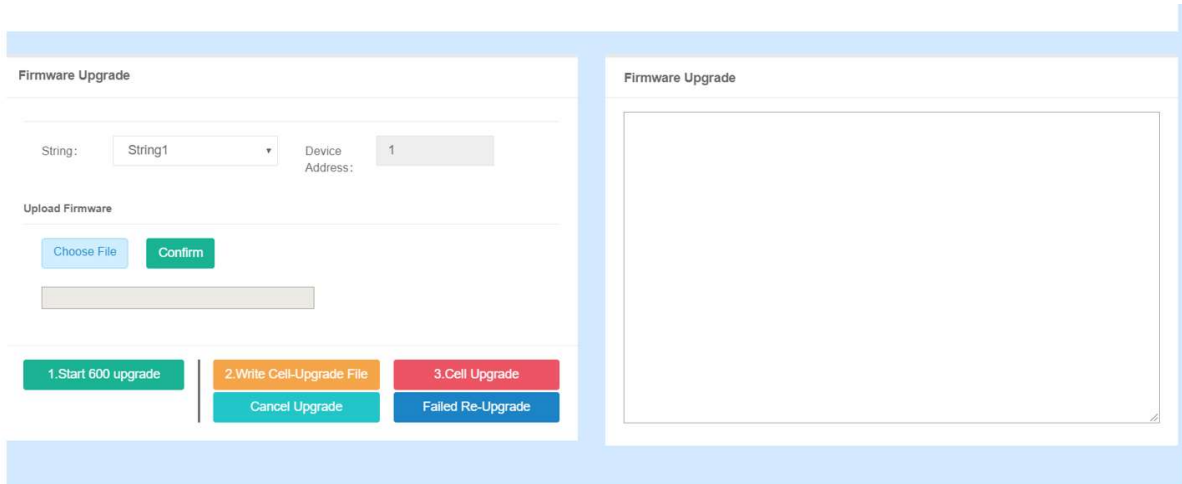


The screenshot shows the 'Firmware Upgrade' section of a web interface. At the top, there is a blue header with the text 'Firmware Upgrade'. Below this, a blue button with a white plus sign and the text '+ Add File' is highlighted with a red rectangular box. Underneath, there is a section titled 'PBAT600 Firmware Upgrade' which contains a 'String:' dropdown menu set to 'String1' and a 'Device Address:' input field with the value '1'. Below these fields is an 'Upload Firmware' section with a 'Choose File' button and a 'Confirm' button. At the bottom of the interface, there are several colored buttons: a green button labeled '1. Start 600 upgrade', an orange button labeled '2. Write Cell-Upgrade File', a red button labeled '3. Cell Upgrade', a teal button labeled 'Cancel Upgrade', and a blue button labeled 'Failed Re-Upgrade'.



The screenshot shows the 'Firmware Upgrade' section of a web interface. At the top, there is a blue header with the text 'Firmware Upgrade'. Below this, a blue button with a white plus sign and the text '+ Add File' is visible. Underneath, there is a file upload progress bar. The progress bar shows a file named '20180423-PGATE-Online-V3.3.zip' with a size of '16.31 MB'. To the right of the progress bar, there is a green download icon highlighted with a red rectangular box, and a red stop icon.

String/Cell Sensor upgrade:



The screenshot displays the 'Firmware Upgrade' interface. On the left, there is a form with a 'String' dropdown menu set to 'String1' and a 'Device Address' input field containing '1'. Below this is an 'Upload Firmware' section with 'Choose File' and 'Confirm' buttons. At the bottom of the form, there are five buttons: '1. Start 600 upgrade' (green), '2. Write Cell-Upgrade File' (orange), '3. Cell Upgrade' (red), 'Cancel Upgrade' (teal), and 'Failed Re-Upgrade' (blue). On the right, there is a large empty rectangular area, likely a progress indicator or log display.

String sensor upgrade:

1. Select the group upgrade file
2. Click on the confirmation to upload the upgrade file.
3. Click the Start 600 Upgrade button to perform the group upgrade, wait for the group upgrade to complete, and refresh the page.

Cell sensor upgrade:

1. Select the monomer upgrade file
2. Click on the confirmation to upload the upgrade file.
3. Click to write the monomer upgrade file and wait for the file to be written.
4. Click the single upgrade button to perform the unit upgrade. After the command is issued, the upgrade process is automatically completed by the group.
5. If you need to cancel the single upgrade, click the cancel subsequent upgrade button (the upgrade operation will be canceled after the upgrade of the single upgrade in this upgrade)
6. After all the units are upgraded, if there is a single unit upgrade failure, you can choose to fail to upgrade again. The failed unit will be upgraded again. All the unit upgrades have not been completed. You cannot perform this operation.

Note: When the system function needs to be upgraded, upgrade the firmware file to the gateway on this page. Always consult a technician before upgrading.

2Z model gateway group upgrade, single upgrade does not support 2G models extended to 4 600, illegal upgrade operations are prohibited.

Attachment: Alarm setting recommendation table

	2V	12V	2nd Upper limit	1st Upper limit	2nd lower limit	1st Lower limit
Float Voltage	2.23 ~ 2.27	13.38 ~ 13.62	2.40	2.56	1.95	1.80
Charge Voltage	2.35 ~ 2.39	14.10 ~ 14.40	2.45	2.60	1.95	1.80
Open Circuit Voltage	2.10 ~ 2.12	12.60 ~ 12.72	-----	-----	-----	-----
Cut-off voltage	1.75 ~ 1.80	10.50 ~ 10.80	-----	-----	1.95	1.80
Reset voltage	2.08 ~ 2.10	12.48 ~ 12.60	-----	-----	-----	-----
Internal Resistance	-----	-----	Standard*1.3	Standard*1.5	-----	-----
Ambient Temperature	-----	-----	30	40	10	0
Negative Temperature (Float)	-----	-----	TEMP+5	TEMP+10	-----	-----
Negative Temperature (Equal)	-----	-----	TEMP+10	TEMP+20	-----	-----
Negative Temperature (Discharge)	-----	-----	TEMP+15	TEMP+30	-----	-----



Note: The above parameters are for reference only, all based on the parameters provided by the battery manufacturer.

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