RAYSTECH

USER MANUAL

APP

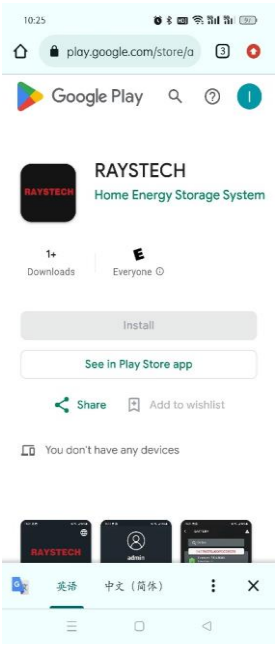
For End User

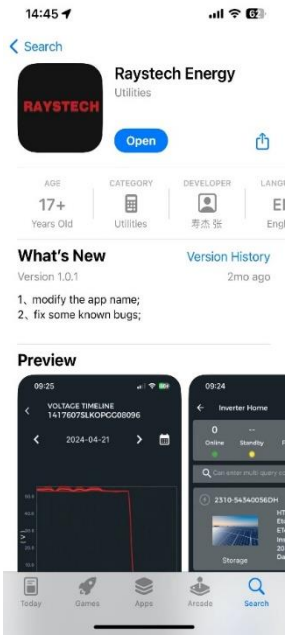
RAYSTECH (TIANJIN) PV ENERGY CO., LTD

CONTENT

1. App Download

Download the app. Search for "Raystech " in the Google Play Store or “Raystech Energy “Apple App Store or scan the QR Code.





Google Play (Android)

App Store (IOS)

2. The login page

After opening the App, users will enter the login page first, as shown in Figure 1. Before using the company's products for the first time, users generally need to configure battery pack WIFI communication and register users through the App. At the same time, this page also provides boundary entrance for several functions, such as online check and adding inverters without login.

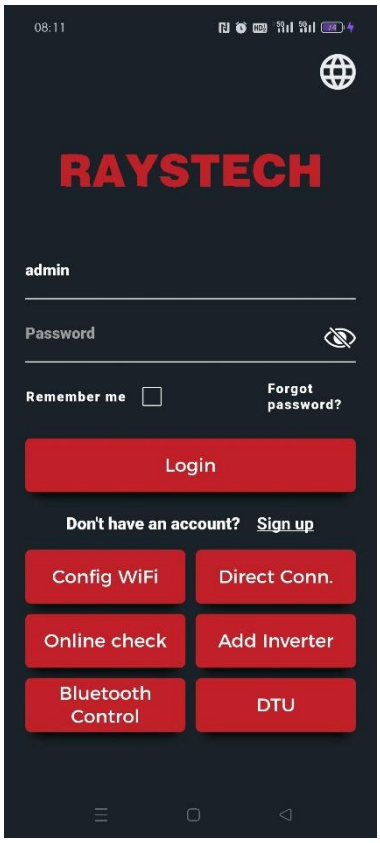


Fig. 1: Login page

3. The WIFI configuration

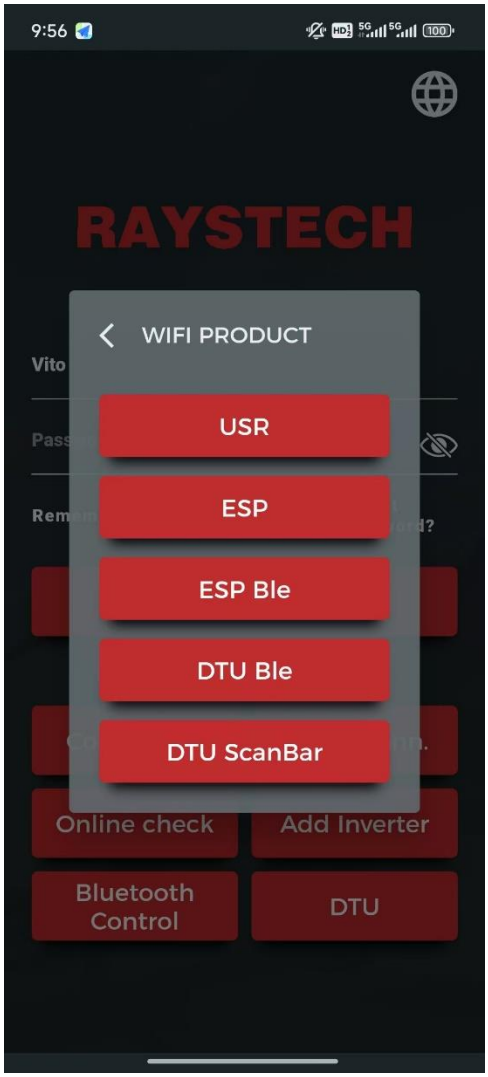


Fig. 2 WIFI product choose

3.1. WIFI configuration

Firstly, you need to **turn on Bluetooth**. On the login page, click "**Configure WIFI**", next click "**ESP Ble**" for Battery series of RT5427, RT5427 HV, RT5427 SHV, RT5427-HV-RACK, etc, or **“ESP”** for Energy Port, or

“DTU Ble” for Mini AIO.

Next, select the S/N of the battery or Energy Port or Mini AIO WIFI BOX.

Next select **config WIFI**. And next turn on WiFi button. The frequency range of WIFI needs to be selected as 2.4GHZ. And then refresh the SSID. Enter the local WiFi password to connect to the same network. And next select “**broadcast”**. Then select “**start BLE Config”**. Finally, return to the

main interface.

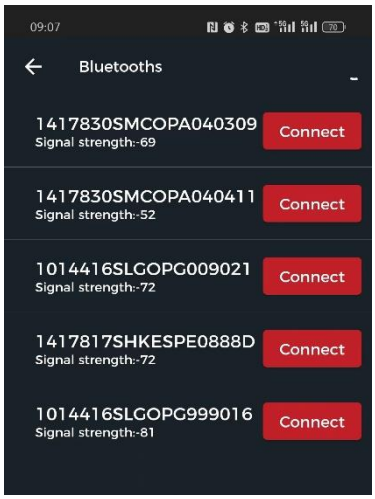


Figure 3: List of searching battery item

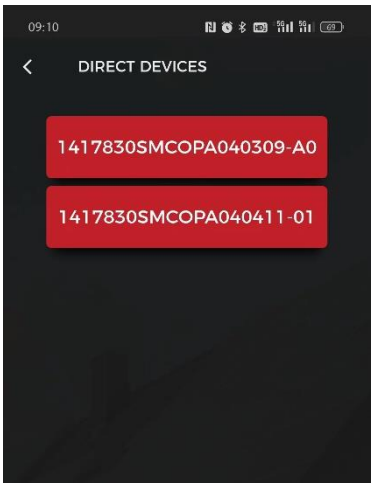


Figure 4: Select the battery

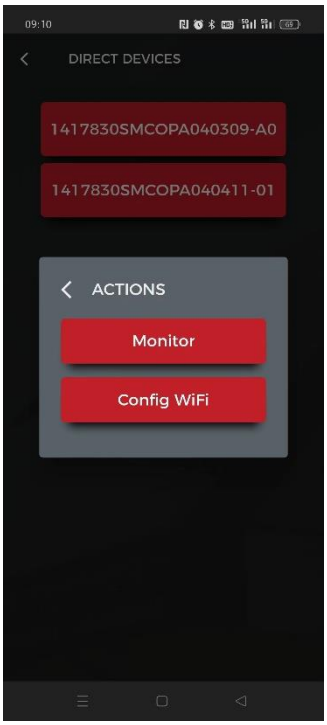


Figure 5: The action of config WIFI interface

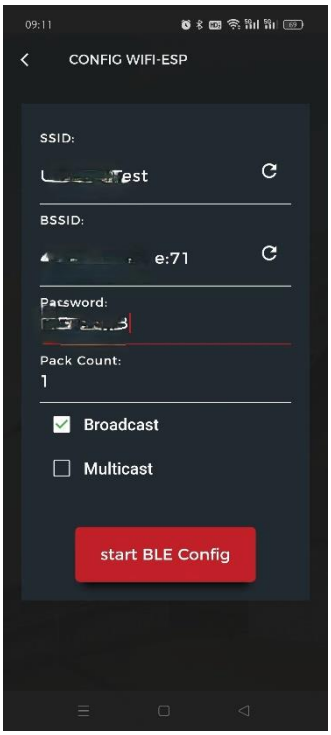


Figure 6: Perform network configuration

4. User registration

4.1 Registration through a battery, users must either scan or manually enter the battery's serial number. Registering multiple users with the same serial number is not allowed. If your serial number is occupied, please contact the after-sales service for assistance.

To register, follow these steps:

Step 1: Open the app and select 'Sign Up.' You will be automatically redirected to the barcode scanning page. Scan the battery barcode (Note: This step requires the app to have camera access). If scanning fails, you can also manually enter the device serial number by clicking 'Enter Device SN.'"

Step 2: After obtaining the battery pack serial number, you will be directed to the user information-collection page.

Note: This page requires location permission from your phone.

1) If multiple inverters are installed, click 'Add Inverter' to add additional inverters.
2) The app will automatically collect the phone's time zone and GPS location. These values are mandatory for after-sales support and to ensure the proper functioning of the battery pack. Note that this data collection cannot be disabled. A User ID and password are required, with the password length being a minimum of five characters.
3) Please read the 'User Agreement' carefully and check the box to agree before submitting. If you do not agree with the terms, you will not be able to complete the registration process."
4) If an error occurs during submission, please correct it and try submitting again. Once registration is successful, you can log into the system using your 'User ID' and password."

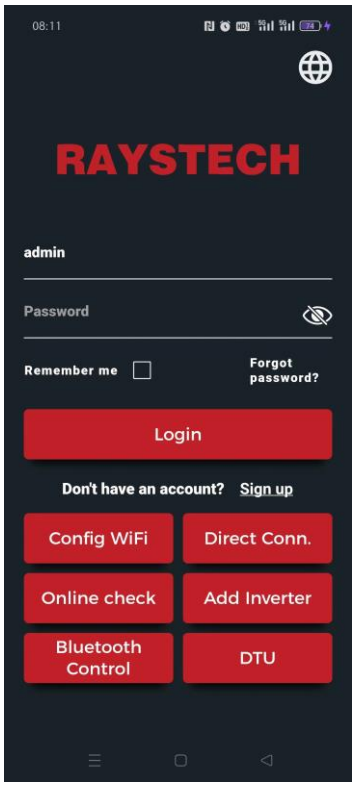


Figure 7: Home Page "Sign Up"

Figure 8: Scan Barcode

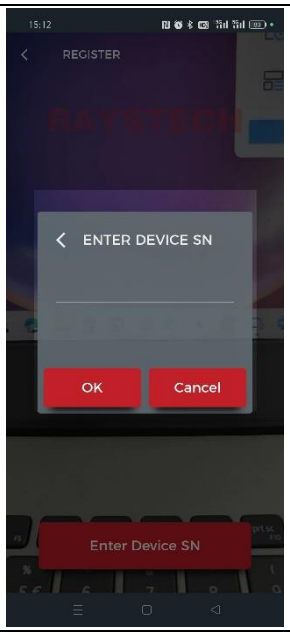


Figure 9: Manually enter the battery pack serial number

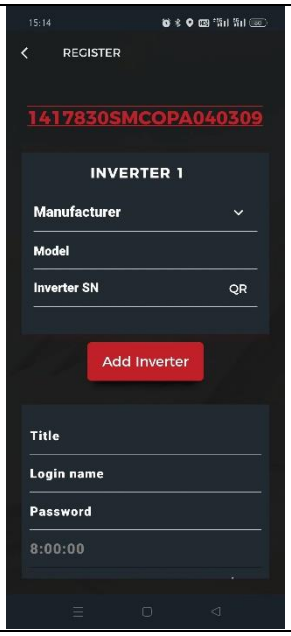


Figure 10: Filling in User Information

4.2 Registration through Mini AIO

Step 1: Open the app and select 'Sign Up.' You will be automatically redirected to the barcode scanning page. Scan the barcode of Mini AIO (Note: This step requires the app to have camera access). If scanning fails, you can also manually enter the device serial number by clicking 'Enter Device SN.'"

Step 2: After obtaining the Mini AIO serial number, you will be directed to the user information-collection page. Simply fill in the required information as shown in Figure 11 below.

Note: This page requires location permission from your phone.

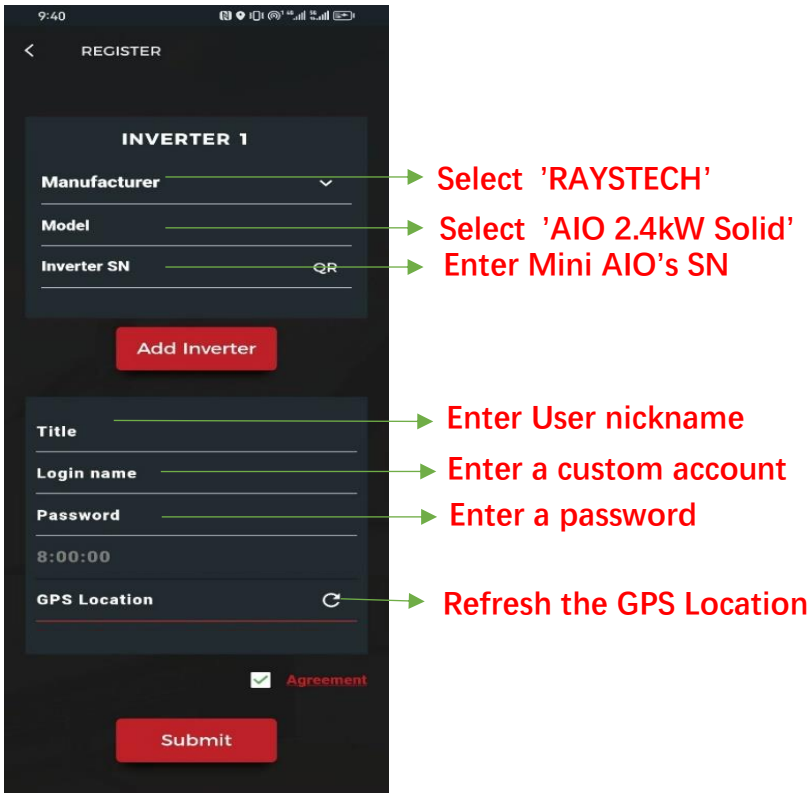


Figure 11: Filling in User Information

5. Reset the password

You can reset the user password based on the user ID and battery pack serial number. After the reset, the password is 123456.

On the login page, click "Forgot password?" Enter the password reset interface, as shown in Figure 12. All information must be filled in correctly, and then click " Recover Password" to reset the password to "123456".

Note: the default password will be changed after the user logs in to the system after the reset.

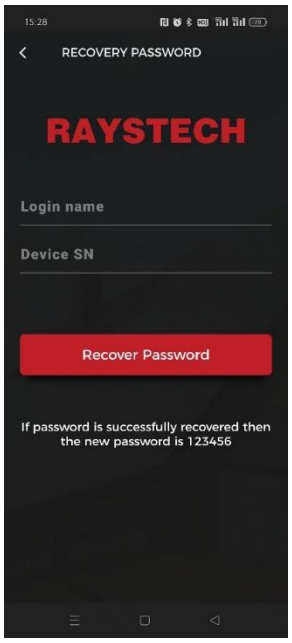


Figure 12: Password reset

6. Add Extra Battery/Mini AIO

Log in using your User ID, click 'Battery' to access the battery page. Next, click the icon in the top-right corner . Scan or manually enter the serial number, and finally, add the battery.

Figure 12: Home page

Figure 13: Adding page

7. Online Check

Users can quickly check if a battery is online by clicking 'Online Check' on the login page. Scan or manually enter the battery pack serial number. Once the correct serial number is obtained, the system will display the last online time for that battery, as shown in Figure 14. The battery is considered online if the recorded time is within 10 seconds of the phone's current time."

Alternatively, you can check the battery's online status on the battery page. A green indicator means the device is online, while a grey indicator signifies it is offline

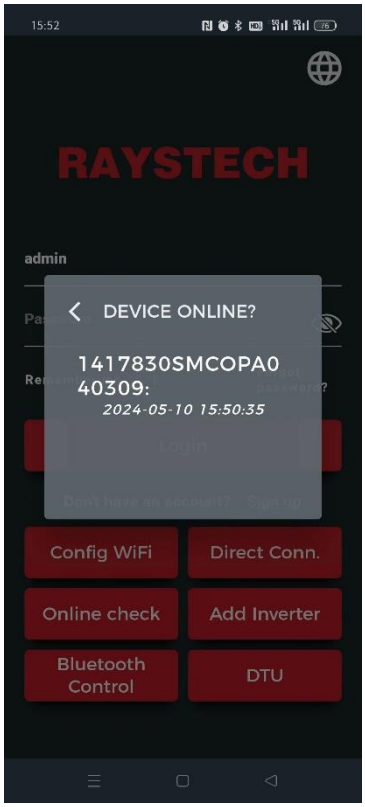


Figure 14: Battery online check

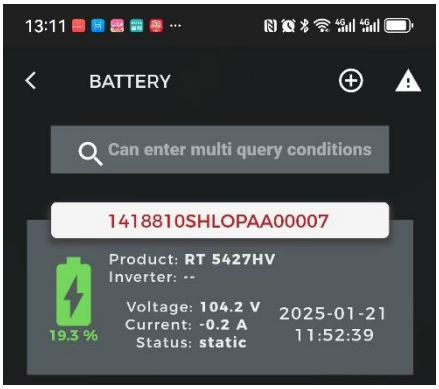


Figure 15: Battery online status

8. Connect the battery pack directly

In certain situations, such as when there is no available wireless network at the battery installation site or during internet outages, the battery can still be fully diagnosed, maintained, and monitored using the direct connection function.

You need to establish separate connections based on the Wi-Fi modules configured in the battery packs. Once the connections are established, you can monitor the battery's operating status.".

8.1. Online by Direct connection module

Tips: Ensure that both location and Bluetooth permissions are enabled for the mobile system and the app

On the login page, click **"Direct Conn." -> 'ESP Ble' only for batteries**

"Direct Conn." -> 'ESP WiFi' only for Energy Port

"DTU" -> only for Mini AIO

Note: The phone must not be running any agent software during this process.

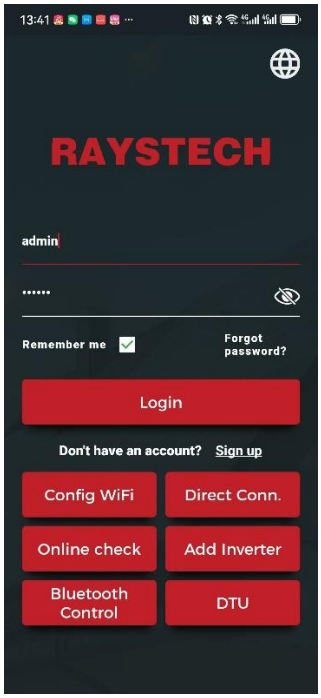


Figure 16: Quick direct online

Figure 17: Direct conn

9. Home page

After a successful login, you will be directed to this page, as shown in Figure 18. This page serves as the main navigation hub, providing access to various function pages, such as 'My' (displaying 'test1111' as the user ID in this example) and 'Battery.'

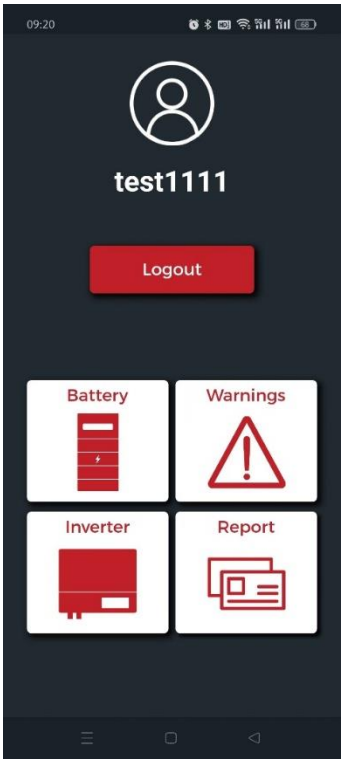


Figure 18: Home page

10. Battery pack management

Click 'Battery' on the home page (Figure 18) to access the battery list page, which displays either a battery cluster or individual batteries (Figure 19). Each block on the page represents a single battery or battery cluster. The information displayed in each block is described as follows:

- The leftmost battery icon 

: green represents the battery is online, red represents the

battery has an alarm, grey represents the battery is not online.

- Battery serial number: At the top of the box is a string of 19 positions representing a battery;
- Product: located in the second row of the box;
- Inverter: An Inverter can be connected to multiple batteries separated by a comma ", ";
- Time stamp: The last communication time between a single battery or battery cluster host and the server, which is displayed according to the time zone where the battery is registered.
- State, there are five types: static state, charge, discharge, fault, sleep;
- SOC: the current remaining charge of the host in a single battery or battery cluster, which is a percentage;
- Total pressure: The total pressure of a single cell or battery cluster. The host in a series battery cluster is the series total pressure, in volts (V);
- Power: The charge of A single battery or battery cluster. The host in A parallel battery cluster is the parallel current, in amperes (A);

In the search, the condition "including online packs" and "including offline packs" is the relationship of or, and the two conditions form the relationship of union with other conditions. The search page is shown in FIG. 20 battery list search.

Click the box to enter the cluster battery list, as shown in FIG. 21. Click the battery box in this page, and the battery function navigation page in FIG. 22 will appear. Click the corresponding item to display different data or perform a certain function, which will be introduced in subsequent chapters.

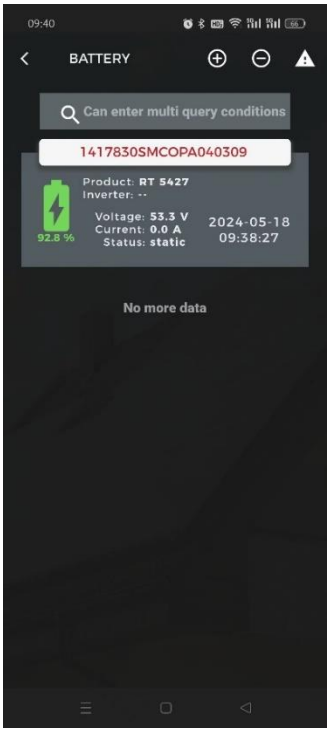


Figure 19: List of battery clusters or individual batteries

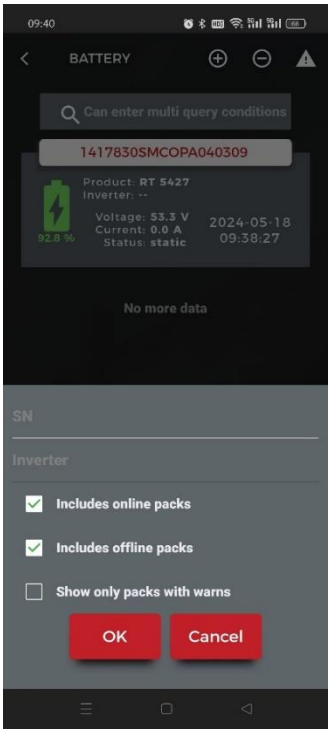


Figure 20: Battery List search

Figure 21: Cell clusters

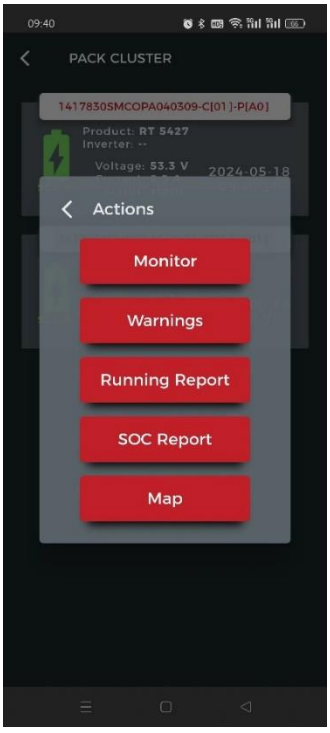


Figure 22: Battery function navigation

10.1. Real-time monitoring

Click "Monitor" in the navigation page of Battery function in FIG. 22 to enter the navigation page of real-time monitoring function of Battery pack in FIG. 23. There are 6 real-time monitoring categories. After clicking the category to enter the monitoring page, you may need to wait for the device to push data in real Time through the push service. If you see "[Time]" at the top of the page, it will turn into a specific Time stamp, indicating that some data has arrived.

（1） Overview. Click "Summary", direct to Figure 24 Battery pack overview in real time.

（2） The information displayed is described as follows:

- Current: the value on the left is the real-time current data
- SOC: Click "SOC (%)" on this page to display information about the current, similar to "current"
- Total voltage: the value on the left is the real-time voltage data
- Max Cell Voltage: Information about the maximum cell voltage in a battery cluster, including the real-time voltage, cluster number, package number, and series number
- Min cell voltage: information about the minimum cell voltage in a battery cluster, including real-time voltage value, cluster number, package number and series number
- Max temperature: information about the maximum temperature in a battery cluster, including real-time temperature value, cluster number, package number and string number
- Min temperature: information about the minimum temperature in a battery cluster, including real-time temperature value, cluster number, package number and string number

(3) Alarm. Click "Warnings", direct to Figure 25 Battery pack real-time alarm, The alarms here are only of the current battery, and each alarm is divided into three levels:

The level 1 can be considered as a reminder, the level 2 can be considered as an alarm, and the level 3 is already faulty (serious, which may cause battery shutdown). The information displayed is described as follows:

- Sensor or link failure, including BMU communication, single voltage acquisition line connection, temperature acquisition line connection, current acquisition module, battery data acquisition module;
- Monomer fault, including excessive monomer pressure difference, over monomer pressure, under monomer pressure;
- Charging fault, including temperature difference is too large, high temperature, low temperature, current over limit;
- Discharge fault, which also includes excessive temperature difference, high temperature, low temperature, current over limit;
- Other faults, including high total pressure, low total pressure, SOC, large pressure difference of the battery pack, and inconsistent battery pack capacity.

(4) Cell voltage. Click "Voltage/Temp", direct to FIG. 26 and list the real-time voltage of each battery string in the battery pack and all real-time temperature data collected in the battery pack in the form of thermometer. If temperature data does not arrive, the mercury in the thermometer is gray.

Figure 23: Battery pack real-time monitoring function navigation

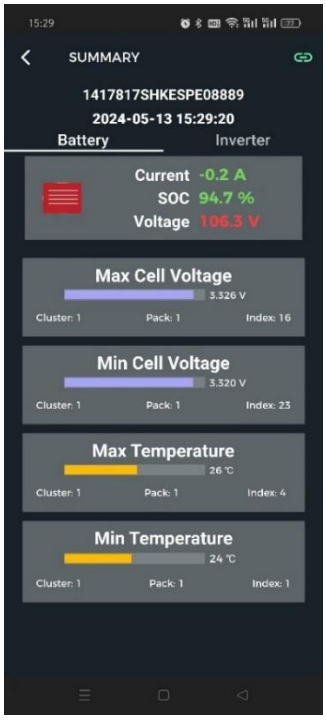


Figure 24: Battery pack overview in real time

Figure 25: Battery pack real-time alarm

Figure 26: Battery pack voltage& temperature information in real time

(5) Relay &Switch information. Click "Relay/Switch" in the navigation page of real-time monitoring function of Battery pack, direct to FIG. 27.

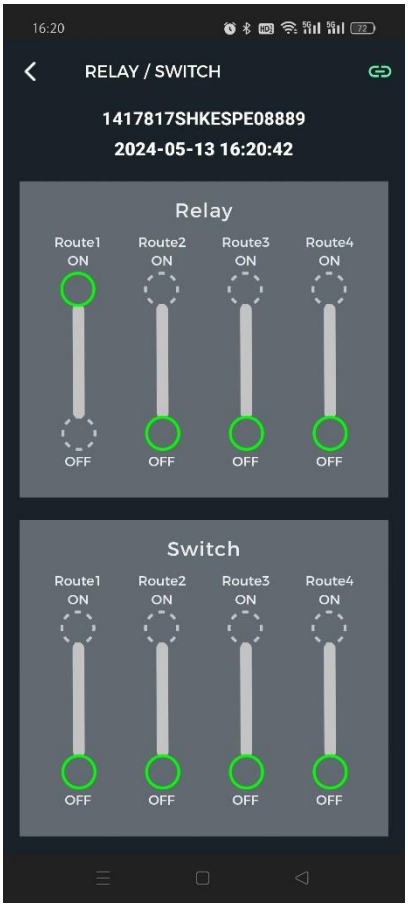


Figure 27: Battery relay information & switch information

10.2. Operation Report

Click "Running report" in the navigation page of battery function in FIG. 22 to enter the navigation page of operation report in FIG. 28. Classification is described as follows:

(1) Voltage daily curve: Expand the curve by day and 24 hours. The ordinate is voltage value and the abscissa is hour.

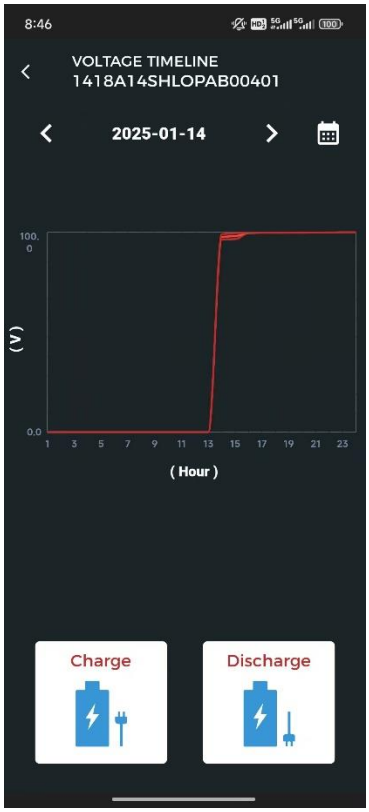


Figure 28: Voltage diurnal curve

(2) histogram of charging. Click "Charge" in to open the histogram page of charging day as shown in FIG. 28. There are two other bars of charging day as shown in FIG. 30 and FIG. 31:

- Charge day histogram, opens the statistical histogram on a 24-hour basis, the ordinate is kWh and the abscissa is hour. The charge quantity is accumulated within 24 hours of a day, that is, the statistical value is cleared at 0 o 'clock every day, and then accumulates to 24 points of the day. Note in particular that the histogram for an hour on the graph represents the amount of charge accumulated from zero to this hour on that day.
- Charge month histogram, a histogram is opened on the 28th or 29th day of a leap month, or the 31st or 30th day of a major month. The ordinate is kilowatt-hour (kWh) and the abscess is day. The histogram of a day on the graph represents the amount of charge on the day.
- Charge year histogram, which expands the histogram according to the 12

months of a year. The ordinate is kilowatt-hour (kWh) and the abscissa is month. The histogram of a month in the graph represents the charge quantity of the month.

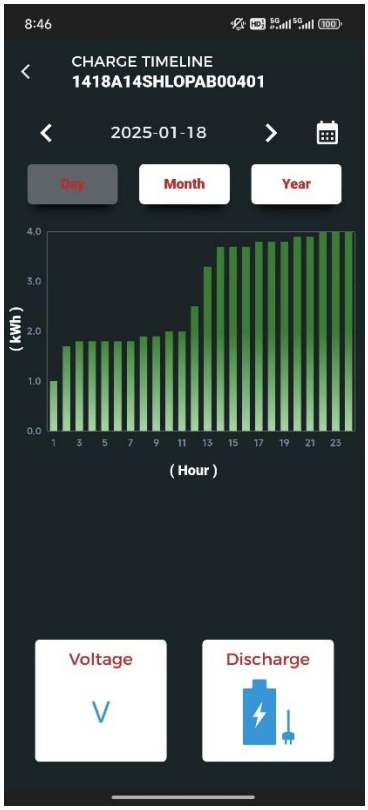


Figure 29: Charge day histogram

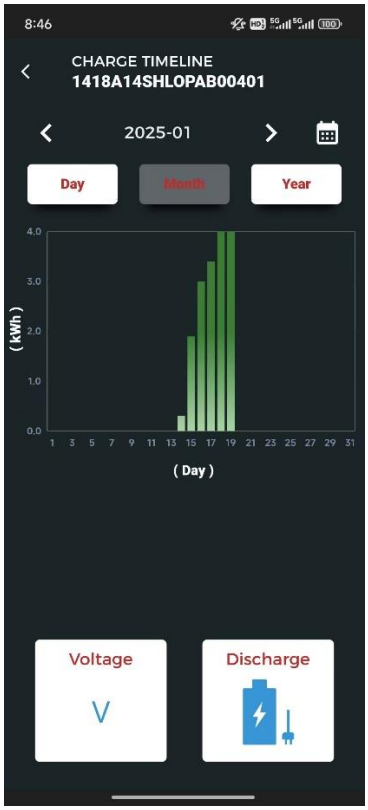


Figure 30: Charge month histogram

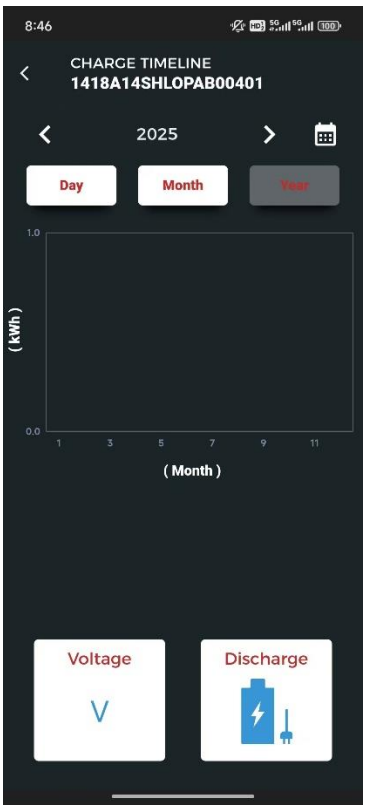


Figure 31: Charge year histogram

(3) Discharge histogram. Click "Discharge" in, the discharge day histogram page as shown in Fig.32 will be opened. There are two other discharge charts: Fig.33 Monthly discharge histogram and Fig.34 Discharge year histogram:

- Discharge day histogram opens the statistical histogram on a 24-hour basis. The ordinate is kWh and the abscissa is hour. The discharge quantity is accumulated in a 24-hour period, that is, the statistical value is cleared at 0 o 'clock each day and accumulated to 24 points on the day. Note in particular that the histogram for an hour on the graph represents the cumulative discharge of 5 power from zero to this hour on that day.

- Discharge month histogram, according to leap month 28 days or 29 days, or 31 days or 30 days of the month, the ordinate is kWh, the abscissa is day, the histogram of a day on the graph shows the amount of electricity released on that day.
- Discharge year bar chart, which unfolds over 12 months of the year. The ordinate is kilowatt-hour (kWh) and the abscissa is month. The bar chart of a month in the graph represents the discharge of the month.

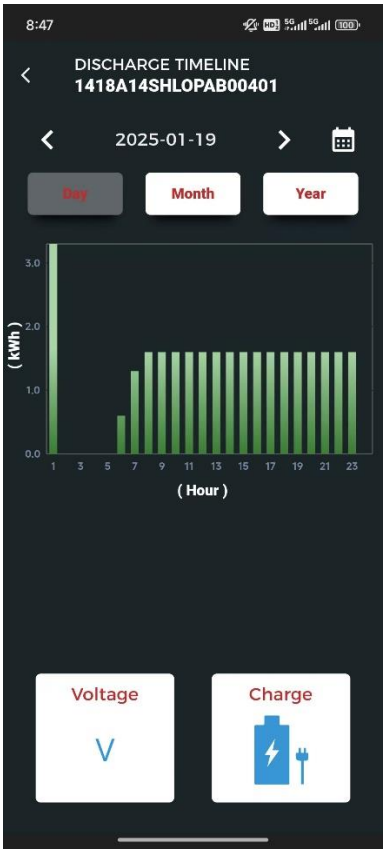


Figure 32: Discharge day histogram

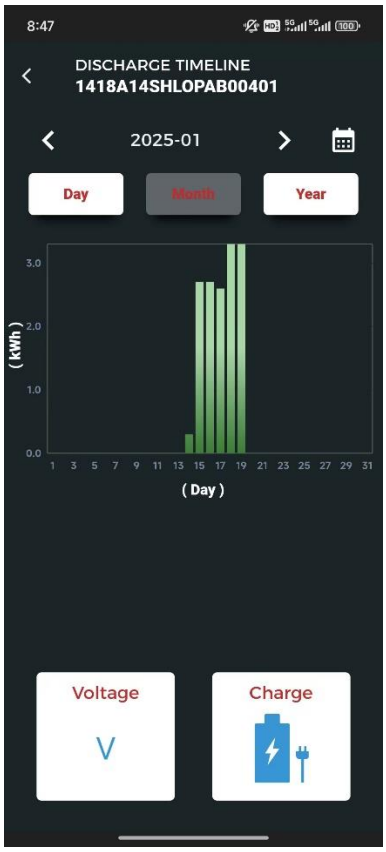


Figure 33: Discharge month histogram

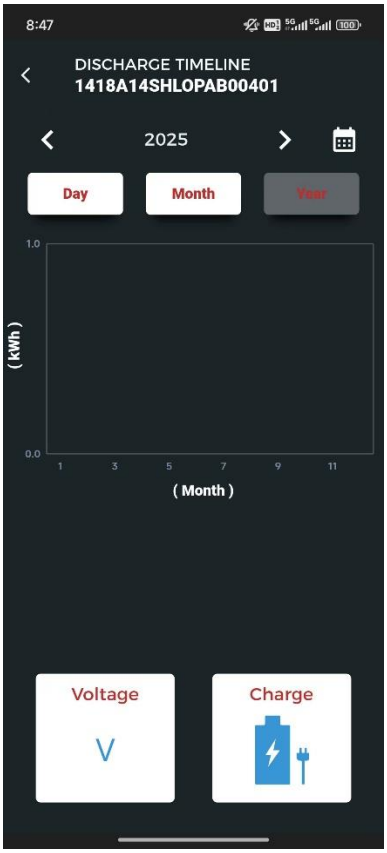


Figure 34: Discharge year histogram

11. Alarm and fault management

Click "warnings" on the home page of Figure 16 to enter the alarm list, as shown in Figure 18 or Figure 23.

（1）To query alarms or faults, click the input box "Can enter multi query conditions" to open the alarm list query page in Figure 36. SN is the serial number of the battery. Both of them support fuzzy query (you only need to enter part of the character string of the information to be queried). You can select multiple alarm types on the displayed page (Alarm List query - Alarm Type Selection), as shown in Figure 37.

- BMU Communication fault status
- voltage acquisition line connection fault status
- Temperature collection cable connection is faulty
- The current collection module is faulty
- excessive pressure difference of a single unit
- Over voltage fault status of a unit
- under-voltage failure of a unit
- The total pressure is excessive
- Total pressure over-low fault state
- Charging temperature difference is excessive
- Charging high temperature fault state
- Charging low temperature fault state
- Charging over-current fault status
- discharge Over-current fault status
- SOC over-low fault state
- The battery data collection module is abnormal
- Battery pack total pressure difference is excessive
- Battery pack capacity is inconsistent
- discharge Excessive temperature difference fault state
- Discharge Indicates the high-temperature fault status
- discharge Low temperature fault state

（2）After selecting "show only unprocessed", only all unprocessed alarms will be displayed in the list.

(3) Click the "unprocessed" alarm information to enter the alarm information Processing page in FIG. 38.

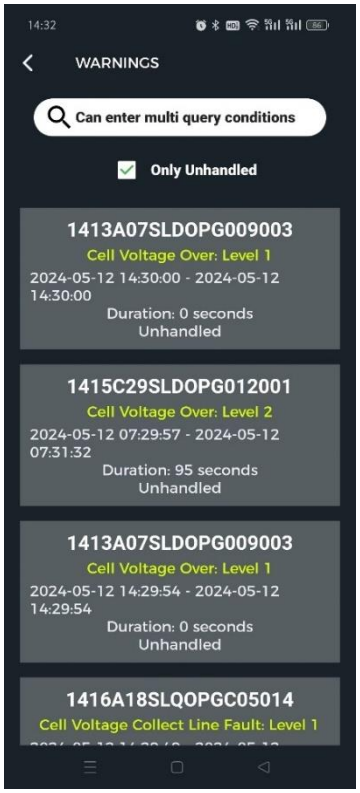


Figure 35: Alarm list

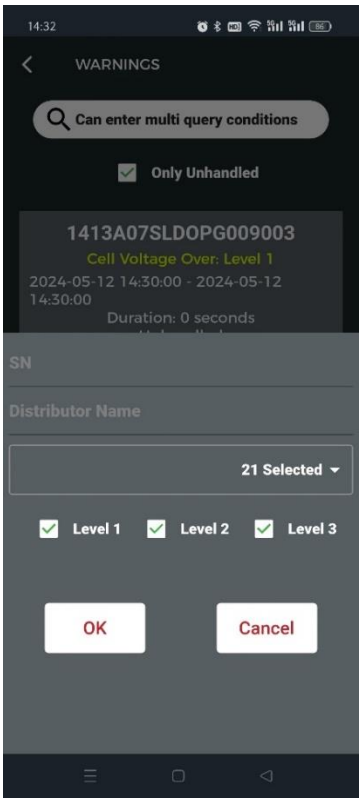


Figure 36: Alarm List Query

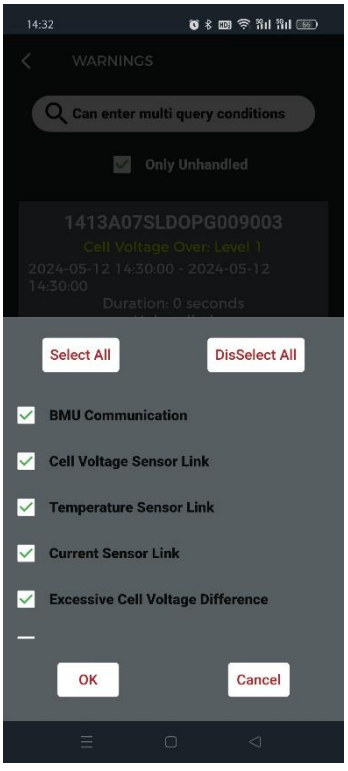


Figure 37: Alarm list query - Select alarm type

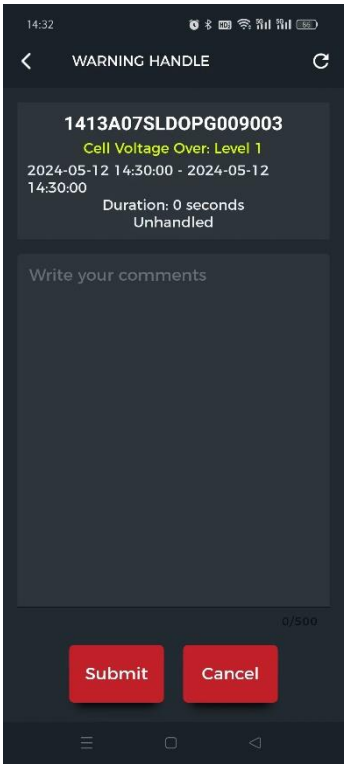


Figure 38: Alarm in processing

12. Report

Click “Report” on the home page of Figure 18 to open the report navigation page of Figure 39. Distributor reports are used by manufacturers and distributors only.

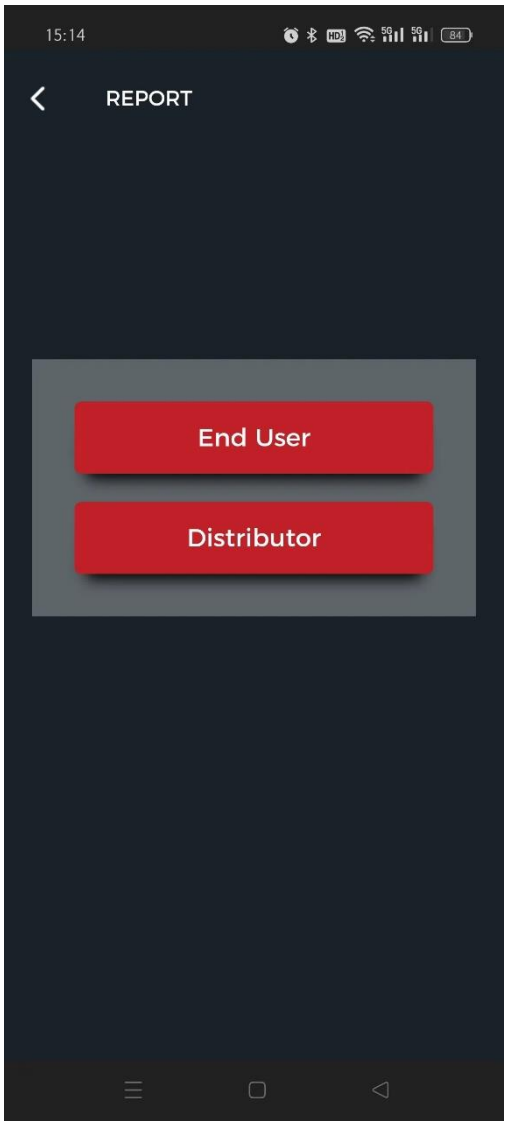


Figure 39: The report navigation

12.1. End-user reports

Click "End User" in the page to open the end User statistics report page in FIG. 40. Users can fuzzily search based end user name. Time can only filter by date, that is to say, can only see one day data. This page contains the following service data:

- Total battery pack number: the number of all battery packs in a statistical day under the user who is measured.
- Alarm Number: the number of batteries that generate an alarm in a statistical day.
- Alarm L1: The total number of level 1 alarms generated by all batteries in a statistical day by a user;
- L2: Statistics the total number of secondary alarms generated by all batteries in a day.
- L3: indicates the total number of level 3 alarms generated by all batteries within a statistical day.

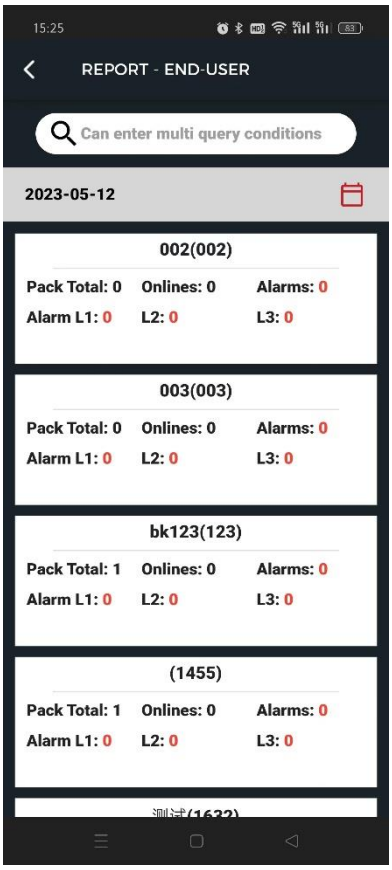


Figure 40: End user statistics report

13. My page

Enter the home page interface shown in FIG.18. Click  on the home page to enter the My page of FIG. 41; click the small triangle  in the upper right corner to enter the page of FIG. 42 to modify password; click the icon  to enter the page of information for editing in FIG.43. Click the contact information to open the contact function page of FIG.44. in which the system's functions of making calls or sending emails can be called.

Other functions are described in the following sections, such as upgrade device and etc.

Figure 41:

My page

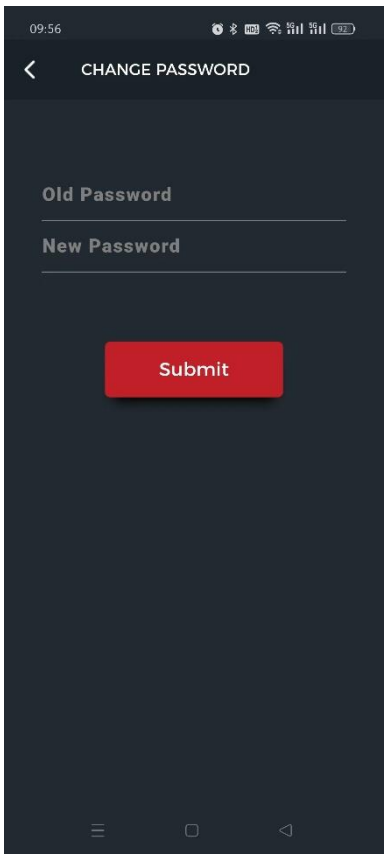


Figure 42:

Change the password

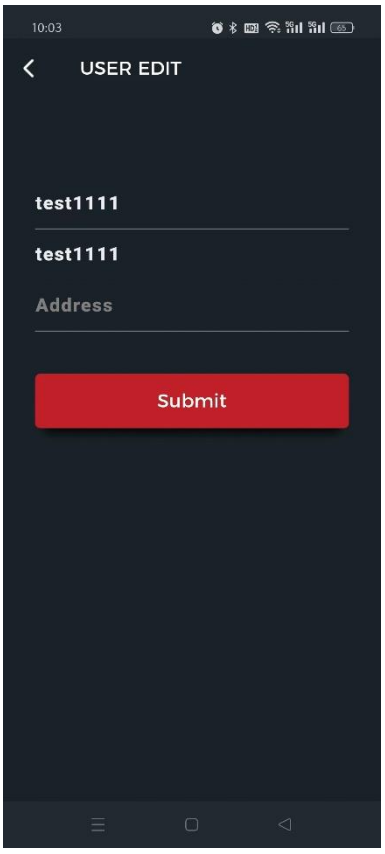


Figure 43:

Editing information

Figure 44: Contact function

14. User agreement

Users can only use the Raystech Energy App if they agree to this agreement. Details can be viewed here as follows: Click "Terms and conditions" on my page as shown in Figure 45 to open the agreement reading page.

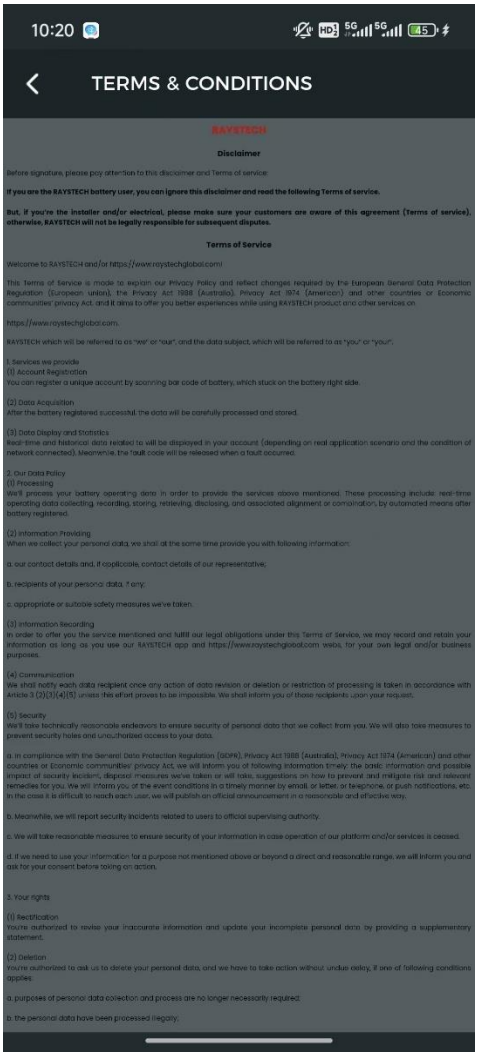


Figure 45: Terms of Service

RAYSTECH

RAYSTECH (TIANJIN) PV ENERGY CO., LTD

ADD: 13TH FLOOR TIANQI INTERNATIONAL MANSION,
CENTRAL BUSINESS DISTRICT,
BINHAL NEW AREA, TIANJIN, CHINA
Tel: +86-22-59901199
Email: service@raystechgroup.com