SC503 Controller

User Manual

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Safety Precautions

To reduce the chance of accident, please read the safety precautions very carefully before operation. The "Caution, Note, Warning, Danger" in this book and on the product do not represent all the safety points to be observed, and are only supplement to various safety points. Therefore, anybody who will install or operate the system has to be strictly train and master the correct ways and all the safety points before operation.

When operating DPC products, the personnel must observe the safety rules in the industry, the general safety points and special safety instructions specified in this book.

Electrical Safety

I. Tools



In AC operations, special tools should be use.

II. Thunderstorm



Never operate on high AC voltages, iron tower or in the thunderstorm conditions.

In thunderstorms, a strong electromagnetic field can generate in the air. Therefore, the equipment should connect with grounding system in time to avoid damages by lightning strikes.

III. ESD



The static electricity generated by the human body will damage the static sensitive elements on PCBs, such as large-scale ICs. Before touching any plug-in board, PCB or IC chip, ESD wrist strap should wear by experts to prevent body static from damaging the sensitive components. The other end of the ESD wrist strap should connect with grounding bar.

IV. Hotsurface



When the controller is running in the environment of high temperature, the surface of the controller may be hot. Please be careful when you plug or extract the controller. At the same time, you may be injure by falling controller from hands.

V. Fire



Please obey the standard operation rules when you connect any cable connectors and ensure reliable connection to avoid an accident, such as fire and damage of equipment.

VI. Short circuit



During operation, never short the positive and negative poles of the DC distribution unit of the power supply system or the non-grounding pole and the earth. The power supply system is a constant-voltage DC power device; short circuit will result in equipment burning and endanger human safety.

Be careful the pin of the controller golden finger connector as they are too close with each other. If the adjacent two pin contacts, a short circuit may occur.

Check the polarity of the cable and connection terminal when performing DC live operations. As the operation space in the DC distribution unit is very tight, please carefully select the operation space. Never wear a watch, bracelet, bangle, ring, or other conductive objects during operation. Use insulated tools.

In live operation, keep the arm, wrist and hand tense, so that when the tool in operation slips, the movement of the human body and tool can reduce to a minimum level.

BLVD

The controller has battery low voltage disconnection (BLVD) function. BLVD means when battery voltage drops down to 43.2V, the power supply system cuts the load off to prevent over-discharge.

BLVD is enable before delivery, which means that if power outage lasts for a long time or the power supply system fails, there might be BLVD. Users should classify the loads and connect the priority loads to BLVD routes. For vital loads, users can disable BLVD to ensure reliability of the power supply.



The advantage of BLVD is protecting the batteries from over-discharge. The disadvantage of BLVD is that when the battery voltage drops down to a certain value, all the loads (including non-priority loads and priority loads) will cut off due to battery disconnection.

The advantage of disabling BLVD is prolonging the power supply of priority loads. The disadvantage is that disabling cannot prevent unwanted power failure due to mis-operation or power supply system's failure.

Others

I. Safety



While replacing the power input fuses of monitoring modules, use the same type of fuses to meet the safety requirement.

II. Sharp object



When moving equipment by hand, wear protective gloves to avoid injury by sharp object.

III. Power cable



Please verify the cable labels and the silkscreen of the power supply before connection.

IV. Signal cables



The signal cables shall route at least 150mm away from power cables.

V. Correct parameter setting



Please make sure the parameter settings are correct, or the function of the power system will get bad affect and the reliability of the system will be reduce.

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Chapter 1 Overview

This chapter introduces model description, composition and configuration, and features of SC503 controller. (Abbreviated as ‘SC503’ or ‘controller’ here in after).

1.1 Model Description

The SC503 appearance of the system shown in Figure 1-1.

SC503 controller is use to communicate small, medium and large power systems. It has a friendly user interface, which is easy to operate. It adopts standard 1U*2U structure, which can save more space.



Figure 1-1 SC503 Appearance

1.2 Front View Introduction

The front view of SC503 shown in Figure 1-2. Moreover, the functions of the front panel components can see in below Table 1-1.

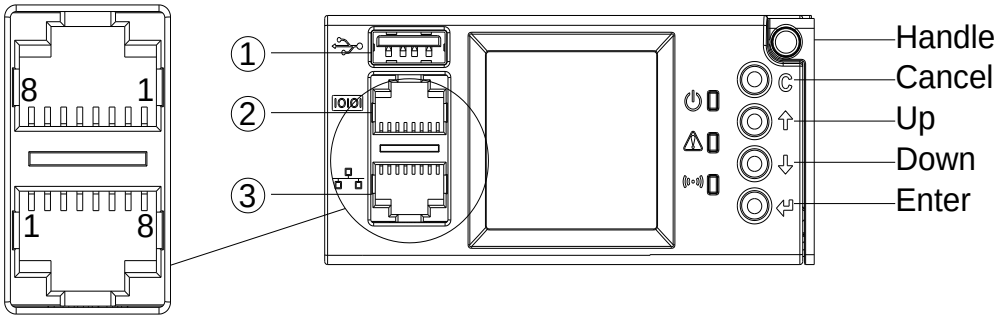


Figure 1-2 Front view of SC503

Table 1-1 Components functions of front panel

1	USB port			Power LED (Green)
2	RS485 port			Minor alarm LED (Yellow)
3	Ethernet port			Critical alarm LED (Red)

1.3 Hardware Interface

1.3.1 USB, Ethernet & RS485 Interface Definition

The positions of these three interfaces show as above Table 1-1, and the definitions show as below:

The USB port and Ethernet port are standard definition. However, in Ethernet port it has two RS485 interfaces, the definitions show as below Table 1-2.

Table 1-2 Definitions of Ethernet & RS485

RS485		**Ethernet**	
Pin	Signal	Pin	Signal
1	NA	1	TX+
2	NA	2	TX-
3	NA	3	RX+
4	485_1_A	4	NA
5	485_1_B	5	NA
6	NA	6	RX-
7	485_2_A	7	NA
8	485_2_B	8	NA

1.4 Main Functions

The main functions of the SC503 as below:

- AC/DC rectifiers management
- AC over voltage and under voltage alarm and protect
- DC over voltage and under voltage alarm and protect
- LLVD and BLVD
- Battery management
- Energy saving
- Rectifier Slot Management
- Fault alarm and protection
- Peak shaving and peak switching function for mains
- Wi-Fi/Bluetooth Connectivity
- Monitor and management, remote communication and remote-control function

SC503 control system is use to manage power system to work in intelligent and high efficient way. It is the mother controller in the control system. In most condition, it can meet the requirement of a system.

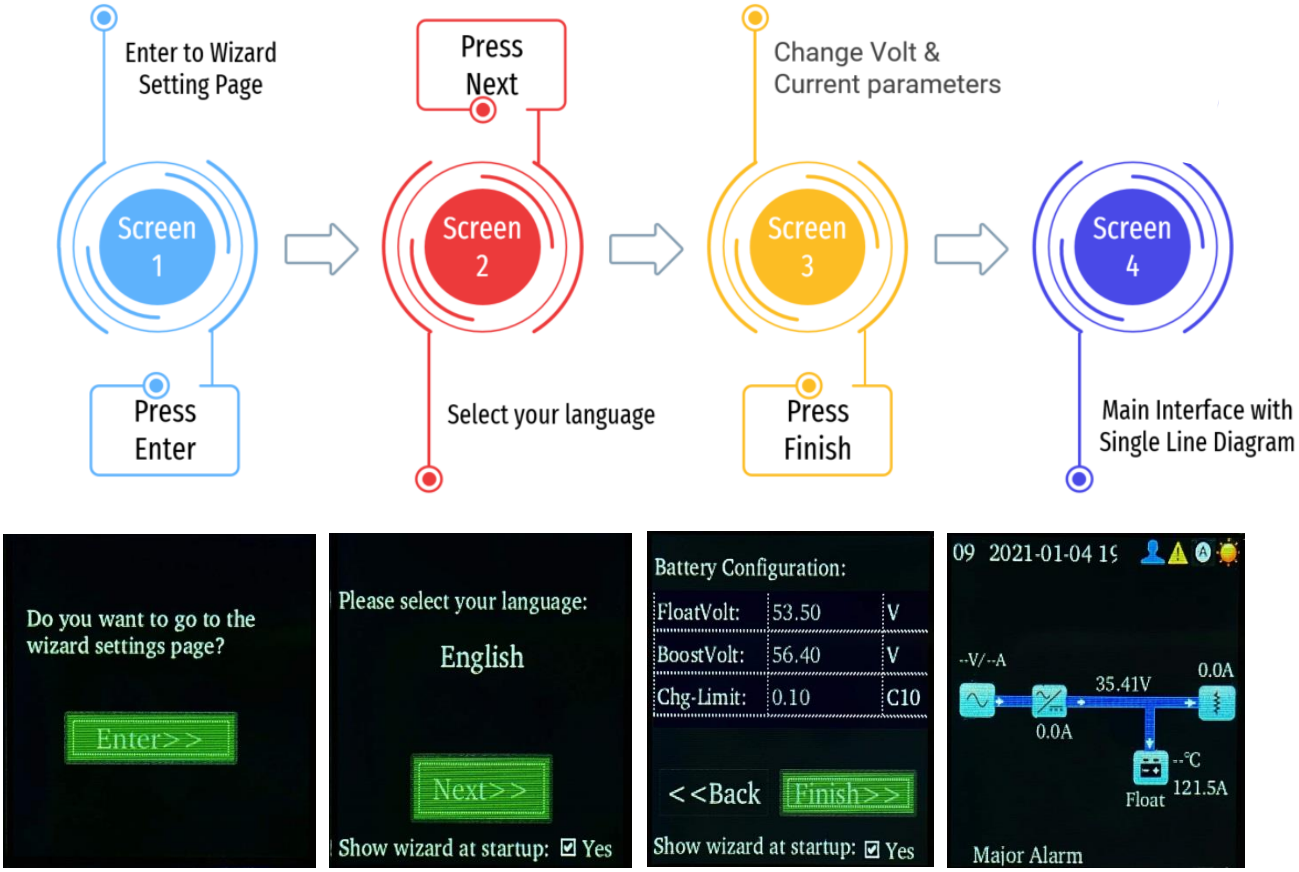
SC503 can expand intelligent parts to get more functions, such as more LVDs, more batteries, more load shunts, more DIs and DOs, more sensors, controlling cooling system, and so on. If you want to know more details about the expandability parts, please do not hesitate to contact us.

1.4.1 Performance Specifications

Item	Quantity	description
Battery Voltage	2	To -48V system: effective measuring voltage range is 0V ~ 75V, accuracy ± 0.1V; To 24V systems: effective measuring voltage range is 0V ~ 30V, accuracy ± 0.1V. Note: The accuracy of the effective temperature range is 15 ℃ ~ 30 ℃.
Battery Current	2	Effective battery current measurement voltage range is ± 25mV, the measurement accuracy of ± 1%. Note: The accuracy of the effective temperature range is 15 ℃ ~ 30 ℃; the ratio between current and voltage can be configured.
Load Current	1	
Busbar Voltage	1	Same to battery voltage
Load Fuse	2	To -48V system: absolute voltage difference and monitor ground reference (-48V) is less than 10V indicates normal; greater than 10V represents the exception. To 24V systems: absolute voltage difference is less than 10V and monitoring ground reference (0V) represents between normal; more than 10V represents the exception.
Battery Fuse	2	To -48V system: absolute voltage difference and monitor ground reference (-48V) is less than 400mV indicates normal; greater than 400mV represents the exception. To 24V systems: absolute voltage difference and monitor ground reference (0V) is less than 400mV indicates normal; more than 400mV represents the exception.
Digital Inputs	6	
Digital Output	6	can be associated with alarm output
LVD (Disconnection Control)	2	The maximum driving capacity is 40A within 0.1s and 1.5A for a long time
LCD	1	128*128
Key	4	
LED	3	
CAN	2	
RS485	4	2 for internal use, 2 for customers use
TCP/IP	1	Support WEB and SNMP
USB	1	
GPRS Interface	1	Support GPRS function

1.4.2 System Setup Guide

The system setup wizard is use to guide users to perform simple configuration when they start up the system. After controller startup, the system setup wizard will display on the controller screen. The last screen of the setup wizard prompts that you can now enter and configure the other system settings. The system setup wizard will not display on the next startup of system but it can be configured from the within the system settings. Figure 1-3 shows the system's setup wizard process.



System Setup Wizard

Note: *Press the Back key to exit the wizard Settings*

The controller has two-level authorization to control the operation show as below:

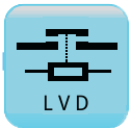
User name	Default password	New password	Authorized range
engineer	1031	Could be changed after login	Part
admin	170313	Could be changed after login	Full

The max password length is nine characters; it can be set as numbers or letters. The way to setup, the password is as follow: For example, password is "170313". Firstly, you need to set these six numbers (1, 7, 0, 3, 1, 3) by pressing the "↓" button, "↑" button. Finally, press "↲" button to confirm, then you will log in and can modify some parameters.

1.4.3 Main Menu Navigation

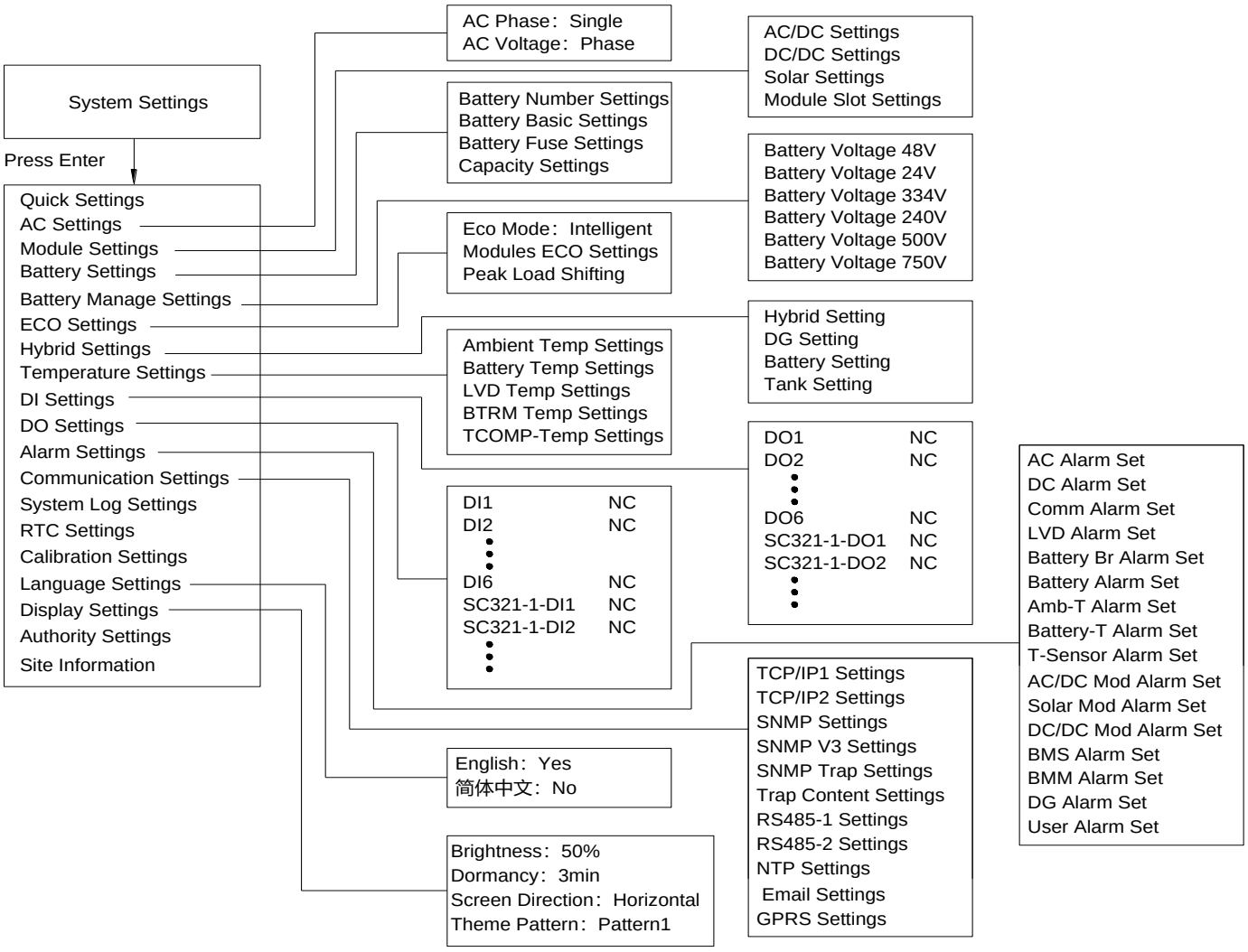
On main interface, when press "down key" the display will enter will enter into the main menu page. On main menu page, all information of the system can browse, and the configuration could be set. Table 1-3 shows the system's main menu with available settings.

Table 1-3 Main Menu Introduction

Sr.	Column-1 icons	Column-2 icons	Column-3 icons	Column-4 icons
1	 Mains Information	 DC Information	 Module Information	 Energy Information
2	 DG Information	 Battery Information	 Current Alarms	 Temp Information
3	 System Settings	 System Control	 LVD Settings	 Devices Setting
4	 Sys Run Information	 Data Process	 System Logs	 About

1.4.4 Menu Tree of System Settings

Figure 1-4 below shows the menu tree. When setting parameters, open the sub-tree and set related parameters. When only one battery shunt is use in the system, the capacity of the battery should be set to the total capacity of all battery strings. When two or more battery shunt devices use in the system, the battery capacity setting value shall be the capacity of each battery group.



Menu tree

1.4.5 Component Number Settings

If the system has extended components, the corresponding communication interface and component configuration must be set first.

In “SC210”, there’re some parameters can be setting, such as three battery current shunts, three load current shunts, one reserved current shunt, one current hall sensor, etc. For high accuracy and low power dissipation, the 25mV or 50mV shunt is recommended.

In “SC340”, you can set the fuse alarm detected numbers here, three SC340 can be supported and each SC340 can maximum supports twenty-four branches.

In “SC321”, you can set the DIDO numbers here. Up to three SC321-DIDO boards can be supported and each SC321 supports different sensors as well.

In “SC350”, you can set the temperature sensors’ numbers and fans settings here. Maximum four temperature sensors and two types can support.

In “SC310”, you can set the branch current detected numbers here. Up to three SC310 can support and each SC310 supports twenty-four branches Max.

One SC503 can support different expanded parts. The setting number range shows below Table 1-4.

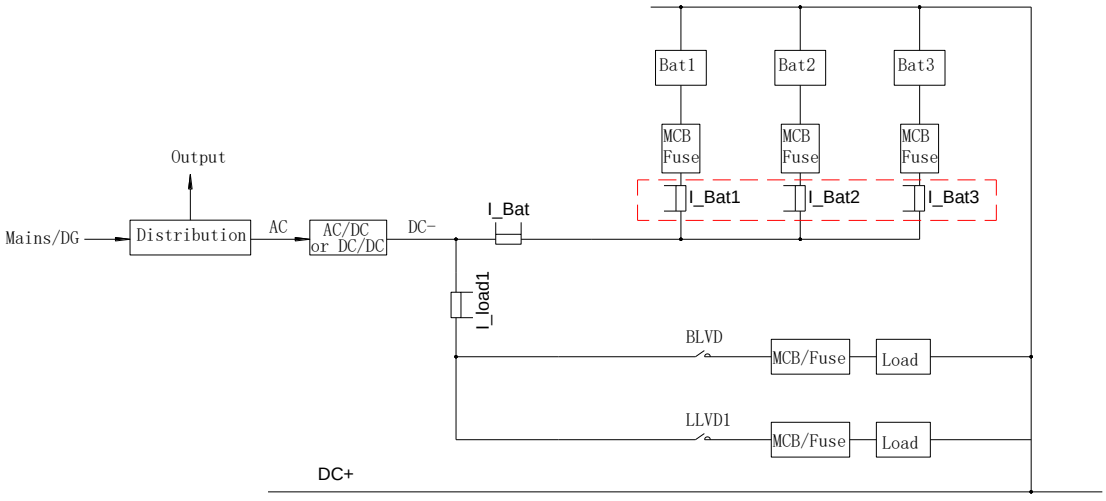
Table 1-4 The Number Range of SC503’s Expanded Parts

SN	Expanded parts	Number range	Description
1	SC210	0-10	Power distribution monitor
2	SC320	0-5	DI/DO/Sensors
3	SC340	0-3	DC Load MCB/Fuse status
4	SC920	0-2	AC Voltage/Current Sampling
5	SC900	0-1	AC Controller
6	SC921	0-2	AC Voltage/Current Sampling Unit
7	BMS	0-64	LPF battery
8	SC300/SC310	0-3	Branch Current Sampling
9	BMM	0-10	Single Battery Cell Voltage Sampling
10	SC350	0-3	Environment Detecting & Control
11	SC321	0-3	DI/DO/Sensors Unit

1.4.6 System Types and Description

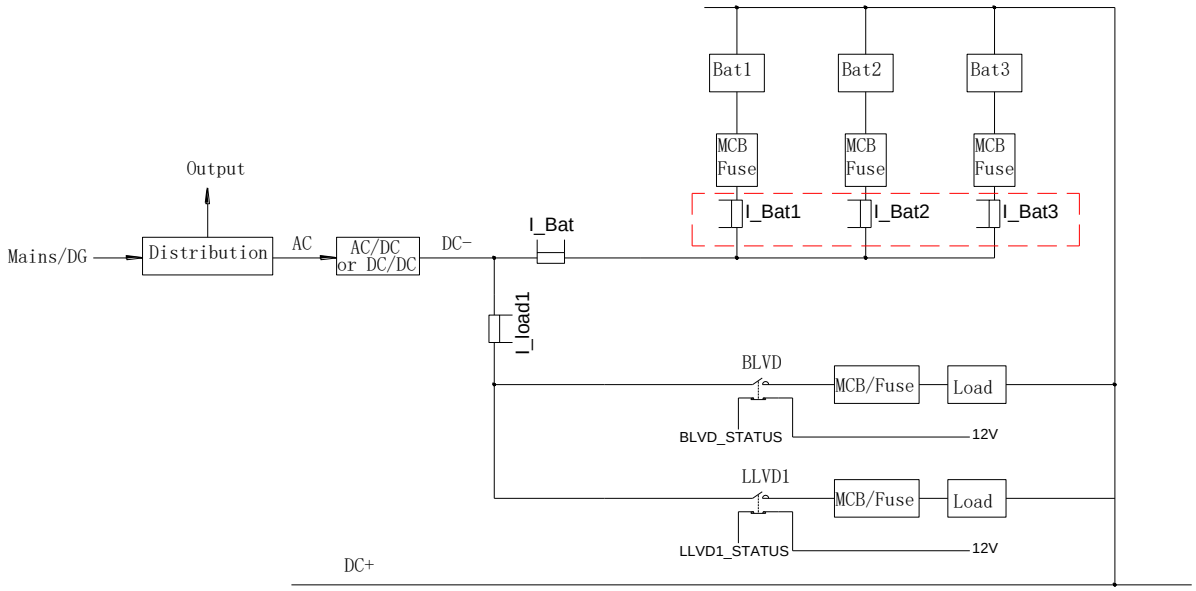
In controller, the system has four types: 48V-Ⅰ, 48V-II, 48V-Ⅲ, 48V-Ⅳ. We will describe the types by drawings below. The ‘48V-Ⅲ’ type is recommended. For the system types, they have nothing to do with the new energy such as solar power, wind power. The differences lies on the contactor of BLVD and their status. The shunts I_Bat or I_Bat1~3 can be configure according to the requirements.

All the currents from shunts will display according to the measurements. All LVD contactors lies on load sides, and the contactors statuses come from the logic of the circuit, refer to ‘System type 1’.

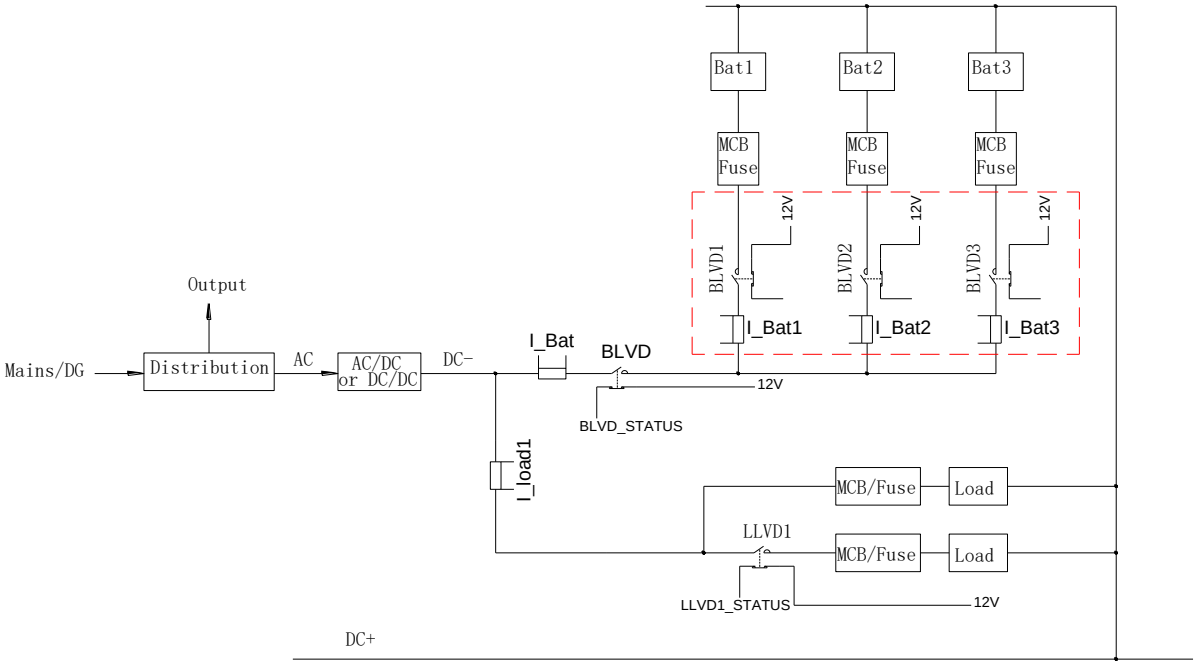


System type1: 48V-Ⅰ

All LVD contactors lies on load sides, and the statuses of LVDs come from the contactors' auxiliary switch, refer to 'System type 2', it includes two different diagrams, (a) & (b), show as below:

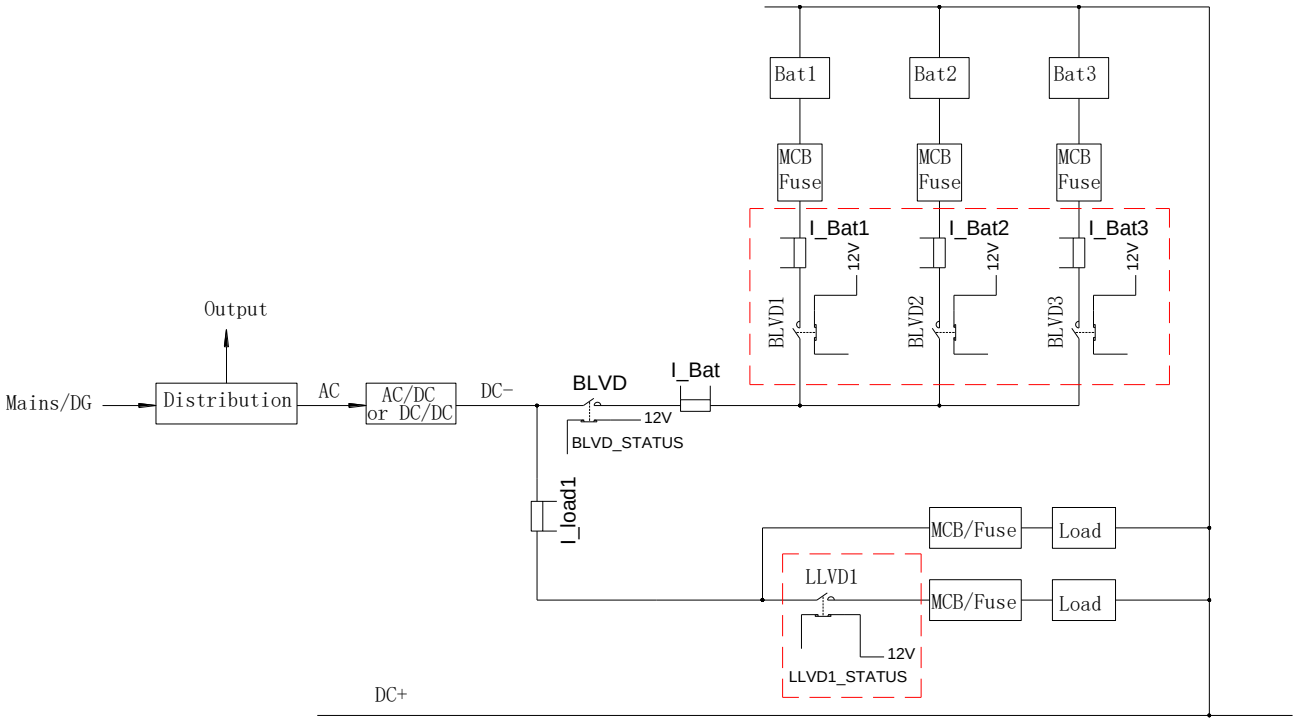


System type2: 48V-Ⅲ (a)



System type2: 48V-Ⅲ (b)

The BLVD contactor lies on the battery side, and the statuses of LVDs come from the contactors' auxiliary switch. When BLVD contactor disconnects, all the battery currents will display as 0A, refer to 'System type 3'.



System type3: 48V-IV

Note: An important thing is after all the LVDs disconnect, all the loads will be power off or disconnected. Most of components will do not work again before the LVDs recover but except the controller & some smart parts. They will still work online and monitor the system or detecting some information, even you can remote connect to controller. If there is still a network. At the same time, that means will cost the power of battery continuously. If you do not want to do like that or if you forbidden to cost battery's power, please bring it out before placing an order.

1.4.7 Quick Setting

1.4.7.1 Menu Tree of Quick Settings

Quick Settings use to set system values, including the most commonly used information. Select the correct options and set the correct parameters, and press Enter to confirm. This menu will be used for most frequency setting of the system, see Figure 1-5.

Quick Settings

System Type: III System Volt: 48V Total Load Curr: Module LVD Number: 2 Load Br Curr Num: 0 Load Br State Num: 6 Float Voltage: 53.5V Boost Voltage: 56.4V Battery Type: VRLA	Curr Measurement Threshold Total Load: 0.40% Battery: 0.40% Branch: 0.40% Solar: 0.40% Discharge: 0.40% Charge: 0.40%

Menu of Quick settings

1.4.7.2 Description of Quick Settings

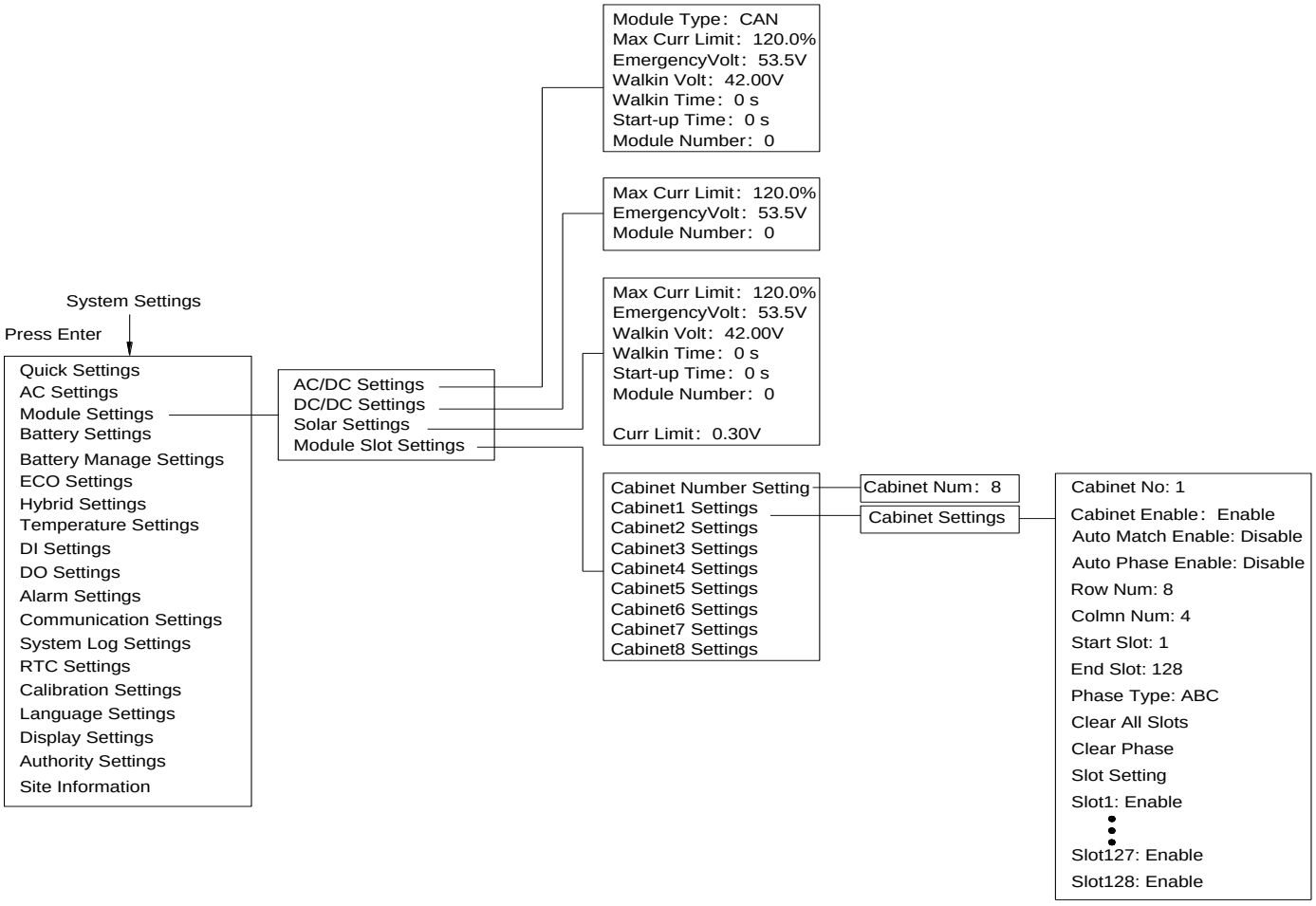
Battery Shunt Number is for setting the battery branch shunts' quantity according real configuration. When only one battery shunt is use in the system, the capacity of battery should be the sum capacity of all battery strings. The battery

branch number is the quantity of battery breakers/fuses. The battery midpoint number is the quantity of battery mid-point, which is for detecting voltage on middle point of battery group. The load branch number is the quantity of load breakers/fuses.

Two types of battery can be support by setting in 'Batt_Type': Lead-acid battery & Lithium battery.

1.4.8 Menu Tree of Module Settings and Description

Press the down key on the main interface of the system to enter the "Main menu interface"-"System Setting"-"Module Setting". Select the parameters you want to set and confirm to set. As shown in Figure 1-6. The description of the parameters are in Table 1-6 below.



Module Slot Settings

Table 1-5 Module parameter setting range and description

Name	Limit	Default	Setting Description
Module Type	CAN/RS485	CAN	CAN：The communication type of the module is CAN RS485：The communication type of the module is RS485
Current limit	10%-120%	120%	Limiting factors of the rectifier module
Emergency Volt	42.00-60.00V	53.50V	
Walk-in Volt	0.00-58.00V	42.00V	
Walk-in Time	0.0-120.0S	0S	
Startup Delay	0.0-120.0S	0S	

Name	Limit	Default	Setting Description
Module Number	0-128	0	

Choose Module Settings > Module Slot Settings. Perform slot matching based on Table 1-7, as shown in Figure 1-6.

Table 1-6 Slot parameter setting range and description

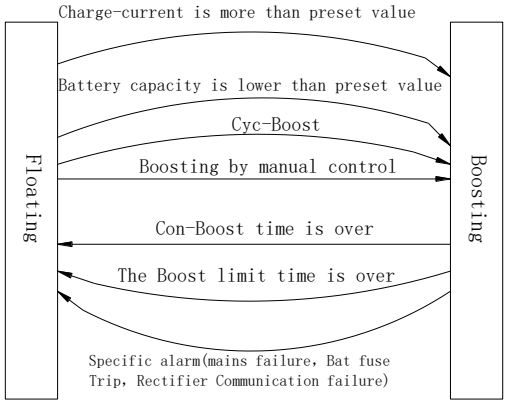
Name	Limit	Default	Setting Description
Module Number	1-128	- -	By default- -， Set this parameter based on the actual situation.
Slot Number	1-128	- -	By default- -， Set this parameter based on the actual situation.
Current Setting	OK	OK	Set the single 一 Confirm OK, after the module and slot are paired
All Setting	OK	OK	Confirm OK, after all the modules and slots are paired
Clear Slot No.	01-128	01	To clear pairing info of a module & slot, select slot no. & confirm clear.
Clear All	OK	OK	This command is used when all modules and slot pairing information needs to be cleared.

Before pairing modules, you need to set the status of the slot to be paired. That is, select Slot Settings ➡Rectifier module➡ Slot Configuration. The menu shown in Figure 1-6 above. Set the status of the slot to Allow. A maximum of 128 modules can be pair with slots.

1.4.9 Battery Management

1.4.9.1 Float and Boost Chrging Transformation

The relationship between the floating and boosting as below Figure 1-7:

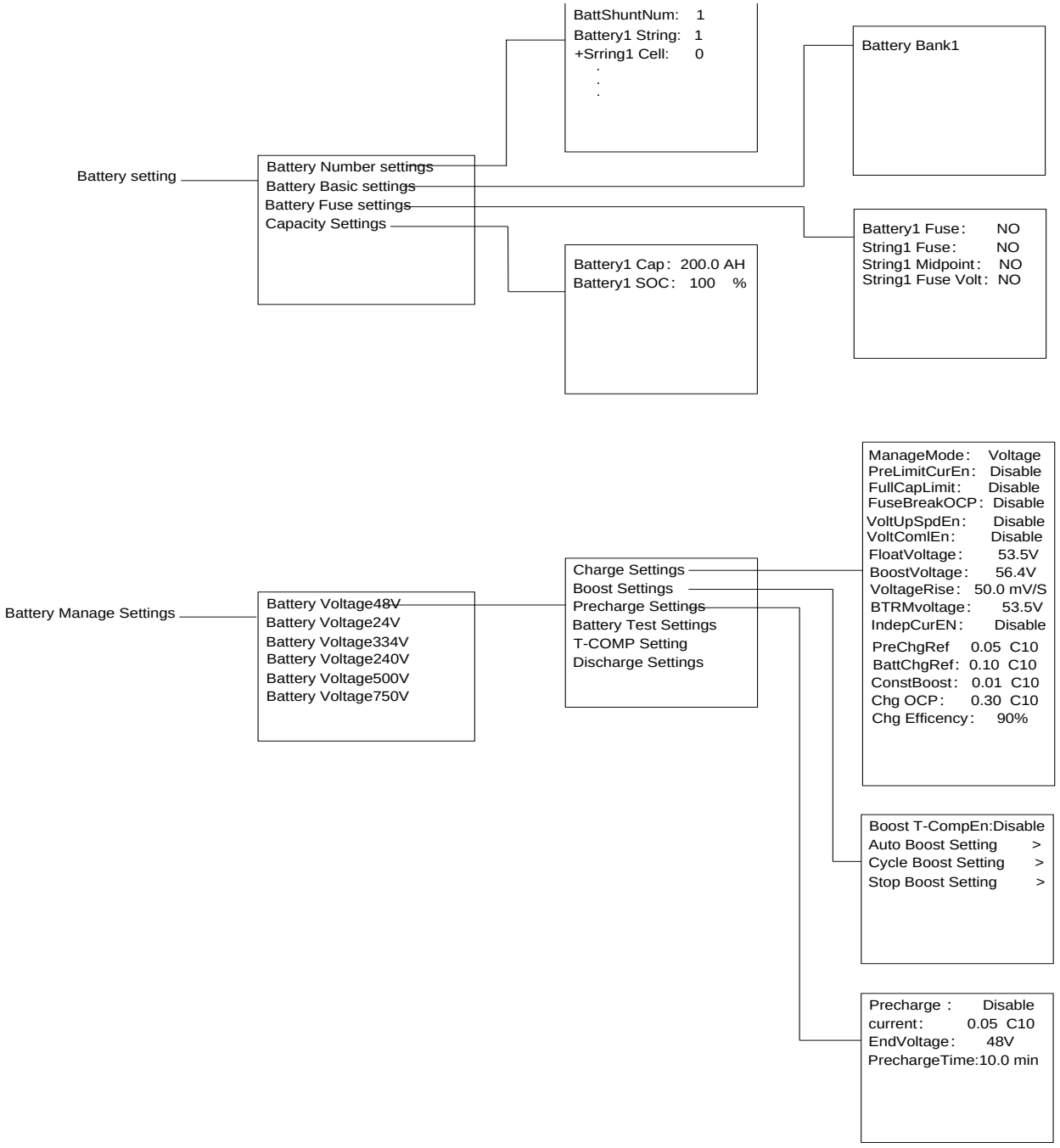


The transformation of floating and boosting

When the system configures battery management function, the specific parameters should be set as below.

1.4.9.2 Working of Charge Management

In battery setting, all the parameters could be setting here, here just shows the charge management as Figure 1-8.



Charge management setting

Choose the right item and set the right parameter, then press the enter key to confirm. The Charge-Manage parameter setting range, factory default value, and setting instructions are shown below in Table 1-8.

Table 1-7 Charge-Manage Parameter Setting Instructions

Name	Setting Range	Default	Setting Instructions
Number of diverters	0-20	1	The number of diverters is less than or equal to the number of battery strings
Number of battery 1 strings	0-6	2	It is equivalent to two groups of batteries used in parallel, with a maximum of 6 groups used in parallel

Name	Setting Range	Default	Setting Instructions
Curr Lmt	0.1-2C_{10}	0.1C_{10}	The battery group charge current is based on this setting value and less than the setting value. C_{10} -- The nominal capacity for lead-acid batteries. The suggestive value is 10-20% capacity of single battery group, depends on the battery's parameters.
Battery 1 Fuse	EN, DIS	DIS	When the number of battery strings is greater than 1, the fuse of battery 1 is set to DIS, and the fuse of battery string 1 is turned on
Battery String 1 Fuse	EN, DIS	DIS	
String 1 Midpoint Detection	EN, DIS	DIS	Set as required
Battery 1 Fuse Volt	EN, DIS	DIS	
Manage Mode	DIS,Curr,Volt	Curr	Methods of battery charge manage. DIS: Function is unavailable. Curr: Current manage mode. Volt: Voltage manage mode.
Auto-Boost	EN, DIS	EN	EN: Function is available; DIS: Function is unavailable.
Cycle Boost		DIS	
Cycle Boost Period	0.4-360d	360d	Cyc-Boost Period: Time between twice Cycle Boost. When Cycle Boost is running, the battery charge voltage is the setting value of the "Boost Volt" and the charge time is the setting value of the "Cycle Boost Time".
Cycle Boost Time	0.1-24h	12h	
Auto Boost Curr	0.05-0.08C_{10}	0.06C_{10}	In the auto-boost condition, the monitor should control the system running under boosting when the capacity of battery group is lower than the "Auto Boost Cap" or when the charge current is more than the "Auto Boost Curr", at this moment, the battery charge voltage is "Boost Volt" setting value.
Auto Boost Cap	10%-95%	80%	
Const Boost Curr	0.002-0.02C_{10}	0.01C_{10}	The system is charged with constant current under uniform charge.
OC Alarm	0.1C10-3C_{10}	0.3C_{10}	OC Alarm means the Over Charge Current Alarm. An alarm should be triggered if the charge current is more than the "OC Alarm" setting value.
Module Lost Quit Boost	EN, DIS	DIS	If enable this function, the system will be quit from boosting charge mode when there's a module lost alarm tripped.
Out Volt Comp	EN, DIS	DIS	System will compensate the output voltage to pre-setting value when enable this function, it's for the customer who need exactly output voltage.
Batt Fuse Break OC Protect	EN, DIS	DIS	Battery Fuse Break Over Current Protection, this function for the customer who has a high requirement for protect battery under follow conditions: Operate the battery breaker/fuse or 电池下电 will cause the bus-bar voltage jump up when the Mains always energized.
BTRM Volt	30V-Float Voltage Value	53.5V	BTRM Voltage setting value. The BTRM function description refer to 1.4.9.3
Volt Rise Speed	20-50000mV/s	50.0mV/s	This function matches the module walk-in function, it's for the customer who wants to get a slower rise voltage for protect battery when the module running as walk-in mode.

1.4.9.3 Battery Thermal Runaway Protection (BTRM)

The Battery Thermal Runaway Management (BTRM) feature reduces voltage during a high battery temperature condition. You can designate a temperature sensor as the BTRM sensor. The BTRM sensor has High 2 and High 1

BTRM temperature alarm limits. If battery temperature exceeds the “BTRM High 2”setting, system voltage is lower to the BTRM voltage setting. This feature can also be disable.

In addition to BTRM function, we have temperature disconnection function to control protect battery over temperature. When enable high temperature or low temperature disconnection function, the system can disconnect the contactors according to the pre-set value to protect the batteries.

1.4.9.4 Temperature Compensation Function

The temperature sensor could be designated, and the reference point is 25℃, when the temperature increases or decreases, the float voltage will decrease or increase. The efficiency of compensation could be changed, the range is 0mV~500mV, and the range of compensation is 2V for 48V power system, 1V for 24V power system.

Temperature compensation is automatically disabled if communication between the controller and rectifiers is lost, a DC under voltage alarm activates, a DC over voltage alarm activates, a battery fuse break alarm occurs, a battery high temperature alarm occurs, manual mode is entered, or the system enters the boosting charge or test modes.

1.4.9.5 Battery Test

When testing the battery, if no rectifiers alarm or battery cycle test over-current alarm occurs. It will continue to end condition. The end test condition is the battery voltage or capacity decrease to pre-set value, or the pre-set duration of battery test is used. When the system set constant current test enabled test the bttery, the rectifiers and batteries will power the loads together to make sure batteries will power the load in constant current. If set as no, battery will not start the testing. The system can support two kinds of battery test:

Timing test: The battery test will be done according to expected time. It can support up to 4 times test.

Cycle test: When testing the batteries, it will be done according to preset cycle period.. For performing this test function, load and battery are needed.

1.4.10 Energy Saving Management (ECO)

1.4.10.1 Operating Principle

The rectifier will get higher efficiency at 40% to 90% load rate. Therefore, we want to make the rectifier works at a higher load rate condition to reduce the loose of the power. Energy-saving function is dedicated design for this.

If the rectifier system has excess capacity of the current, more than the sum of load current, the system will turn rectifiers off and on to ensure the remaining rectifiers will operate in the most efficient zone of the output efficiency characteristic. If the load increases, the rectifiers shall automatically be turned on to avoid battery discharge.

The ECO function shall have a ‘Shuffle rectifier’ setting. This function will sequentially rotate which rectifiers are switch on. The interval of rotation shall be programmable. Furthermore, during the rotation cycle, one rectifier turns on and after a ‘delay period’, the longest running rectifier will then be turned off. The ‘delay period’ shall be programmable. The energy saving function is not allowed when the battery is unavailable.

The energy saving function will be interrupted when AC over voltage/under voltage, phase failure, DC over voltage/under voltage, rectifiers fault, controller fault, boosting charge, battery test, and such as these important things happen.

1.4.10.2 Parameter Settings of ECO

Mode setting: Enter the “Main Monitor Set” – “ECO Setting” – “Module ECO Setting”, as below Figure 1-9:

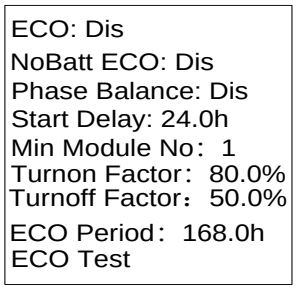
There are three mode: Intel (Intelligent), Time and Efficient (High Efficiency).

In ‘Time’ mode, module that has the shortest running time will have a high priority level during the rotation cycle. However, the shortcoming is the high efficiency module might not running more time than the low efficiency module.

In ‘Efficient’ mode, the module that is high efficiency module will have a high priority level during the rotation cycle. However, the shortcoming is the low efficiency module might have a shorter running time even no running.

In 'Intel' mode, the logical of the software will find a balance between 'Time' mode and 'Efficiency' mode; it is a smart mode and is recommended.

Parameters setting: Enter the "Main Monitor Set" – "ECO Setting" – "ACDC ECO Setting", as below Figure 1-9:



Menu of ECO Setting

1.4.10.3 Starting Conditions of ECO

- Set "ECO" to "EN".
- Set "Min RectNum: X" , that means at least X rectifier(s) in the system when ECO running.
- Set rectifiers turn on and turn off point.
- Set shift cycle of rectifiers.
- Set "Phase Balance" to Dis or En means if the AC is the necessary condition of running ECO function or not.
- Set "Phase Balance: EN", the ECO will adjust the output power of each phase module to ensure the balance of three-phase input voltage.

Note: The ECO function is not allowed when the number of the battery shunt is zero. The solar module are not supportable with ECO function.

1.4.11 Peak Shaving and Valley Filling Function

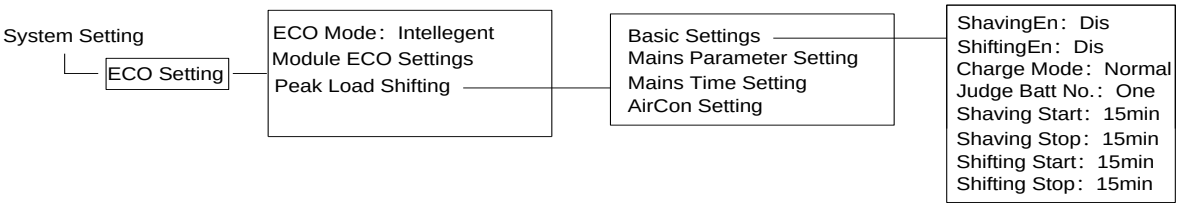
1.4.11.1 Operating Principle

Peak Shaving: The power supply system can be combine with load fluctuation of base station's communication equipment. The power supply system can reduce the demand of peak load on the input capacity of mains by limiting power or supplementary discharge of energy storage batteries, and realize peak load clipping of mains.

The power supply system has the function of off-peak power consumption. According to the daily peak and valley electricity prices, the function of off-peak power consumption can be set to realize the function of using external mains power (battery energy storage) in off-peak time and battery discharge (no mains power consumption) in peak time, and finally achieve the purpose of reducing electricity costs.

1.4.11.2 Setting of Peak Load Shaving & Shifting Functions

On the System Settings screen, press up or down to select energy Saving Settings, as shown in Figure 1-10. If you want the system to run under peak shaving and peak shifting, select "Peak shaving Enable" and set it to "Enable"; otherwise, set it to "disable". Set Peak shifting Enable to Permit, otherwise to disable. Other parameters can be set based on the actual running situation.



Peak shaving & shifting settings

1.4.12 LVD Settings and Description

For example, when the contactor is disconnected from the non-priority load, it is called LLVD. When it is connected to a priority load, it is called a BLVD. To drive the LVD contactor will be set up according to the conditions. Different conditions can use in different applications, and any one of them can be disable . Refer to table 1-9 below for description.

Table 1-9 LVD parameter setting range, factory value, and setting description

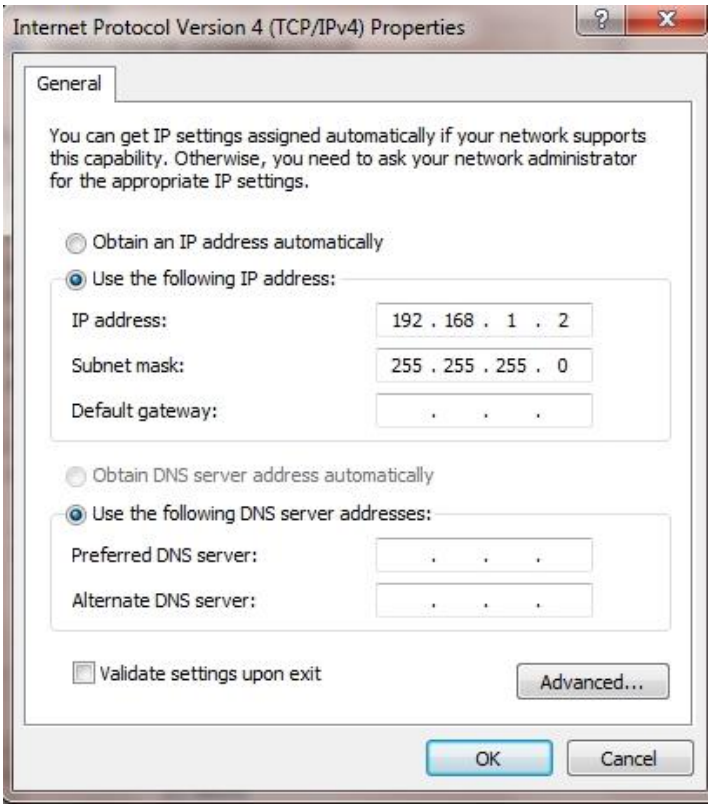
Name	Limit Value	Default	Settings Description
LVDEnable	Enable,Disable	Enable	Set according to the actual situation
LVD1	None,BLVD1~20,LLVD1~32	BLVD1	LVD Type:BLVD1 LVD Contactor type: magnetic hold.
LVD2	None,BLVD1~20,LLVD1~32	LLVD1	LVD Type:LLVD1 LVD Contactor type: magnetic hold.。
LVD on / off mode setting	Time, voltage, ， over voltage，temperature, capacity, standby power	Volt	Voltage: Controls LVD function based on the voltage of the battery pack. Time: LVD function is controlled based on the discharge time of the battery pack. Temperature: Control LVD function based on battery temperature, high or low temperature. Capacity: Controls LVD function based on battery pack remaining capacity or discharge charge. Standby power: Controls LVD function based on battery string standby power. Over voltage: Control LVD function based on bus over voltage.
LLVD time off setting	3-1000min	600min	When the battery group discharge time reaches the set time value, the LLVD branch will disconnect only when the LVD mode is "time"。
BLVD time off setting	3-1000min	600min	When the "time" mode of the LVD mode is enabled, the corresponding branch of the BLVD is disconnected when the battery group discharge time reaches the set time value
LLVD Operation Voltage	41V-57.6V	44.0V	When the "voltage" mode of the LVD mode is enabled, the corresponding branch of the battery is disconnected when the battery group discharge voltage reaches the setting voltage value
BLVD Operation Voltage	41V-57.6V	43.2V	When the "voltage" mode of the LVD mode is enabled, the corresponding branch of the BLVD is disconnected when the battery group discharge voltage reaches the setting voltage value
LVD High temp	35℃-66℃	35℃	High temperature disconnection
LVD Low temp	-33℃-9℃	-15℃	Low temperature disconnection
LVD SOC	60%	0~100%	When the "capacity -soc" mode" mode of the LVD mode is enabled, the corresponding LVD will be disconnected when the remaining capacity of the battery pack reaches the set capacity value
LVD Standby Power	100kWh	0~10000 kWh	When the "standby electric power" mode is enabled in the LVD mode, the corresponding LVD is disconneted when the battery discharge is set to the set of the power value

1.5 Webpage Introducion

SC503 can support webpage function, and we recommend users use webpage to set the system, easier and more convenient.

1.5.1 Connection and IP Settings

Connect the Ethernet port on computer to the Ethernet port on Controller SC503 by Ethernet cable. Find the IP address of the controller via LCD and set up the IP of the computer, make sure the two IP address in the same network segment, where in the last bit of the controller IP address can be any one from 2 to 254, as shown in figure below, but different from the controller. Please be noted that the default IP address of controller is 192.168.1.5.



1.5.2 Log-in and Password Display

Open a web browser (suggested: Google Chrome) in computer which already have set the IP address according to the method in sub chapter 1.5.1, put the IP of controller into the browser's address bar and enter, then the WEB can be connected as below.



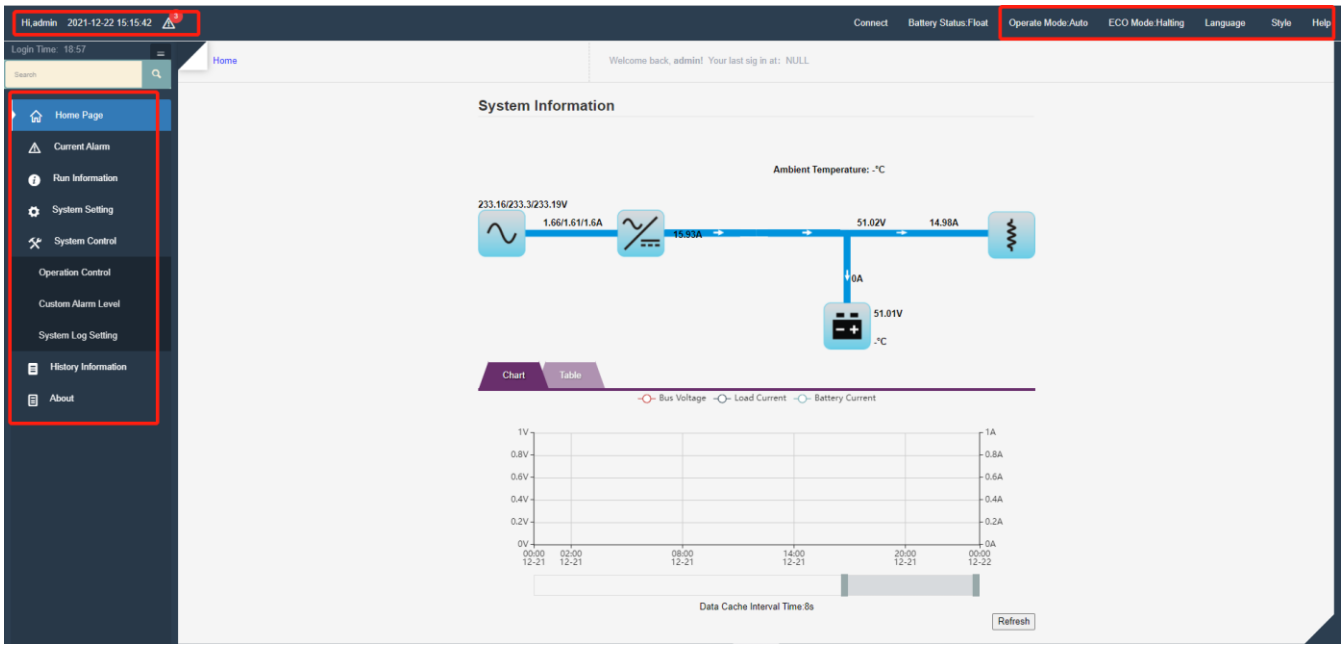
The system has Two-level authorization to control the operation.

User name	Default password	New password	Authorized range
engineer	1031	Could be changed after login	Partial
admin	170313	Could be changed after login	Full

1.5.3 Overview of Main Webpage

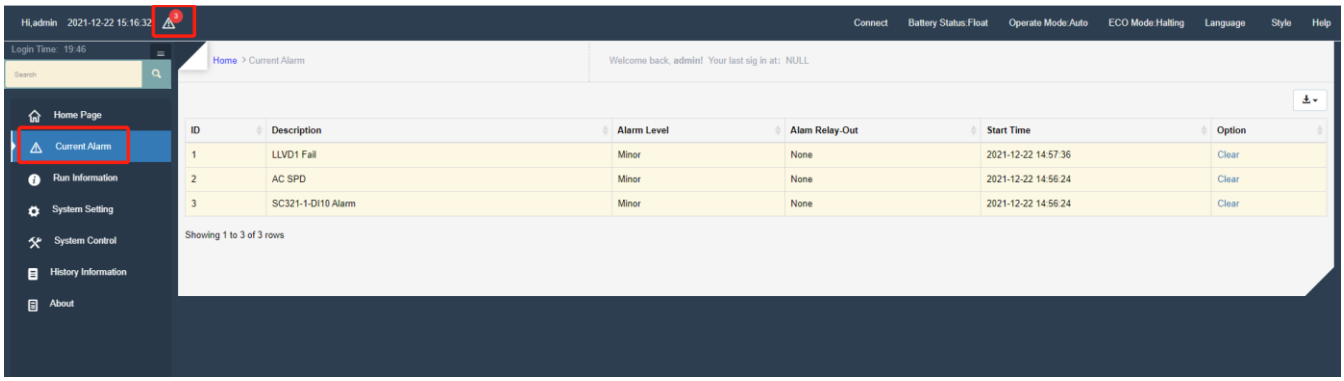
All the parameters of the system could be set on the webpage. In addition to LCD, the webpage has lots of expanded function, which will make the system more flexible, and easier to use, such as PLC, Calibrating, Operate log, Equipment Information.

In first page, we can get the mains status of the system, such as alarms, ECO Status, bus voltage/current, battery voltage/current, ambient temperature and battery temperature, AC or new energy information, and so on. We can open wanted menu to browse or set the parameters.



1.5.4 Current Alarm Page

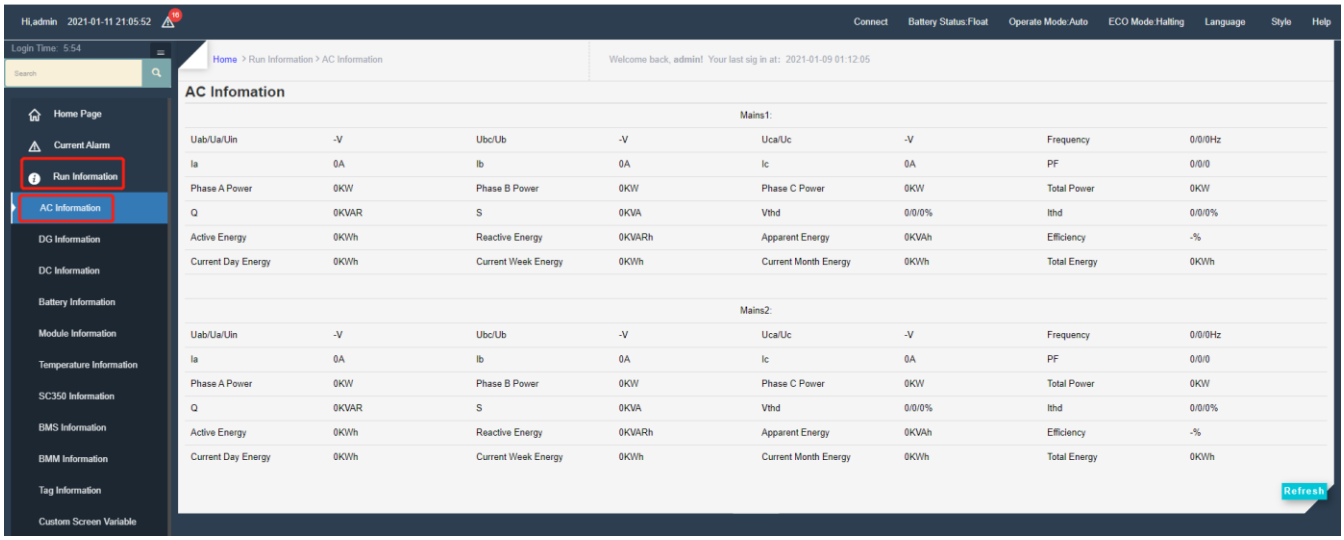
On this page, you can find which alarms are present in 'current alarm' submenu. Here we can also directly click on the small alarm icon to get current alarm information as shown in figure below.



1.5.5 Run Informations

1.5.5.1 AC Information

In 'AC Information' submenu, there are two items 'Mains1' & 'Mains2', as shown in figure below.

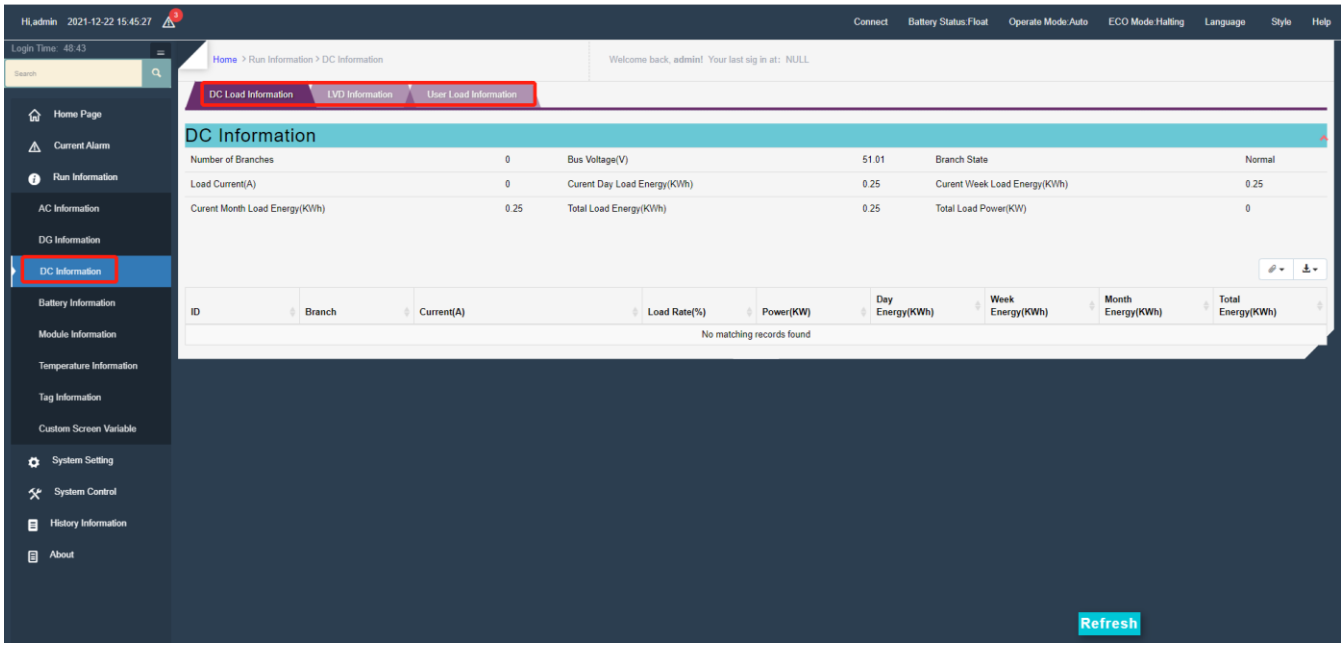


When we configure SC921, SC920 or SC900 with the system only then we can have this detailed AC information.

SC921 is AC measurement board, it can measure one three-phase/single phase voltage and current, power, PF, and others AC information. SC900 or SC920 can measure same information with SC921, and it can monitor AC SPD, AC output breakers, can display the information via LCD. If there is no SC921/SC920, SC503 will get the input voltage of system via rectifiers' information and display. Other information will be blank, such as the line-line voltage, PF, THD and so on.

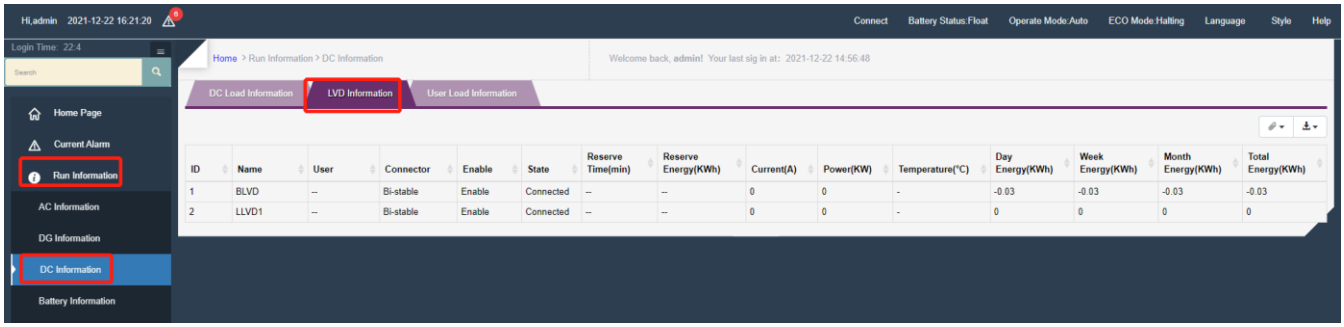
1.5.5.2 DC Load Information

This page includes information related to customer load connected with system. Customer can check each load branch power, energy and current data, as shown in figure below.



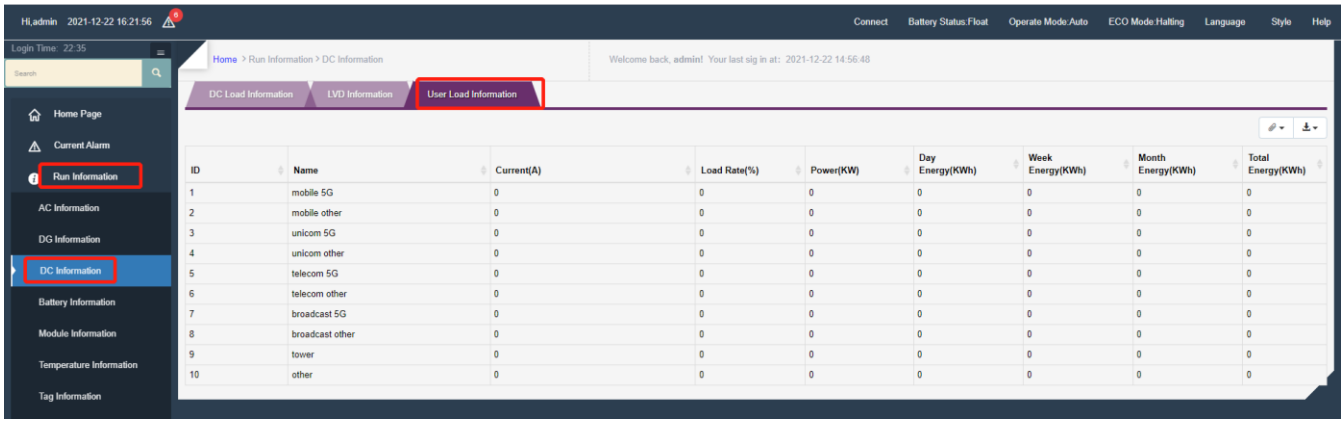
1.5.5.3.1 LVD Information

Through this page, we can check how much dc load/battery charge discharge current is handle by each LVD. We can also check each LVD power, energy and current data, as shown in figure below.



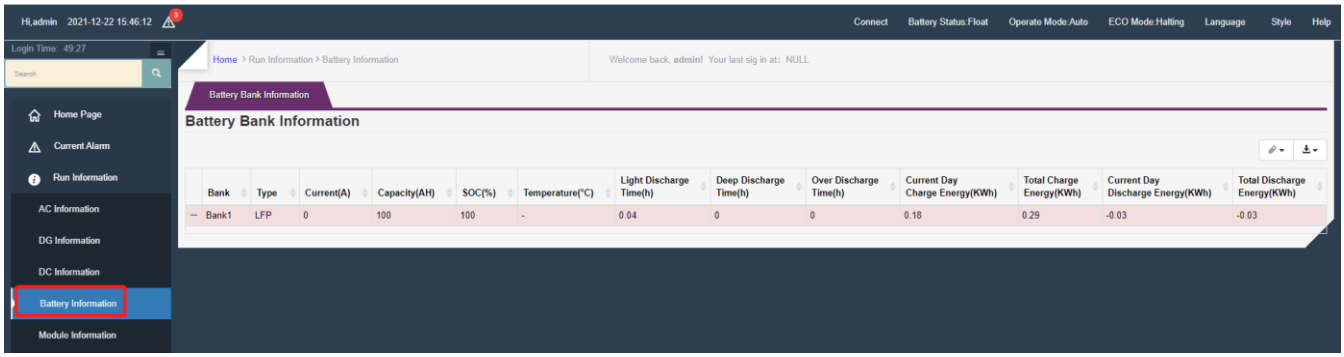
1.5.5.3.2 User Load Information

Through this page, we can see that how many customer equipment's are attach with the system. We can also check each equipment's power, energy and current data, as shown in figure below.



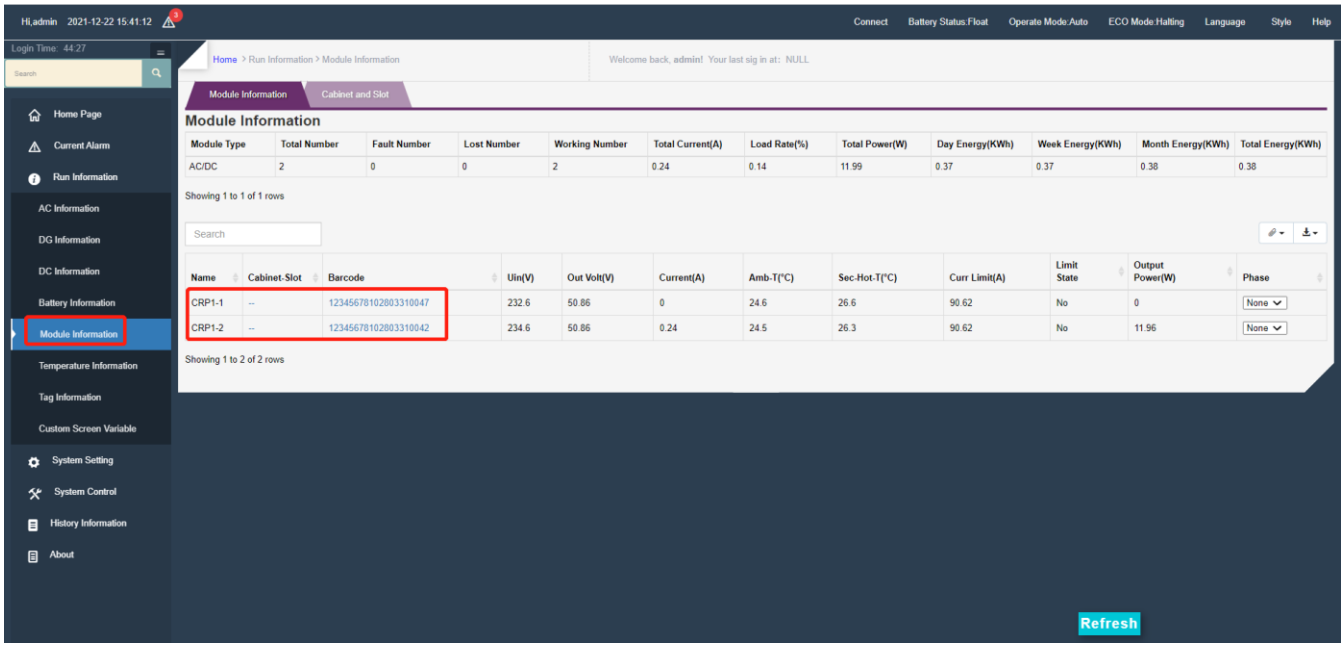
1.5.5.3 Battery Information

Battery info is the battery running information. All the batteries information will display and it support up to eight groups of Lead-Acid batteries. Nowadays more and more Lithium-ion batteries are being use in power systems. Most Lithium-ion batteries have BMS and the batteries are manage by BMS, as shown in figure below.



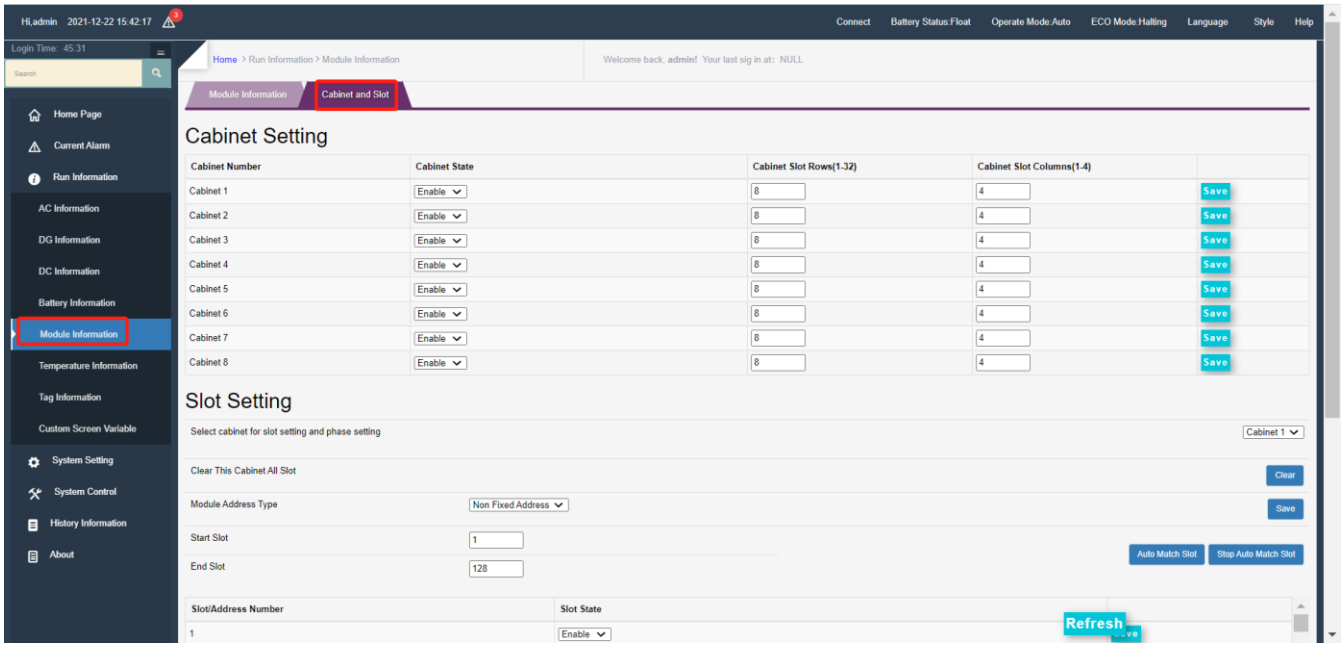
1.5.5.4 Module Information

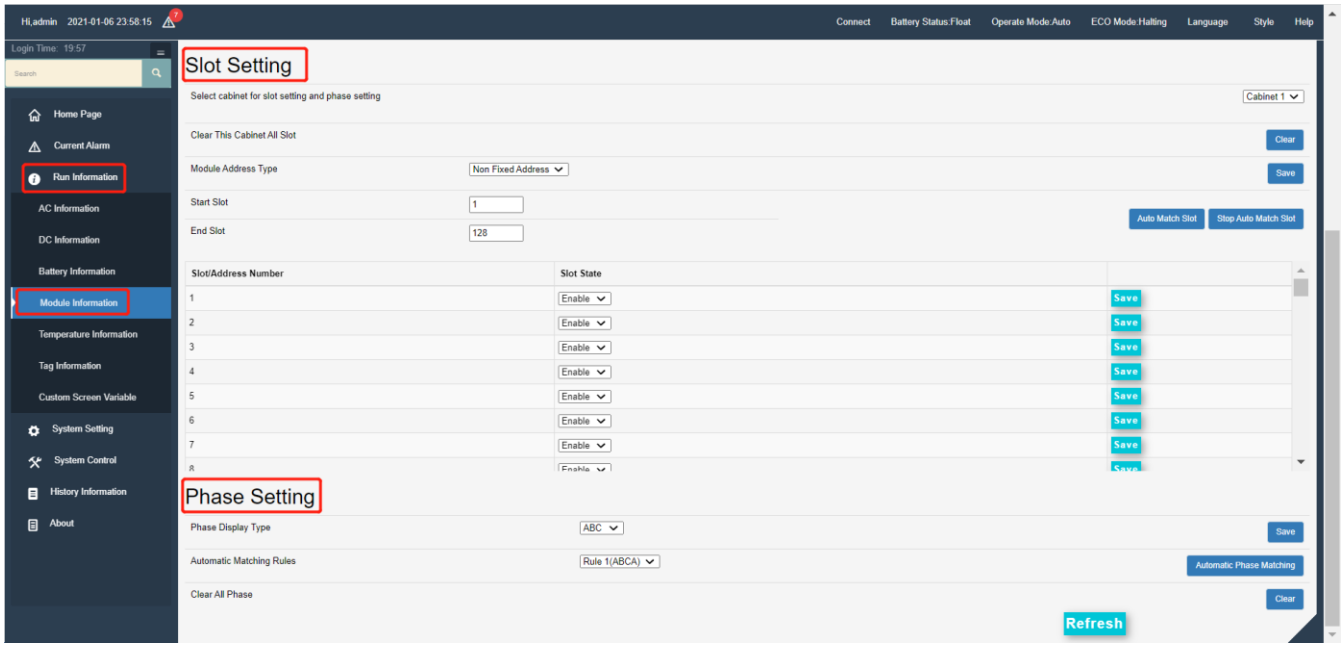
In module information, we can browse all the information of different power modules, including rectifiers, solar controllers, and DCDC converters. Besides that, we can also check detailed information of each module i.e. barcodes, input/output voltage and current, Amb-T and power data, as shown in figure below.



1.5.5.5.1 Cabinet and Slot

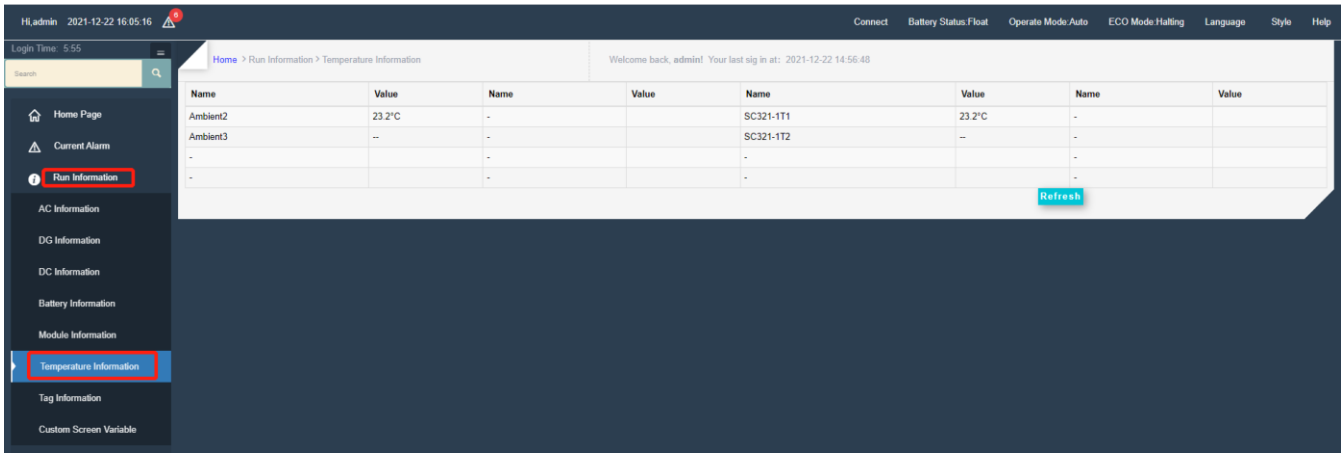
In cabinet and slot setting, it can support up to 128 modules and 8 cabinets. When setting the slots, the quantity of power module should be same with the slots in use. After matching the power modules and slots, confirmation is necessary to finish the setting. After this, the rectifier will work in order of slot setting.





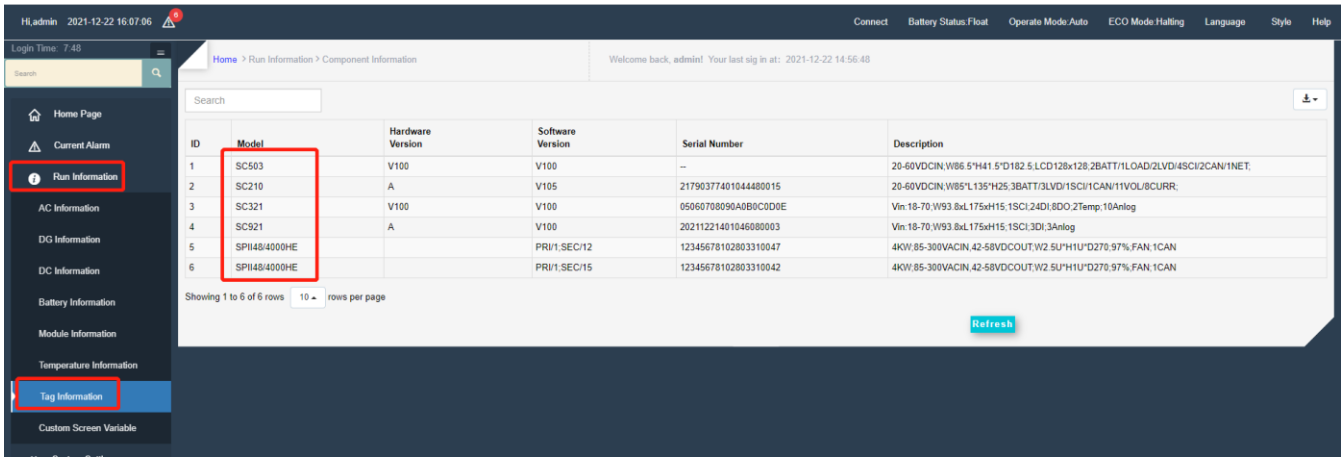
1.5.5.5 Temperature Information

All the temperature information will display here. Users can check the temperatures or humidity information here.



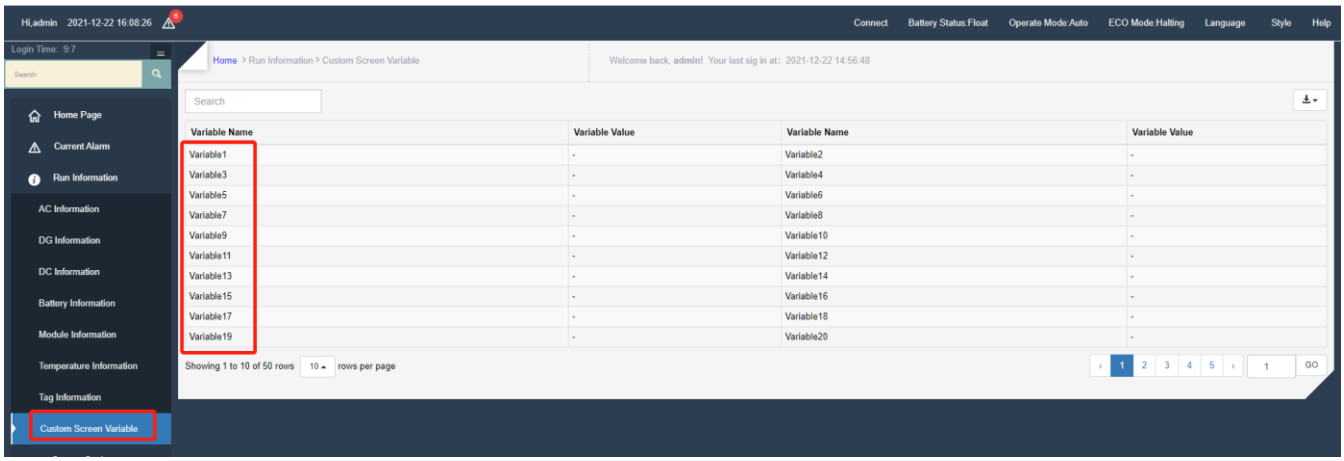
1.5.5.6 Tag Information

A new submenu name ‘Tag Info’ is added to the information menu tree as well. It is a special function for getting the each component information, as shown in figure below.



1.5.5.7 Customer Screeen Variable

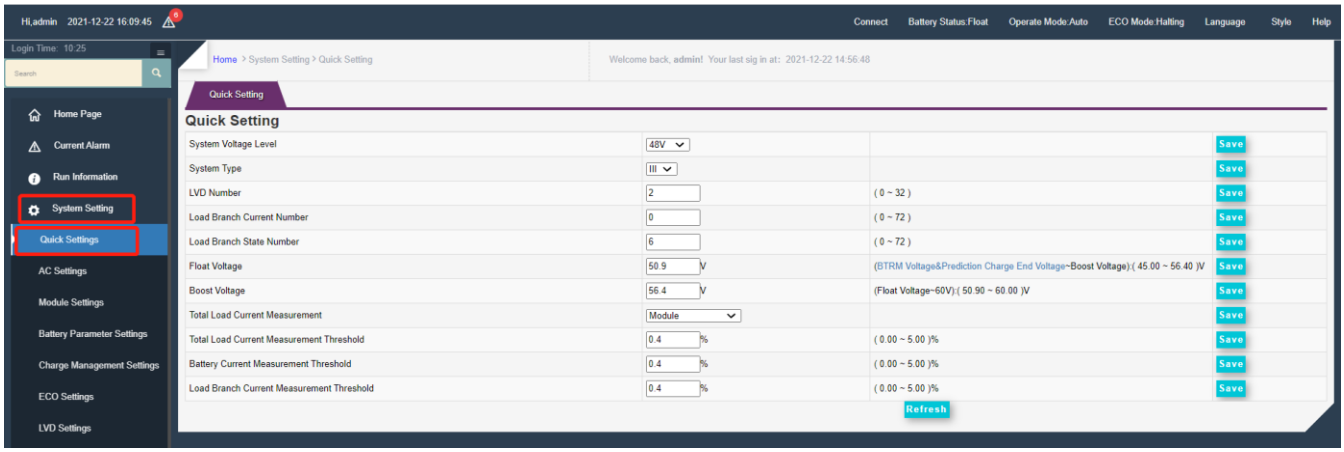
It is a special function for to get additional customized display in screen or webpage. For example, SC503 display load current and battery current but not total current. Customer can put the total current into one of the ‘Variable1’ through PLC settings. The information name and result can be configure as well, as shown in figure below.



1.5.6 System Setting

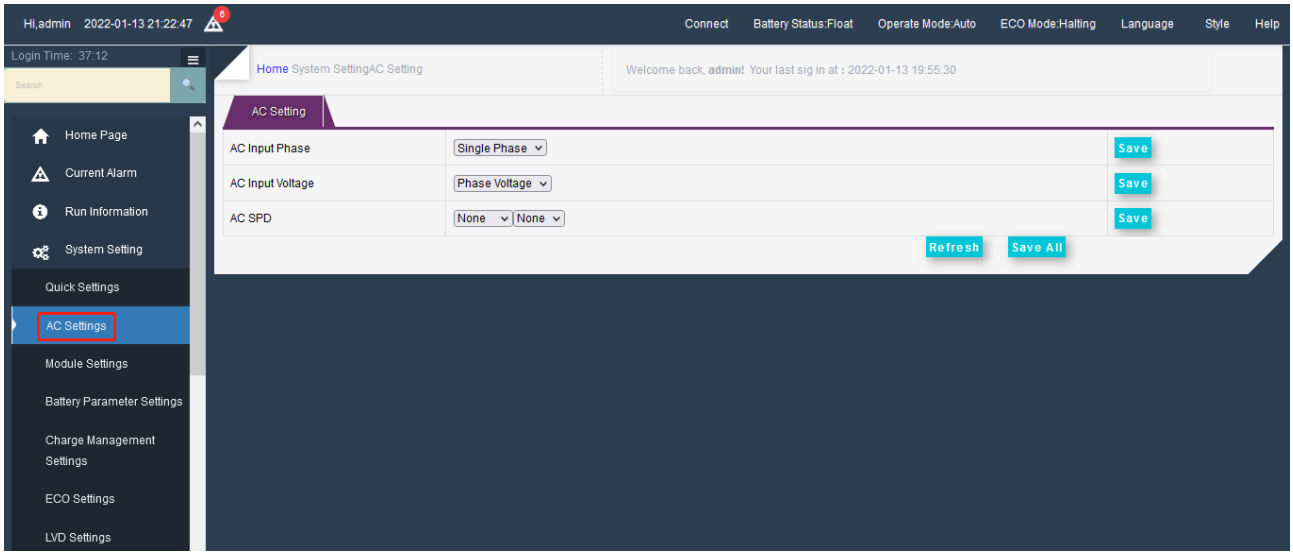
1.5.6.1 Quick Setting

Initially, system type and voltage can be set on this page. Otherwise, the system maybe not work correctly. Then other basic settings i.e. float & boost voltages, number of LVDs and others can be set according to actual conditions. The numbers about every parameter should be set according to the real situation. Such as the LLVD, the Load Branch current, Load Branch State etc., as shown in figure below.



1.5.6.2 AC Setting

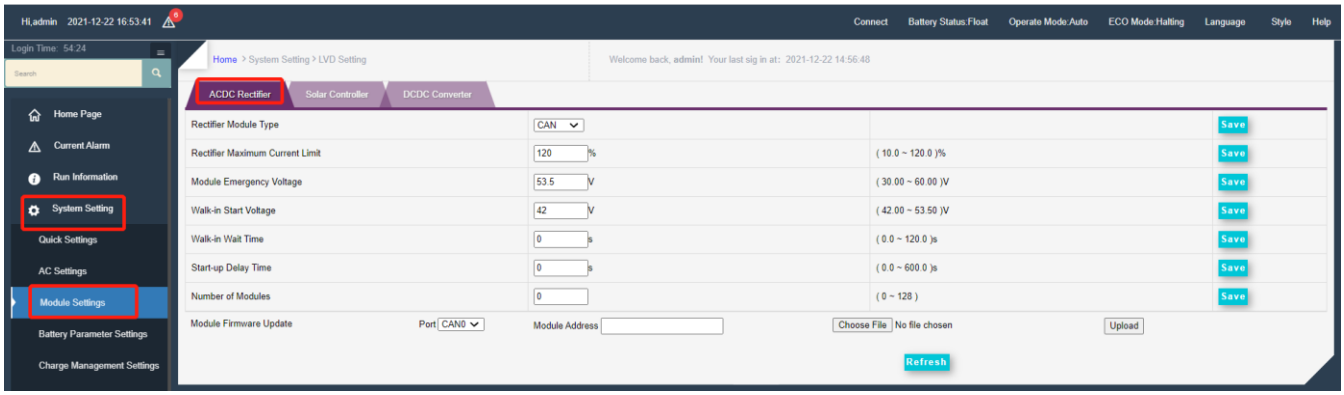
On this page, we can set some basic AC settings i.e. phase an input voltage type, as shown in figure below.



1.5.6.3 Module Settings

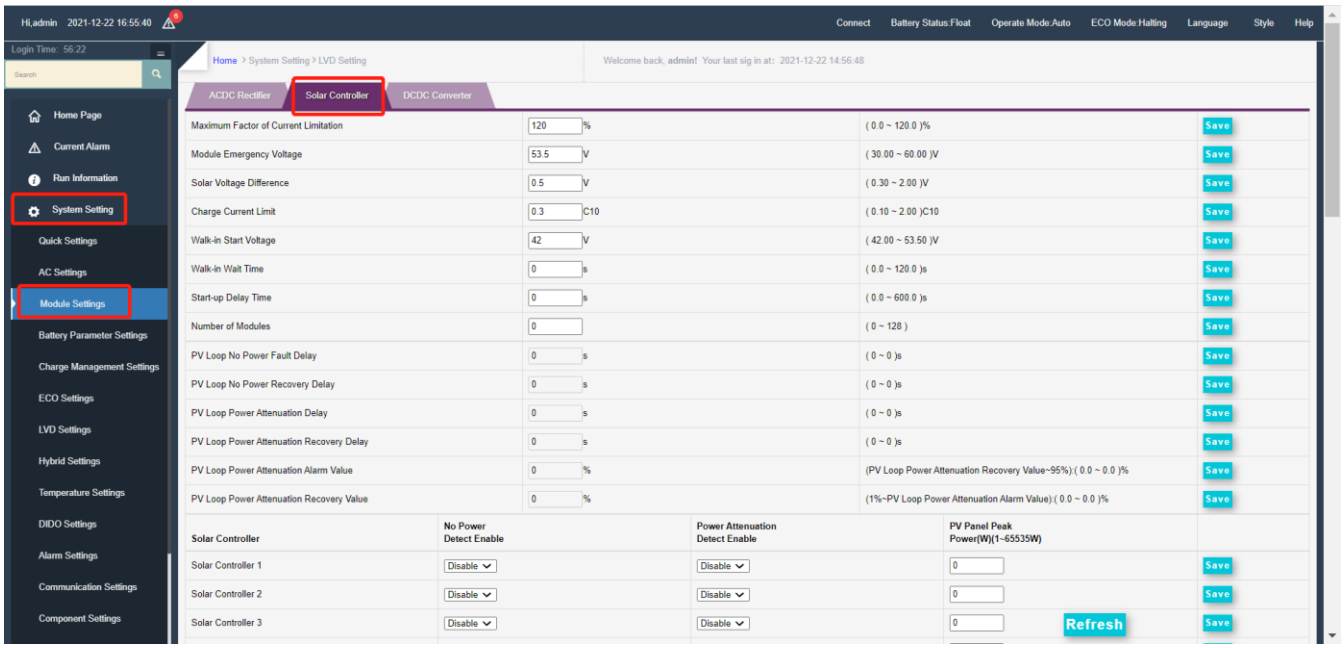
1.5.6.3.1 ACDC Rectifier

This page includes the basic settings for rectifier modules. Customer can set some basic parameters according to their requirement i.e. current limit, emegency voltage and Number of Modules, as shown in figure below.



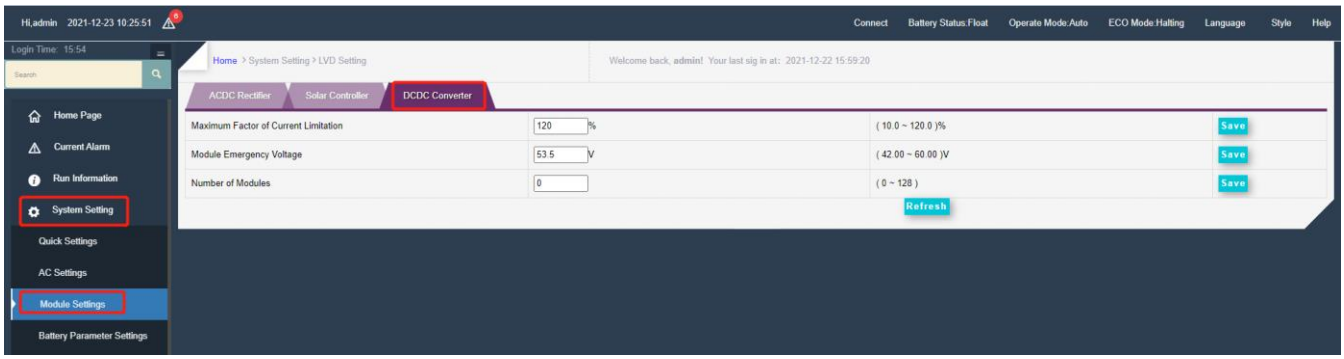
1.5.6.3.2 Solar Controller

This page includes the basic settings for solar modules. Customer can set some basic parameters according to their requirement i.e. module current limit, emegency voltage, cahrge current limit, walk-in time and start-up delay time and solar modules enable/disable functionality, as shown in figure below.



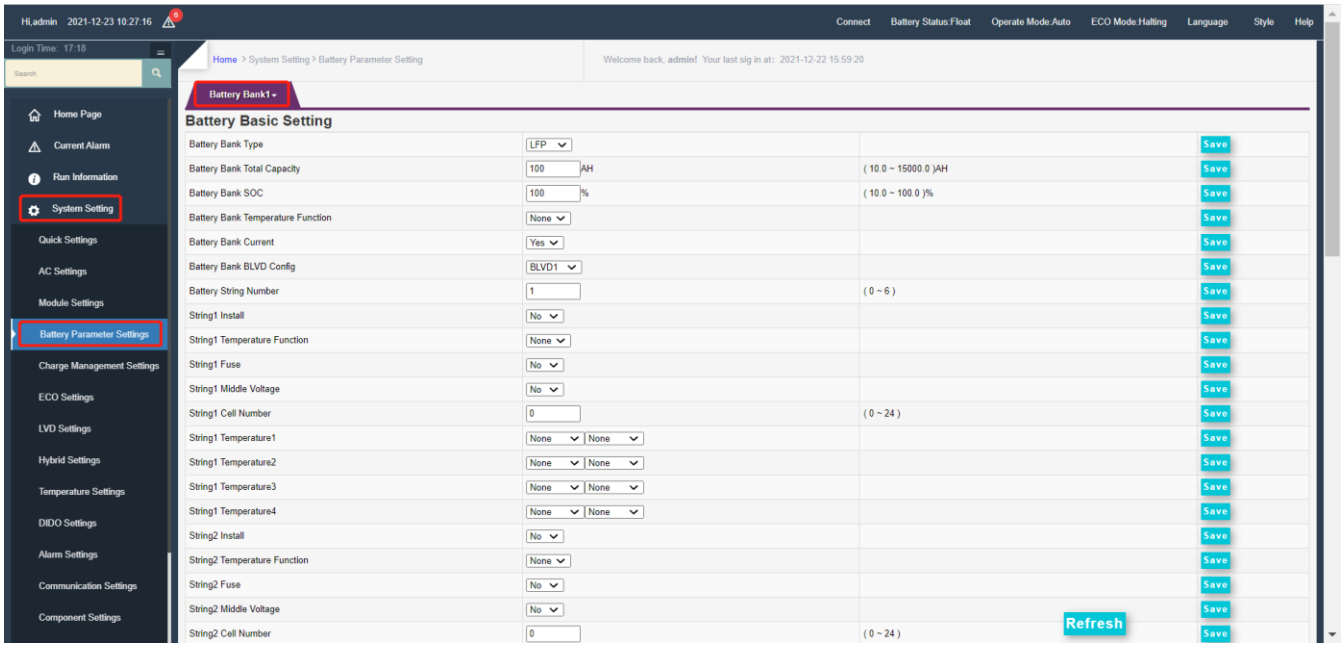
1.5.6.3.3 DCDC Converter

This page includes the basic settings for DC/DC modules. Customer can set some parameters according to their requirement i.e. current limit, emegency voltage and start-up delay time, as shown in figure below.



1.5.6.4 Battery Parameter Settings

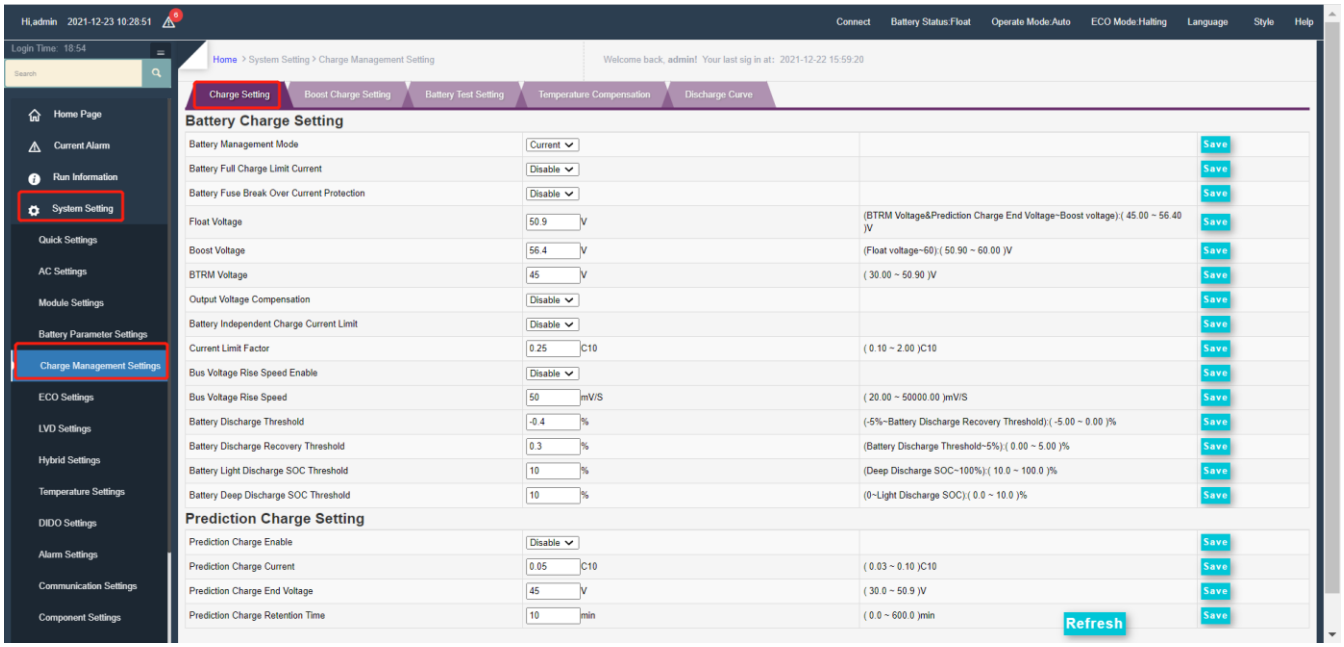
This page includes the battery parameters settings for each battery bank and battery string. Customer can set some parameters according to their requirement i.e. number of battery banks, number of strings of each battery bank, battery bank type, capacity, SOC, temperature, middle voltage and other settings, as shown in figure below.



1.5.6.5 Charge Management Settings

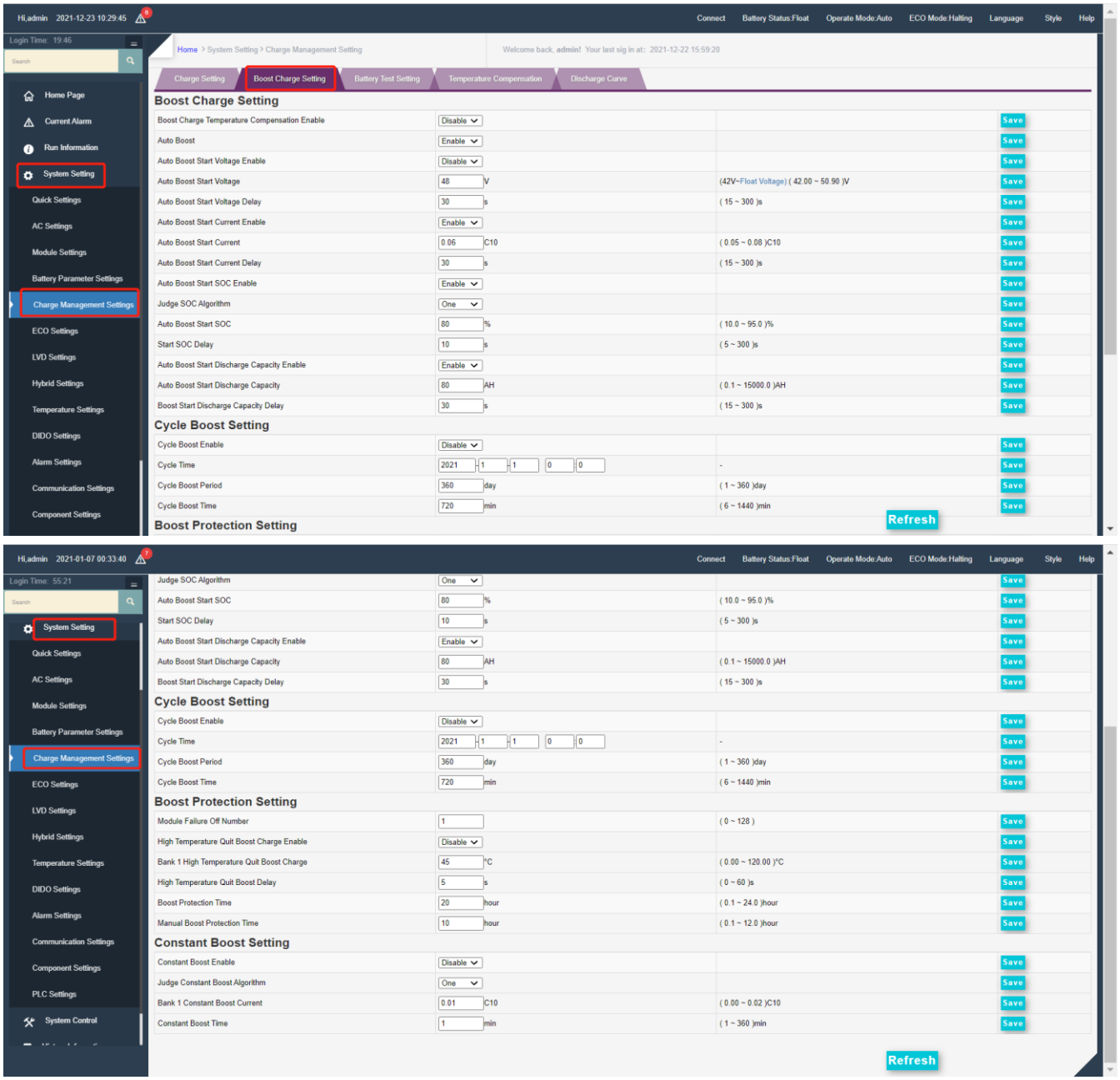
1.5.6.5.1 Charge Settings

This page includes the battery charge settings for battery banks. Customer can set some parameters according to their requirement i.e. battery float & boost voltages, BTRM voltages for temperature compensation, bus voltage rise speed, current limit factor and battery independent chrage current limit (means every battery bank's charge current limit can be set separately) , as shown in figure below.



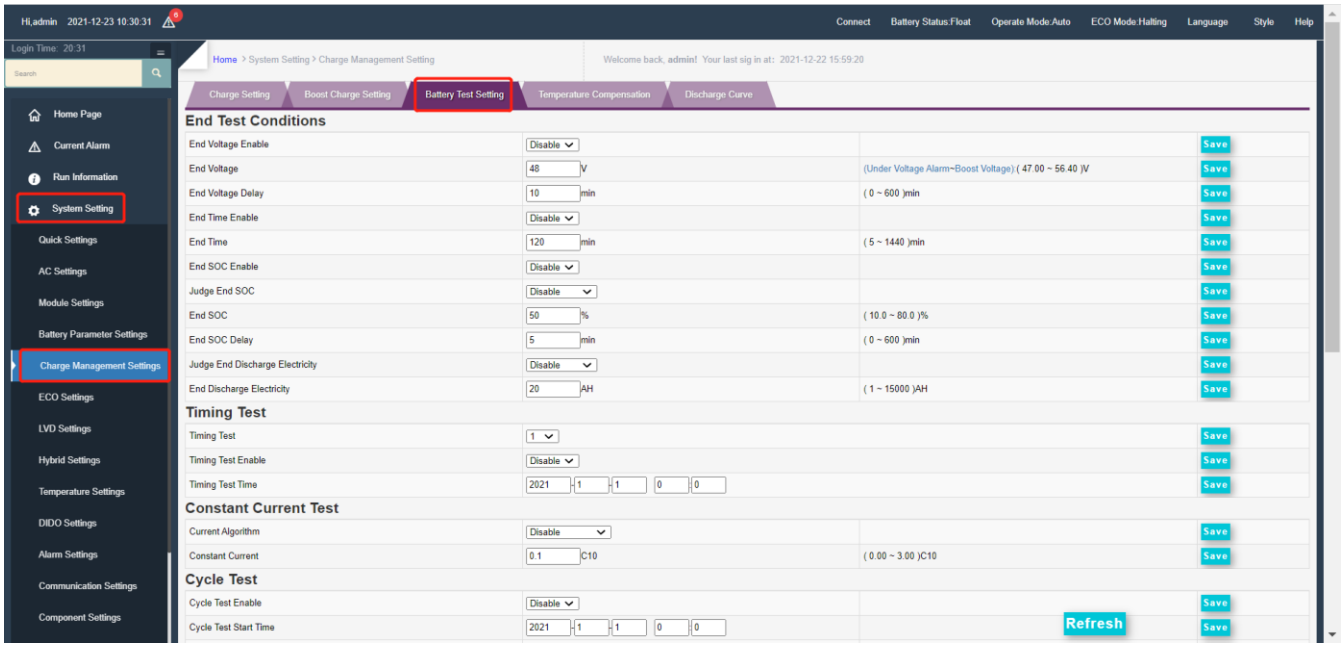
1.5.6.5.2 Boost Charge Settings

Customer can set some parameters according to their requirement i.e. when auto boost charge should start/stop, battery voltage/SOC at which auto boost should start. Besides that, customer can also set cycle boost settings, boost protection settings and constant boost settings for tsting the batteries, as shown in figures below.



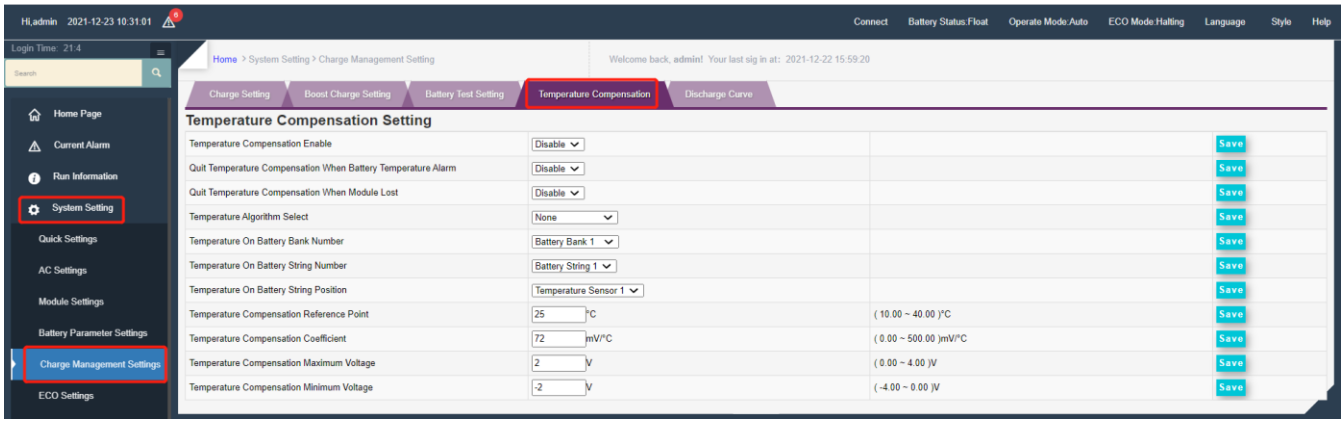
1.5.6.5.3 Battery Test Settings

Customer can set some parameters according to their requirement i.e. what type of test customr needs to perform and what is the starting/stoppong conditions for that test. For example, customer can do settings for timing test, constant current test, cycle test, test over current, auto test and battery test log setting, as shown in figure below.



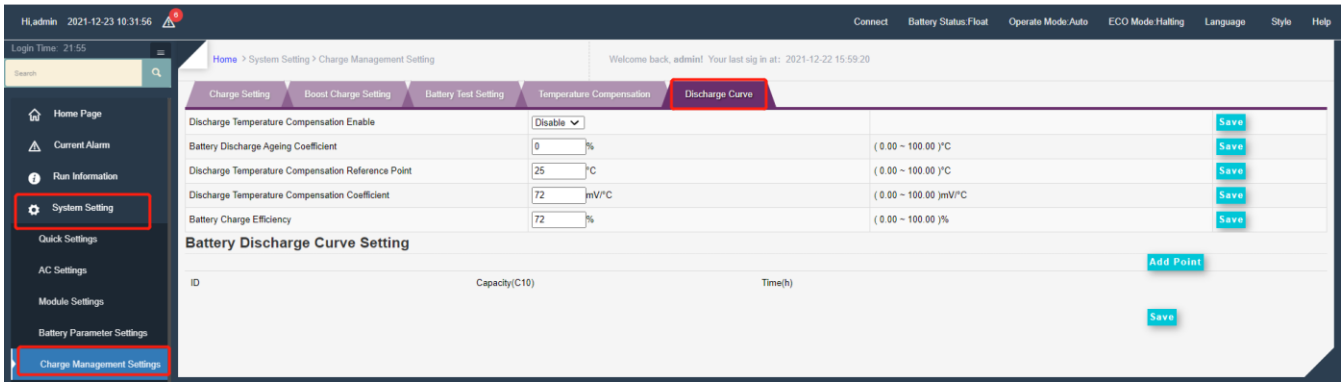
1.5.6.5.4 Temperature Compensation

This page includes the temperature compensation settings for battery banks. Customer can set some parameters according to their requirement i.e. enable/disable this function, when to quit this function, which temperature sensor and battery bank to choose for this function etc., as shown in figure below.



1.5.6.5.5 Discharge Curve

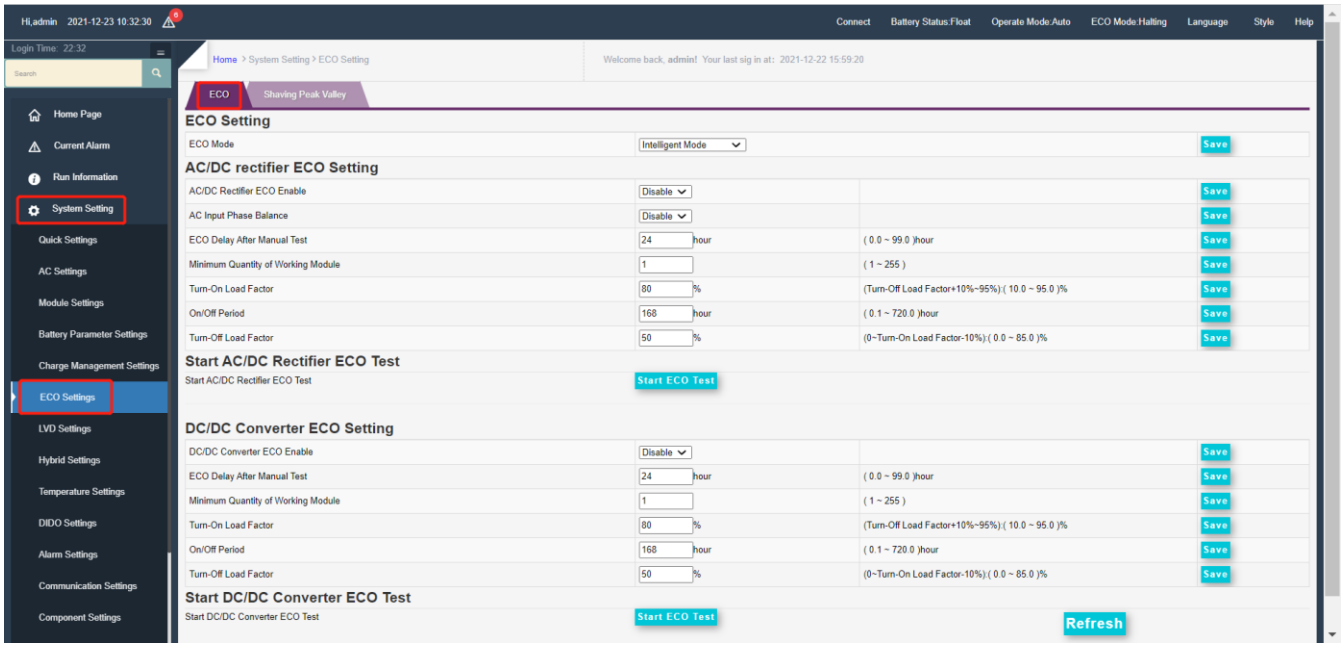
This page includes the discharge curve settings for battery banks. This settings is directly links with temperature compensation settings, as shown in figure below.



1.5.6.6 ECO Settings

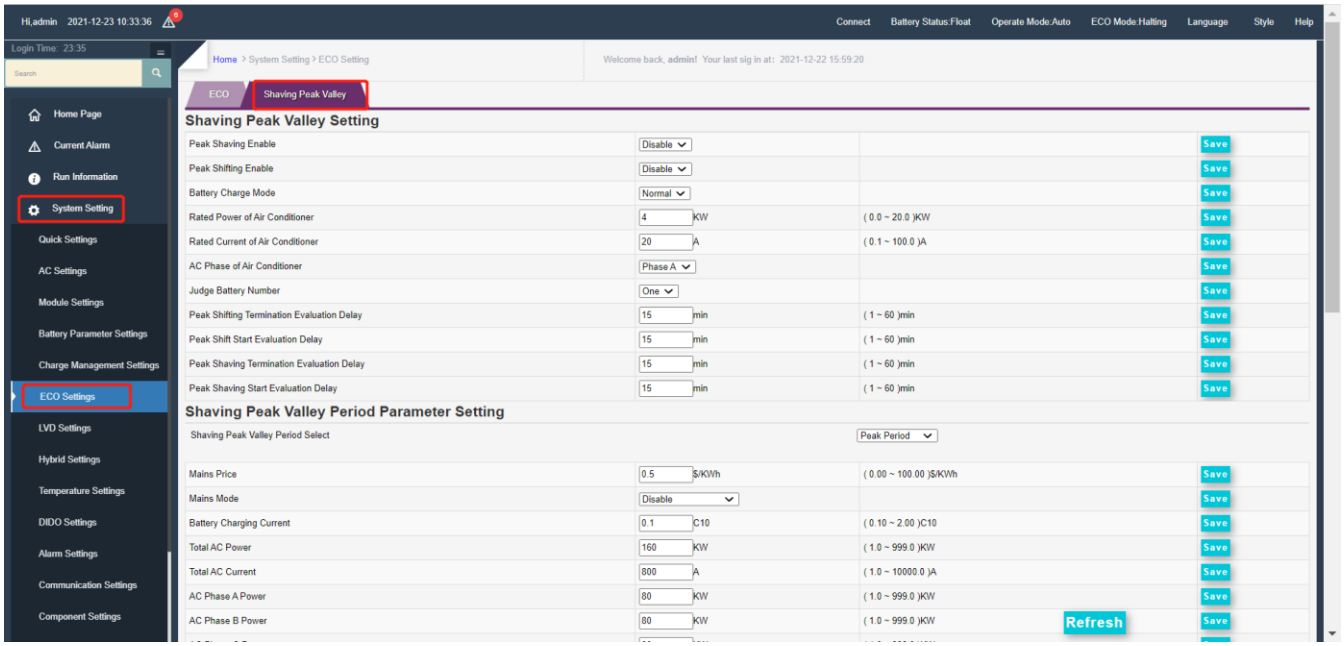
1.5.6.6.1 ECO

Customer can set ECO mode as intelligent, time or HE mode. Intelligent mode is recommended. This enables your modules to run based on customer load situation hense, increasing the module overall efficiency. Customer can choose when to start/stop this function based on load factor, on/off period settings etc. This fuction is not available for solar modules, as shown in figure below.

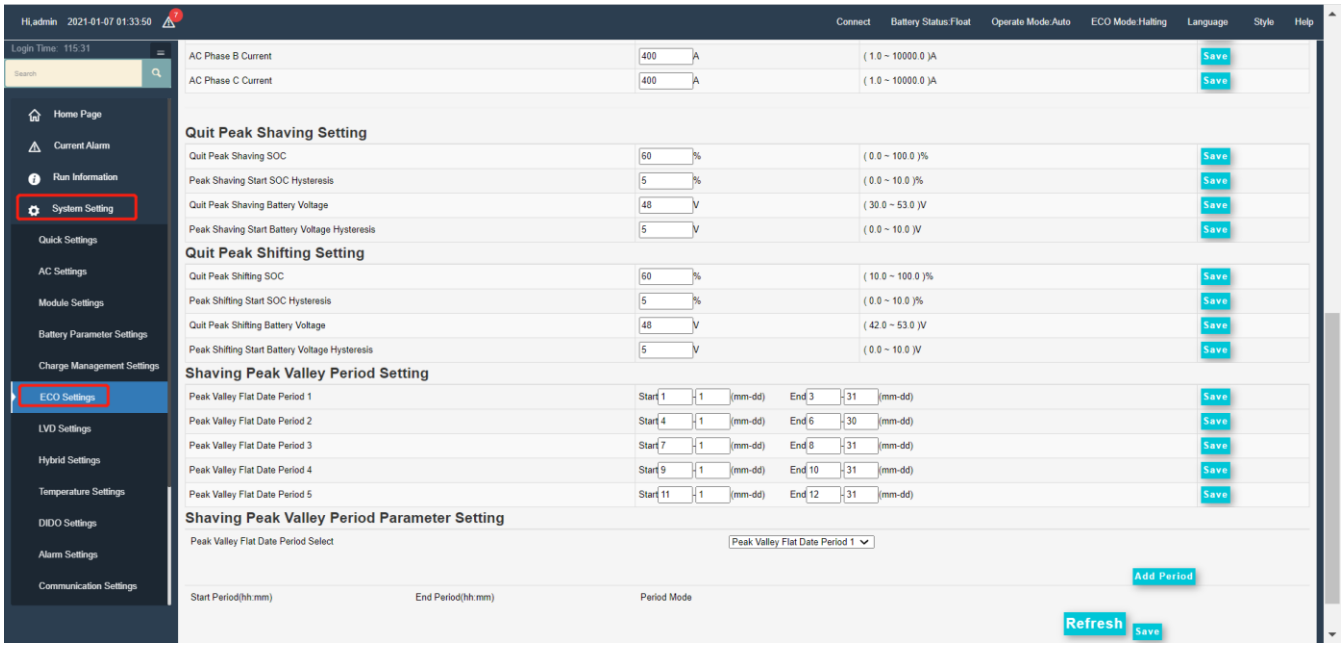


1.5.6.6.2 Shaving Peak Valley

This function include two type. One is for shaving peak valley, which means we can now control power supply system to reduce the demand of peak load on the input capacity of mains by limiting power or supplementary discharge of energy storage batteries. Customer can set some parameters according to their requirement i.e. peak shaivng timing period, judge battery numbers and AC phase settings.



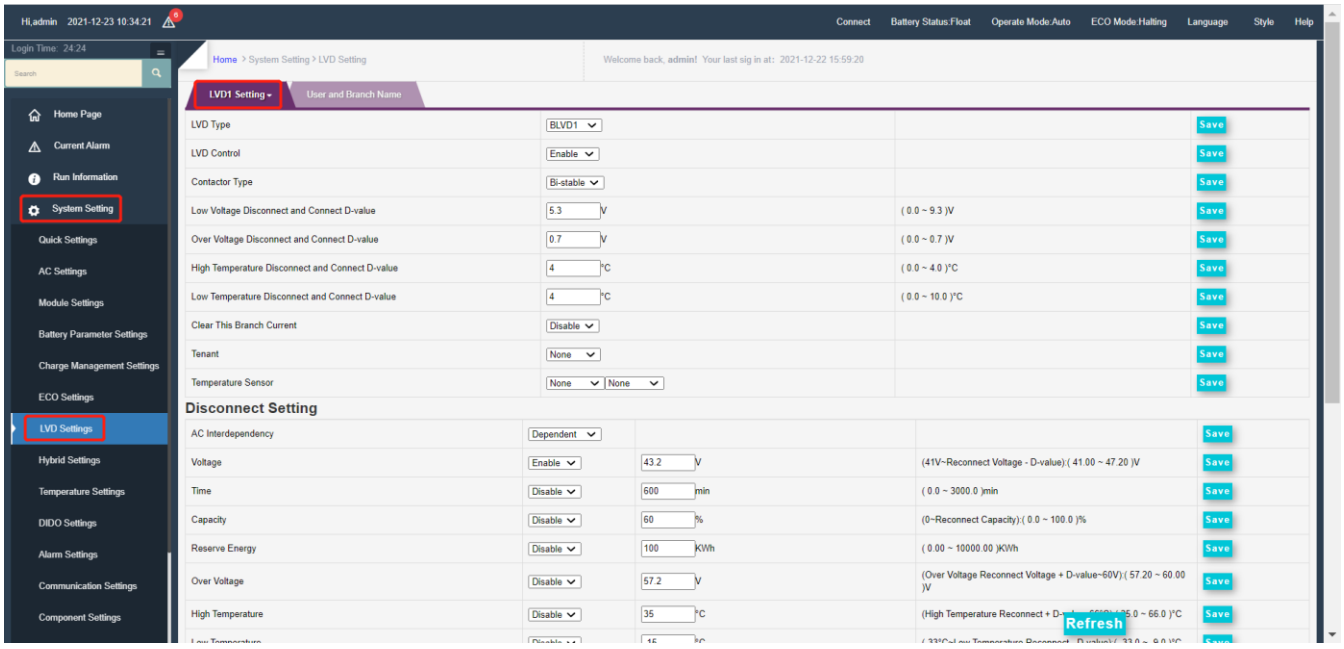
Second is for shifting peak valley, which means that according to the daily peak and valley electricity prices, the function of off-peak power consumption can be set to realize the function of using external mains power (battery energy storage) in off-peak time. Whereas, discharge battery (no mains power consumption) in peak time, and finally achieve the purpose of reducing electricity costs, as shown in figures below.



1.5.6.7 LVD Settings

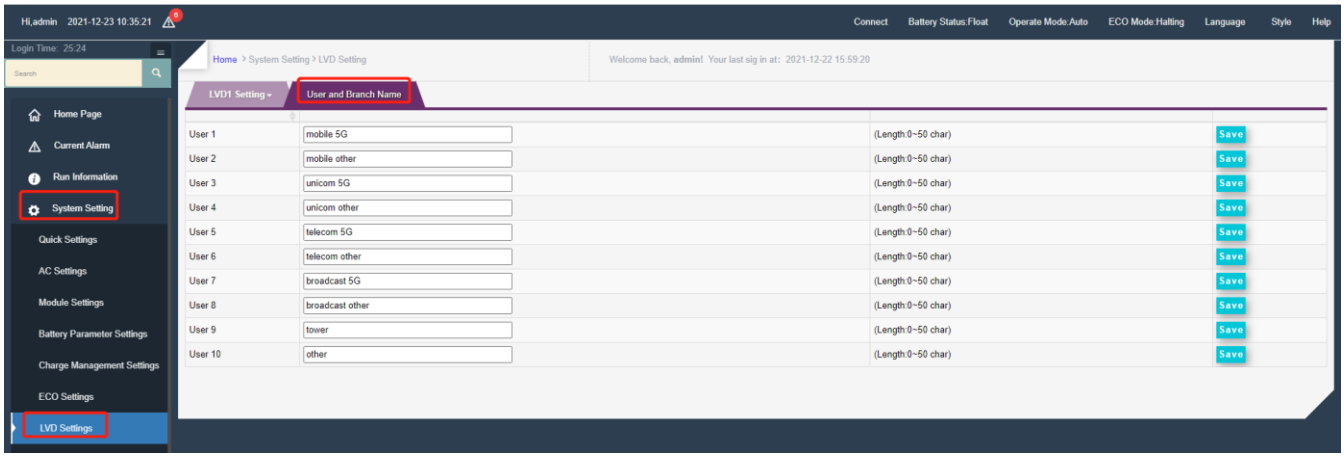
1.5.6.7.1 LVD1 Settings

This function include LVDs connect and disconnect logic based on temperature, voltage, SOC and time. Customer can set some parameters according to their requirement for LVDs extended control, as shown in figures below.



1.5.6.7.2 User and Branch Name

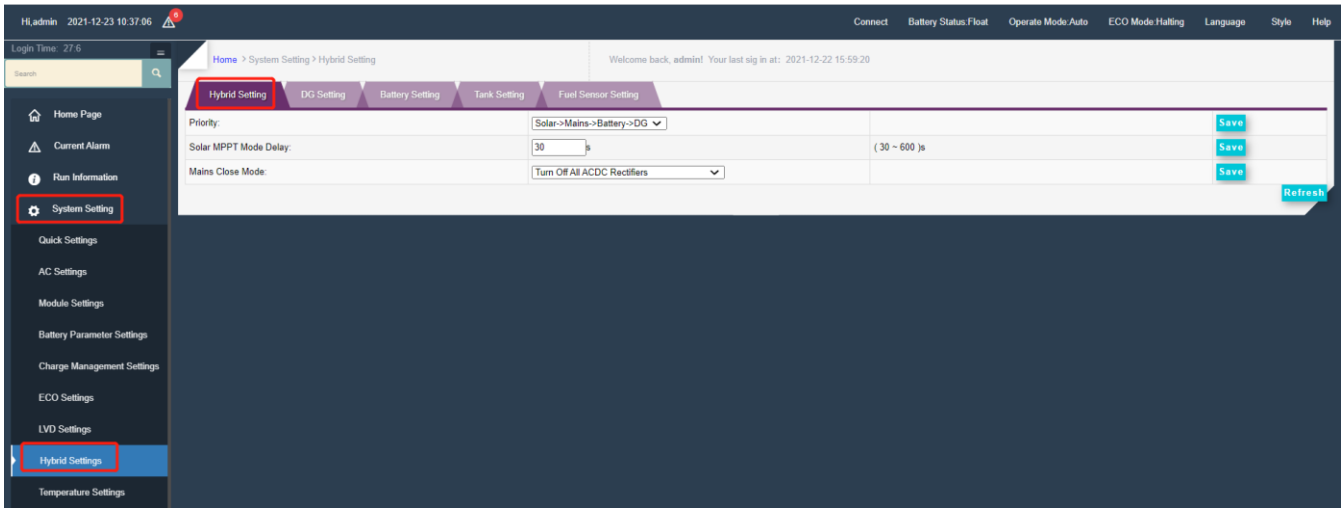
It is mainly used to distinguish customer load. Customer can set their devices here as per real site scenario, as shown in figures below.



1.5.6.8 Hybrid Settings

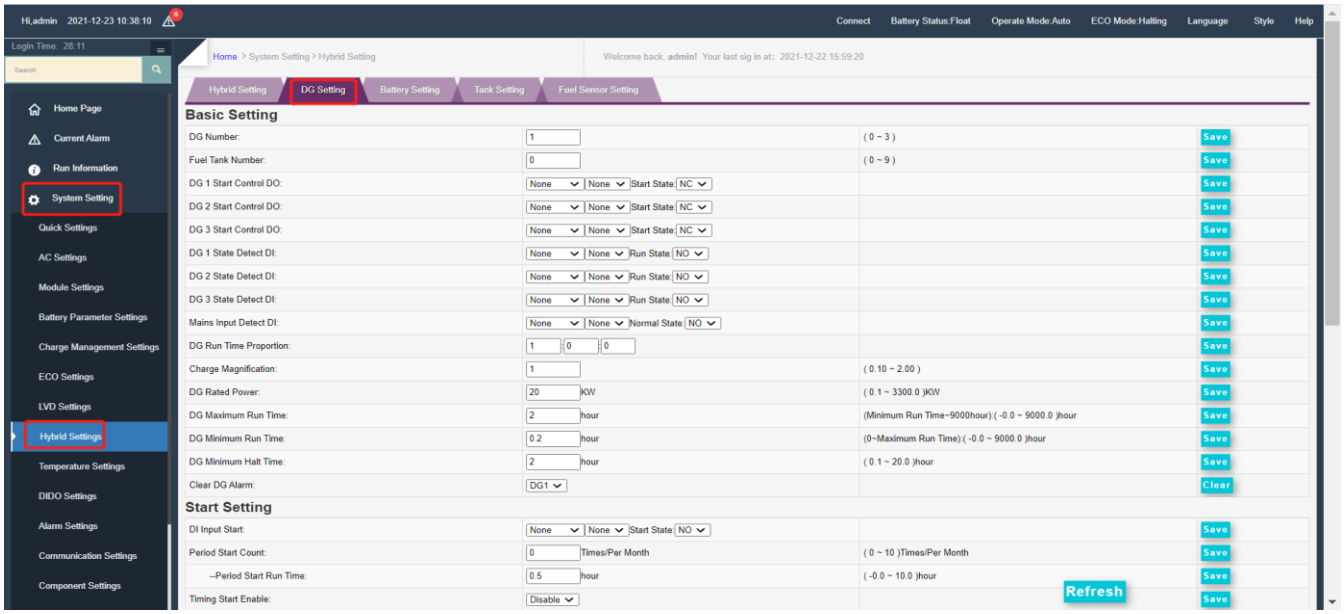
1.5.6.8.1 Hybrid Setting

This is a new function, which is develop for new energy or hybrid energy applications. Now we can support the solar, AC Mains, DG and battery in the same power system, it can suit for most of customers' requirements and very convenient and flexible, as shown in figures below.



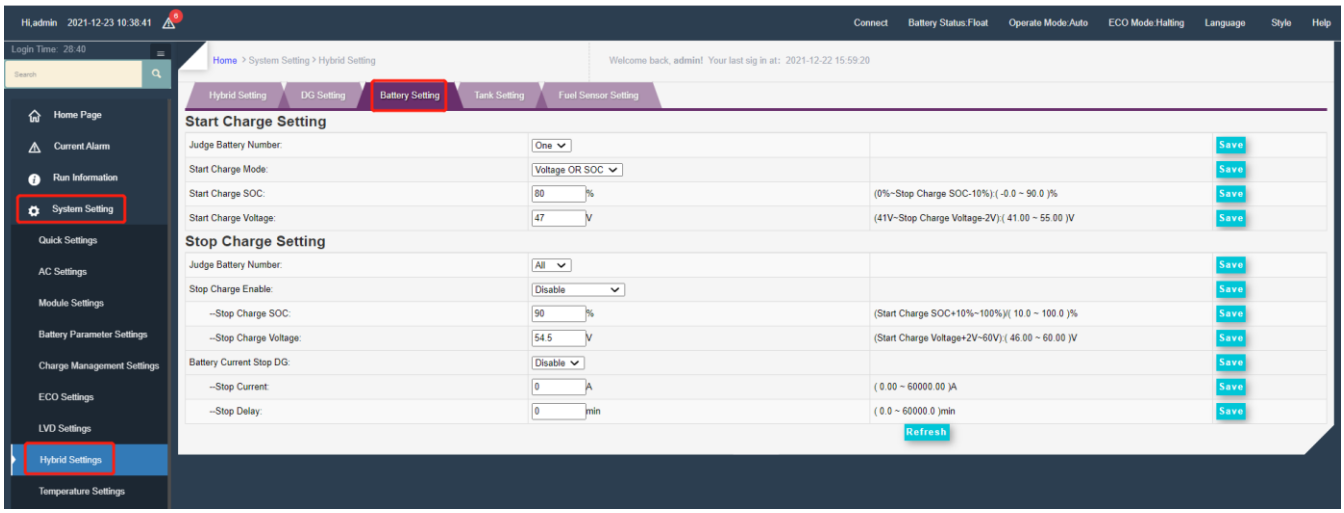
1.5.6.8.2 DG Settings

This page mainly sets the start and stop conditions of the oil machine, detects whether the oil machine is started through Di, and makes the oil machine run through do oil feeder controller.



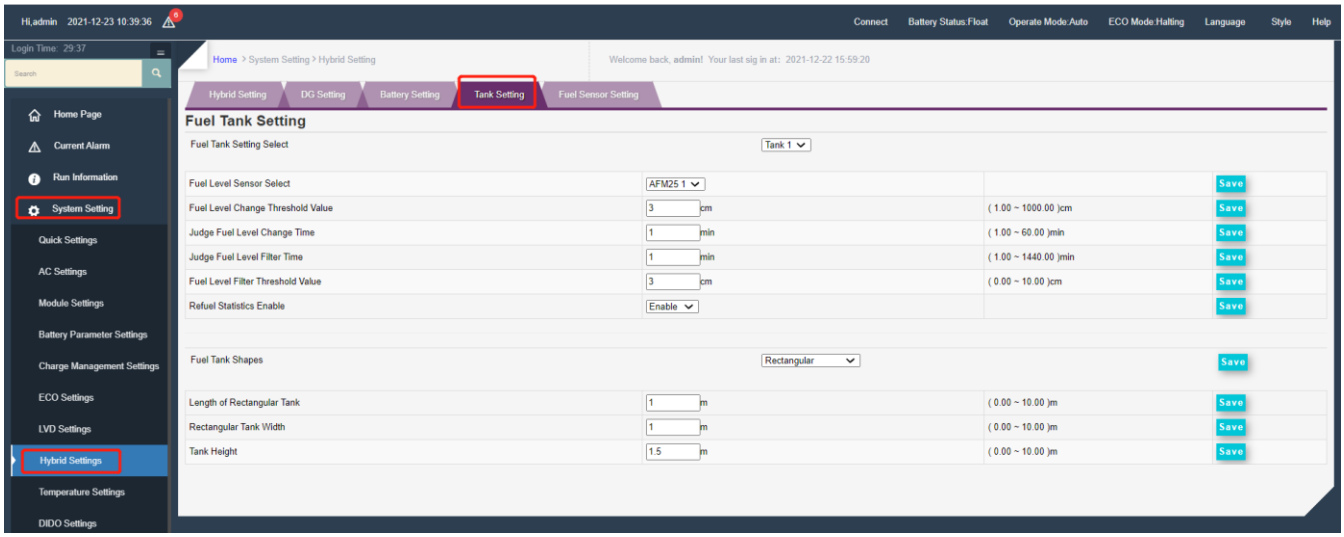
1.5.6.8.3 Battery Settings

This page mainly introduces the parameter settings of battery charging and discharging conditions in hybrid power supply, as shown in the figure below.



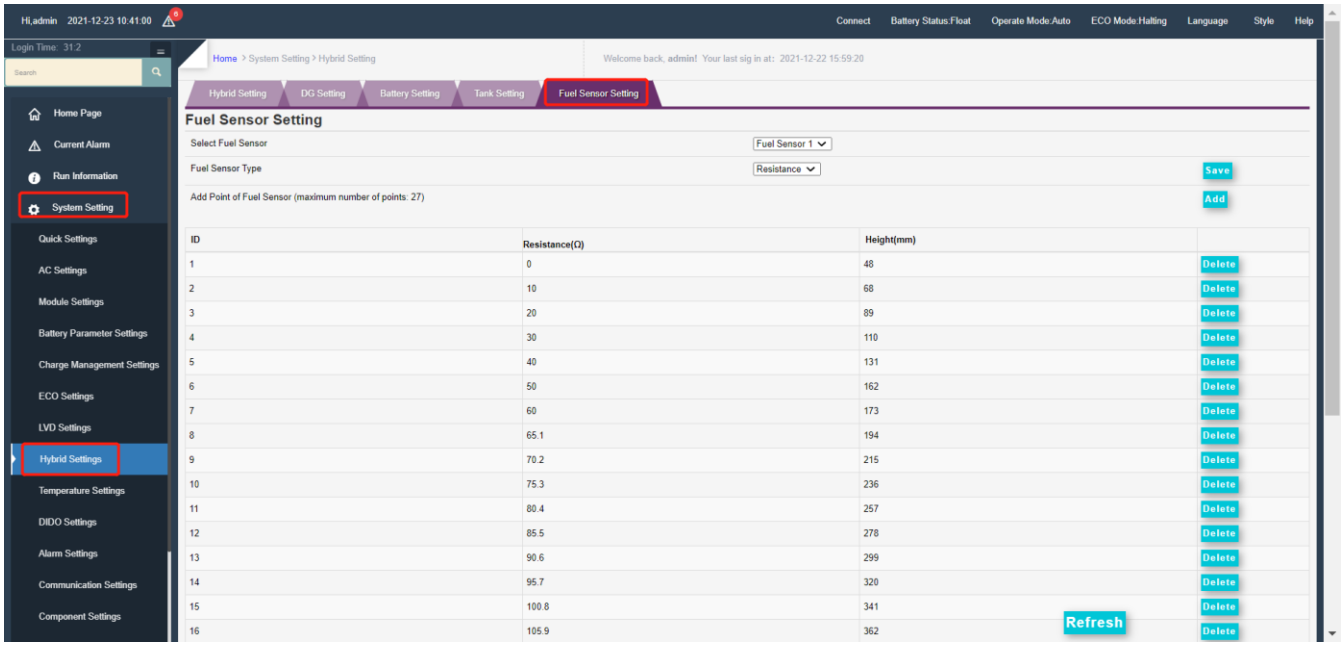
1.5.6.8.4 Tank Settings

This page introduces the oil tank setting of the oil engine. According to the actual situation, set the oil tank liquid level sensor and relevant parameters for detecting the liquid level here, as shown in the figure below.



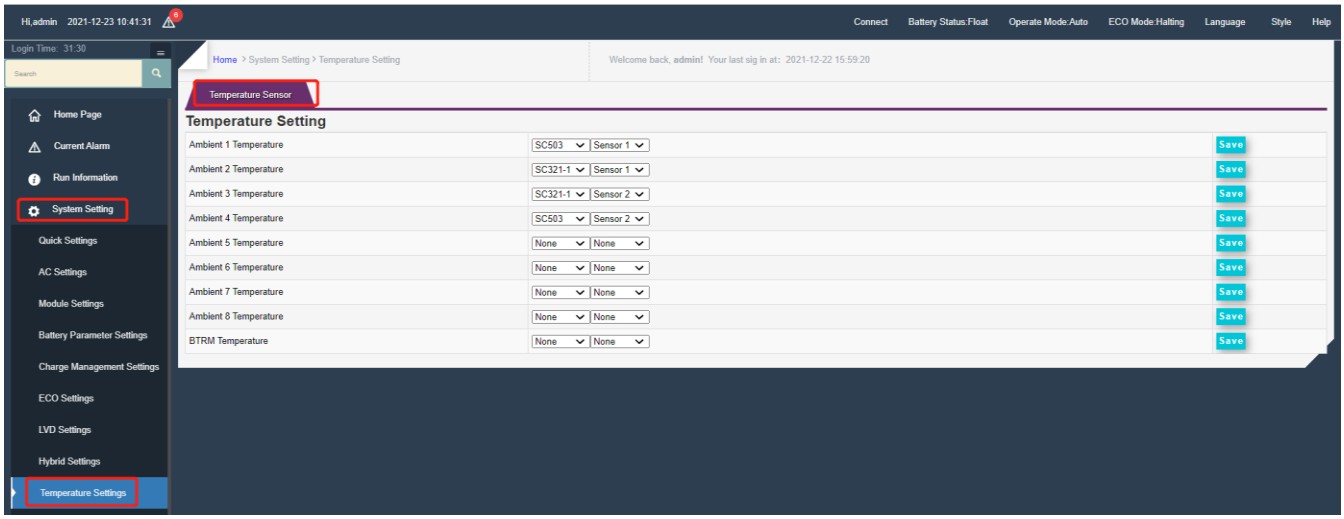
1.5.6.8.5 Fuel Sensor Settings

According to the actual sensor parameter settings, it is currently used with sc320. Please consult relevant personnel for specific usage. The parameter settings are shown in the figure below.



1.5.6.9 Temperature Settings

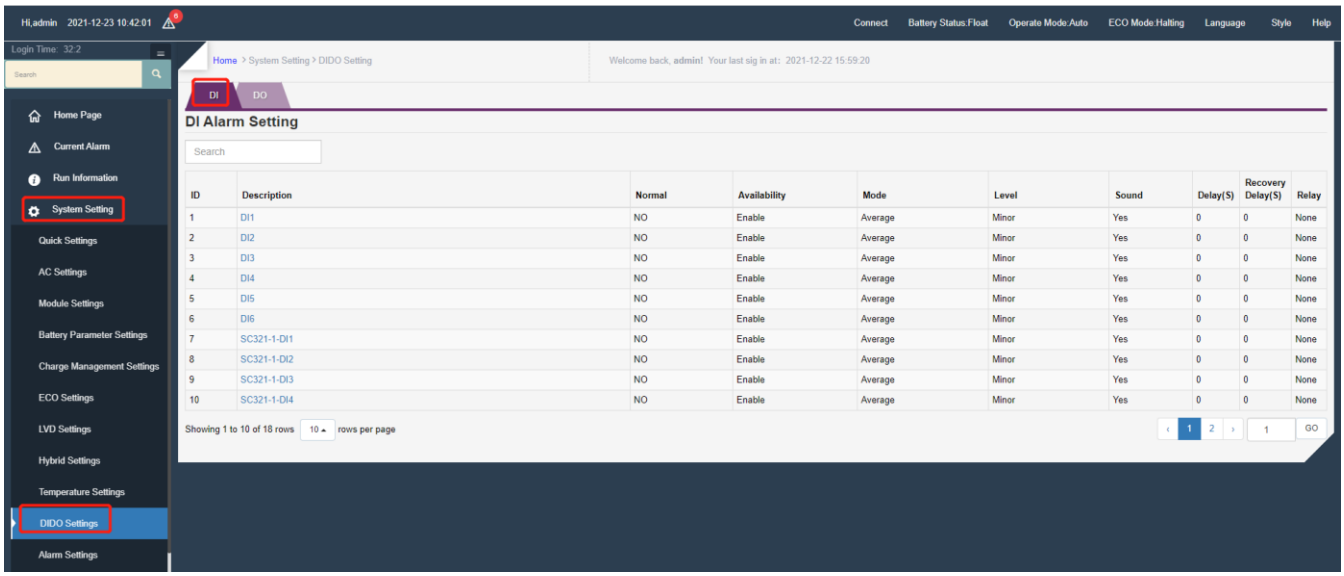
This page describes the temperature sensor detection point settings. You can use sc503 or other smart cards (such as sc321) to associate the temperature sensor and set it according to the actual situation, as shown in the figure below.



1.5.6.10 DIDO Settings

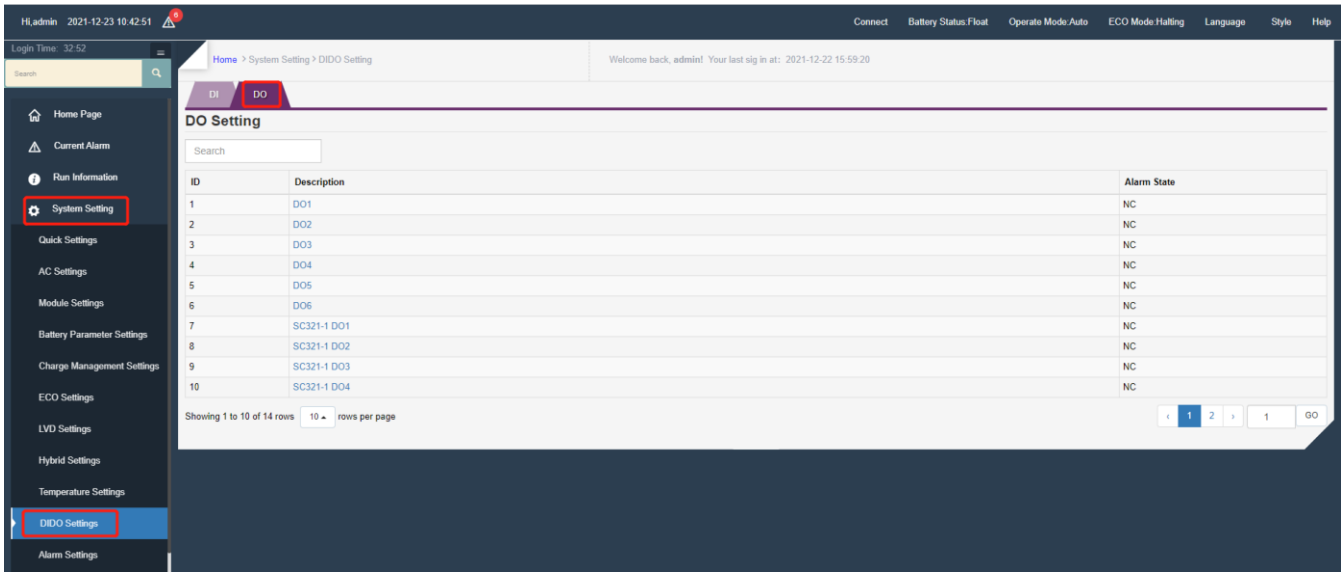
1.5.6.10.1 DI

On this page, you can set the alarm status on di according to your own requirements. The settings here should conform to the actual site scenario, as shown in the following figure.



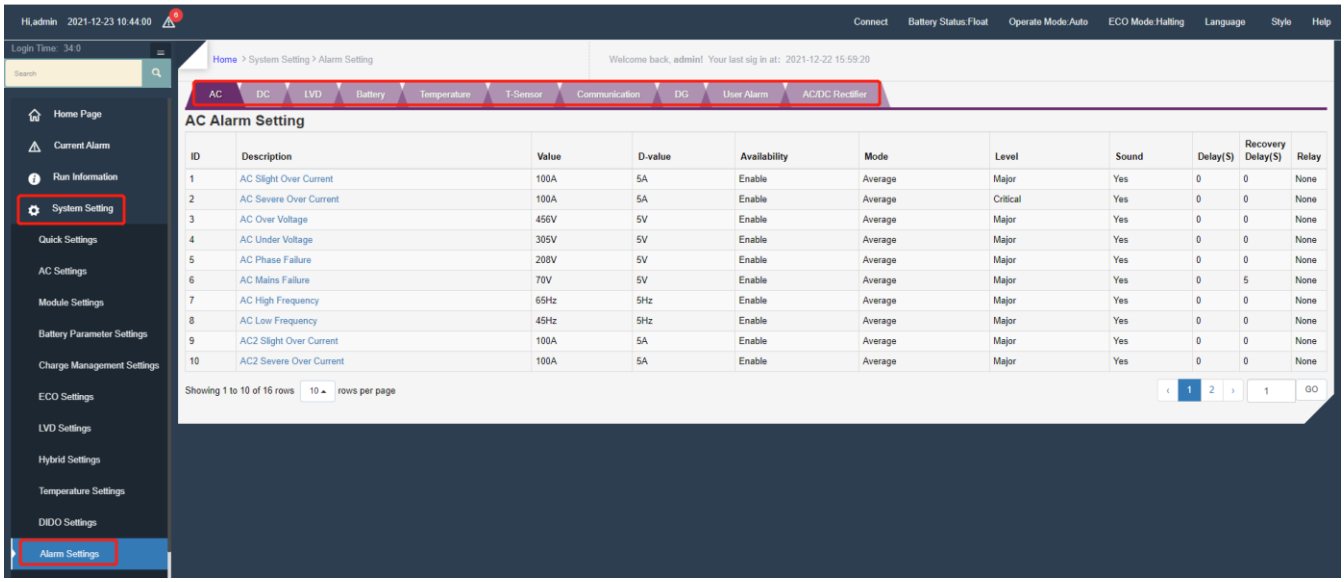
1.5.6.10.2 DO

This page mainly sets the do alarm status, which is determined according to the actual external equipment, as shown in the figure below.



1.5.6.11 Alarm Settings

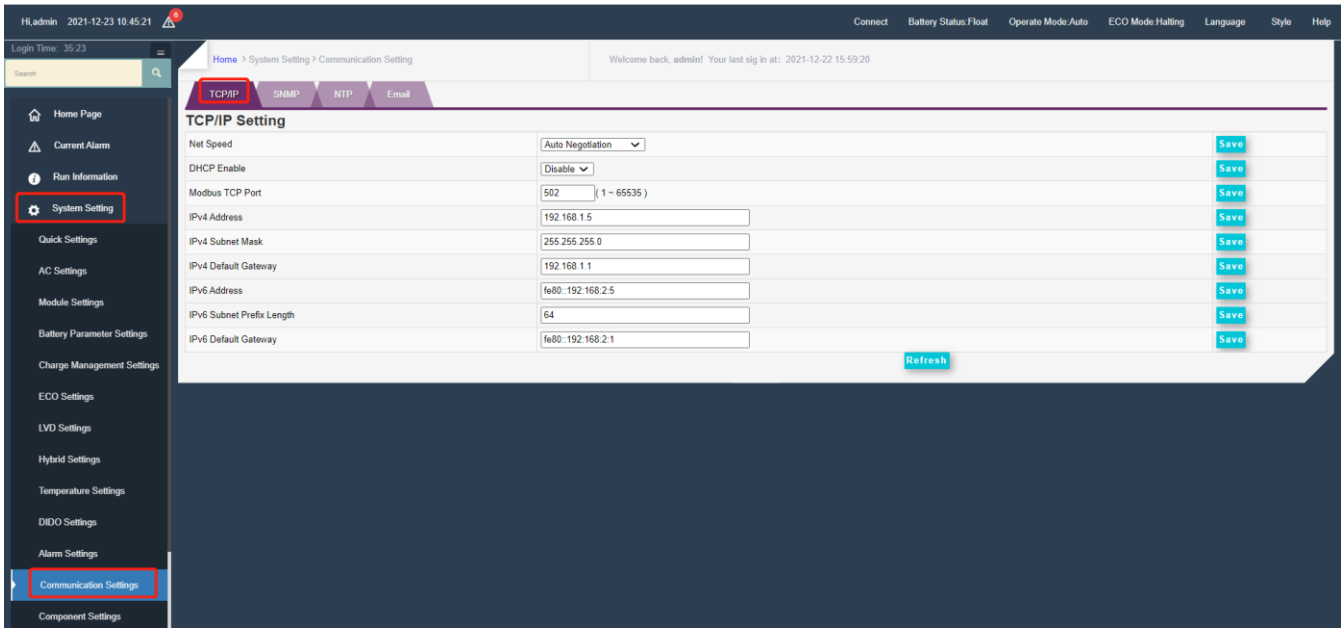
This page lists all alarms, and you can set alarm related parameters according to your own needs. If customers want to configure AC related alarms, they can click battery related alarm settings. In addition, there are other alarm lists, such as DC, power down, battery, temperature, temperature sensor, communication, DG, user alarm, rectifier alarm, etc., as shown in the figure below.



1.5.6.12 Communication Settings

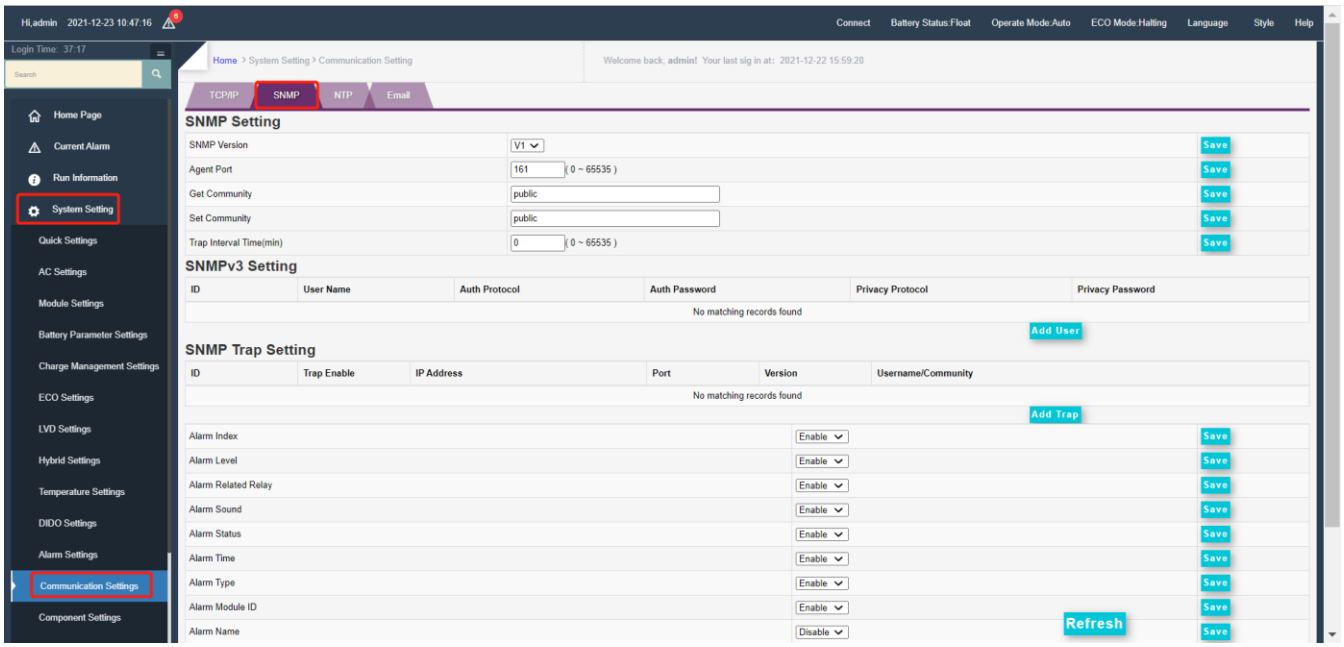
1.5.6.12.1 TCP/IP

On the front panel of the SC503, there is an Ethernet port that customer can use for network connection. We can set the IP address by DHCP or not. In this way, we can visit the SC503's webpage locally or remotely, as shown in figure below.



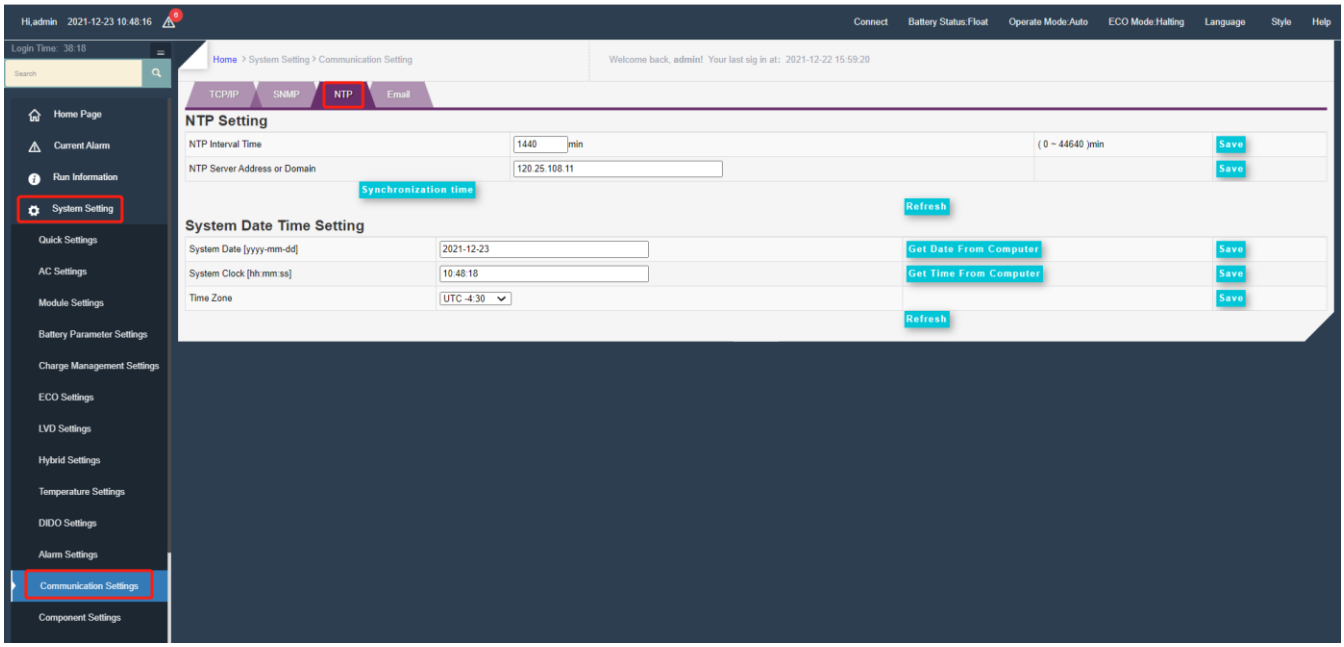
1.5.6.12.2 SNMP

The Ethernet port can also support SNMP V3 function. Trap can be used after it is enabled. It can support up to 20 trap IP addresses, as shown in the figure below.



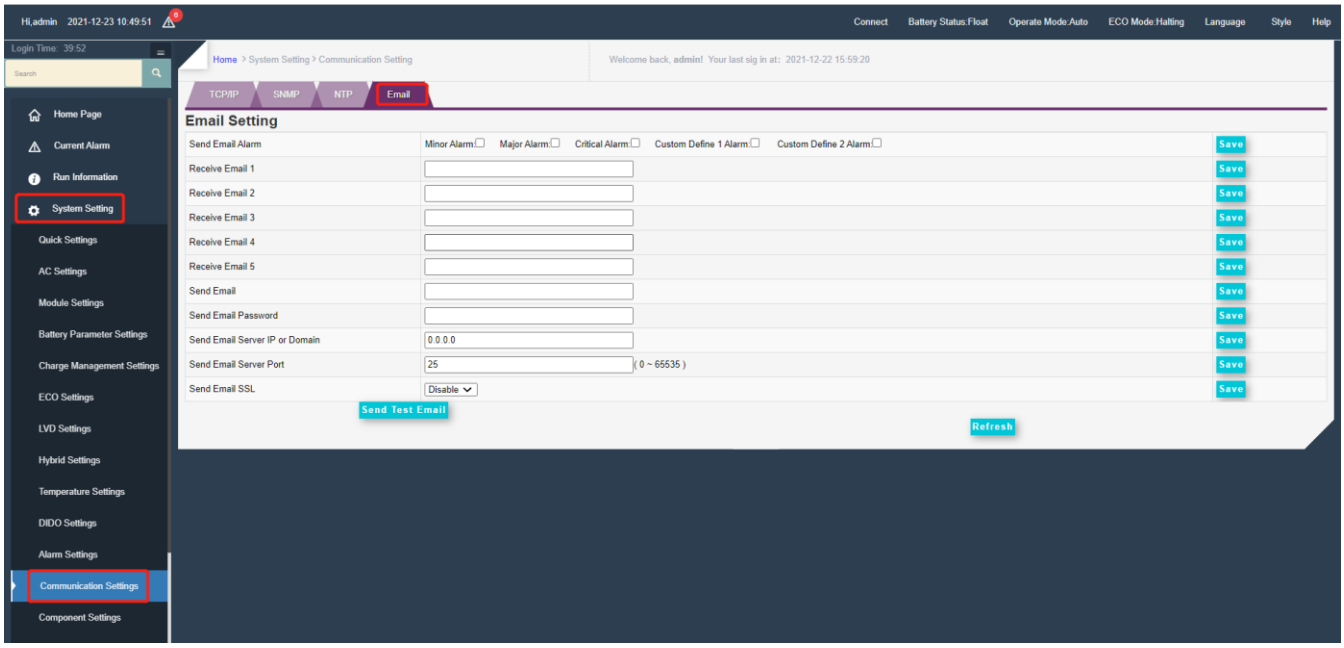
1.5.6.12.3 NTP

NTP function means that when the network is synchronized, the controller will synchronize with the network time at the specified time, as shown in the figure below.



1.5.6.12.4 Email

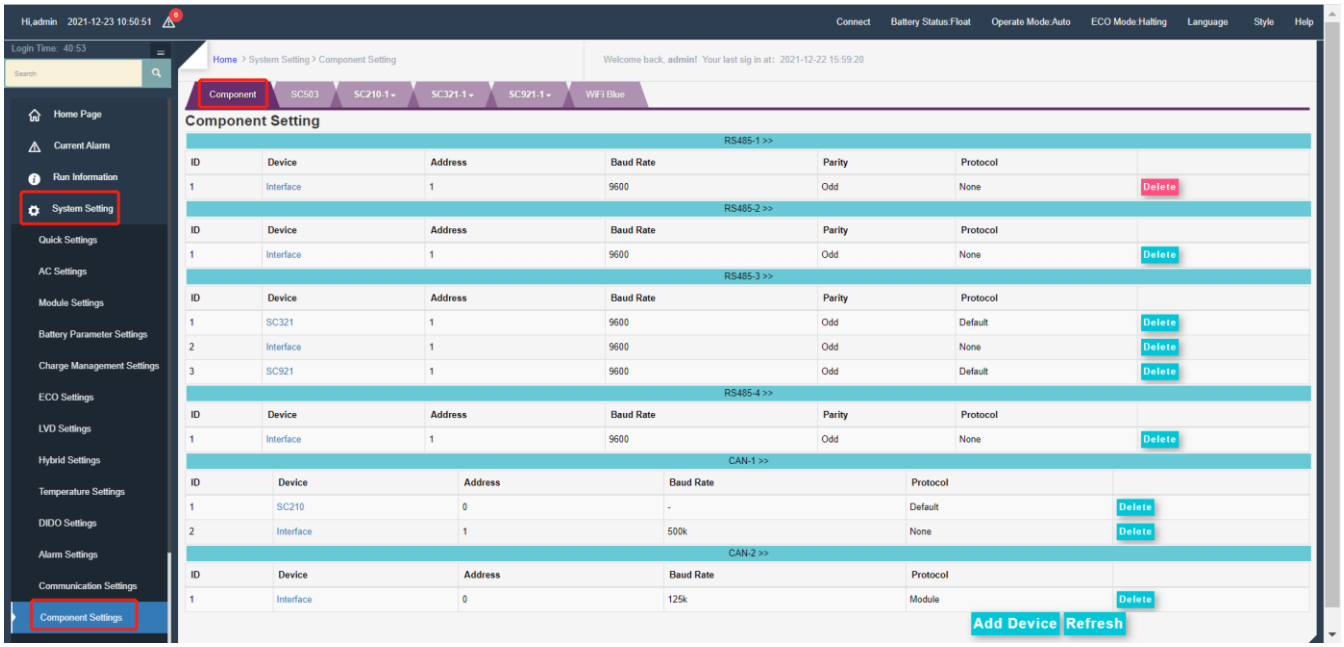
This function requires the controller to connect to the network. By setting five different e-mail addresses, when the controller gives an alarm, it will send the corresponding level alarm to five e-mail addresses, as shown in the figure below.



1.5.6.13 Component Settings

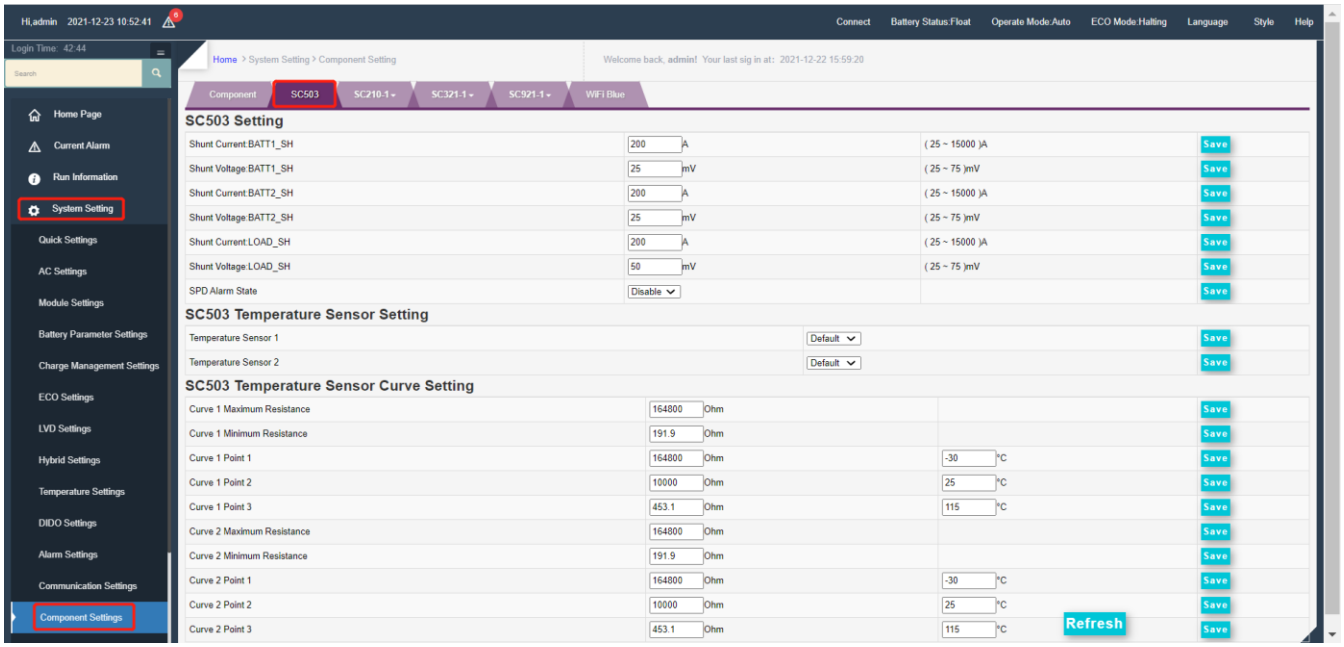
1.5.6.13.1 Component

The extended smart boards and SC503 function definition settings will be set here. After setting the number of extended parts and their parameters, the function related to that smart board become available, as shown in figure below.



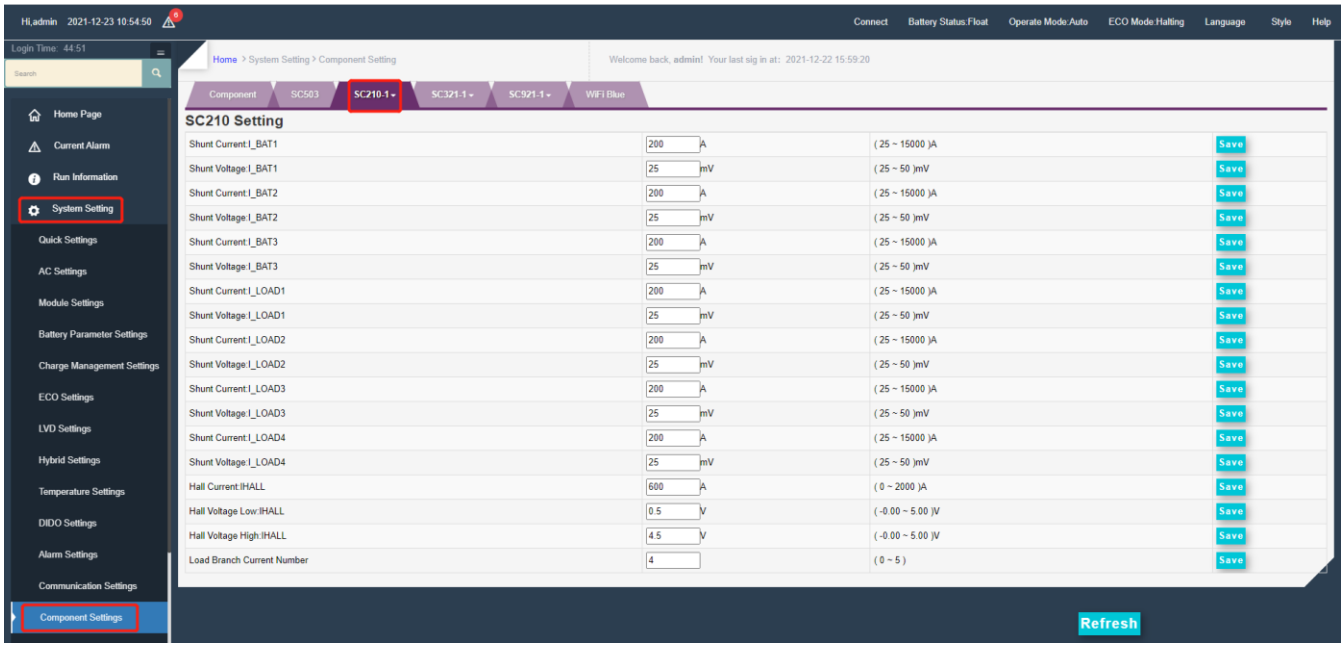
1.5.6.13.2 SC503

On this page, the parameters of the load current shunt or battery current shunt can be set here. Customers can also set the resistance temperature relationship of temperature sensor, as shown in the figure below.



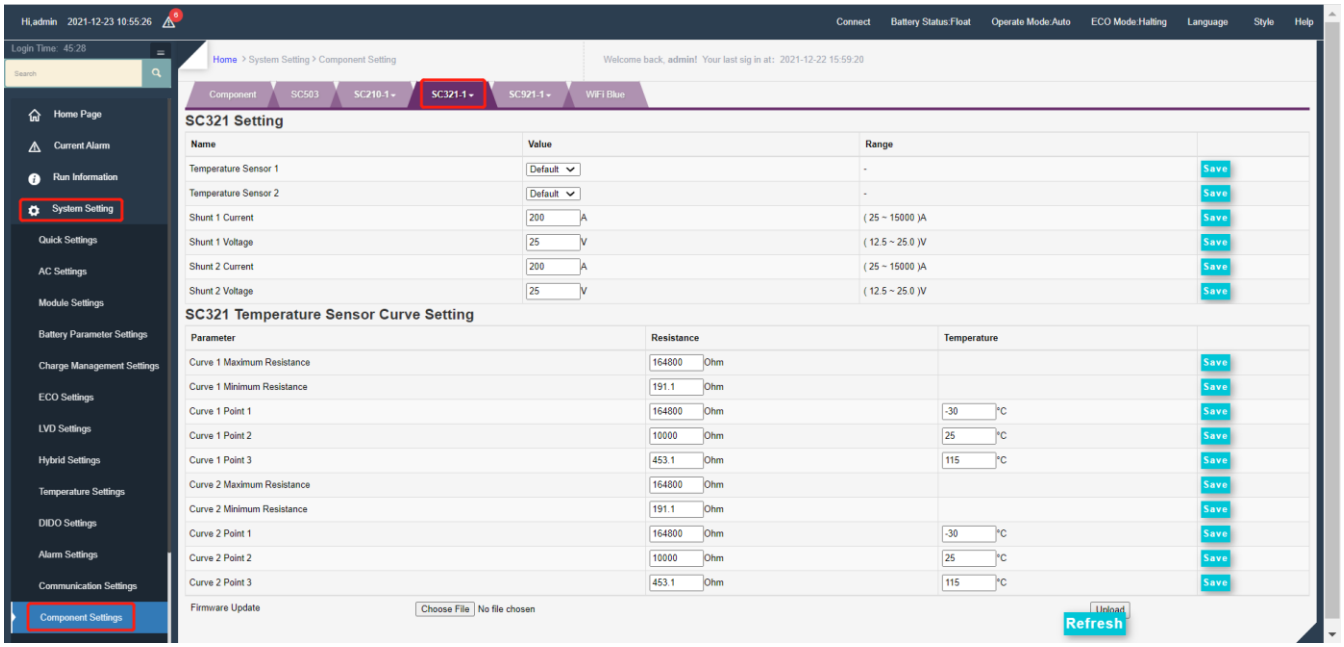
1.5.6.13.3 SC210-1

On this page, the parameters of the load current shunt or battery current shunt can be set here. Customer can also set the hall current sensor which are attached with SC210 ports, as shown in figure below. Maximum ten SC210 boards can be attached with one system.



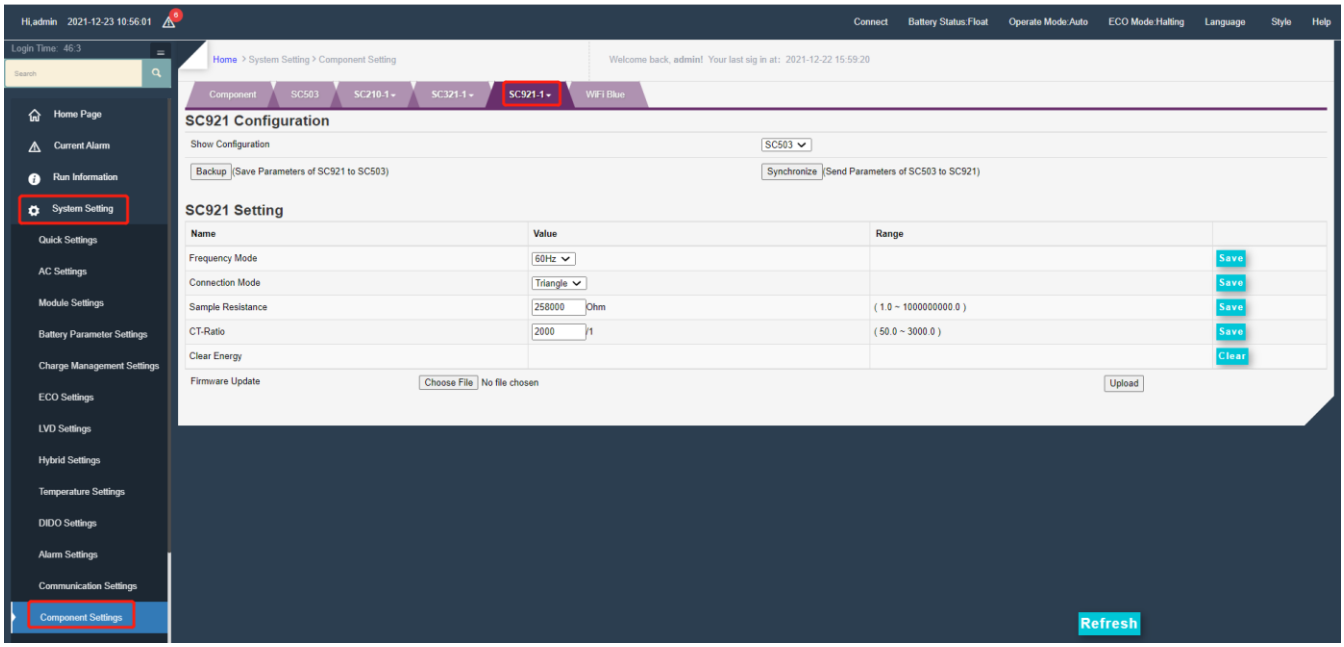
1.5.6.13.4 SC321-1

On this page, you can set the parameters of the temperature sensor, and the customer can also set the parameters of two current sampling diverters, as shown in the figure below. A system can connect up to three sc321 boards.



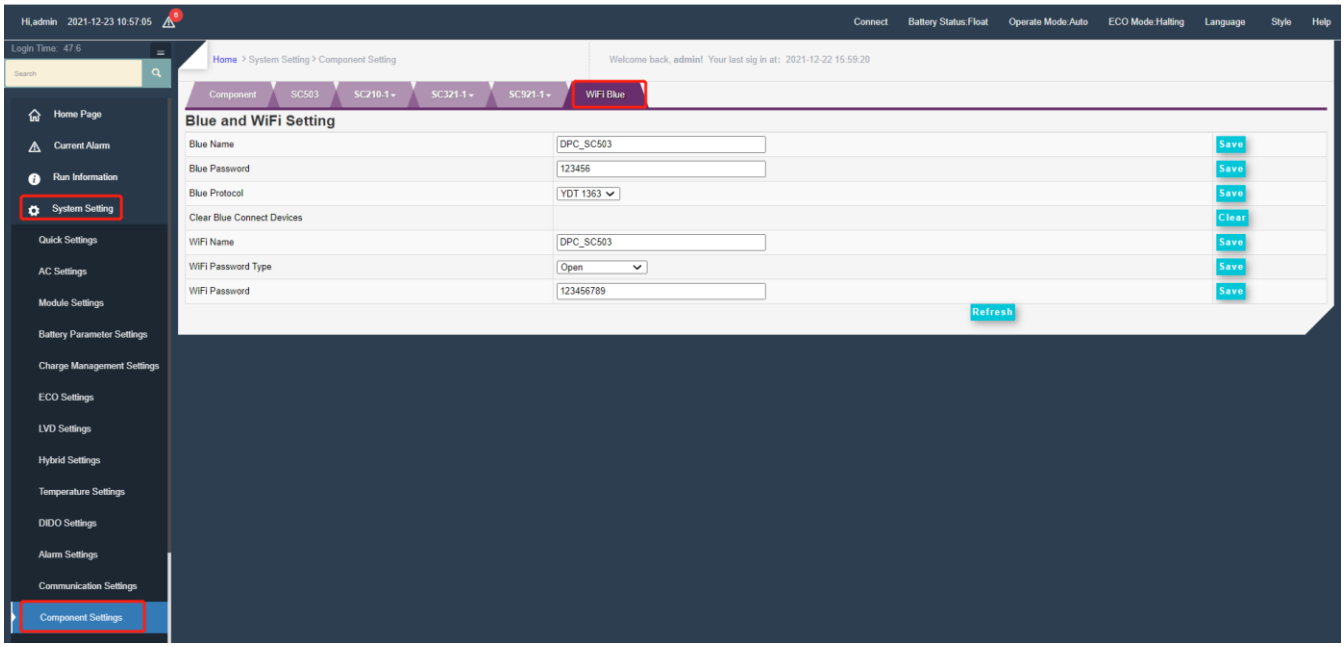
1.5.6.13.5 SC921-1

On this page, the parameters of the AC Input Power can be set here. Customer can also set the CT sensors parameters, which are attached with SC921 ports, as shown in figure below. Maximum two SC921 boards can be attached with one system.



1.5.6.13.6 WI-FI and Bluetooth

On this page, the parameters and protocols of the bluetooth and wi-fi can be set. Customer can also clear the already connected bluetooth devices from the system, as shown in figure below.



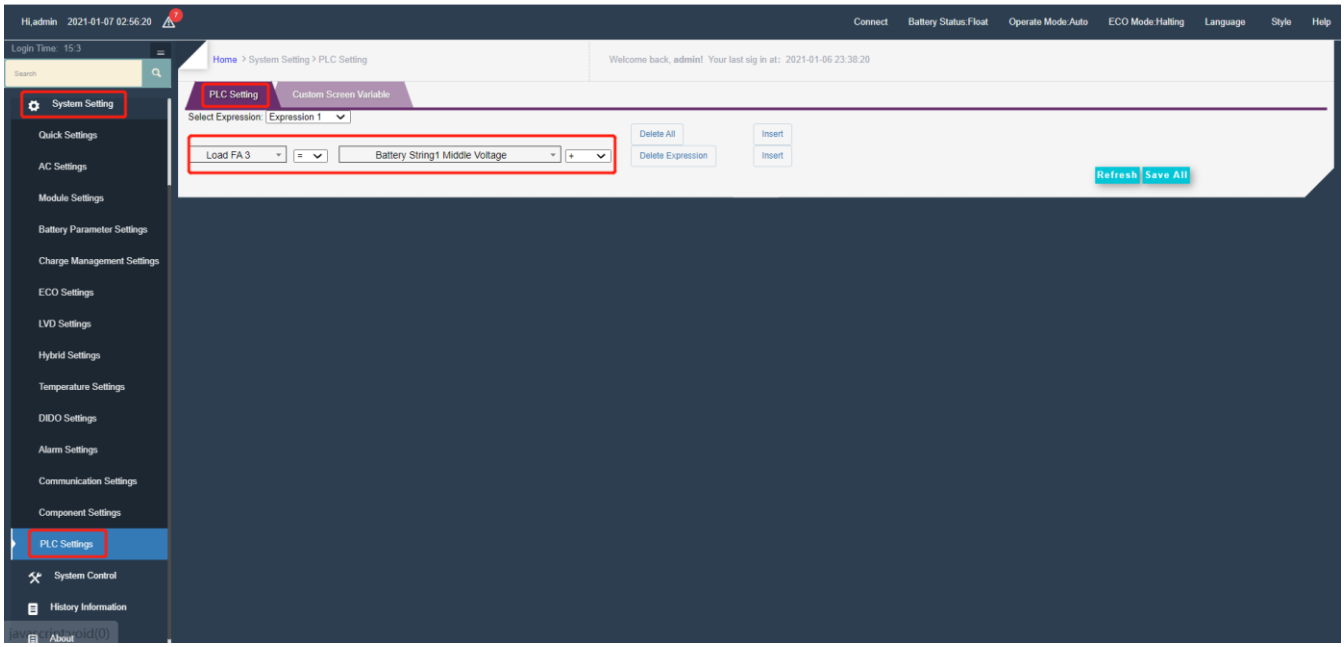
1.5.6.14 PLC Settings

This function can customize special requirements that are not commonly used. It has two functions, as shown below.

1.5.6.14.1 PLC Setting

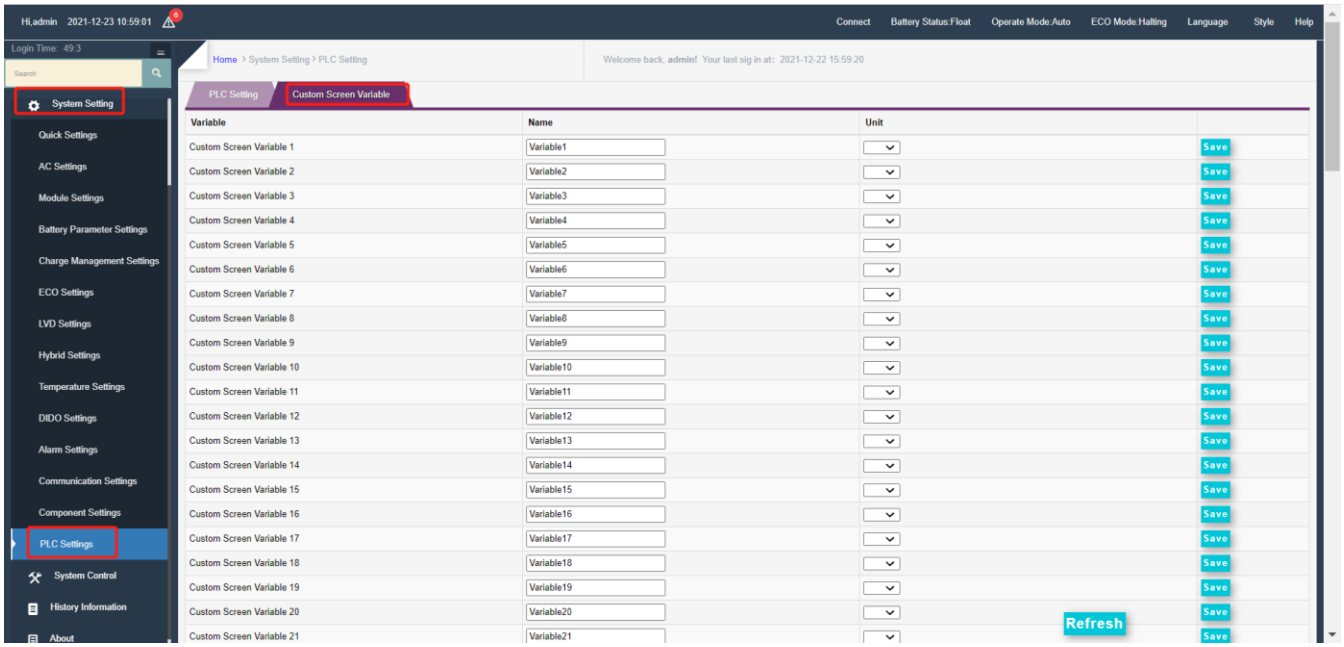
In this part, we can redefine an interface's function. For example, if we need third Load breaker disconnection alarms (as default software only have two such alarms), then in that case we can use the battery middle point detecting the interface as the third Load breaker disconnection alarm port. In this way we don't need to configure an expansion board in the system, as shown in figure below.

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1.5.6.14.2 Custom Screen Variable

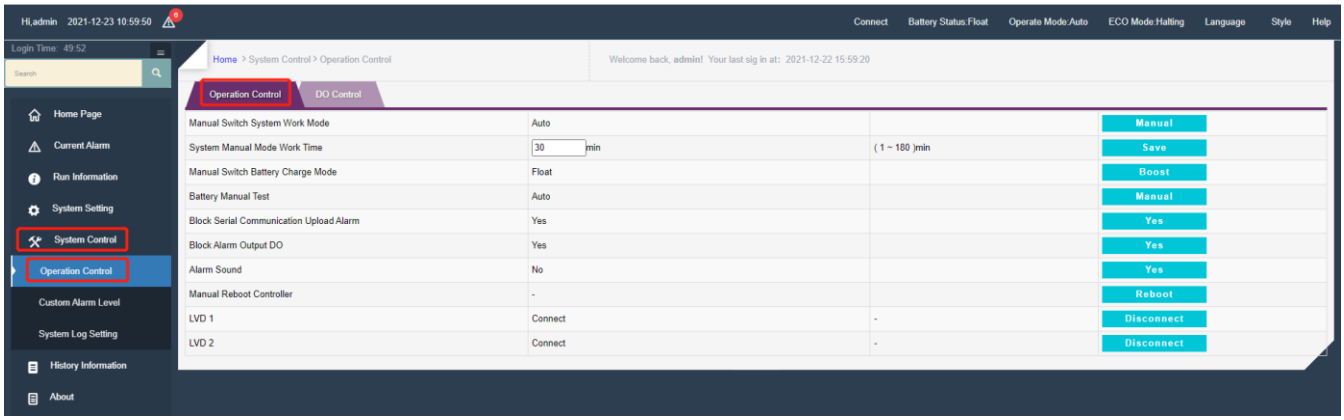
This page introduces another very useful method to customize the display value. For example, we want to display the total current. By using the screen variable and adding PLC setting conditions, assign the total current to the "customer screen variable", and configure the information name and results, as shown in the following figure.



1.5.7 System Control

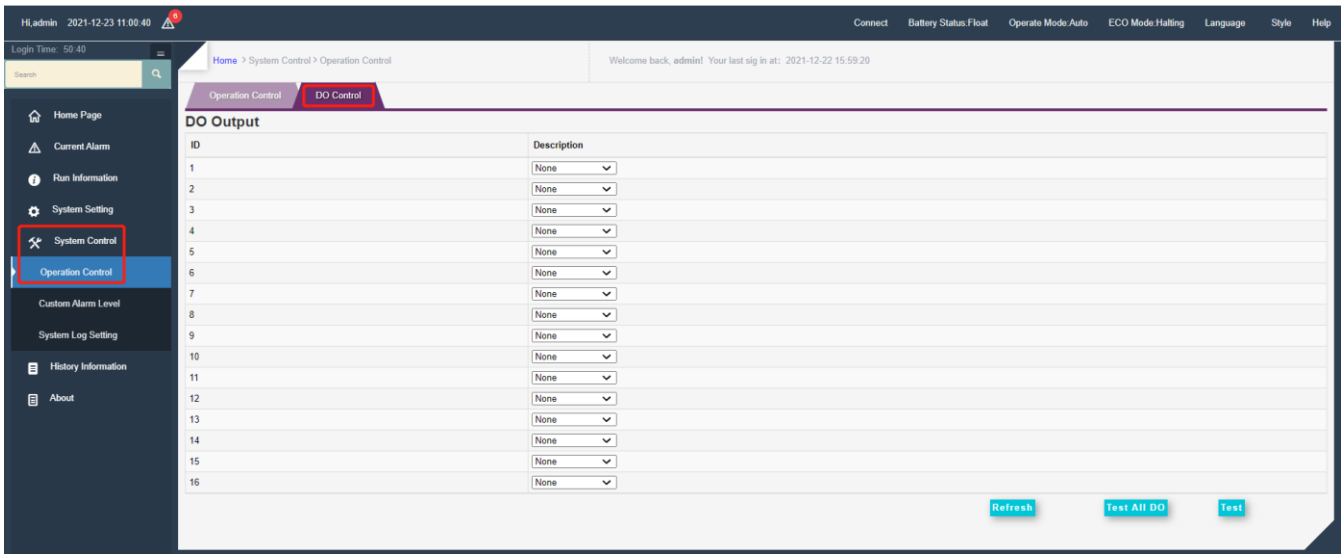
1.5.7.1 Operation Control

On this page,you can put the system on manual to change or control many system parameter. For example, customer can manully connect/disconnect the LVDs, change alarm sound to off, do battery manual testing etc., as shown in figure below.



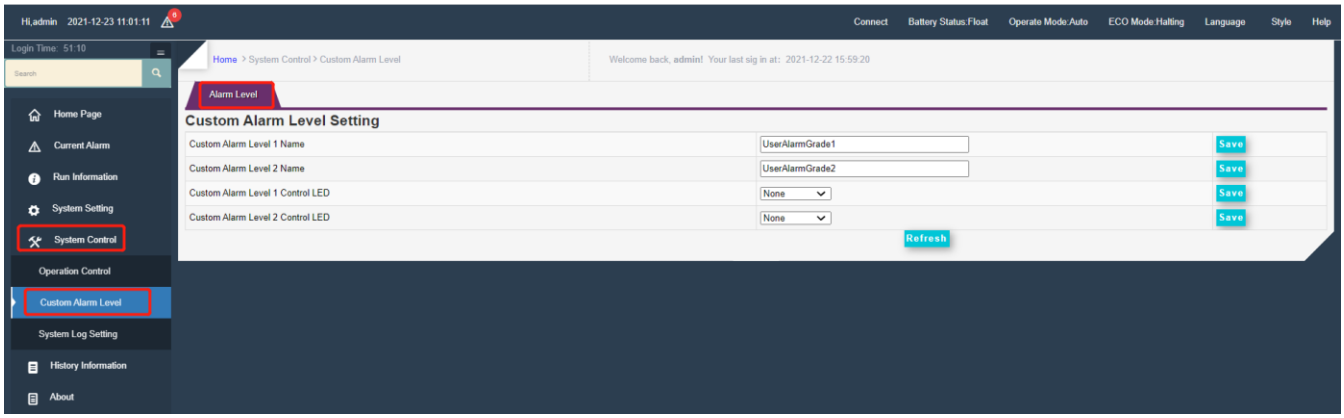
1.5.7.1.1 DO Control

On this page, you can manually test the controlled do, as shown in the following figure.



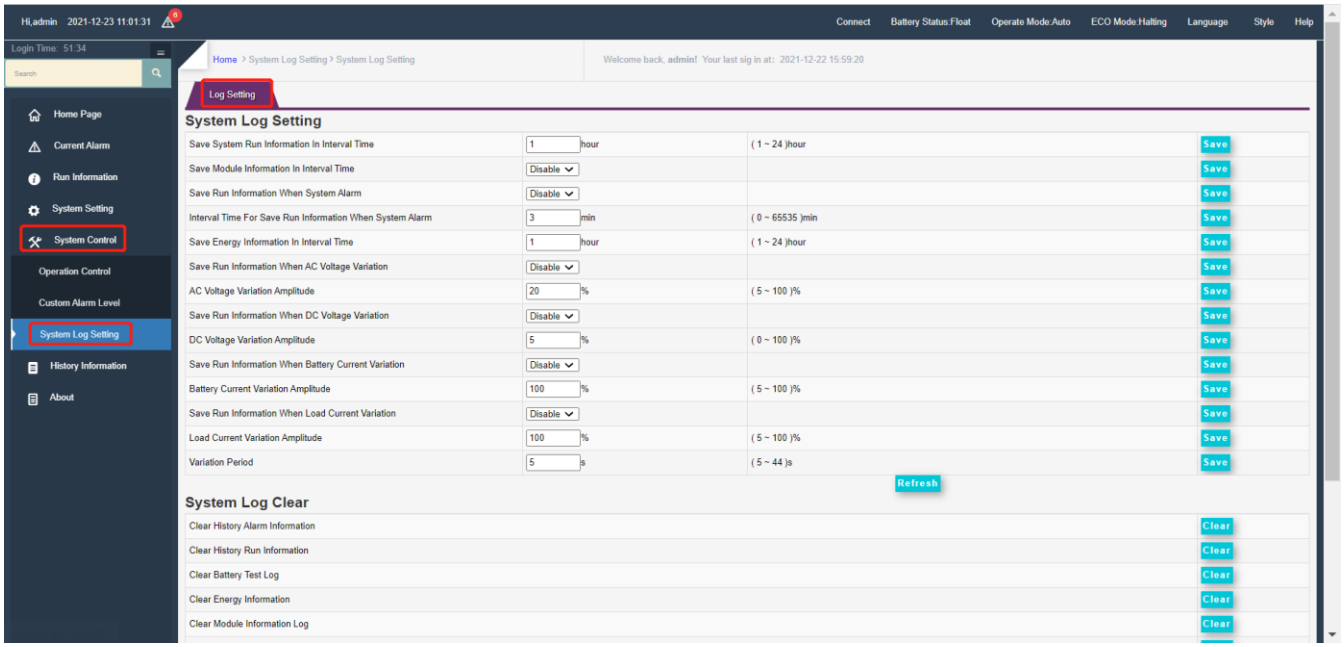
1.5.7.2 Custom Alarm Level

On this page, the customer can change the alarm level name and get response on LED as yellow or red, as shown in figure below.



1.5.7.3 System Log Settings

If the system parameters change greatly in a short time, the customer can obtain an operation record on this page. Customers can choose to clear history information here, as shown in the figure below.

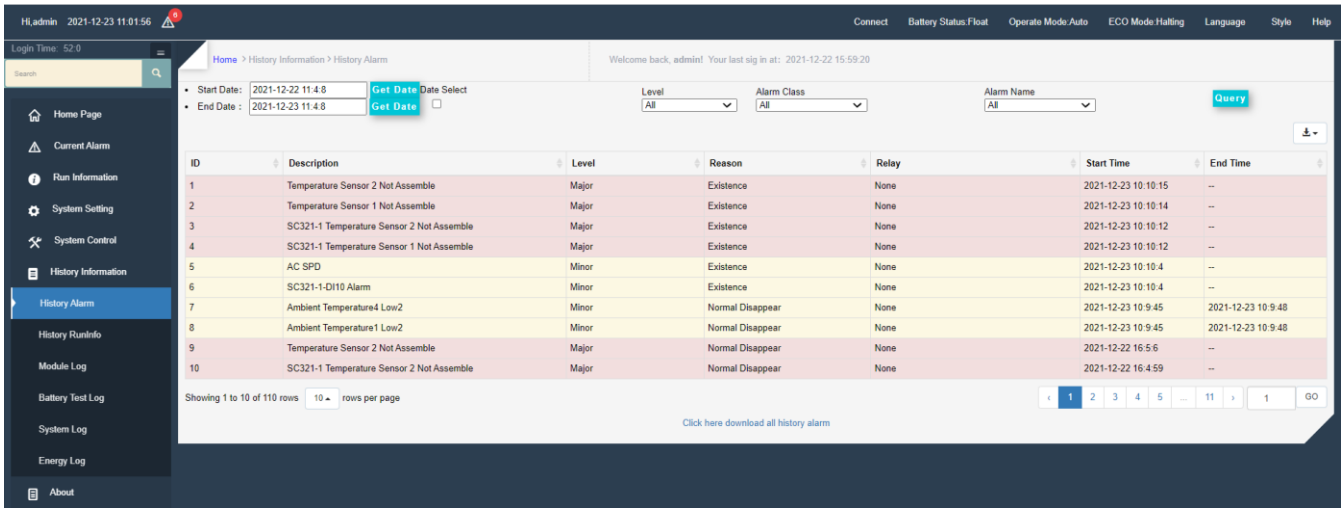


1.5.8 History Information

All the history information could be check here, such as history alarm, history run operation, battery test log, system log, and energy logs.

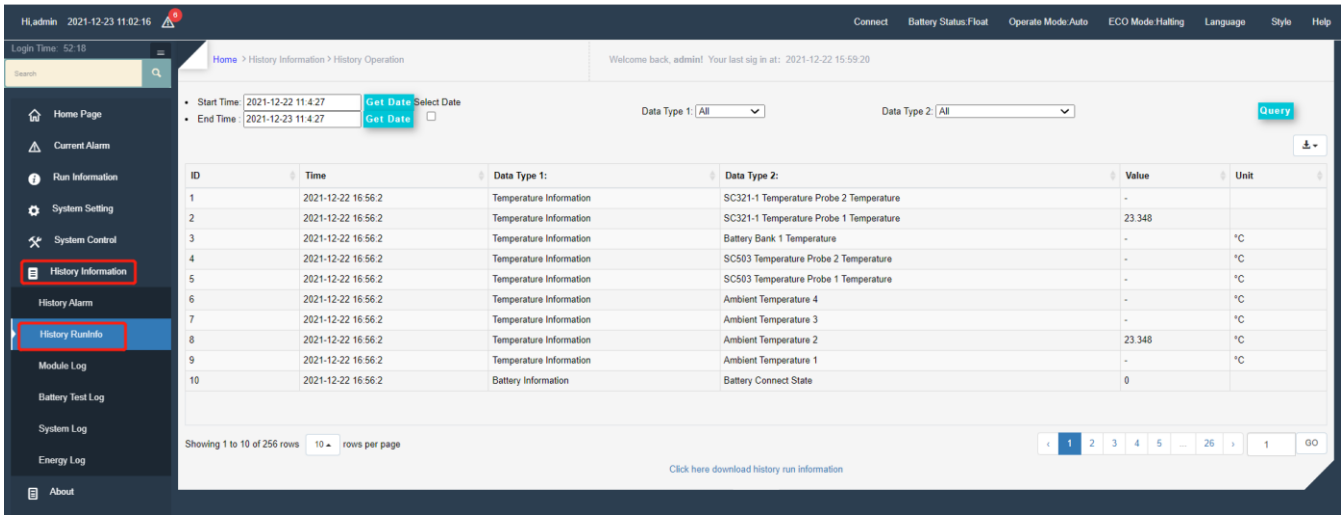
1.5.8.1 History Alarm

On this page, the customer can get the all history alarm information and can also download them in excel file for later analysis, as shown in figure below.



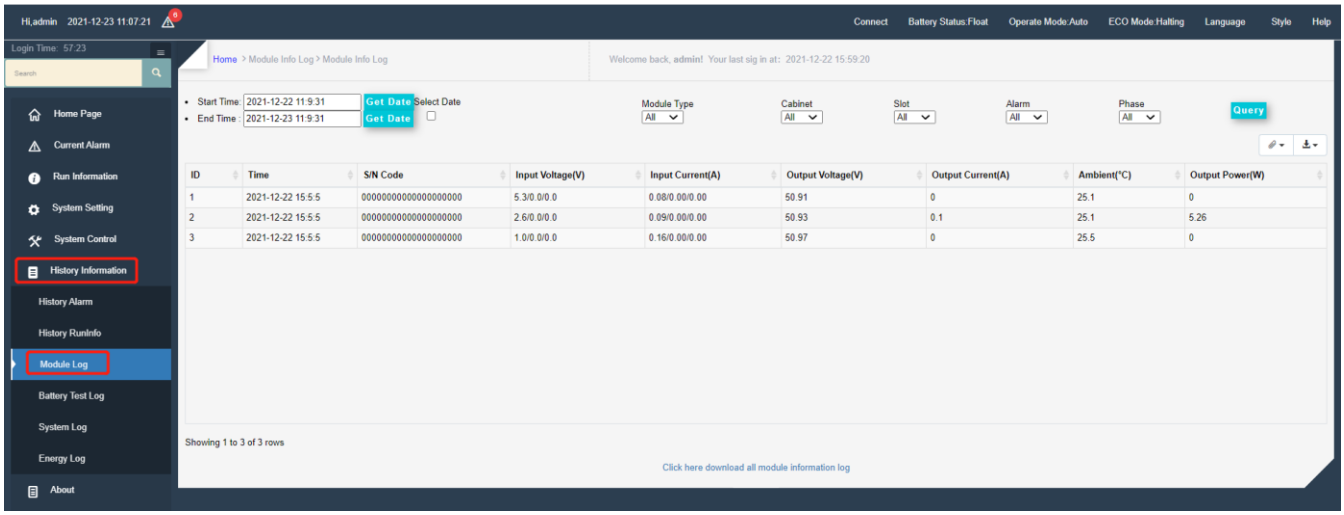
1.5.8.2 History Run Information

On this page, the customer can get the all history operation system run information and can also download them in excel file for later analysis, as shown in figure below.



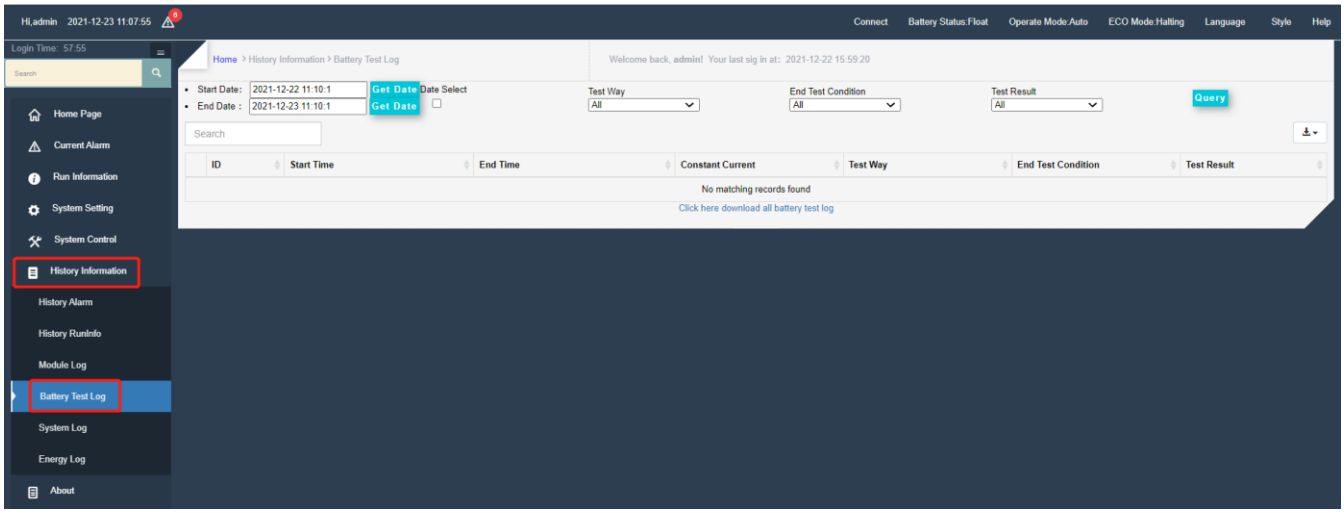
1.5.8.3 Module Log

On this page, the customer can get the all module logs and information plus they can also download them in excel file for later analysis, as shown in figure below.



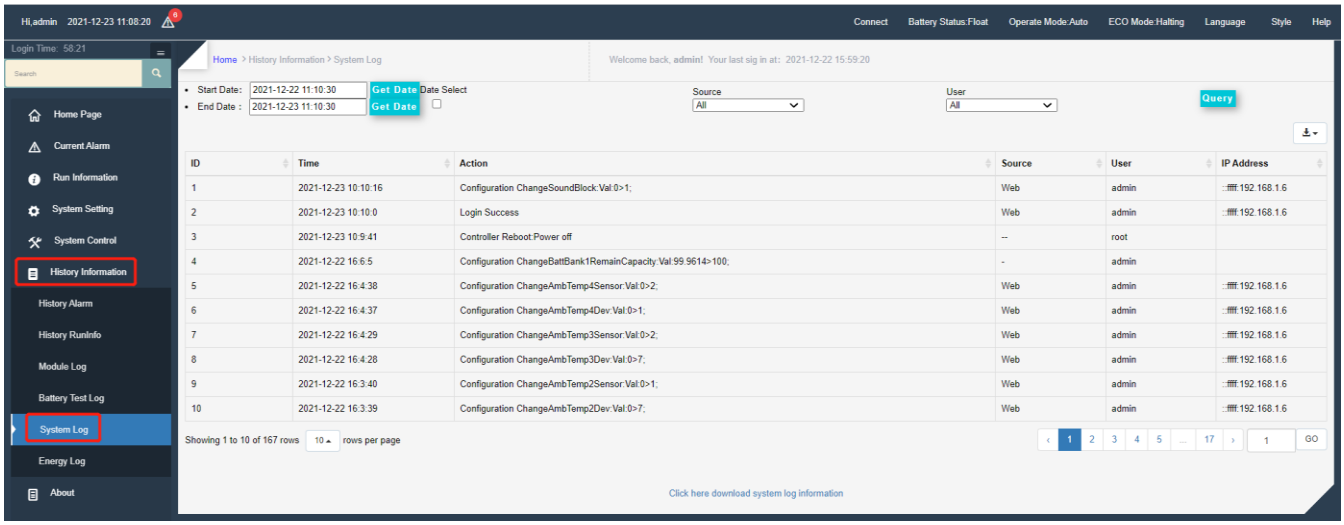
1.5.8.4 Battery Test Log

On this page, the customer can get the all battery logs and information plus they can also download them in excel file for later analysis, as shown in figure below.



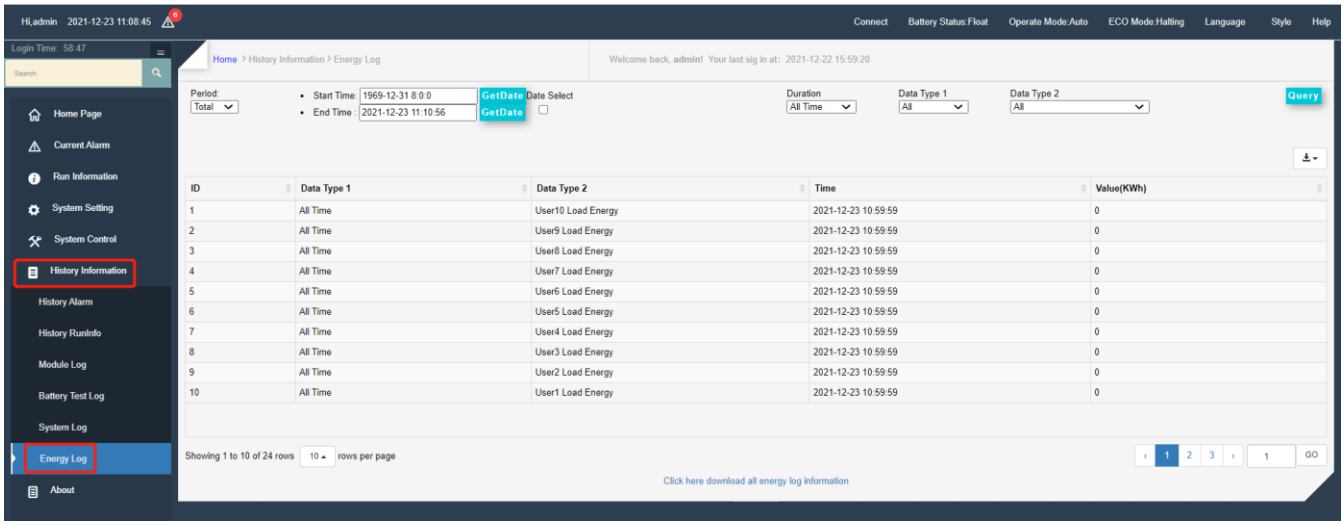
1.5.8.5 System Log

On this page, the customer can get the all system logs and information plus they can also download them in excel file for later analysis, as shown in figure below.



1.5.8.6 Energy Log

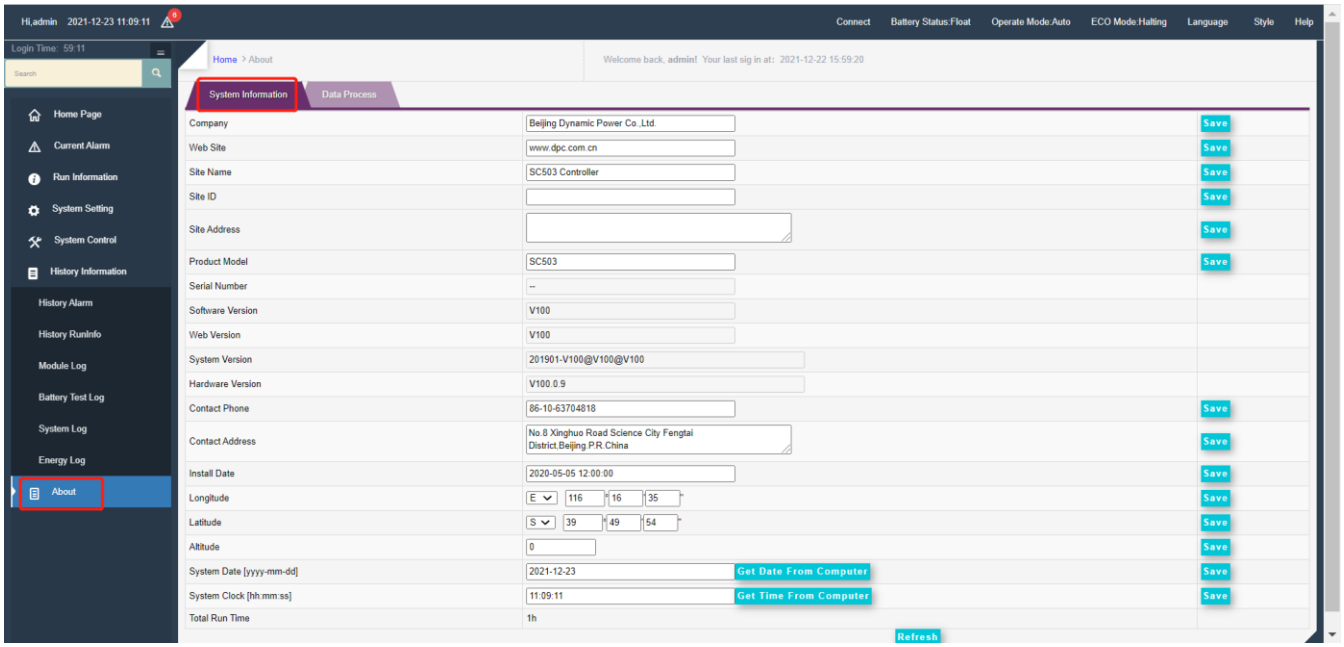
On this page, the customer can get the all enegy logs and information plus they can also download them in excel file for later analysis, as shown in figure below.



1.5.9 About

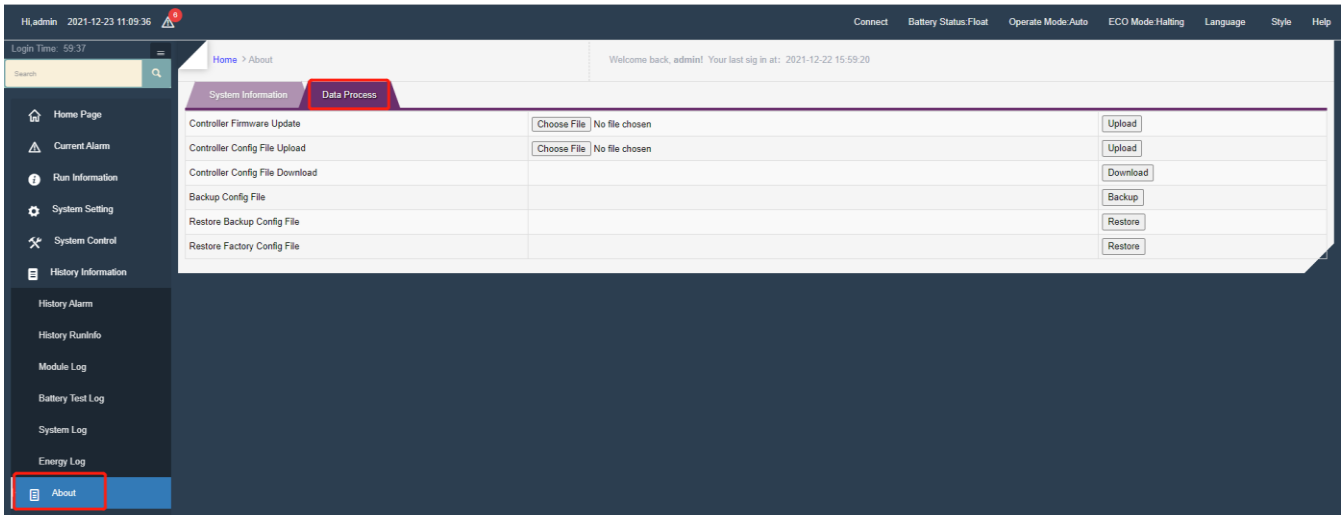
1.5.9.1 System Information

On this page, the customer can set their company information here. We can also change the system date, time and the site location position can also be defined here, as shown in figure below.



1.5.9.2 Data Process

On this page, customers can upgrade software, import and export configuration files and backup configuration files, as shown in figure below.



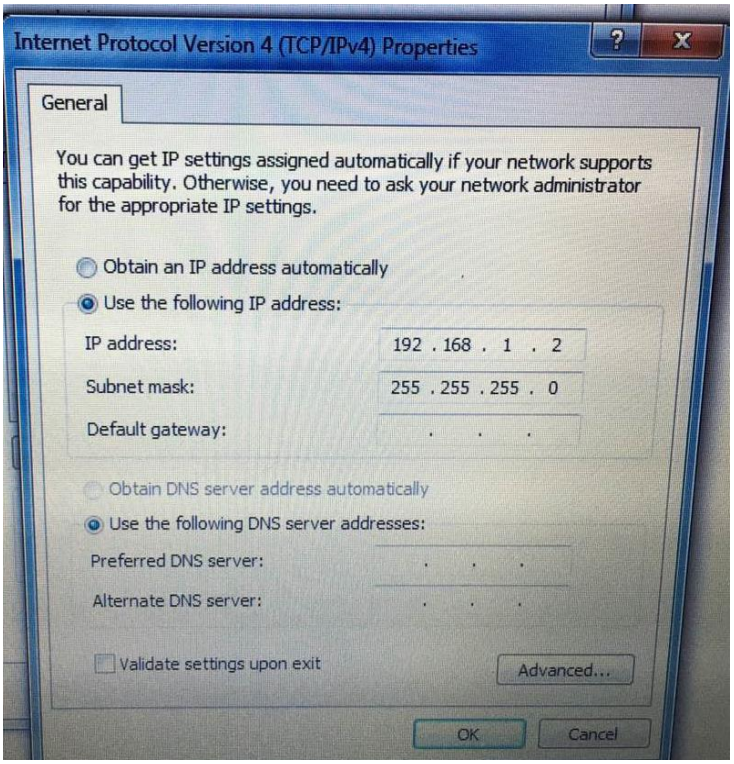
Note: After upgrading the app, the controller will restart.

1.6 SNMP Introduction

SC503 can support SNMP function, and the operation method is refer below:

1.6.1 Connection and IP Settings

Connect the Ethernet port on computer to the Ethernet port on Controller SC503 by Ethernet cable. Find the IP address of the controller via LCD and set up the IP of the computer, make sure the two IP address in the same network segment, where in the last bit of the controller IP address can be any one from 2 to 254, as shown in figure below, but different from the controller. Please be noted that the default IP address of controller is 192.168.1.5.

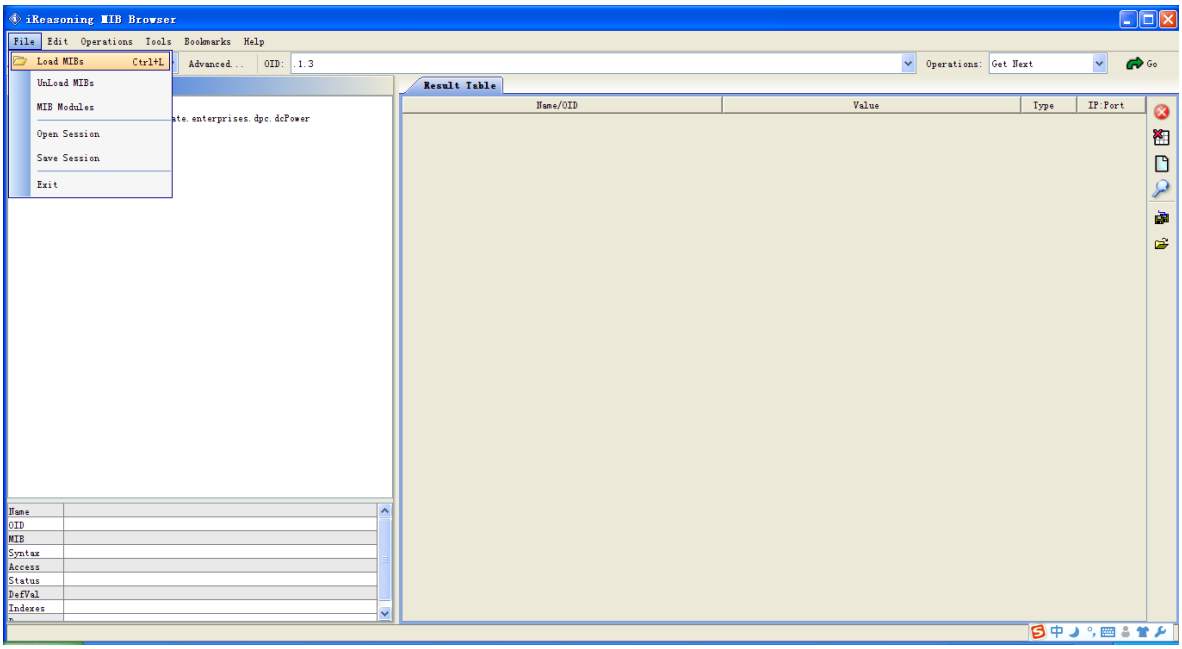


1.6.2 Testing Description

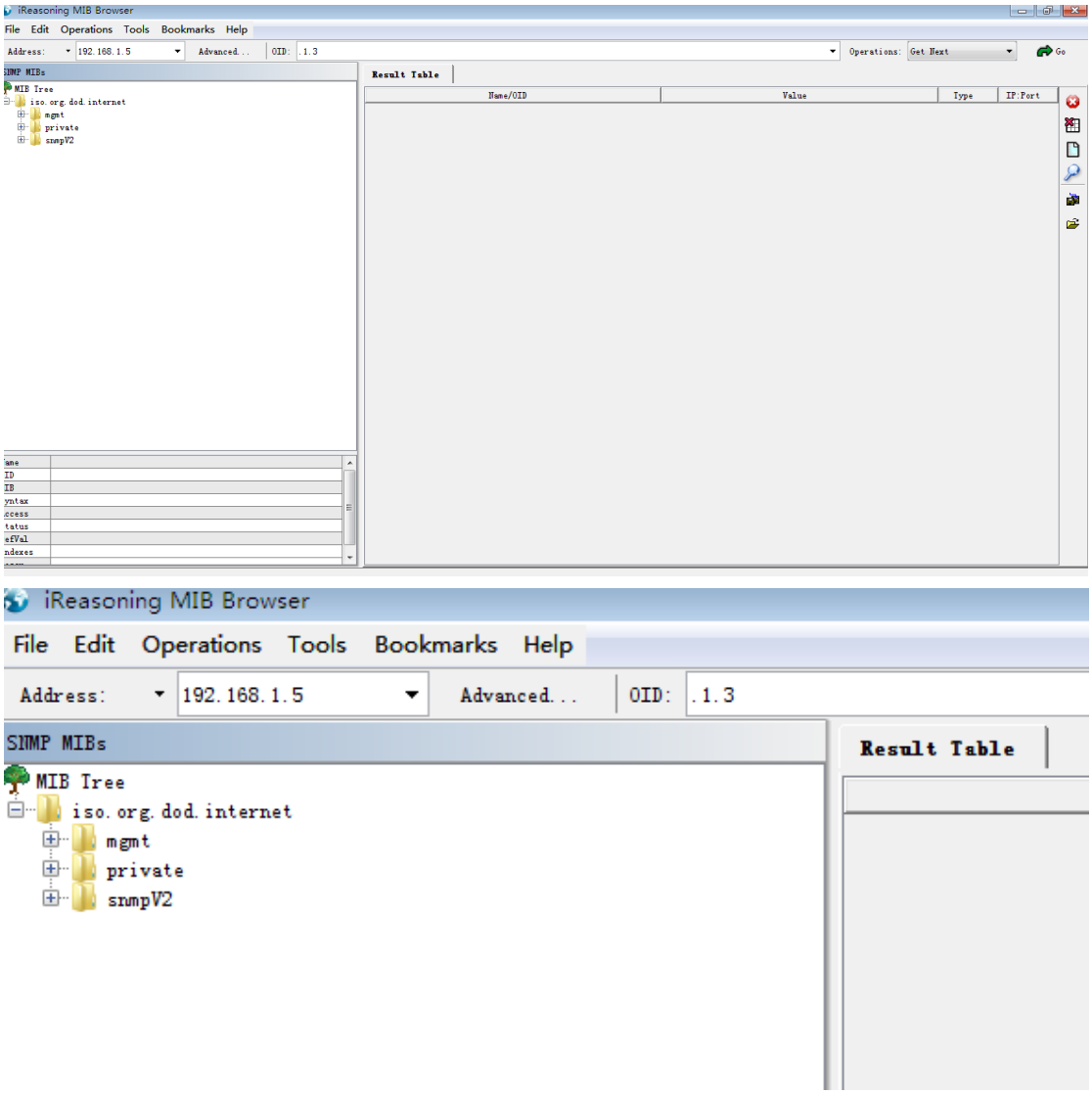
The following instruction bases on a public platform of SNMP, such as MIB Browser. We can download it from the internet and install the software in the computer. We can also use another third-party platform if require.

a. Opening the MIB Browser software (named iReasoning MIB Browser)

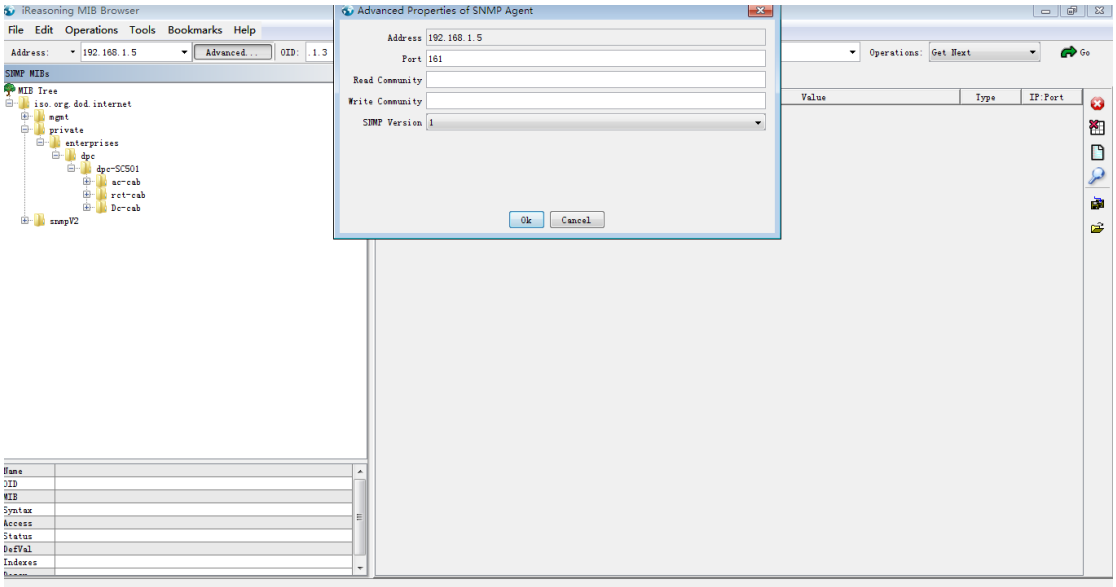
b. Importing MIB table of Beijing Dynamic Power Co., Ltd as annex 1. Click on “File” and select “Load MIBs”, as shown below.

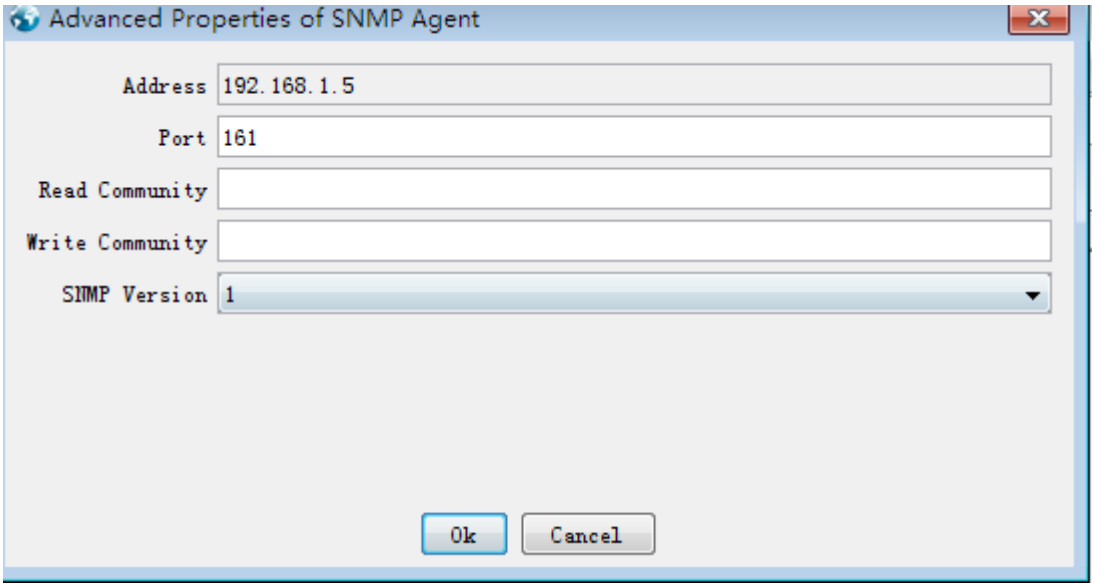


c. Fill in the controller IP address such as 192.168.1.5 in address bar as follows:

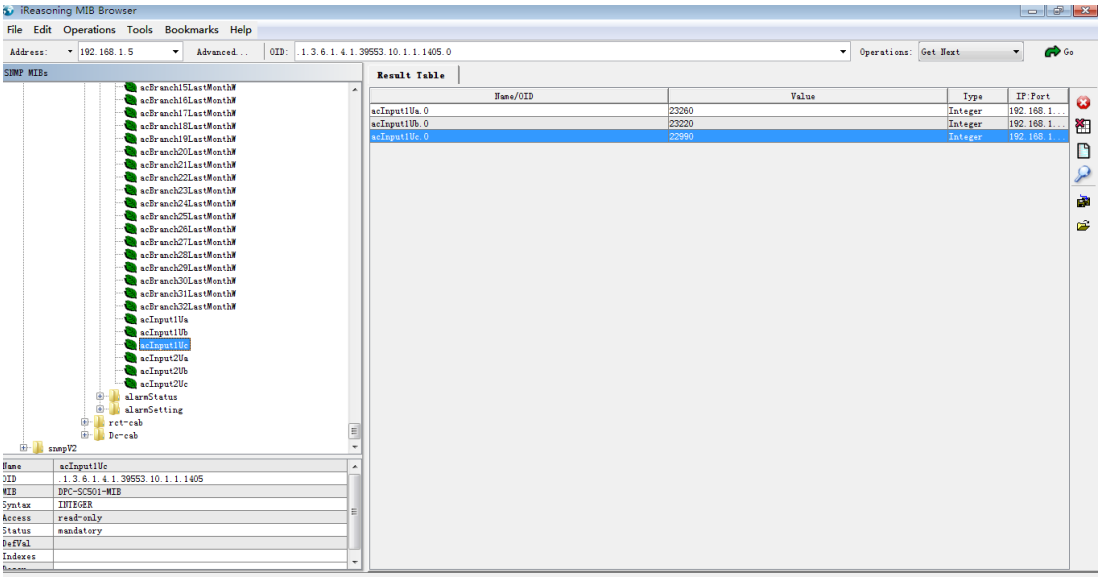


d. After filling the IP address, click “Advanced”. At last, click OK as shown below.





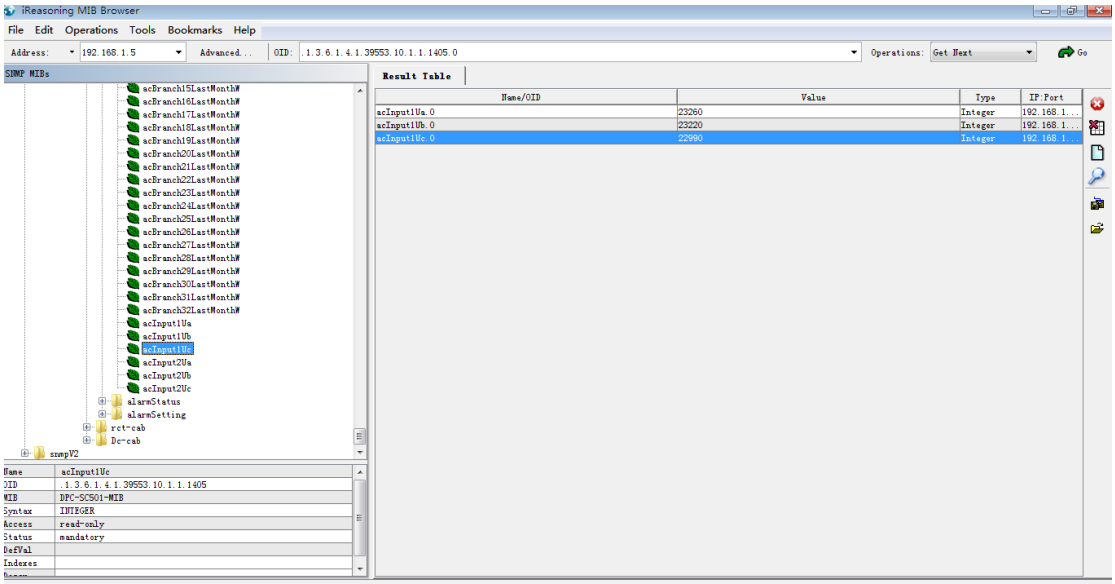
e. Click on any DPC standard power SNMP_OID, and then click GET. The RJ45 green light on the controller will flash and data will be return, indicating that the communication between computer and controller is normal. As shown below.



1.6.3 Parameter Reading and Writing

a. Read AC Analog Data:

Find the MIB Tree on the left side of the interface, click the “ac-cab”—“analog” by right button and choose “Get Sub-tree” to get all the AC analog data. We can click “acInput1Ua” and choose “get” to obtain one AC phase voltage data. In the below table, A-phase voltage is AC 232.6V, B-phase voltage is AC 232.2V.



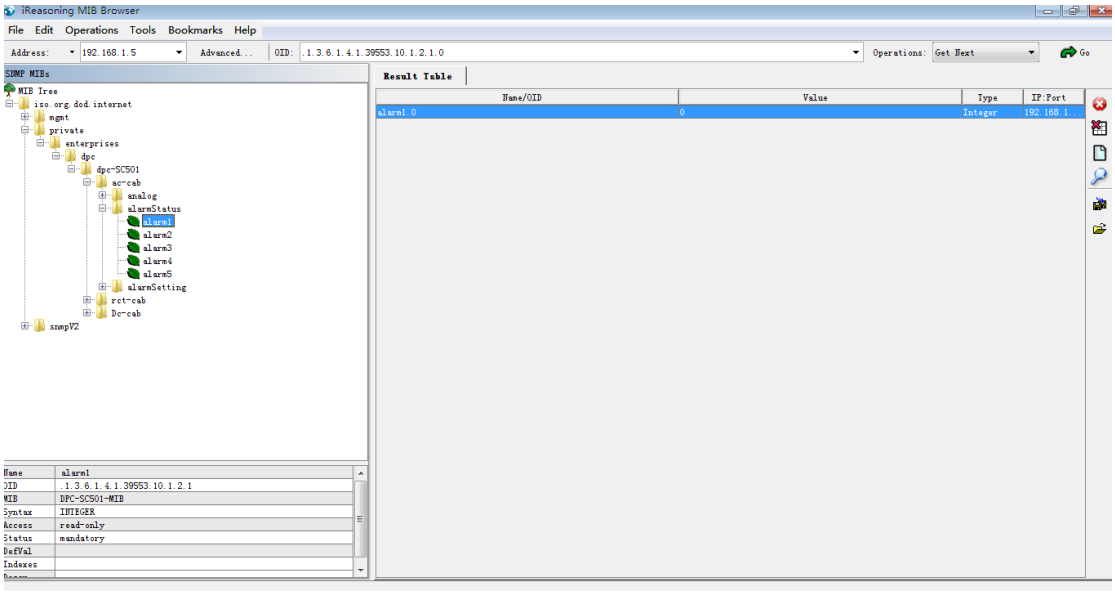
b. Read AC Alarm Information:

According to the definition below in table, the alarm1 value is 0.

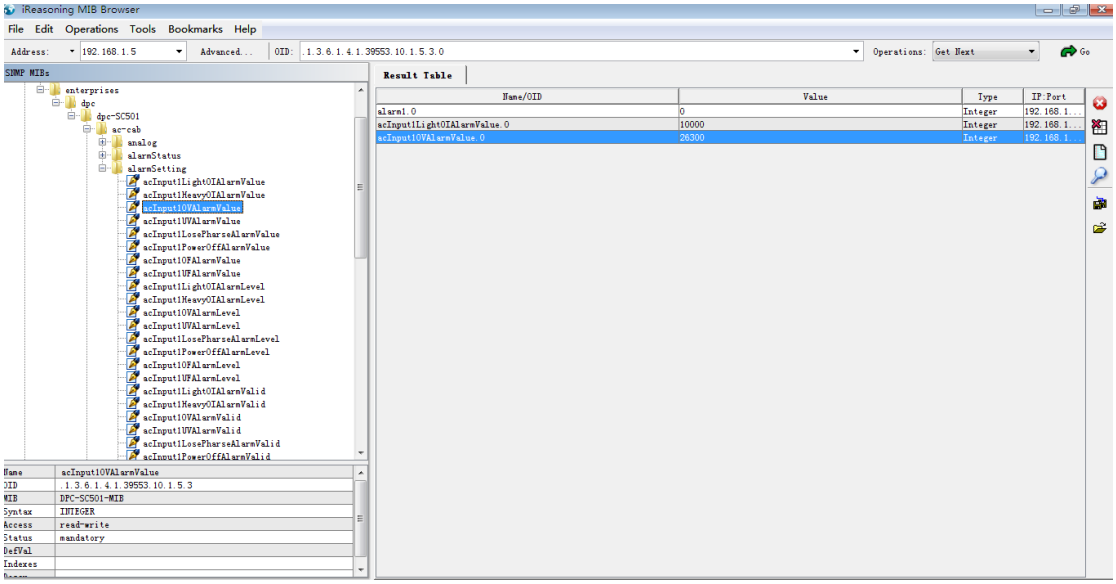
AC Alarm 1 bit definition

Bit31	Bit30	Bit29	Bit28	Bit27	Bit26	Bit25	Bit24
Bit23	Bit22	Bit21	Bit20	Bit19	Bit18	Bit17	Bit16
				AC SC920 communication	AC trip	AC SPD switch	AC SPD fault
Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8
AC input 1 frequency low	AC input 1 frequency high	AC input 1 lost	AC input 1 lost phase	AC input 1 under Voltage	AC input 1 over Voltage	AC input 1 severely OC	AC input 1 slightly OC
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
AC input 1 frequency low	AC input 1 frequency high	AC input 1 lost	AC input 1 lost phase	AC input 1 under Voltage	AC input 1 over Voltage	AC input 1 severely OC	AC input 1 slightly OC

That is why; we say there is no alarm reported.

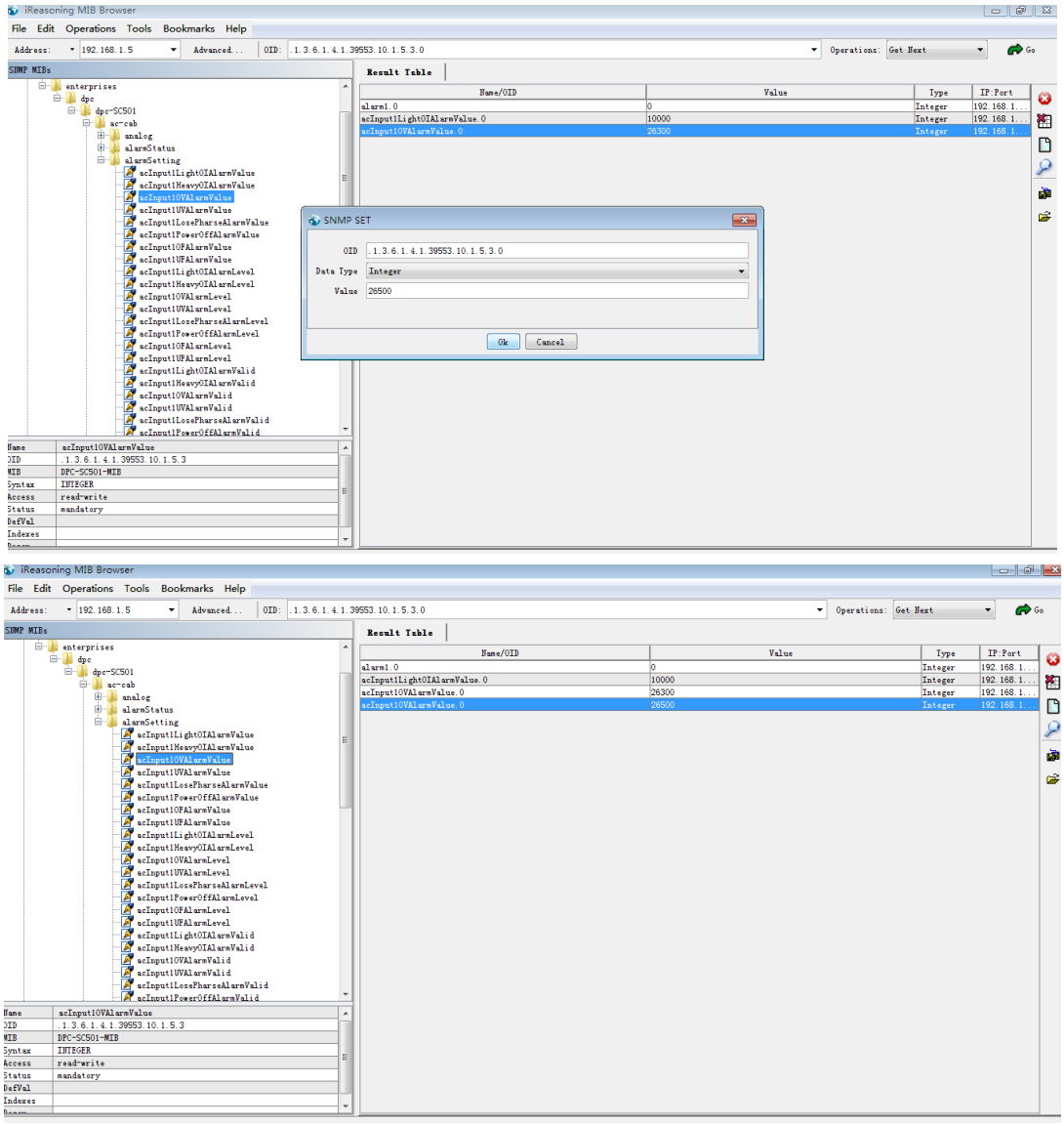


c. Read AC Alarm Parameter:

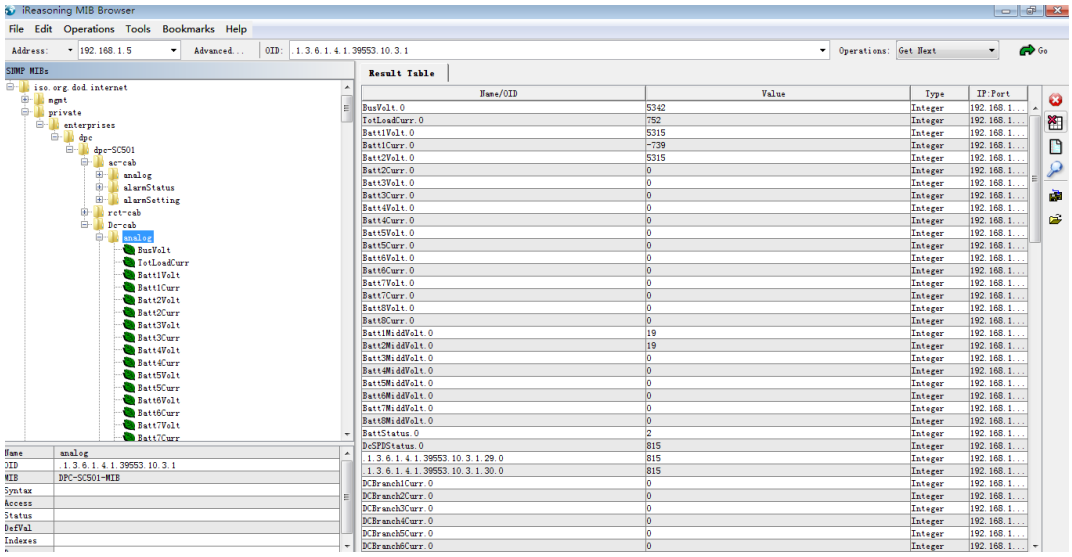


d. Write AC Alarm Parameters:

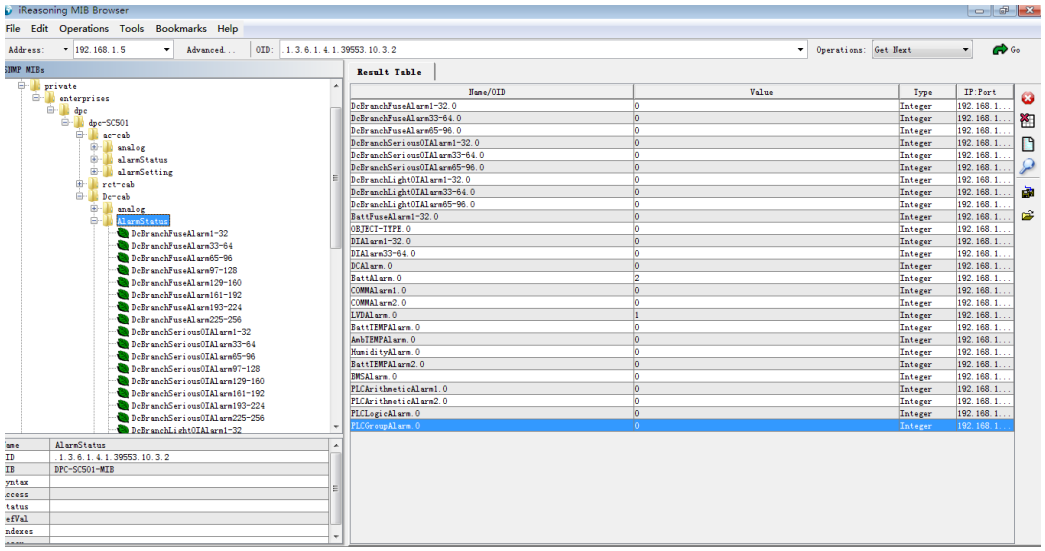
Using the right button to click “acInput1OVAlarmValue” in the Left of MIB Browser and select “Set”. It will pop-up the below table. Enter “26500” and click OK in the Value, it will set up the AC voltage upper limit value as 265 V. Please follow up the Annex 2 “SNMP_OID definition 2015.10.23” for values setup.



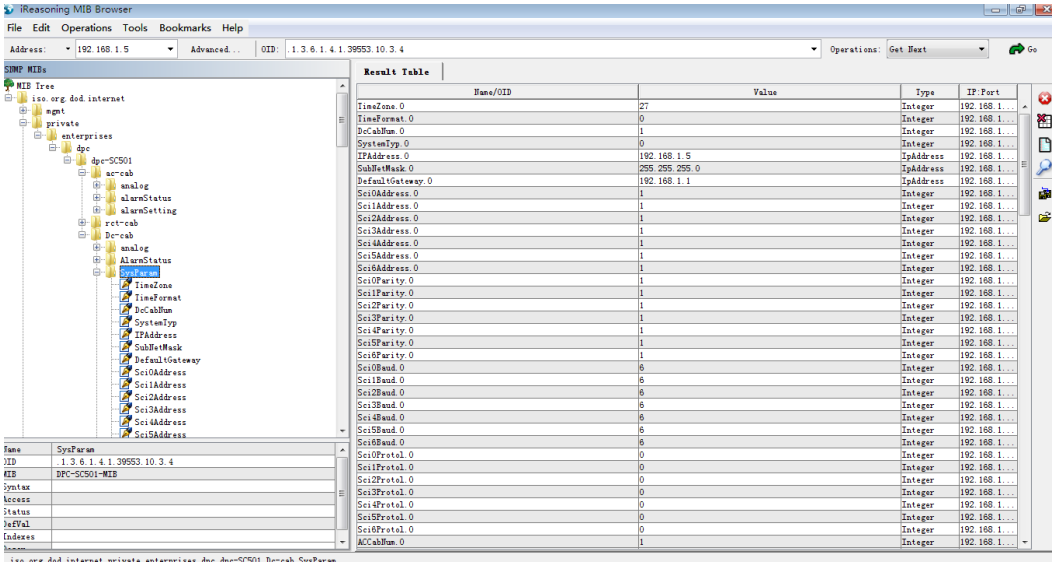
e. Read DC Analog Quantized Data:



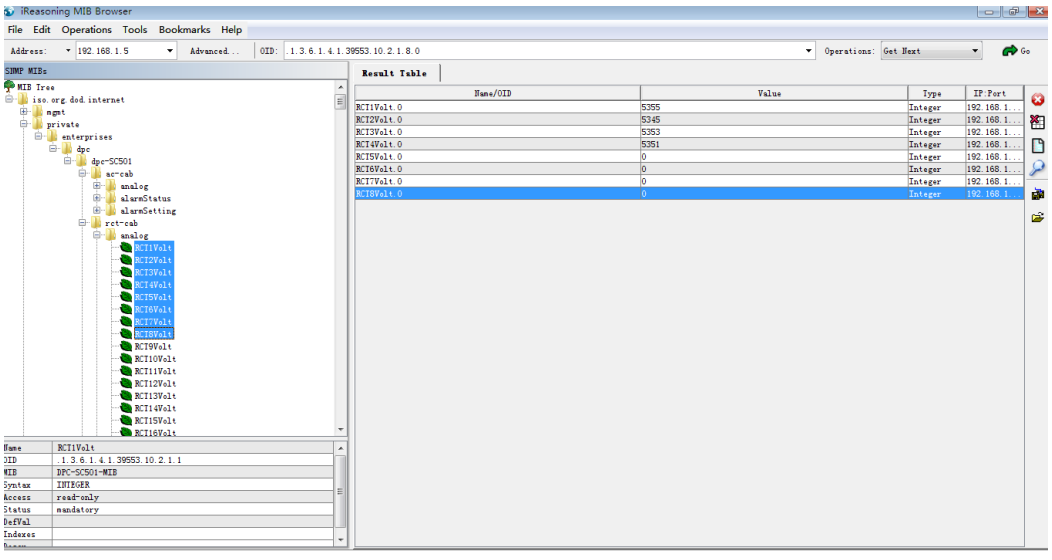
f. Read DC Alarm Information:



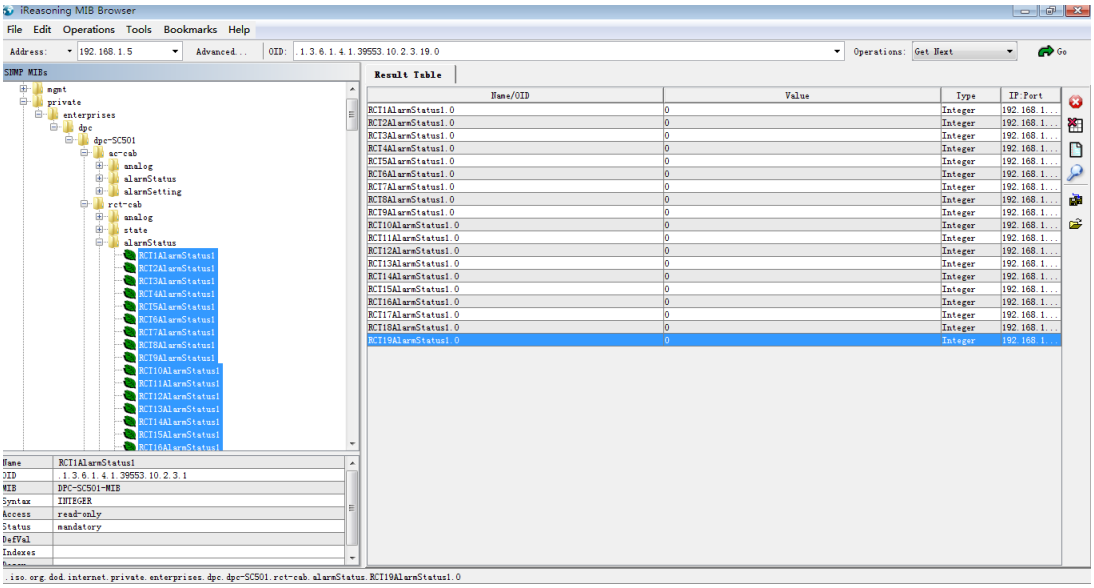
g. Read DC System Parameter:



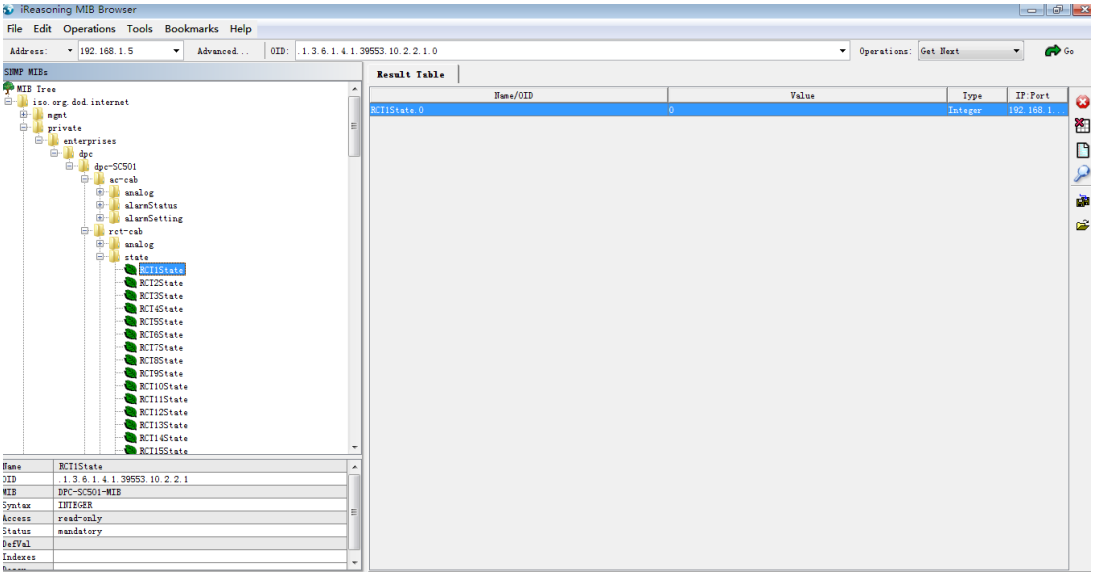
h. Read Rectifier Analog Quantized Data:



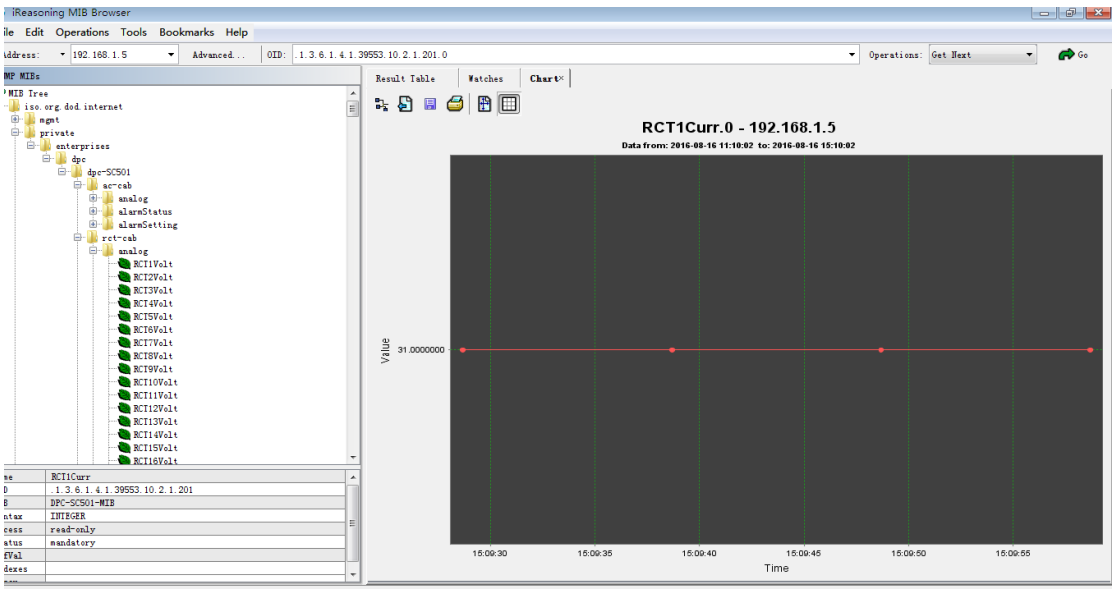
i. Read Rectifier Alarm Information:



j. Read Rectifier Module on/off Status:

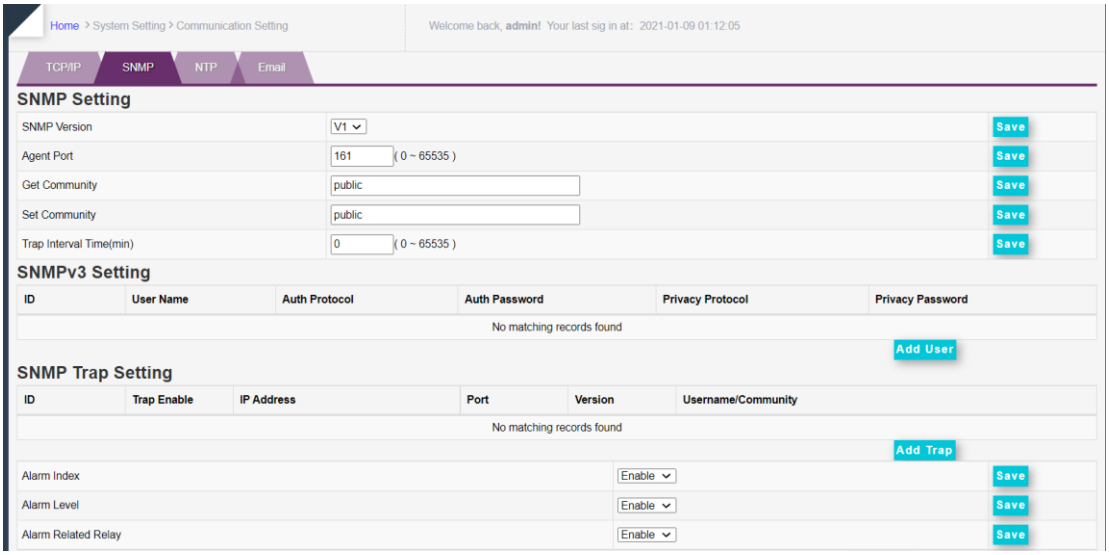


k. Rectifier Output Current Graph:

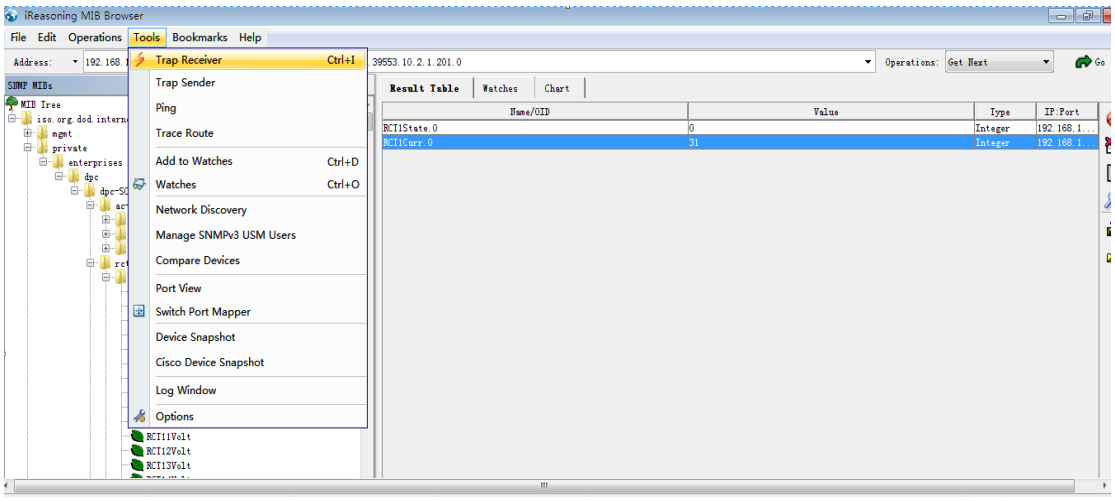


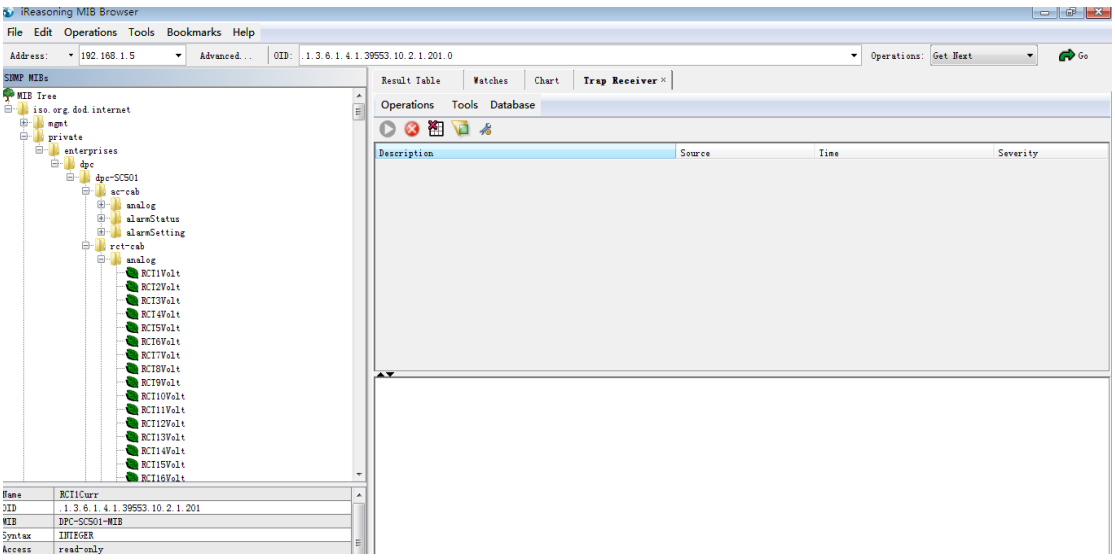
1.6.4 Reading Alarm Information by Trap function

Set up the IP address to be the same IP of computer and the Send Data in the interface of controller as follow. The “Trap interval time (min)” = 1, means the alarms will report to computer after every 1 minute. The “Trap interval time (min)” = 0, means the cycle trap function is disable.

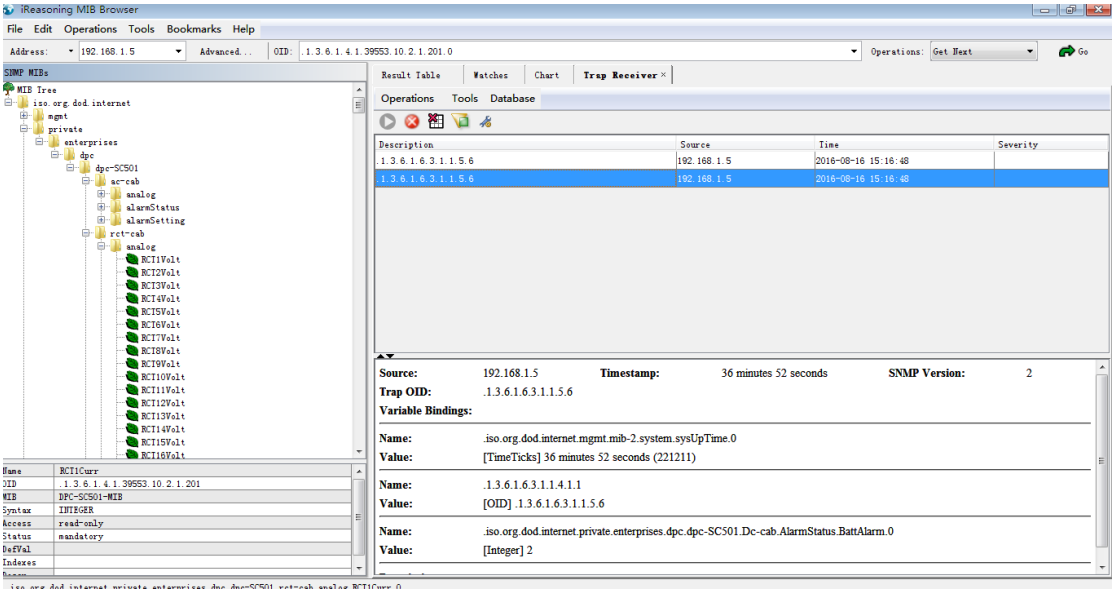


Click Tools and Receiver, the alarm item will appear in the interface one by one as below.





Click each alarm item; the detailed information of the alarm will appear as below.



Chapter 2 Installation & Maintenance Instructions

The controller module supports hot plug-in/out function. It can be installed or remove during live operation.

2.1 Operation Procedure

2.1.1 Preparation

1. This procedure will probably activate external alarm. The following measures can be taken to avoid these alarms: (1) If possible, cancel these alarming functions. (2) If these alarming functions cannot be easily cancelled, then advice relevant people to neglect any potential alarming that are combine with the system.
2. Connect one end of safety wrist strap to the wrist while the other end shall connect to proper the ground.

2.1.2 Dismounting of Controller Module

1. Loosen the captive screw on the top of the lock handle, which is at the front of the controller module. Pull out the controller through the lock handle (which will retract the locker that is place beneath the controller module). This procedure will separate the controller module from the system rack.
2. The controller module will completely slide from the rack.

2.1.3 The Installation / Replacement of Controller Module

1. Loosen the captive screw on the top of the lock handle, which is at the front of the controller module. Pull out the controller through the lock handle (which will retract the locker that is place beneath the controller module). This procedure will separate the controller module from the system rack.
2. Slither the controller module to the installation position.
3. Push the roof of the locker into the front panel of the controller module and use captive screw for fixation. This procedure fixes the controller module into the rack.

2.1.4 Subsequent Procedures

1. Enter the next step: configure and examine the operation of the controller module.
2. Recover external alarming function or inform relevant people to finish this operation.
3. Check and confirm that there is currently no local or remote alarm present in the system.

Chapter 3 Available Parameters Settings Listing

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
	AC Setting						
1	AC Input Phase	admin	Single-Phase(1)	Three-Phase(0)	SinglePhase-1	--	
2	AC Input Volt	admin	Phase-Volt(1)	Line-Voltage (0)	Phase-Volt (1)	--	
	Quick Setting						
3	System Volt Level	admin	5	0	48V(0)	--	0:48V,1:24V,2:336V;3:240V;4:500V;5:750V
4	System Type	admin	3	0	I(0)	--	0:Type Ⅰ ; 2:Type Ⅲ ; 3:Type Ⅳ ;
5	LVD Number	admin	32	0	1	--	
6	Load Branch Current Number	admin	72	0	0	--	
7	Load Branch State Number	admin	72	0	6	--	
8	Float Voltage	Engineer/admin	Boost Voltage	BTRM volt & Prediction charge end volt	53.5	V	
9	Boost Voltage	Engineer/admin	60	Float Voltage	56.4	V	
10	Total Load Current Measure	admin	2	0	Module(0)	--	0：Module；1：Total Load Shunt；2：DC Branch Shunt
11	Total Load Current Measurement Threshold	admin	5	0	0.4	%	
12	Battery Current Measurement Threshold	admin	5	0	0.4	%	
13	Load Branch Current Measurement Threshold	admin	5	0	0.4	%	
	Module Settings (AC/DC Rectifier)						
14	Rectifier Module Type	admin	CAN	RS485	CAN		
15	Rectifier Maximum Current Limit		10	120	120%	%	
16	Module Emergency Voltage		30	60	53.5	V	
17	Walk-in Start Voltage		42	53.5	42	V	
18	Walk-in Wait Time		0	120	0	S	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
19	Start-up Delay Time		0	600	0	S	
20	Number of Modules		0	128	0		
21	Load Branch Current Measurement Threshold	admin	5	0	0.4	%	
	Module Settings (Solar Controller)						
22	Maximum Factor Current Limit		10	120	120%	%	
23	Module Emergency Voltage		30	60	53.5	V	
24	Charge Current Limit		0.1	2	0.3	C10	
25	Solar Voltage Difference		0.3	2	0.5	V	
26	Walk-in Start Voltage		42	53.5	42	V	
27	Walk-in Wait Time		0	120	0	S	
28	Start-up Delay Time		0	600	0	S	
29	Number of Modules		0	128	0		
	Module Settings (DCDC Converter)						
30	Maximum Factor Current Limit		10	120	120%	%	
31	Module Emergency Voltage		30	60	53.5	V	
32	Number of Modules		0	128	0		
	Battery Parameter Settings (Bank1-20)						
33	Battery Type	admin	1	0	VRLA(0)	--	0:VRLA;1:LFP
34	Battery Bank Total capacity	admin	15000	10	2000	AH	
35	Battery Bank SOC	admin	100	0.1	100	%	
36	Battery Bank Temperature Function				None		Max; Avg; Min
37	Battery Bank Current				No		Yes; No
38	Battery Bank BLVD Config				BLVD1		BLVD1-BLVD20
39	Battery String Number		0	6	0		
40	String1 Install				No		Yes; No

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
41	String1 Temperature Function				None		Max; Avg; Min
42	String1 Fuse				No		Yes; No
43	String1 Middle Voltage				No		Yes; No
44	String1 Cell Number		0	24	0		
45	String1 Temperature1		None	None	None		SC503; SC320-1; SC321-1,Sensor-1&2;
46	String1 Temperature2		None	None	None		SC503; SC320-1; SC321-1,Sensor-1&2;
47	String1 Temperature3		None	None	None		SC503; SC320-1; SC321-1,Sensor-1&2;
48	String1 Temperature4		None	None	None		SC503; SC320-1; SC321-1,Sensor-1&2;
	Battery Charge Setting (Charge Setting)						
49	Battery management mode	Engineer/admin	2	0	Current(0)	--	0:Current; 1:Voltage; 2:Disable
50	Battery Full Charge Limit Current	admin	1	0	Disable (1)	--	0:Disable;1:Enable
51	Battery Fuse Break Over Current Protection	admin	1	0	Disable (1)	--	0:Disable;1:Enable
52	Float Voltage	Engineer/admin	Boost Voltage	BTRM volt & Prediction charge end volt	53.5	V	
53	Boost Voltage	Engineer/admin	60	Float Voltage	56.4	V	
54	BTRM Voltage	Engineer/admin	30	53.5	53.5	V	
55	Output Voltage Compensation	admin	1	0	Disable (0)	--	0:Disable;1:Enable
56	Bank1-20 Current limit factor	Engineer/admin	2	0.1	0.1	C10	
57	Bus Voltage Rise Speed	admin	50000	20	50	mv/s	
58	Bank 1-20 Prediction Charge Current		0.03	0.10	0.05	C10	
59	Prediction Charge End Voltage		30	53.5	48	V	
60	Prediction Charge Retention Time		0	600	10	Min	
	Battery Charge Setting (Boost Charge Setting)						
61	Boost Charge Temperature Compensation Enable				Enable		Enable; Disable
62	Auto Boost				Enable		Enable; Disable
63	Auto Boost Start Voltage				Enable		Enable; Disable

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
64	Auto Boost Start Voltage				48		(42V~Float Voltage):(42.00 ~ 53.50)V
65	Auto Boost Start Voltage Delay		15	300	30	S	
66	Auto Boost Start Current Enable				Enable		Enable; Disable
67	Auto Boost Start Current		0.05	0.08	0.06	C10	
68	Auto Boost Start Current Delay		15	300	30	S	
69	Auto Boost Start SOC				Enable		Enable; Disable
70	Judge SOC Algorithm				One		One; All; Enable; Disable
71	Auto Boost Start SOC Delay		15	300	30	S	
72	Auto Boost Start Discharge Capacity		0.1	15000	100	AH	
73	Boost Start Discharge Capacity Delay		15	300	30	S	
74	Cycle boost setting: Cycle boost	Engineer/admin	1	0	Disable(0)	--	0: Disable;1:Enable
75	Cycle boost setting: Cycle boost period	Engineer/admin	360	0.4	360	day	
76	Cycle boost setting: Cycle boost time	Engineer/admin	24	0.1	12	hr	
77	Boost Protection: Module Failure Off Number	Engineer/admin	0	128	1		
78	Bank 1 High Temperature Quit Boost Charge	Engineer/admin	0	120	45	°C	
79	High Temperature Quit Boost Delay	Engineer/admin	0	60	5	S	
80	Boost Protection Time	Engineer/admin	0.1	24	20	hr	
81	Manual Boost Protection Time	Engineer/admin	0.1	12	10	hr	
82	Boost charge setting: Constant boost current	Engineer/admin	0.02	0.002	0.01	C10	
83	Boost charge setting: Constant boost time	Engineer/admin	24	0.1	3	hr	
	Battery Charge Setting (Battery Test Setting)						
84	End test conditions: End voltage	Engineer/admin	Boost voltage	DC Under Voltage	48	V	
85	End Voltage Delay		0	600	10	min	
86	End test conditions: End Time	Engineer/admin	1440	5	120	min	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
87	End test conditions: End SOC	Engineer/admin	99	0	80	%	
88	End SOC Delay		0	600	10	min	
89	End Discharge Electricity		1	15000	20	AH	
90	Timing test	Engineer/admin	4	1	1	--	
91	Timing test: enable	Engineer/admin	1	0	Disable(0)	--	0: Disable;1:Enable
92	Timing test time	Engineer/admin			20160101		
93	Constant current test: Constant current test control	Engineer/admin	1	0	Disable(0)	--	0: Disable;1:Enable
94	Constant current test: Constant current	Engineer/admin	0	3	0.1	C10	
95	Cycle test: Cycle test control	Engineer/admin	1	0	Disable(0)	--	0: Disable;1:Enable
96	Cycle test: Cycle test time	Engineer/admin	6	1440	720	min	
97	Cycle test: Cycle test period	Engineer/admin	1	360	360	day	
98	Test Over Current Algorithm	Engineer/admin	1	0	Disable(0)	--	0: Disable;1:Enable
99	Test Over Current	Engineer/admin	0	3	0.1	C10	
100	Auto Test Enable	Engineer/admin	1	0	Disable(0)	--	0: Disable;1:Enable
101	Auto Test Delay Time	Engineer/admin	0	600	10	hr	
102	Battery Test Log Voltage Trigger Change	Engineer/admin	0	10000	0.5	V	
103	Battery Test Log Voltage Trigger Period	Engineer/admin	0	10000	0	S	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
104	Battery Test Log Current Trigger Change	Engineer/admin	0	10000	1	A	
105	Battery Test Log Current Trigger Period	Engineer/admin	0	10000	1	A	
106	Battery Test Log User Trigger Change	Engineer/admin	0	10000	0		
107	Battery Test Log User Trigger Period	Engineer/admin	0	10000	0	S	
	Battery Charge Setting (Temperature Compensation)						
108	Temperature compensation control	Engineer/admin	1	0	No(0)	--	0:No;1:Yes
109	Quit Temperature Compensation When Battery Temperature Alarm	Engineer/admin	1	0	Enable(1)	--	0:Disable;1:Enable
110	Disable temperature compensation when module lost	Engineer/admin	1	0	Enable(1)	--	0:Disable;1:Enable
111	Temperature On Battery Bank Number	Engineer/admin	20	0	none(0)	--	0:None ; 20: Battery bank 20
112	Temperature On Battery String Number	Engineer/admin	6	0	none(0)	--	0:None ; 20: Battery string 6
113	Temperature On Battery String Position	Engineer/admin	4	0	none(0)	--	0:None ; 20: Temperature sensor 4
114	Temperature compensation control	Engineer/admin	40	10	25	℃	
115	Temperature compensation coefficient	Engineer/admin	500	0	72	mV/℃	
116	Temperature Compensation Maximum Voltage	Engineer/admin	0	4	2	V	
117	Temperature Compensation Minimum Voltage	Engineer/admin	0	-4	-2	V	
	Battery Charge Setting (Discharge Curve)						
118	Discharge Temperature Compensation	Engineer/admin	1	0	Enable(1)	--	0:Disable;1:Enable

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
119	Battery Discharge Ageing Coefficient	Engineer/admin	0	100	0	%	
120	Discharge Temperature Compensation Reference Point	Engineer/admin	0	100	25	℃	
121	Discharge Temperature Compensation Coefficient	Engineer/admin	0	100	72	mV/℃	
122	Battery Charge Efficiency	Engineer/admin	0	100	72	%	
	ECO Settings						
123	ECO Mode	admin	2	0	Intelligent Mode (0)	--	0:Intelligent mode; 1:Time Mode; 2:High Efficiency Mode
124	ACDC Rectifier ECO Enable	admin	1	0	Disable(0)	--	0:Disable; 1:Enable
125	AC Input Phase Balance	admin	1	0	Disable(0)	--	0:Disable; 1:Enable
126	Rectifier ECO Delay after manual test	admin	99	0	24	h	
127	Minimum Quantity of working rectifier	admin	255	1	1		
128	On/Off Period	admin	720	0.1	168	h	
129	Turn-On Load Factor	admin	95	Turn-Off Load Factor+10	80	%	
130	Turn-Off Load Factor	admin	Turn-On Load Factor-10	0	50	%	
131	DCDC Converter ECO Enable	admin	1	0	Disable(0)	--	0:Disable; 1:Enable
132	DCDC Converter ECO Delay	admin	99	0	24	h	
133	Minimum Quantity of working DCDC Converter	admin	255	1	1	--	
134	On/Off Period	admin	720	0.1	168	h	
135	Turn-On Load Factor	admin	95	Turn-Off Load Factor+10	80	%	
136	Turn-Off Load Factor	admin	Turn-On Load Factor-10	0	50	%	
	ECO Settings (Shaving Peak Valley)						

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
137	Peak Shaving Enable	admin	1	0	Disable(0)	--	0:Disable; 1:Enable
138	Peak Shifting Enable	admin	1	0	Disable(0)	--	0:Disable; 1:Enable
139	Battery Charge Mode	admin	1	0	Normal(0)	--	0:Normal; 1:Period
140	Rated Power of Air Conditioner	admin	0	20	4	KW	
141	Rated Current of Air Conditioner	admin	0.1	100	20	A	
142	AC Phase of Air Conditioner	admin	3	0	None(0)	--	0:Normal; 4:Phase C
143	Judge Battery Number	admin	1	0	One(0)	--	0:One; 1:All
144	Peak Shifting Termination Evaluation Delay	admin	60	1	15	min	
145	Peak Shift Start Evaluation Delay	admin	60	1	15	min	
146	Peak Shaving Termination Evaluation Delay	admin	60	1	15	min	
147	Peak Shaving Start Evaluation Delay	admin	60	1	15	min	
	Shaving Peak Valley Period Parameter Setting						
148	Shaving Peak Valley Period Select	admin	3	0	Peak period(0)	--	0: Peak period; 4: Valley period
149	Mains Price	admin	0	100	0.5	$/KWh	
150	Mains Mode	admin	1	0	Disable(0)	--	0:Disable; 1:Enable
151	Battery Charging Current	admin	0.1	2	0.1	C10	
152	Total AC Power	admin	999	1	80	KW	
153	Total AC Current	admin	10000	1	400	A	
154	AC Phase A Power	admin	999	1	80	KW	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
155	AC Phase B Power	admin	999	1	80	KW	
156	AC Phase C Power	admin	999	1	80	KW	
157	AC Phase A Current	admin	10000	1	400	A	
158	AC Phase B Current	admin	10000	1	400	A	
159	AC Phase C Current	admin	10000	1	400	A	
	Quit Peak Shaving Setting						
160	Quit Peak Shaving SOC	admin	100	0	60	%	
161	Peak Shaving Start SOC Hysteresis	admin	10	0	5	%	
162	Quit Peak Shaving Battery Voltage	admin	53	42	48	V	
163	Peak Shaving Start Battery Voltage Hysteresis	admin	10	0	5	V	
	Quit Peak Shifting Setting						
164	Quit Peak Shifting SOC	admin	100	0	60	%	
165	Peak Shifting Start SOC Hysteresis	admin	10	0	5	%	
166	Quit Peak Shifting Battery Voltage	admin	53	42	48	V	
167	Peak Shifting Start Battery Voltage Hysteresis	admin	10	0	5	V	
	LVD Settings (LVD1-32)						
168	LVD Type	admin	51	0	BLVD1	--	0:BLVD1; 51:LLVD32
169	LVD Control	admin	1	0	Disable(0)	--	0:Disable; 1:Enable
170	Contactor Type	admin	2	0	Bi-table(0)	--	0:Bi-table ; 1 : NO ; 2 : NC

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
171	Low Voltage Disconnect and Connect D-value	admin	9.3	0	5.3	V	
172	Over Voltage Disconnect and Connect D-value	admin	0.7	0	0.7	V	
173	High Temperature Disconnect and Connect D-value	admin	4	0	4	℃	
174	Low Temperature Disconnect and Connect D-value	admin	10	0	4	℃	
175	Clear This Branch Current	admin	1	0	Disable(0)	--	0:Disable; 1:Enable
176	Tenant	admin	9	0	User1(0)	--	0:User1; 9:User10
	LVD Settings (Disconnect Setting)						
177	AC Interdependency	admin	1	0	dependent(0)	--	0 : dependent;1 : independent
178	Voltage	Engineer/admin	Reconnect Voltage-D value	41	43.2	V	(41V~Reconnect Voltage - D-value):(41.00 ~ 47.20)V
179	Time	Engineer/admin	3000	0	600	min	
180	Capacity	Engineer/admin	0~Reconnect Capacity	0	100	%	
181	Reserve Energy	Engineer/admin	0~10000	0	100	kwh	
182	Over Voltage	Engineer/admin	Over Voltage Reconnect Voltage + D-value~60V	57.2	57.2	V	
183	High Temperature	Engineer/admin	66	High Temperature Reconnect + D-value~66°C	35	℃	
184	Low Temperature	Engineer/admin	-9	33°C~Low Temperature Reconnect - D-value	-15	℃	
185	Battery Discharge Current Threshold	Engineer/admin	5	0	2.5	%	
186	Delay	Engineer/admin	900	0	10	S	
	LVD Settings (Reconnect Setting)						
187	AC Interdependency	admin	1	0	dependent(0)	--	0 : dependent;1 : independent
188	Voltage	Engineer/admin	Disconnect Voltage + D-value~60V	48.5	52.5	V	
189	Time	Engineer/admin	3000	0	600	min	
190	Capacity	Engineer/admin	Disconnect Capacity~100%	0	100	%	
191	Over Voltage	Engineer/admin	Reconnect Voltage ~ Disconnect	54	56.5	V	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
192	High Temperature	Engineer/admin	Over Voltage - D-value 31	26°C~High Temperature Disconnect - D-value	31	℃	
193	Low Temperature	Engineer/admin	-11	Low Temperature Disconnect + D-value~20°C	-5	℃	
194	Delay	Engineer/admin	900	0	10	S	
	LVD Settings (User and Branch Name)						
195	User1-10	Engineer/admin			Any character		Length:0~50 char
196	DC Branch 1-72	Engineer/admin			Any character		Length:0~50 char
	Hybrid Settings						
197	Hybrid Setting: Priority	admin	1	0	Solar->Mains->Battery->DG (0)	--	0:Solar->Mains->Battery->DG;1: Solar-> Battery -> Mains ->DG
198	Hybrid Setting: Solar MPPT Mode Delay	admin	600	30	30	s	
199	Hybrid Setting: Mains close mode	admin	1	0	Turn off all ACDC rectfiers (0)	--	0:Turn off all ACDC rectfiers;1:Turn down ACDC rectifier output voltage
	Hybrid Settings (DG Settings)						
200	DG Setting: DG Number	admin	3	0	0		number
201	Fuel Tank Number:	admin	9	0	0		number
202	DG Setting: DG 1 Start control DO	admin	3	0	None (0)	--	1:Sc503;2:sc320-1;3:sc321-1
203	DG Setting: DG 1 Start control DO	admin	3	0	None (0)	--	1:Sc503;2:sc320-1;3:sc321-1
204	DG Setting: DG 1 Start control DO	admin	3	0	None (0)	--	1:Sc503;2:sc320-1;3:sc321-1
205	DG Setting: DG 1 Start DO	admin	16	1	1	--	
206	DG Setting: DG 1 Start DO Status	admin	NO	NC	NC	--	
207	DG Setting: DG 2 Start DO	admin	16	1	1	--	
208	DG Setting: DG 2 Start DO Status	admin	NO	NC	NC	--	
209	DG Setting: DG 3 Start DO	admin	16	1	1	--	
210	DG Setting: DG 3 Start DO Status	admin	NO	NC	NC	--	
211	DG Setting: DG 1 State DI	admin	3	0	None(0)	--	1:Sc503;2:sc320-1;3:sc321-1

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
212	DG Setting: DG 2 State DI	admin	3	0	None(0)	--	1:Sc503;2:sc320-1;3:sc321-1
213	DG Setting: DG 3 State DI	admin	3	0	None(0)	--	1:Sc503;2:sc320-1;3:sc321-1
214	Mains Input DI	admin	3	0	None(0)	--	1:Sc503;2:sc320-1;3:sc321-1
215	DI Input Start	admin	16	1	1		
216	DG 1 State DI Run State	admin	NC	NO	NO	--	
217	DG 2 State DI Run State	admin	NC	NO	NO	--	
218	DG 3 State DI Run State	admin	NC	NO	NO	--	
219	Mains Input DI Normal State	admin	NC	NO	NO	--	
220	DG Run Time Proportion	admin	9999	0	1:0:0	--	
221	Charge Magnification	admin	2	0.1	1	--	
222	DG Rated Power	admin	3300	0.1	20	Kw	
223	DG Maximum Run Time	admin	20	Minimum Run Time~9000	2	hr	
224	DG Minimum Run Time	admin	0~Maximum Run Time	0	0.2	hr	
225	DG Minimum Halt Time	admin	20	0.1	2	hr	
226	Clear DG Alarm	admin	3	0	None (0)	--	0:None;1:DG1;2:DG2;3:DG3;
	Start/Stop Settings						
227	DI Input State	admin	NC	NO	NO	--	
228	Period Start Count	admin	10	0	1		Times/Per Month
229	Period Start Run Time	admin	10	0	0.5	hr	
230	Timing Start Enable	admin	1	0	disable (0)	--	0:disable;1:enable
231	Auto Boost	admin	1	0	disable (0)	--	0:disable;1:enable
232	Timing Start Time	admin	--	--	2021-1-1 0:0	--	
233	Interval Time	admin	720	0	120	hr	
234	Timing Start Run Time	admin	10	0	0.5	hr	
235	Schedule 1-5 Enable:	admin	1	0	disable (0)	--	0:disable;1:enable
236	Schedule 1-2Time	admin	--	--	22:0-- 2:0	--	
237	Timing Stop Enable	admin	1	0	disable (0)	--	0:disable;1:enable Time

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
238	Timing Stop Time	admin	--	--	22:0-- 2:0	--	
239	Prior Start Enable	admin	1	0	enable (1)	--	0:disable;1:enable
240	Prior Start SOC	admin	100	Battery Start Charge SOC	100	%	
241	Solar Power Stop Ratio	admin	2	0	0.2		
	Battery Setting (Start Charge)						
242	Judge Battery Number	admin	1	0	one(1)	--	0:all;1:one
243	Start Charge Mode	admin	2	0	one(1)	--	0:SOC;2:Voltage
244	Start Charge SOC	admin	Stop Charge SOC	0	80	%	
245	Start Charge Voltage	admin	Stop Charge Voltage	41	47	V	
	Battery Setting (Stop Charge)						
246	Judge Battery Number	admin	1	0	all(0)	--	0:all;1:one
247	Stop Charge Enable	admin	1	0	disable (0)	--	0:disable;1:enable
248	Stop Charge SOC	admin	100	Start Charge SOC	90	%	
249	Stop Charge Voltage	admin	60	Start Charge Voltage	54.5	V	
	Hybrid Settings (Tank Settings)						
250	Fuel Tank Setting Select	admin	8	0	Tank1 (0)	--	0:Tank1;8:Tank9
251	Fuel Level Sensor Select	admin	11	0	None (0)	--	0:None;11:SC321-3
252	Fuel Level Change Threshold Value	admin	1000	1	3	cm	
253	Judge Fuel Level Change Time	admin	60	1	1	min	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
254	Judge Fuel Level Filter Time	admin	1440	1	1	min	
255	Fuel Level Filter Threshold Value	admin	10	1	3	cm	
256	Refuel Statistics Enable	admin	1	0	disable (0)	--	0:disable;1:enable
257	Fuel Tank Shapes	admin	3	0	Rectangular (0)	--	0: Rectangular;3:Horizontal Cylinder
258	Length of Rectangular Tank	admin	10	0	1	m	
259	Rectangular Tank Width	admin	10	0	1	m	
260	Tank Height	admin	10	0	1.5	m	
	Hybrid Settings (Fuel Sensor Settings)						
261	Select Fuel Sensor	admin	1	0	Fuel Sensor 1(0)	--	0: Fuel Sensor 1; 1: Fuel Sensor 2;
262	Fuel Sensor Type	admin	1	0	Resistance(0)	--	0: Resistance; 1: Current;
263	Resistance1-27	admin	--	--	0-190	Ω	
264	Height1-27	admin	--	--	48-563	mm	
	Communication Settings (TCP/IP)						
265	NET Speed	admin	2	0	Auto negotiation (0)		0: Auto negotiation; 1:10Mbps Half duplex; 2: 10Mbps Full duplex;
266	DHCP Enable	admin	1	0	disable(0)	--	0:disable;1:enable
267	Modbus TCP Port	admin	65535	1	502		
268	IPv4 Address	admin	255.255.255.255	0.0.0.0	192.168.1.5	--	
269	IPv4 Subnet mask	admin	255.255.255.255	0.0.0.0	255.255.255.0	--	
270	IPv4 Default gateway	admin	255.255.255.255	0.0.0.0	192.168.1.1	--	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
271	IPv6 Address	admin	--	--	fe80::192:168:2:5	--	
272	IPv6 Subnet length	admin	--	--	64	--	
273	IPv6 Default gateway	admin	--	--	fe80::192:168:2:1	--	
	Communication Settings (SNMP)						
274	SNMP Version	admin	3	0	V2(1)	--	0：V1；3：All
275	agent port	admin	65535	1	161		
276	Get Community	admin	--	--	public		
277	Set Community	admin	--	--	public		
278	Trap interval time	admin	65535	0	0	min	
279	Trap Address 1-20	admin	255.255.255.255	0.0.0.0	0.0.0.0	--	
280	Community1-20	admin	--	--	public		
281	Alarm Index	admin	1	0	disable(0)	--	0:disable;1:enable
282	Alarm Level	admin	1	0	disable(0)	--	0:disable;1:enable
283	Alarm Related Relay	admin	1	0	disable(0)	--	0:disable;1:enable
284	Alarm Sound	admin	1	0	disable(0)	--	0:disable;1:enable
285	Alarm Status	admin	1	0	disable(0)	--	0:disable;1:enable
286	Alarm Time	admin	1	0	disable(0)	--	0:disable;1:enable
287	Alarm Type	admin	1	0	disable(0)	--	0:disable;1:enable
288	Alarm Module ID	admin	1	0	disable(0)	--	0:disable;1:enable

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
289	Alarm Name	admin	1	0	disable(0)	--	0:disable;1:enable
290	Site ID	admin	1	0	disable(0)	--	0:disable;1:enable
291	Site Name	admin	1	0	disable(0)	--	0:disable;1:enable
292	Site Address	admin	1	0	disable(0)	--	0:disable;1:enable
293	NTP interval time	admin	44640	0	1440	min	
294	NTP server Address	admin	255.255.255.255	0.0.0.0	0.0.0.0	--	
295	Email Enable	admin	7	0	disable(0)	--	0:disable;1:Minor Alarm;2:Major Alarm; 3:Critical Alarm;4:Minor Alarm/Major Alarm; 5:Minor Alarm/Critical Alarm; 6:Major Alarm/Critical Alarm;7:All ALARM
296	Receive Email 1	admin	--	--	--	--	Maximum 50 characters
297	Receive Email 2	admin	--	--	--	--	Maximum 50 characters
298	Receive Email 3	admin	--	--	--	--	Maximum 50 characters
299	Receive Email 4	admin	--	--	--	--	Maximum 50 characters
300	Receive Email 5	admin	--	--	--	--	Maximum 50 characters
301	Send Email	admin	--	--	--	--	Maximum 50 characters
302	Send Email Password	admin	--	--	--	--	Maximum 20 characters
303	Send Email Server IP	admin	255.255.255.255	0.0.0.0	0.0.0.0	--	
304	Send Email Server Port	admin	65535	0	25	--	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
	Temperature Settings						
305	Ambient 1-8 Temperature	admin	7	0	None(0)	--	0:None1:SC503Alarm ;2:SC320-(0-2); 3:SC321-(0-2)
306	Ambient 1-8 Temperature	admin	2	0	None(0)	--	0:None1:Sensor-1;2: Sensor-2
307	BTRM Temperature	admin	7	0	None(0)	--	0:None1:SC503Alarm ;2:SC320-(0-2); 3:SC321-(0-2)
308	BTRM Temperature	admin	2	0	None(0)	--	0:None1:Sensor-1;2: Sensor-2
	Component Settings (RS4851-4 & CAN1-2)						
309	SC310 Number	admin	3	0	0	--	
310	SC320 Number	admin	3	0	0	--	
311	SC340 Number	admin	3	0	0	--	
312	SC920 Number	admin	2	0	0	--	
313	SC900 Number	admin	1	0	0	--	
314	SC921 Number	admin	2	0	0	--	
315	BMS Number	admin	20	0	0	--	
316	BMM Number	admin	10	0	0	--	
317	SC350 Number	admin	3	0	0	--	
318	SC310 Number	admin	10	0	0	--	
319	SC321 Number	admin	3	0	0	--	
320	Interface1-20	admin	Address:1	Baud Rate:9600	Parity: Odd		Protocol: Default

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
	Component Settings (SC503)						
321	BATT1_SH Shunt current	admin	15000	25	200	A	
322	BATT1_SH Shunt voltage	admin	75	25	25	mv	
323	BATT2_SH Shunt current	admin	15000	25	200	A	
324	BATT2_SH Shunt voltage	admin	75	25	25	mv	
325	LOAD_SH Shunt current	admin	15000	25	200	A	
326	LOAD_SH Shunt voltage	admin	75	25	25	mv	
327	SPD Alarm State	admin	1	0	disable(0)	--	0:disable;1:enable
328	Temp Sensor 1	admin	2	0	Default (0)		0:Default;2:Curve2
329	Temp Sensor 2	admin	2	0	Default (0)		0:Default;2:Curve2
330	Maximum Resistance	admin	--	--	164800	Ω	
331	Minimum Resistance	admin	--	--	191.9	Ω	
332	Curve 1 Point 1-3	admin	--	--	25	Ω	
333	Curve 1 Point 1-3	admin	--	--	115	℃	
334	Curve 2 Point 1-3	admin	--	--	25	Ω	
335	Curve 2 Point 1-3	admin	--	--	115	℃	
	Component Settings (SC210(1-10))						
336	I_BAT1 Shunt Curr	admin	15000	25	200	A	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
337	I_BAT1 Shunt Volt	admin	50	25	25	mV	
338	I_BAT2 Shunt Curr1	admin	15000	25	200	A	
339	I_BAT2 Shunt Volt1	admin	50	25	25	mV	
340	I_BAT3 Shunt Curr2	admin	15000	25	200	A	
341	I_BAT3 Shunt Volt2	admin	50	25	25	mV	
342	I_LOAD1 Shunt Curr3	admin	15000	25	200	A	
343	I_LOAD1 Shunt Volt3	admin	50	25	25	mV	
344	I_LOAD2 Shunt Curr3	admin	15000	25	200	A	
345	I_LOAD2 Shunt Volt3	admin	50	25	25	mV	
346	I_LOAD3 Shunt Curr3	admin	15000	25	200	A	
347	I_LOAD3 Shunt Volt3	admin	50	25	25	mV	
348	IHALL Hall Cur	admin	2000	0	600	A	
349	IHALL Hall Cur L	admin	5	0	0.5	V	
350	IHALL Hall Cur H	admin	5	0	4.5	V	
351	Load Branch Current Number	admin	5	0	4		
	Component Settings (SC210(1-3))						
352	Shunt Current Branch 1-Branch 24	admin	2000	25	200	A	
353	Shunt Voltage Branch 1-Branch 24	admin	75	25	25	mv	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
354	Shunt Current Branch 1-Branch 24	admin	2000	25	200	A	
355	Shunt Voltage Branch 1 -Branch 24	admin	75	25	25	mv	
	Component Settings (SC320(1-5))						
356	SC320-1 DO Number	admin	16	0	16	--	
357	SC320-2 DO Number	admin	16	0	16	--	
358	SC320-3 DO Number	admin	16	0	16	--	
359	SC320-4 DO Number	admin	16	0	16	--	
360	SC320-5 DO Number	admin	16	0	16	--	
361	Temp Sensor 1	admin	2	0	Default (0)		0:Default;2:Curve2
362	Temp Sensor 2	admin	2	0	Default (0)		0:Default;2:Curve2
363	Humiture&Temperature Sensor Type	admin	3	0	Current(0)	--	0:Current;1:Voltage;2:Fuel sensor type 1;3:Fuel sensor type 2
364	EX2-Humiture&Temperature Sensor Type	admin	1	0	Current(0)	--	
365	Humidity Temperature Low Temperature	admin	100	-40	-30	℃	
366	Humidity Temperature Low Temperature	admin	100	-40	-30	℃	
367	Curve1 Maximum Resistance	admin	--	--	164800	Ω	
368	Curve1 Minimum Resistance	admin	--	--	191.9	Ω	
369	Curve 1 Point 1-3	admin	--	--	25	Ω	
370	Curve 1 Point 1-3	admin	--	--	115	℃	
371	Curve2 Maximum Resistance	admin	--	--	164800	Ω	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
372	Curve2 Minimum Resistance	admin	--	--	191.9	Ω	
373	Curve 1 Point 1-3	admin	--	--	25	Ω	
374	Curve 2 Point 1-3	admin	--	--	115	℃	
	Component Settings (SC321(1-3))						
375	Temp Sensor 1	admin	2	0	Default (0)		0:Default;2:Curve2
376	Temp Sensor 2	admin	2	0	Default (0)		0:Default;2:Curve2
377	Shunt1 Current	admin	2000	25	200	A	
378	Shunt1 Voltage	admin	75	25	25	mv	
379	Shunt2 Current	admin	2000	25	200	A	
380	Shunt2 Voltage	admin	75	25	25	mv	
381	Curve1 Maximum Resistance	admin	--	--	164800	Ω	
382	Curve1 Minimum Resistance	admin	--	--	191.9	Ω	
383	Curve 1 Point 1-3	admin	--	--	25	Ω	
384	Curve 1 Point 1-3	admin	--	--	115	℃	
385	Curve2 Maximum Resistance	admin	--	--	164800	Ω	
386	Curve2 Minimum Resistance	admin	--	--	191.9	Ω	
387	Curve 1 Point 1-3	admin	--	--	25	Ω	
388	Curve 2 Point 1-3	admin	--	--	115	℃	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
	Component Settings (SC340(1-3))						
389	SC340-1 Branch Number	admin	24	0	24	--	
390	SC340-2 Branch Number	admin	24	0	24	--	
391	SC340-3 Branch Number	admin	24	0	24	--	
	Component Settings (SC920(1-2))						
392	Frequency Mode	admin	1	0	Auto (0)	--	0:Auto;1:Manual;
393	Frequency Center	admin	1	0	50Hz (0)	--	0:50Hz;1:60Hz;
394	Connection Mode	admin	1	0	Star (0)	--	0:Star;1:Triangle;
395	CT-Ratio Branch 1-Branch 8	admin	3000	50	160	--	
	Component Settings (SC921(1-2))						
396	Frequency Mode	admin	1	0	Auto (0)	--	0:Auto;1:Manual;
397	Frequency Center	admin	1	0	50Hz (0)	--	0:50Hz;1:60Hz;
398	Connection Mode	admin	1	0	Star (0)	--	0:Star;1:Triangle;
399	CT-Ratio Branch 1-Branch 8	admin	3000	50	160	--	
	Component Settings (SC360)						
400	GPRS Module Type	admin	2	0	0	--	0:none;1:neoway;2:yuge;
401	APN	admin	--	--	--	--	Maximum 30 characters
402	Authentication Protocol	admin	2	1	None (0)	--	0:None;1:PAP;2:CHAP;
403	Authentication Name	admin	--	--	--	--	Maximum 30 characters

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
404	Authentication Password	admin	--	--	--	--	Maximum 30 characters
405	Active Alarm Send Message	admin	7	0	0	--	0:None;1:Minor Alarm;2:Major Alarm;3:Critical Alarm;4: Minor Alarm/Major Alarm;5: Minor Alarm/ Critical Alarm;6: Major Alarm/ Critical Alarm;7:All Alarm
406	Cease Alarm Send Message	admin	7	0	0	--	0:None;1:Minor Alarm;2:Major Alarm;3:Critical Alarm;4: Minor Alarm/Major Alarm;5: Minor Alarm/ Critical Alarm;6: Major Alarm/ Critical Alarm;7:All Alarm
407	Phone 1-Phone5 Number	admin	--	--	--	--	Maximum 17 characters
408	GPS Enable	admin	1	0	disable(0)	--	0:disable;1:enable
409	Interval Time	admin	65534	1	1	min	
	Component Settings (SC350(1-3))						
410	Fan 1 enable	admin	1	0	Disable(0)	--	0: Disable;1:Enable;
411	Fan 2 enable	admin	1	0	Disable(0)	--	0: Disable;1:Enable;
412	Fan 3 enable	admin	1	0	Disable(0)	--	0: Disable;1:Enable;
413	Cabinet temperature 1 high	admin	100	Cabinet temperature 1 low+10	35	°C	
414	Cabinet temperature 1 high alarm hysteresis	admin	10	1	5	°C	
415	Cabinet temperature 1 low	admin	Cabinet temperature 1 high-10	-60	5	°C	
416	Cabinet temperature 1 low alarm hysteresis	admin	10	1	5	°C	
417	Cabinet temperature 2 high	admin	100	Cabinet temperature 1 low+10	35	°C	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
418	Cabinet temperature 2 high alarm hysteresis	admin	10	1	5	°C	
419	Cabinet temperature 2 low	admin	Cabinet temperature 1 high-10	-60	5	°C	
420	Cabinet temperature 2 low alarm hysteresis	admin	10	1	5	°C	
421	Ambient temperature 1 high	admin	100	Ambient temperature 1 low+10	35	°C	
422	Ambient temperature 1 high alarm hysteresis	admin	10	1	5	°C	
423	Ambient temperature 1 low	admin	Ambient temperature 1 high-10	-60	5	°C	
424	Ambient temperature 1 low alarm hysteresis	admin	10	1	5	°C	
425	Ambient temperature 2 high	admin	100	Ambient temperature 1 low+10	35	°C	
426	Ambient temperature 2 high alarm hysteresis	admin	10	1	5	°C	
427	Ambient temperature 2 low	admin	Ambient temperature 1 high-10	-60	5	°C	
428	Ambient temperature 2 low alarm hysteresis	admin	10	1	5	°C	
429	Heat box protect temperature high	admin	100	50	50	°C	
430	Heat box protect temperature high alarm hysteresis	admin	10	1	5	°C	
431	Fan 1 minimum duty cycle	admin	100	0	11	%	
432	Fan 2 minimum duty cycle	admin	100	0	11	%	
433	Fan 3 minimum duty cycle	admin	100	0	11	%	
434	Fan 4 minimum duty cycle	admin	100	0	11	%	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
435	Fan 5 minimum duty cycle	admin	100	0	11	%	
436	Fan 6 minimum duty cycle	admin	100	0	11	%	
437	Fan 7 minimum duty cycle	admin	100	0	11	%	
438	Fan 8 minimum duty cycle	admin	100	0	11	%	
439	Fan 9 minimum speed	admin	10000	0	1000		Round
440	DI1 Normal State	admin	1	0	NO(1)	--	0:NC; 1:NO;
441	DI2 Normal State	admin	1	0	NO(1)	--	0:NC; 1:NO;
442	DI3 Normal State	admin	1	0	NO(1)	--	0:NC; 1:NO;
443	Cabinet Door	admin	3	0	None(0)	--	0:None; 1:DI 1; 2:DI 2; 3:DI 3;
444	Fan group 1 related temperature 1	admin	2	0	Cabinet Temperature 1 (1)	--	0:None; 1:Cabinet Temperature 1; 2: Cabinet Temperature 2;
445	Fan group 2 related temperature 1	admin	2	0	Cabinet Temperature 1 (1)	--	0:None; 1:Cabinet Temperature 1; 2: Cabinet Temperature 2;
446	Fan group 1 related temperature 2	admin	2	0	Ambient Temperature 1 (1)	--	0:None; 1:Ambient Temperature 1; 2: Ambient Temperature 2;
447	Fan group 2 related temperature 2	admin	2	0	Ambient Temperature 1 (1)	--	0:None; 1:Ambient Temperature 1; 2: Ambient Temperature 2;
448	Fan group 3 correlation	admin	1	0	Heat Box Start-Stop Temperature (1)	--	0:None; 1:Heat Box Start-Stop Temperature;

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
449	Temperature Sensor 1	admin	6	0	None(0)	--	0:None; 1: Cabinet Temperature 1; 2: Cabinet Temperature 2; 3:Ambient Temperature 1; 4: Ambient Temperature 2; 5:Heat Box Start-Stop Temperature; 6:Heat Box protect Temperature;
450	Temperature Sensor 2	admin	6	0	None(0)	--	0:None; 1: Cabinet Temperature 1; 2: Cabinet Temperature 2; 3:Ambient Temperature 1; 4: Ambient Temperature 2; 5:Heat Box Start-Stop Temperature; 6:Heat Box protect Temperature;
451	Temperature Sensor 3	admin	6	0	None(0)	--	
452	Temperature Sensor 4	admin	6	0	None(0)	--	
453	Temperature Sensor 5	admin	6	0	Cabinet Temperature 1 (1)	--	
454	Temperature Sensor 6	admin	6	0	Ambient Temperature 1 (3)	--	
455	Temperature Sensor 7	admin	6	0	Heat Box Start-Stop Temperature (5)	--	
456	Temperature Sensor 8	admin	6	0	Heat Box protect Temperature (6)	--	
457	Temperature Sensor 1 Low Value	admin	--	--	-20	°C	
458	Temperature Sensor 1 High Value	admin	--	--	80	°C	
459	Temperature Sensor 2 Low Value	admin	--	--	-20	°C	
460	Temperature Sensor 2 High Value	admin	--	--	80	°C	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
461	Temperature Sensor 3 Low Value	admin	--	--	-20	°C	
462	Temperature Sensor 3 High Value	admin	--	--	80	°C	
463	Temperature Sensor 4 Low Value	admin	--	--	-20	°C	
464	Temperature Sensor 4 High Value	admin	--	--	80	°C	
465	Temperature Sensor 5 Curve Resistance 1	admin	--	--	164800	ohm	
466	Temperature Sensor 5 Curve Resistance 2	admin	--	--	10000	ohm	
467	Temperature Sensor 5 Curve Resistance 3	admin	--	--	687.9	ohm	
468	Temperature Sensor 5 Curve Temperature 1	admin	--	--	-30	°C	
469	Temperature Sensor 5 Curve Temperature 2	admin	--	--	25	°C	
470	Temperature Sensor 5 Curve Temperature 3	admin	--	--	100	°C	
471	Temperature Sensor 6 Curve Resistance 1	admin	--	--	164800	ohm	
472	Temperature Sensor 6 Curve Resistance 2	admin	--	--	10000	ohm	
473	Temperature Sensor 6 Curve Resistance 3	admin	--	--	687.9	ohm	
474	Temperature Sensor 6 Curve Temperature 1	admin	--	--	-30	°C	
475	Temperature Sensor 6 Curve Temperature 2	admin	--	--	25	°C	
476	Temperature Sensor 6 Curve Temperature 3	admin	--	--	100	°C	
477	Temperature Sensor 7 Curve Resistance 1	admin	--	--	164800	ohm	
478	Temperature Sensor 7 Curve Resistance 2	admin	--	--	10000	ohm	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
479	Temperature Sensor 7 Curve Resistance 3	admin	--	--	687.9	ohm	
480	Temperature Sensor 7 Curve Temperature 1	admin	--	--	-30	°C	
481	Temperature Sensor 7 Curve Temperature 2	admin	--	--	25	°C	
482	Temperature Sensor 7 Curve Temperature 3	admin	--	--	100	°C	
483	Temperature Sensor 8 Curve Resistance 1	admin	--	--	164800	ohm	
484	Temperature Sensor 8 Curve Resistance 2	admin	--	--	10000	ohm	
485	Temperature Sensor 8 Curve Resistance 3	admin	--	--	687.9	ohm	
486	Temperature Sensor 8 Curve Temperature 1	admin	--	--	-30	°C	
487	Temperature Sensor 8 Curve Temperature 2	admin	--	--	25	°C	
488	Temperature Sensor 8 Curve Temperature 3	admin	--	--	100	°C	
489	Open door delay time	admin	600	0	180	S	
490	Close door delay time	admin	600	0	60	S	
491	Heater fan close delay time	admin	300	0	10	S	
492	Start temperature	admin	Stop temperature-5	-20	10	°C	
493	Stop temperature	admin	40	Start temperature+5	20	°C	
494	Protect temperature	admin	100	50	100	°C	
495	Start voltage	admin	50	Stop voltage+2	40	V	
496	Stop voltage	admin	Start voltage-2	30	38	V	

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
497	Fan Duty Cycle Setting: Fan group 1 Temperature 1	admin	--	--	30	°C	
498	Fan Duty Cycle Setting: Fan group 1 Temperature 2	admin	--	--	40	°C	
499	Fan Duty Cycle Setting: Fan group 1 Temperature 3	admin	--	--	50	°C	
500	Fan Duty Cycle Setting: Fan group 1 Duty Cycle 1	admin	100	0	0	%	
501	Fan Duty Cycle Setting: Fan group 1 Duty Cycle 2	admin	100	0	50	%	
502	Fan Duty Cycle Setting: Fan group 1 Duty Cycle 3	admin	100	0	100	%	
503	Fan Duty Cycle Setting: Fan group 2 Temperature 1	admin	--	--	30	°C	
504	Fan Duty Cycle Setting: Fan group 2 Temperature 2	admin	--	--	40	°C	
505	Fan Duty Cycle Setting: Fan group 2 Temperature 3	admin	--	--	50	°C	
506	Fan Duty Cycle Setting: Fan group 2 Duty Cycle 1	admin	100	0	0	%	
507	Fan Duty Cycle Setting: Fan group 2 Duty Cycle 2	admin	100	0	50	%	
508	Fan Duty Cycle Setting: Fan group 2 Duty Cycle 3	admin	100	0	100	%	
509	Fan Speed Setting: Fan 1 K	admin	65535	Greater than 0	15		Round
510	Fan Speed Setting: Fan 2 K	admin	65535	Greater than 0	15		Round
511	Fan Speed Setting: Fan 3 K	admin	65535	Greater than 0	15		Round
512	Fan Speed Setting: Fan 4 K	admin	65535	Greater than 0	15		Round
513	Fan Speed Setting: Fan 5 K	admin	65535	Greater than 0	15		Round
514	Fan Speed Setting: Fan 6 K	admin	65535	Greater than 0	15		Round

ID	Content	Authority	Upper limit	Lower limit	Default	Unit	Describe
515	Fan Speed Setting: Fan 7 K	admin	65535	Greater than 0	15		Round
516	Fan Speed Setting: Fan 8 K	admin	65535	Greater than 0	15		Round
517	Fan Speed Setting: Fan 9 K	admin	65535	Greater than 0	15		Round
518	Fan group 1 drive frequency	admin	100000	100	25000	Hz	
519	Fan group 2 drive frequency	admin	100000	100	25000	Hz	
520	Fan start temperature difference	admin	15	1	3	°C	

Chapter 4 Available Alarms Listing

4.1 AC Alarms

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	AC Slight Over Current	Enable	Yes	Major	None	--
2	AC Severe Over Current	Enable	Yes	Major	None	--
3	AC Over Voltage	Enable	Yes	Major	None	--
4	AC Under Voltage	Enable	Yes	Major	None	--
5	AC Phase Failure	Enable	Yes	Major	None	--
6	AC Mains Failure	Enable	Yes	Major	None	--
7	AC High Frequency	Enable	Yes	Major	None	--
8	AC Low Frequency	Enable	Yes	Major	None	--
9	AC2 Slight Over Current	Enable	Yes	Major	None	--
10	AC2 Severe Over Current	Enable	Yes	Major	None	--
11	AC2 Over Voltage	Enable	Yes	Major	None	--
12	AC2 Under Voltage	Enable	Yes	Major	None	--
13	AC2 Phase Failure	Enable	Yes	Major	None	--
14	AC2 Mains Failure	Enable	Yes	Major	None	--
15	AC2 High Frequency	Enable	Yes	Major	None	--
16	AC2 Low Frequency	Enable	Yes	Major	None	--

4.2 DC Alarms

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	DC Over Voltage(48V System)	Enable	Yes	Major	None	--
2	DC High Voltage(48V System)	Enable	Yes	Major	None	--
3	DC Low Voltage(48V System)	Enable	Yes	Major	None	--
4	DC Under Voltage(48V System)	Enable	Yes	Major	None	--
5	ECO Running	Enable	Yes	Major	None	--
6	Bus Insulation fault	Enable	Yes	Major	None	--
7	Load branch Insulation fault	Enable	Yes	Major	None	--
8	DC Total Load Slight Over Current	Enable	Yes	Major	None	--
9	DC Total Load Severe Over Current	Enable	Yes	Major	None	--
10	System SPD Fault	Enable	Yes	Major	None	--
11	System Total Alarm	Enable	Yes	Major	None	--
12	Load1 Break	Enable	Yes	Major	None	--

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
13	Load2 Break	Enable	Yes	Major	None	--
	Up to					
83	Load72 Break	Enable	Yes	Major	None	--
84	DC Branch 1 Slight Over Current	Enable	Yes	Major	None	--
85	DC Branch 2 Slight Over Current	Enable	Yes	Major	None	--
	Up to					
155	DC Branch 72 Slight Over Current	Enable	Yes	Major	None	--
156	DC Branch 1 Severe Over Current	Enable	Yes	Major	None	--
157	DC Branch 2 Severe Over Current	Enable	Yes	Major	None	--
	Up to					
227	DC Branch 72 Severe Over Current	Enable	Yes	Major	None	--

4.3 LVD Alarms

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	BLVD1	Enable	Yes	Major	None	--
2	BLVD1 Fail	Enable	Yes	Major	None	--
3	PreAlarm-BLVD1	Enable	Yes	Major	None	--
4	BLVD1 Reconnect Fail	Enable	Yes	Major	None	--
	Up to					
73	BLVD20	Enable	Yes	Major	None	--
74	BLVD20 Fail	Enable	Yes	Major	None	--
75	PreAlarm-BLVD20	Enable	Yes	Major	None	--
76	BLVD20 Reconnect Fail	Enable	Yes	Major	None	--
77	LLVD1	Enable	Yes	Major	None	--
78	LLVD1 Fail	Enable	Yes	Major	None	--
79	PreAlarm-LLVD1	Enable	Yes	Major	None	--
80	LLVD1 Reconnect Fail	Enable	Yes	Major	None	--
	Up to					
153	LLVD20	Enable	Yes	Major	None	--
154	LLVD20 Fail	Enable	Yes	Major	None	--
155	PreAlarm-LLVD20	Enable	Yes	Major	None	--
156	LLVD20 Reconnect Fail					

4.4 Battery Alarms

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	Battery Discharge	Enable	Yes	Major	None	--
2	Battery Cycle Test Over Current	Enable	Yes	Major	None	--
3	Battery Test Fail	Enable	Yes	Major	None	--
4	Mains Shifting Low SOC	Enable	Yes	Major	None	--
5	Mains Shaving Low SOC	Enable	Yes	Major	None	--
6	Mains Shifting Low Voltage	Enable	Yes	Major	None	--
7	Mains Shaving Low Voltag	Enable	Yes	Major	None	--
8	Battery 1 Charge Over Current	Enable	Yes	Major	None	--
	Up to					
24	Battery 20 Charge Over Current	Enable	Yes	Major	None	--
25	Battery1 String Break1	Enable	Yes	Major	None	--
26	Battery1 String Break2	Enable	Yes	Major	None	--
27	Battery1 String Break3	Enable	Yes	Major	None	--
28	Battery1 String Break4	Enable	Yes	Major	None	--
29	Battery1 String Break5	Enable	Yes	Major	None	--
30	Battery1 String Break6	Enable	Yes	Major	None	--
	Up to					
139	Battery20 String Break1	Enable	Yes	Major	None	--
140	Battery20 String Break2	Enable	Yes	Major	None	--
141	Battery20 String Break3	Enable	Yes	Major	None	--
142	Battery20 String Break4	Enable	Yes	Major	None	--
143	Battery20 String Break5	Enable	Yes	Major	None	--
144	Battery20 String Break6	Enable	Yes	Major	None	--
145	Battery1 Middle Imbalance	Enable	Yes	Major	None	--
	Up to					
164	Battery20 Middle Imbalance	Enable	Yes	Major	None	--
165	Battery 1 Can Not Charge	Enable	Yes	Major	None	--
	Up to					
184	Battery 20 Can Not Charge	Enable	Yes	Major	None	--
185	Battery 1 Charge Over Current	Enable	Yes	Major	None	--
	Up to					
204	Battery 20 Charge Over Current	Enable	Yes	Major	None	--
205	Battery Bank 1 Low SOC	Enable	Yes	Major	None	--
	Up to					
224	Battery Bank 20 Low SOC	Enable	Yes	Major	None	--

4.5 Temperature Alarms

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	Ambient Temperature1 High1	Enable	Yes	Major	None	--
	Up to					
8	Ambient Temperature8 High1	Enable	Yes	Major	None	--
9	Ambient Temperature1 High2	Enable	Yes	Major	None	--
	Up to					
16	Ambient Temperature8 High2	Enable	Yes	Major	None	--
17	Ambient Temperature1 Low1	Enable	Yes	Major	None	--
	Up to					
24	Ambient Temperature8 Low1	Enable	Yes	Major	None	--
25	Ambient Temperature1 Low2	Enable	Yes	Major	None	--
	Up to					
34	Ambient Temperature8 Low2	Enable	Yes	Major	None	--
35	Humidity 1 High	Enable	Yes	Major	None	--
36	Humidity 1 Low	Enable	Yes	Major	None	--
37	Battery Temperature1 High1	Enable	Yes	Major	None	--
	Up to					
56	Battery Temperature20 High1	Enable	Yes	Major	None	
57	Battery Temperature1 High2	Enable	Yes	Major	None	--
	Up to					
76	Battery Temperature20 High2	Enable	Yes	Major	None	
77	Battery Temperature1 Low1	Enable	Yes	Major	None	--
	Up to					
96	Battery Temperature20 Low1	Enable	Yes	Major	None	
97	Battery Temperature1 Low2	Enable	Yes	Major	None	--
	Up to					
116	Battery Temperature20 Low2	Enable	Yes	Major	None	
117	BTRM High 1	Enable	Yes	Major	None	--
118	BTRM High 1	Enable	Yes	Major	None	--

4.6 T-Sensor Alarms

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	Temperature Sensor 1 Not Assemble	Enable	Yes	Major	None	--
2	Temperature Sensor 2 Not Assemble	Enable	Yes	Major	None	--
3	SC321-1 Temperature Sensor 1 Not Assemble	Enable	Yes	Major	None	--

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
4	SC321-1 Temperature Sensor 2 Not Assemble	Enable	Yes	Major	None	--

4.7 BMS Alarms

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	BMS Total Alarm	Enable	Yes	Major	None	--
2	BMS Battery Over Current	Enable	Yes	Major	None	--
3	BMS Battery Packs Over Voltage	Enable	Yes	Major	None	--
4	BMS Battery Packs Under Voltage	Enable	No	Minor	None	--
5	BMS Battery Cell Over Voltage	Enable	No	Minor	None	--
6	BMS Battery Cell Under Voltage	Enable	No	Minor	None	--
7	BMS Battery High Temperature	Enable	Yes	Major	None	--
8	BMS Battery Low Temperature	Enable	No	Minor	None	--
9	BMS Battery Output Short	Enable	Yes	Major	None	--
10	BMS Battery Low SOC	Enable	No	Minor	None	--

4.8 BMM Alarms

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	BMM-Total Alarm	Enable	Yes	Major	None	--
2	BMM-Battery Over Current	Enable	Yes	Major	None	--
3	BMM-Battery Packs Over Voltage	Enable	Yes	Major	None	--
4	BMM-Battery Packs Under Voltage	Enable	No	Minor	None	--
5	BMM-Battery Cell Over Voltage	Enable	No	Minor	None	--
6	BMM-Battery Cell Under Voltage	Enable	No	Minor	None	--
7	BMM-Battery High Temperature	Enable	Yes	Major	None	--
8	BMM-Battery Low Temperature	Enable	No	Minor	None	--
9	BMM-Battery High Resistance	Enable	Yes	Major	None	--

4.9 Communication Alarms

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	SC210-1 Communication Fault	Enable	Yes	Major	None	--
	Up to					
10	SC210-10 Communication Fault	Enable	Yes	Major	None	--

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
11	SC310-1 Communication Fault	Enable	No	Minor	None	--
12	SC310-2 Communication Fault	Enable	No	Minor	None	--
13	SC310-3 Communication Fault	Enable	No	Minor	None	--
14	SC350-1 Communication Fault	Enable	Yes	Major	None	--
15	SC350-2 Communication Fault	Enable	Yes	Major	None	--
16	SC350-3 Communication Fault	Enable	Yes	Major	None	--
17	SC321-1 Communication Fault	Enable	Yes	Major	None	--
18	SC321-2 Communication Fault	Enable	Yes	Major	None	--
19	SC321-3 Communication Fault	Enable	Yes	Major	None	--
20	SC921-1 Communication Fault	Enable	Yes	Major	None	--
21	SC921-2 Communication Fault	Enable	Yes	Major	None	--
22	DG1 Communication Fault	Enable	Yes	Major	None	--
23	DG2 Communication Fault	Enable	Yes	Major	None	--
24	DG3 Communication Fault	Enable	Yes	Major	None	--
25	BMS1 Communication Fault	Enable	Yes	Major	None	--
	Up to					
88	BMS64 Communication Fault	Enable	Yes	Major	None	--
89	BMM1 Communication Fault	Enable	Yes	Major	None	--
	Up to					
98	BMM10 Communication Fault	Enable	Yes	Major	None	--

4.10 DG Alarms

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	DG-Total Alarm	Enable	Yes	Major	None	--
2	DG-Emergency Stop	Enable	Yes	Major	None	--
3	DG-Start Fail	Enable	Yes	Major	None	--
4	DG-Stop Fail	Enable	Yes	Major	None	--
5	DG-Oil Pressure Low	Enable	Yes	Major	None	--
6	DG-Engine Temperature High	Enable	Yes	Major	None	--
7	DG-Over Speed	Enable	Yes	Major	None	--
8	DG-Under Speed	Enable	Yes	Major	None	--
9	DG-Over Load	Enable	Yes	Major	None	--
10	DG-Fuel Level Low	Enable	Yes	Major	None	--

4.11 User Alarm

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	User Alarm 1	Enable	Yes	Major	None	--
2	User Alarm 2	Enable	Yes	Major	None	--
3	User Alarm 3	Enable	Yes	Major	None	--
4	User Alarm 4	Enable	Yes	Major	None	--
5	User Alarm 5	Enable	Yes	Major	None	--
6	User Alarm 6	Enable	Yes	Major	None	--
7	User Alarm 7	Enable	Yes	Major	None	--
8	User Alarm 8	Enable	Yes	Major	None	--
9	User Alarm 9	Enable	Yes	Major	None	--
10	User Alarm 10	Enable	Yes	Major	None	--
11	User Alarm 11	Enable	Yes	Major	None	--
12	User Alarm 12	Enable	Yes	Major	None	--
13	User Alarm 13	Enable	Yes	Major	None	--
14	User Alarm 14	Enable	Yes	Major	None	--
	Up to					
100	User Alarm 100	Enable	Yes	Major	None	--

4.12 AC/DC Rectifier Alarms

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	Rectifier Current Sample Fault	Enable	Yes	Major	None	--
2	Rectifier Primary-Side Circuit Short	Enable	Yes	Major	None	--
3	Rectifier Mutiple Rectifier No Output	Enable	Yes	Major	None	--
4	Rectifier Single Rectifier No output	Enable	Yes	Major	None	--
5	Rectifier Outside Circuit Short	Enable	Yes	Major	None	--
6	Rectifier PFC Imbalance	Enable	Yes	Major	None	--
7	Rectifier Identify Fault	Enable	Yes	Major	None	--
8	Rectifier Lost	Enable	Yes	Major	None	--
9	Rectifier Current Sharing Slightly Fault	Enable	Yes	Major	None	--
10	Rectifier Current Sharing Severe Fault	Enable	Yes	Major	None	--
11	Rectifier No Position	Enable	Yes	Major	None	--
12	Rectifier Output Over Current	Enable	Yes	Major	None	--

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
13	Rectifier E2PROM Fault	Enable	Yes	Major	None	--
14	Rectifier CAN Communication Fault	Enable	Yes	Major	None	--
15	Rectifier Second Side Communication Fault	Enable	Yes	Major	None	--
16	Rectifier Primary Side Communication Fault	Enable	Yes	Major	None	--
17	Rectifier Fan Fault	Enable	Yes	Major	None	--
18	Rectifier Start Resistor Break	Enable	Yes	Major	None	--
19	Rectifier PFC Over voltage Protection	Enable	Yes	Major	None	--
20	Rectifier PFC Under voltage Protection	Enable	Yes	Major	None	--
21	Rectifier AC Imbalance	Enable	Yes	Major	None	--
22	Rectifier AC Lose Phase	Enable	Yes	Major	None	--
23	Rectifier AC Under Voltage Protection	Enable	Yes	Major	None	--
24	Rectifier AC Over Voltage Protection	Enable	Yes	Major	None	--
25	Rectifier Internal Circuit Short	Enable	Yes	Major	None	--
26	Rectifier Output Fuse Break	Enable	Yes	Major	None	--
27	Rectifier Secondary Hot Point Over Temperature	Enable	Yes	Major	None	--
28	Rectifier Primary Hot Point Over Temperature	Enable	Yes	Major	None	--
29	Rectifier Ambient Over Temperature	Enable	Yes	Major	None	--
30	Rectifier Output Under Voltage Protection	Enable	Yes	Major	None	--
31	Rectifier Outer Over Voltage Protection	Enable	Yes	Major	None	--
32	Rectifier Internal Over Voltage Protection	Enable	Yes	Major	None	--
33	Rectifier PFC Short	Enable	Yes	Major	None	--
34	Rectifier OVSD	Enable	Yes	Major	None	--
35	Rectifier Single Fault	Enable	No	Minor	None	--
36	Rectifier Multiple Fault	Enable	Yes	Major	None	--

4.13 Solar Controller Alarms

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	Solar Controller-Primary Calibrate Fault	Enable	Yes	Major	None	--
2	Solar Controller-Single No output	Enable	Yes	Major	None	--
3	Solar Controller-Outside Circuit Short	Enable	Yes	Major	None	--
4	Solar Controller-Lost	Enable	Yes	Major	None	--
5	Solar Controller-No Position	Enable	Yes	Major	None	--
6	Solar Controller-Output Over Current	Enable	Yes	Major	None	--
7	Solar Controller-E2PROM Fault	Enable	Yes	Major	None	--
8	Solar Controller-CAN Communication Fault	Enable	Yes	Major	None	--
9	Solar Controller-Second Side Communication Fault	Enable	Yes	Major	None	--
10	Solar Controller-Primary Side Communication Fault	Enable	Yes	Major	None	--
11	Solar Controller-Fan Fault	Enable	Yes	Major	None	--
12	Solar Controller-PFC Over voltage Protection	Enable	Yes	Major	None	--
13	Solar Controller-PFC Under voltage Protection	Enable	Yes	Major	None	--
14	Solar Controller-Input Under Voltage Protection	Enable	Yes	Major	None	--
15	Solar Controller-Input Over Voltage Protection	Enable	Yes	Major	None	--
16	Solar Controller-Internal Circuit Short	Enable	Yes	Major	None	--
17	Solar Controller-Secondary Hot Point Over Temperature	Enable	Yes	Major	None	--
18	Solar Controller-Ambient Over Temperature	Enable	Yes	Major	None	--
19	Solar Controller-Outer Over Voltage Protection	Enable	Yes	Major	None	--
20	Solar Controller-Internal Over Voltage Protection	Enable	Yes	Major	None	--
21	Solar Controller-Security Code Error	Enable	Yes	Major	None	--
22	Solar Controller-PV Power Lack	Enable	Yes	Major	None	--
23	Solar Controller-Single Fault	Enable	No	Minor	None	--

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
24	Solar Controller-Multiple Fault	Enable	Yes	Major	None	--

4.14 DC/DC Converter Alarms

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
1	DC/DC Converter-Current Sample Fault	Enable	Yes	Major	None	--
2	DC/DC Converter-Primary-Side Circuit Short	Enable	Yes	Major	None	--
3	DC/DC Converter-Multiple Rectifier No Output	Enable	Yes	Major	None	--
4	DC/DC Converter-Single Rectifier No output	Enable	Yes	Major	None	--
5	DC/DC Converter-Outside Circuit Short	Enable	Yes	Major	None	--
6	DC/DC Converter-Identify Fault	Enable	Yes	Major	None	--
7	DC/DC Converter-Lost	Enable	Yes	Major	None	--
8	DC/DC Converter-Current Sharing Slightly Fault	Enable	Yes	Major	None	--
9	DC/DC Converter-Current Sharing Severe Fault	Enable	Yes	Major	None	--
10	DC/DC Converter-No Position	Enable	Yes	Major	None	--
11	DC/DC Converter-Output Over Current	Enable	Yes	Major	None	--
12	DC/DC Converter-E2PROM Fault	Enable	Yes	Major	None	--
13	DC/DC Converter-CAN Communication Fault	Enable	Yes	Major	None	--
14	DC/DC Converter-Second Side Communication Fault	Enable	Yes	Major	None	--
15	DC/DC Converter-Primary Side Communication Fault	Enable	Yes	Major	None	--
16	DC/DC Converter-Fan Fault	Enable	Yes	Major	None	--
17	DC/DC Converter-Start Resistor Break	Enable	Yes	Major	None	--
18	DC/DC Converter-Input Under Voltage Protection	Enable	Yes	Major	None	--
19	DC/DC Converter-Input Over Voltage Protection	Enable	Yes	Major	None	--
20	DC/DC Converter-Internal Circuit	Enable	Yes	Major	None	--

ID	Alarm Name	Availability	Alarm sound	Alarm level	Related Relay-out position	Related Relay-out
	Short					
21	DC/DC Converter-Output Fuse Break	Enable	Yes	Major	None	--
22	DC/DC Converter-Secondary Hot Point Over Temperature	Enable	Yes	Major	None	--
23	DC/DC Converter-Primary Hot Point Over Temperature	Enable	Yes	Major	None	--
24	DC/DC Converter-Ambient Over Temperature	Enable	Yes	Major	None	--
25	DC/DC Converter-Output Under Voltage Protection	Enable	Yes	Major	None	--
26	DC/DC Converter-Outer Over Voltage Protection	Enable	Yes	Major	None	--
27	DC/DC Converter-Internal Over Voltage Protection	Enable	Yes	Major	None	--
28	DC/DC Converter-Security Code Error	Enable	Yes	Major	None	--
29	DC/DC Converter-Single Fault	Enable	No	Minor	None	--
30	DC/DC Converter-Multiple Fault	Enable	Yes	Major	None	--

4.15 SC350 Alarms

ID	Alarm Name	Availability	Related DO	Delay
1	Cabinet temperature 1 low	Enable	None	0S
2	Cabinet temperature 1 high	Enable	None	0S
3	Cabinet temperature 2 low	Enable	None	0S
4	Cabinet temperature 2 high	Enable	None	0S
5	Ambient temperature 1 low	Enable	None	0S
6	Ambient temperature 1 high	Enable	None	0S
7	Ambient temperature 2 low	Enable	None	0S
8	Ambient temperature 2 high	Enable	None	0S
9	Heat box protect temperature high	Enable	None	0S
10	Heating fault	Enable	None	0S
11	Input voltage low	Enable	None	0S
12	Fan 1 fault	Enable	None	0S
13	Fan 2 fault	Enable	None	0S
14	Fan 3 fault	Enable	None	0S
15	Fan 4 fault	Enable	None	0S

16	Fan 5 fault	Enable	None	0S
17	Fan 6 fault	Enable	None	0S
18	Fan 7 fault	Enable	None	0S
19	Fan 8 fault	Enable	None	0S
20	Fan 9 fault	Enable	None	0S
21	Heating box stop	Enable	None	0S
22	Heating board fan stop	Enable	None	0S
23	DI1 alarm	Enable	None	0S
24	DI2 alarm	Enable	None	0S
25	DI3 alarm	Enable	None	0S
26	EEPROM fault	Enable	None	0S
27	Temperature sensor 1 fault	Enable	None	0S
28	Temperature sensor 2 fault	Enable	None	0S
29	Temperature sensor 3 fault	Enable	None	0S
30	Temperature sensor 4 fault	Enable	None	0S
31	Temperature sensor 5 fault	Enable	None	0S
32	Temperature sensor 6 fault	Enable	None	0S
33	Temperature sensor 7 fault	Enable	None	0S
34	Temperature sensor 8 fault	Enable	None	0S

Note: Availability: Enable/Disable; Related DO: None/DO1/DO2/DO3; Delay:0—300S;