SolarPower

User Manual

Suitable Products:

- 1KW/2KW/3KW/4KW/5KW Grid-tie inverter with energy storage

Management Software for Solar Inverter

Table of Contents

1. SolarPower Overview

1.1. Introduction

SolarPower is an inverter monitoring software which can monitor multiple devices via serial port at the same time. The major functions of SolarPower monitoring software include data log for devices, alarm messages, fault messages, and parameter setting for devices.

1.2. Features

- Automatic and real-time data acquisition of devices and secured data log saving
- Graphic display of device data for quick and easy reading.
- Warning notifications or fault alarms via mobile messenger, tray message and e-mail
- Easy diagnosis from event statistics
- Supports online upgrade and manual upgrade

2. SolarPower Install and Uninstall

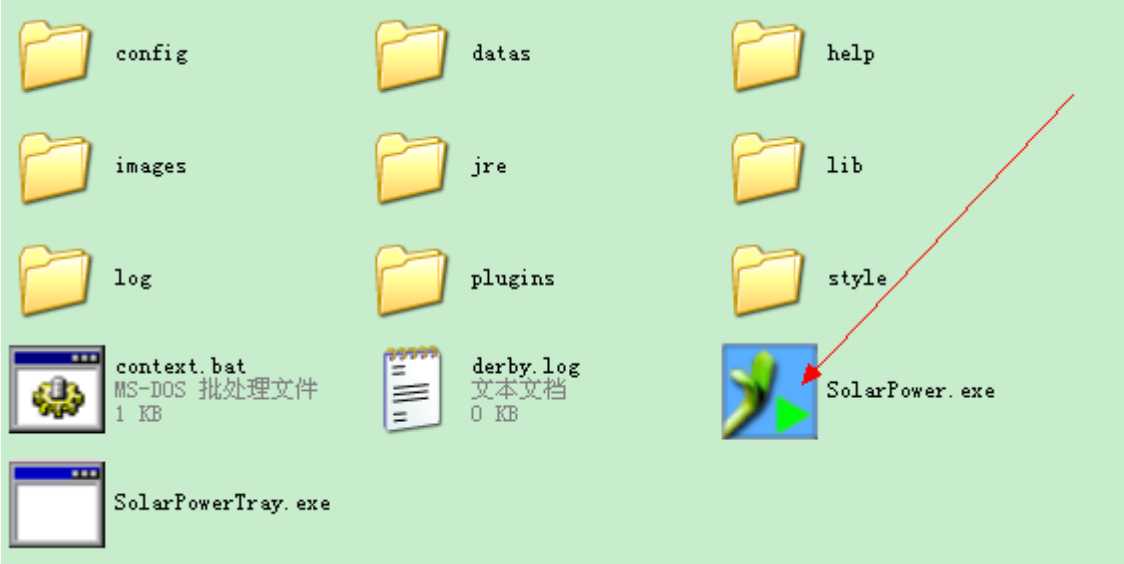
2.1. System Requirement

- 512 MB physical memory at least (1 GB is recommended)
- 2GB hard disk space at least
- Administrator authority is required
- More than 32-bit colors and 1280 x 800 or above resolution display is recommended
- An available communication port is needed
- Platforms supported by software are listed below:
  - Windows 2003/2008/XP/Vista/7/8/8.1/10 (32bit & 64bit)
  - RedHat Linux 8,9
  - Linux RedHat Enterprise AS3, AS5, AS6(32bit & 64bit)
  - Linux SUSE 10 (32bit & 64bit)
  - Linux Cent OS 5.4 (32bit & 64bit)
  - Ubuntu 8.x,9.x,10.x (32bit & 64bit)
  - Linux Fedora 5
  - Linux OpenSUSE 11.2 (32bit & 64bit)
  - Linux Debian 5.x, 6.x (32bit & 64bit)
  - Mac OS 10.x (64-bit)

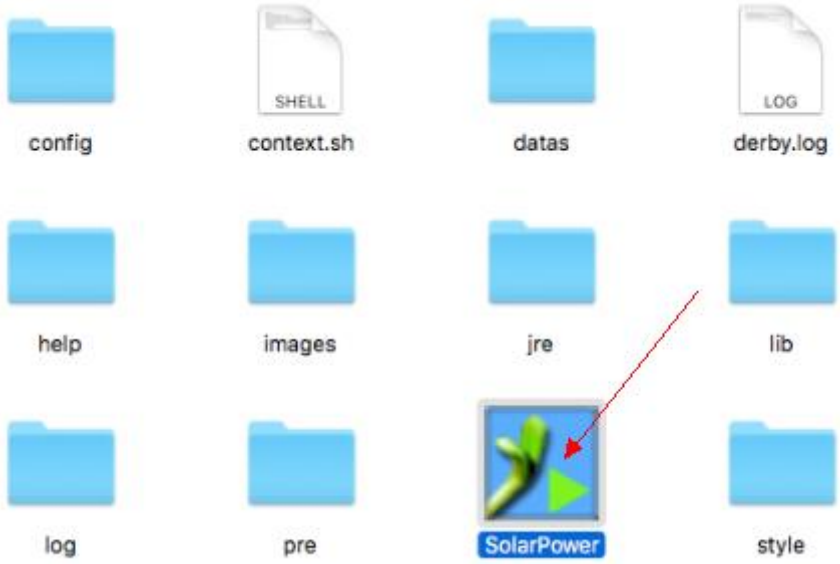
2.2. Software Install

SolarPower is a portable application. It's no need to install this software. You may simply double click "SolarPower.exe" to automatically run this software after extracting files.

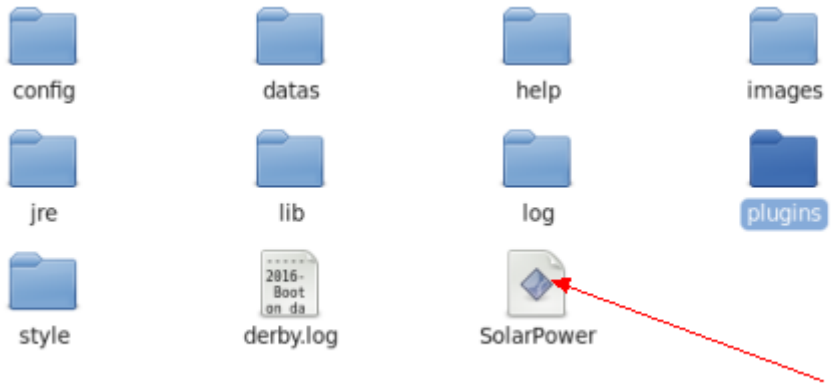
Windows Version:



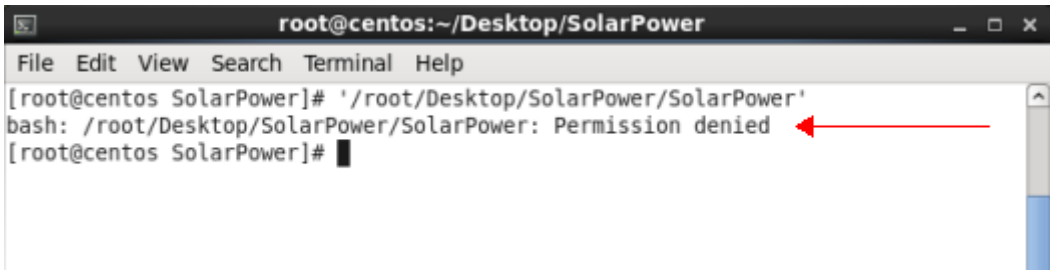
Macosx Version:



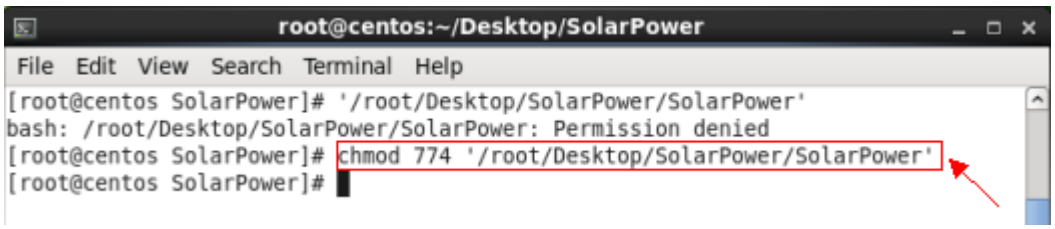
Linux Version:



NOTE: If it's not running after double clicking SolarPower in Linux OS, please check if there is authority to run SolarPower with terminal.



If it shows "Permission denied" in dialog, please send command for elevation of privilege to run SolarPower.



2.3. Software Uninstall

This software becomes portable software. It's easy to delete all files for software uninstallation.

3. Tray Application

3.1. Startup

The Installer will leave a shortcut icon called "SolarPower" on your desktop. Refer to Diagram 3-1. Simply double click the shortcut icon. Then, it will start the software and a service icon will be displayed in the right side of tray. A function menu will pop up after you click the right button of the mouse. Refer to below diagram 3-2.

Diagram 3-1

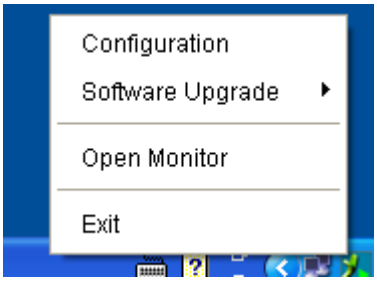


Diagram 3-2

3.2. Configuration

3.2.1. Software Upgrades

Refer to Diagram 3-3 for the detailed configuration for online upgrade:

- Specify the URL for update files: This is the directory to online update software. Please do not change it unless it's instructed by software manufacturer.
- Save files to: The targeted directory in your hard drive.
- Online auto-update: If selected, it will automatically check if there is any new version launched online every 1 hour.
- If applying online upgrade, please follow the configuration below:
  1. Select "Apply the proxy configuration".
  2. Enter IP address and port of the server.
  3. If ID identification is requested, select "Enable authentication" and enter User Name and Password.
- Connection test: Click this button to test if all configurations are set up well.

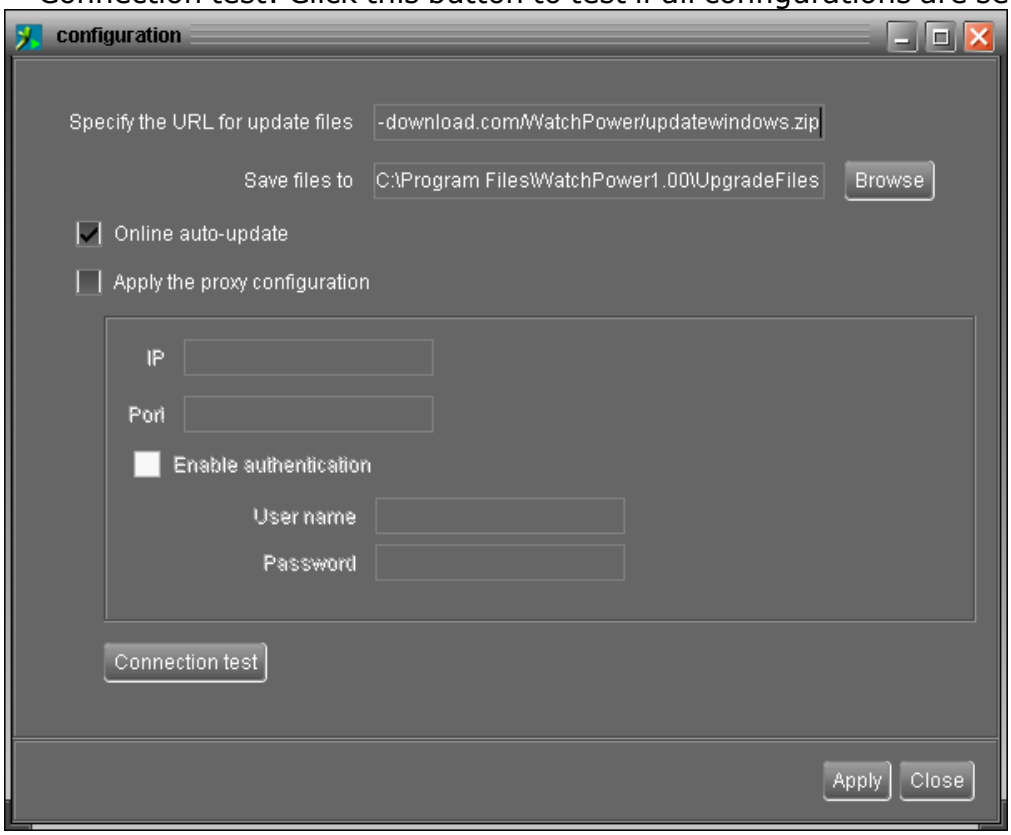


Diagram 3-3

3.2.2. Configuration Saved

Click "Apply" button to save all changes in Configuration page. Click "Cancel" to stop the change.

3.3. Software Upgrade

Software upgrades includes online upgrade and manual upgrade.

- Online Upgrade:
  Click "Online Upgrade" to search the latest software version. If there is any new version, it will be automatically downloaded and upgraded. Refer to Diagram 3-4.

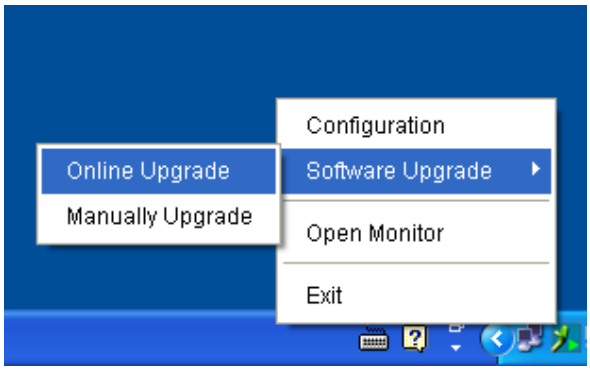


Diagram 3-4

- Manually Upgrade:
  Users can manually upgrade the software. Follow the steps below:
  1. Click "Manually Upgrade" from function menu. Refer to Diagram 3-5.

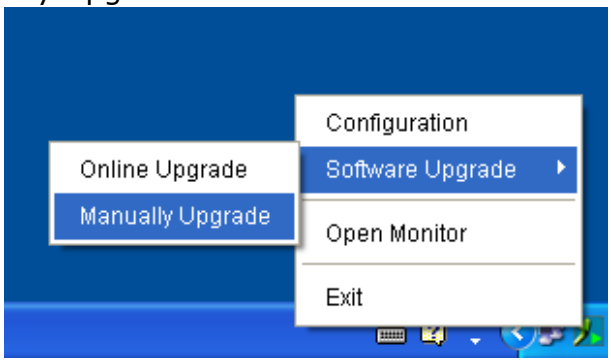


Diagram 3-5

  2. Click "Browse" to choose the targeted file directory. Then, click "Upgrade" to upgrade software. Refer to Diagram 3-6.

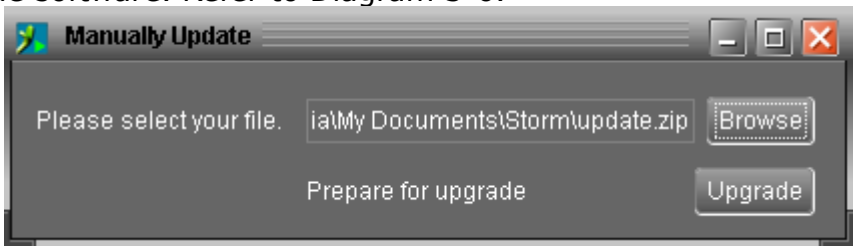


Diagram 3-6

3.4. Open Monitor

Click "Open Monitor" to launch the monitoring webpage of SolarPower.

3.5. Icon and Software Status

- Connecting devices: and will flash in rotation.
- When receiving event message with devices connected: will flash for reminder
- When receiving event message without devices connected: will flash for reminder

3.6. Message Board

Users can check message board for event list. Refer to Diagram 3-26：

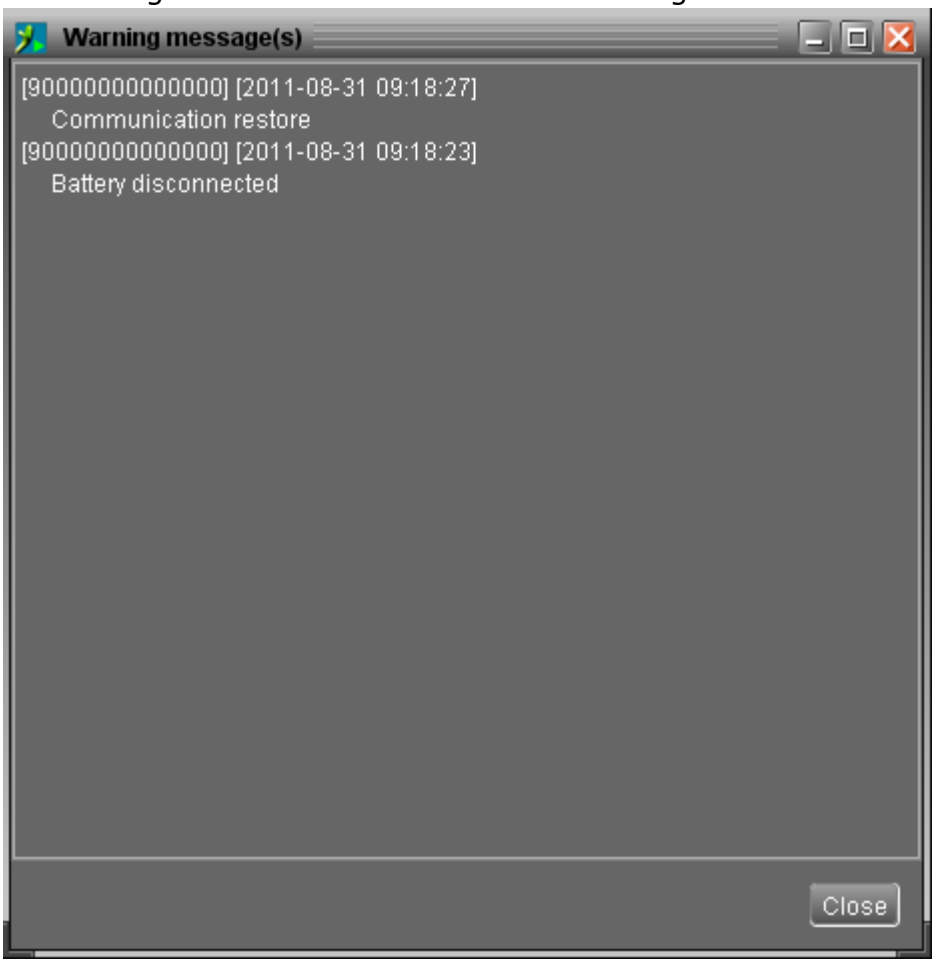


Diagram 3-26

3.7. Exit

Click “Exit” to close monitor application.

4. Graphic User Interface (GUI)

There are five sections in GUI as marked in the illustration below:

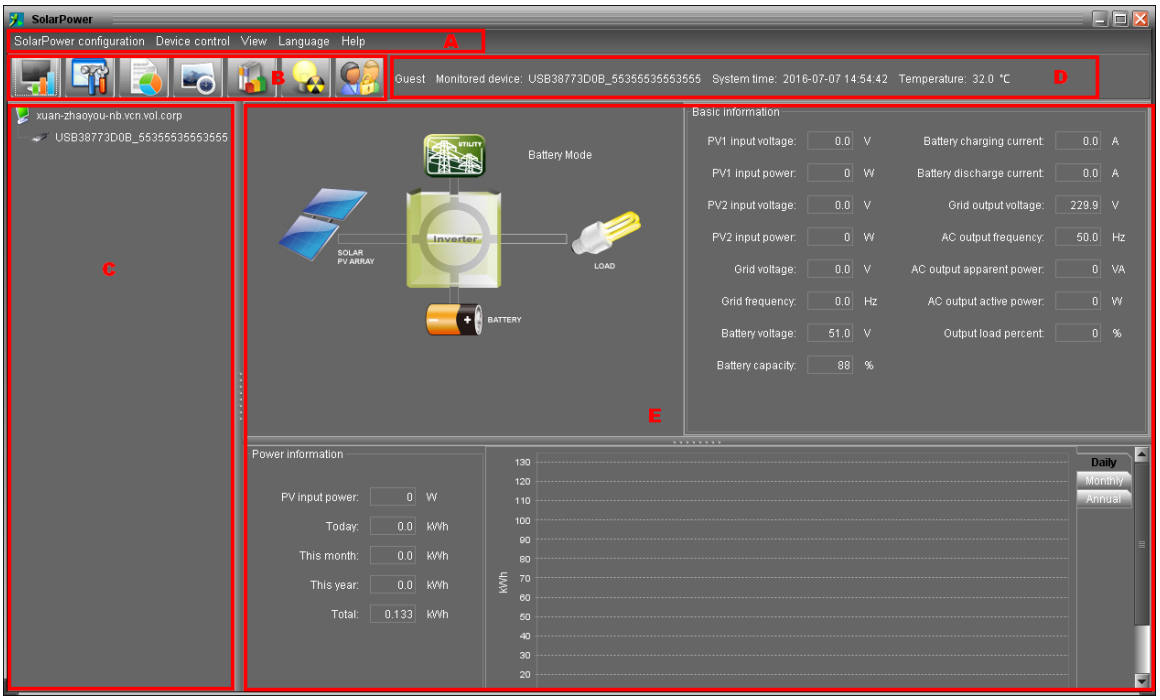


Diagram 4-1

A. Function Menu offers complete tool-set for navigating and setting the GUI.

B. Shortcut Menu provides short cuts to more commonly used functions.

C. Inverter Navigation indicates all devices.

D. Current Monitoring Information displays User ID, monitored inverter ID.

E. Main Window displays power flow, operation information, device information and rated information of current monitored inverter. Refer to Diagram 4-2.

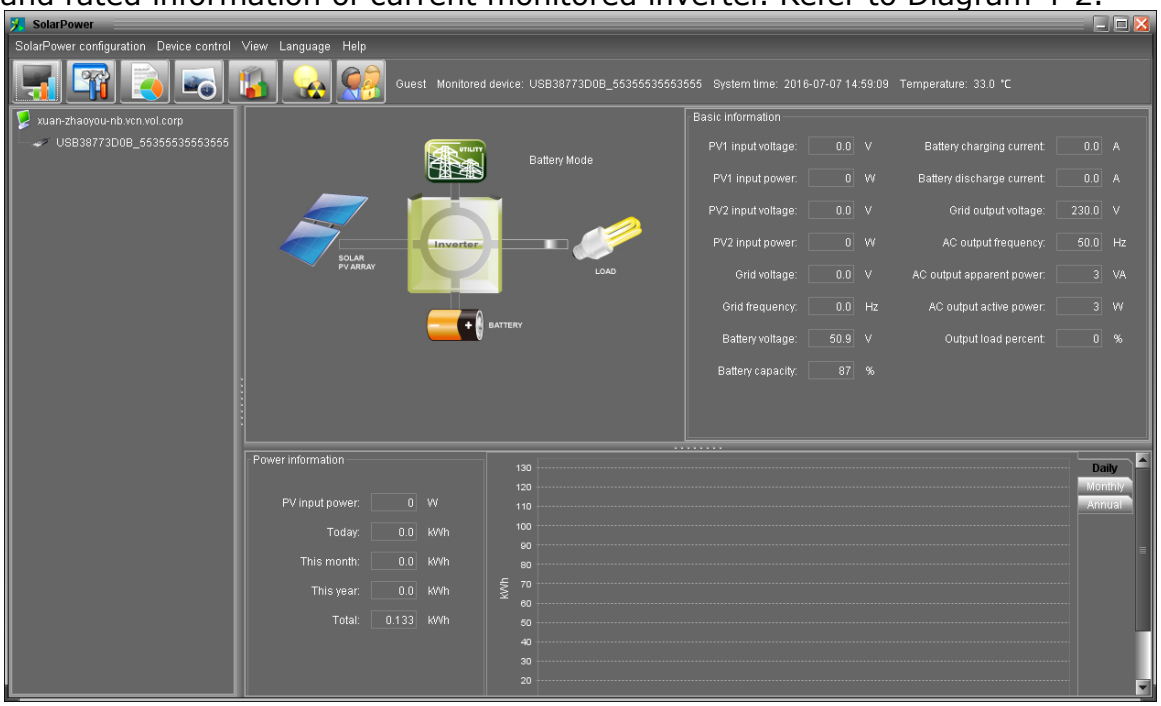


Diagram 4-2

1. Power flow:
   There are five device icons: solar panel, battery, inverter, load and the utility. It displays dynamic power flow with these five device icons.
2. Basic Information:
   It displays information of PV input voltage, PV input power, Grid voltage, Grid frequency, Battery voltage, Battery capacity, Battery charging current, Battery discharge current, Grid output current, AC output frequency, AC output apparent power, AC output active power and Output load percentage.
3. Power Information:

Power information displays real-time PV input power and power generation data based on current date, current month and current year.

Power generation bar chart:

- Display daily power generation in current month when selecting "daily".
- Display monthly power generation in current year when selecting "monthly".
- Display annual power generation so far this year when selecting "annual"

4.1. SolarPower Configuration

4.1.1. Basic

It is to set up parameters for display. Select SolarPower Configuration>>Basic. Refer to Diagram 4-1-1.

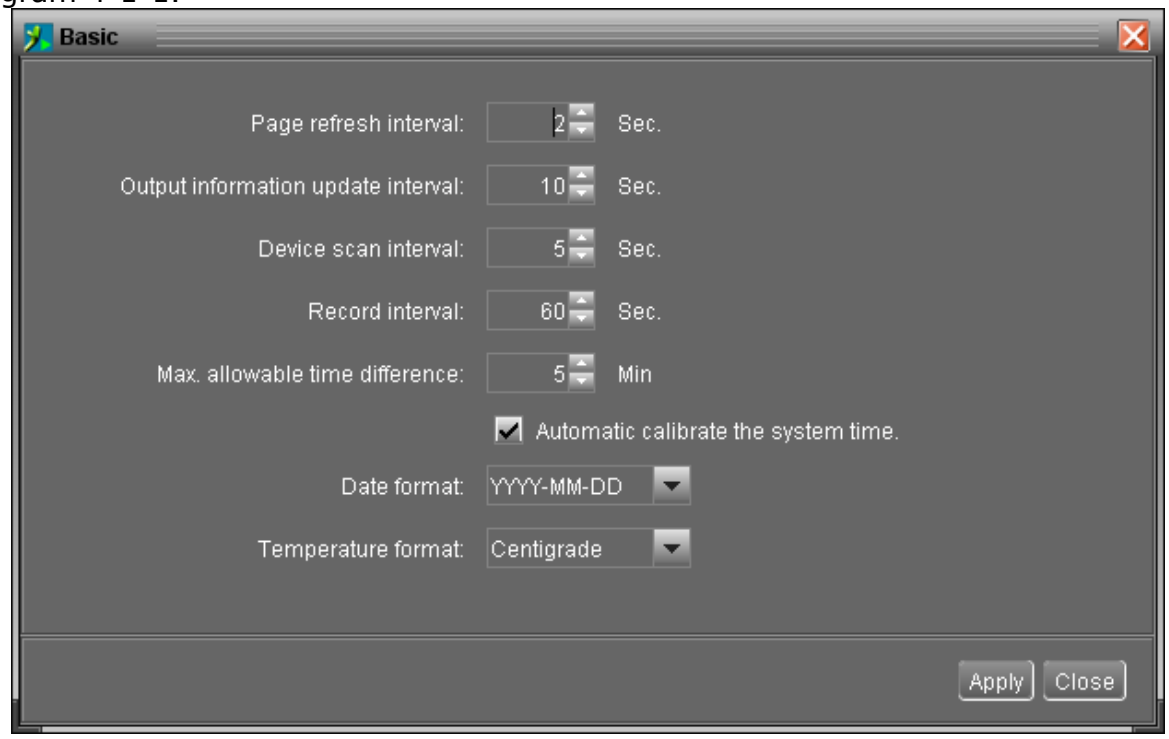


Diagram 4-1-1

1. Page refresh interval: This interval time will determine how often the web page is refreshed. Setting range is from 5 to 600 seconds. The default setting is 5 seconds.

2. Output information update interval: This interval time will determine how often the power generation data is updated. Setting range is from 10 to 600 seconds. The default setting is 20 seconds.
3. Devices scan interval: This interval time will determine how often device-scanning action will be executed. The setting range is from 5 to 600 seconds. The default setting is 5 seconds.
4. Record interval: This interval time will determine how often the monitoring data of solar inverters will be recorded into database. The setting range is from 30 to 600 seconds. The difference between each option is 30 seconds. The default setting is 60 seconds.
5. Max. allowable time difference: It will send alarm message when the time difference between device and computer is longer than setting time. The setting range is from 1 to 60 minutes. The default setting is 5 minutes.
6. Auto time calibration: If selected, it will automatically calibrate the system time.
7. Date format: This system supports 4 different formats: "YYYY-MM-DD", "YYYY/MM/DD", "MM-DD-YYYY" and "MM/DD/YYYY". The default setting is "YYYY-MM-DD".
8. Temperature format: This system supports Centigrade (℃) and Fahrenheit (℉). The default setting is Centigrade (℃).

If any change is made, simply click "Apply" button in the end of the page. Then, the setting will be saved.

4.1.2. Password

It's password configuration for administrator only. Before operating and configuring the software, please login first and modify the password. The default password is "**administrator**" at first login. Users can only browse inverter status and information as Guest without login as an Administrator. A guest can not control or execute any setting.

Step 1 Select SolarPower Configuration>>Password. Refer to Diagram 4-1-2.

Diagram 4-1-2

Step 2 Enter old password, new password and re-type new password again to make

confirmation. The new password should be at least 6 digits. Then, click "Apply" button to successfully modify password for administrator.

NOTE1: Simply click "Login" button on the top right corner to log in the software.

NOTE2: If password is forgotten, it's necessary to re-install the software.

4.1.3. SMS Setting

It's to enter SMS receiver list. In the event of an alarm occurring, a message about inverter status will be sent to the specified users via mobile phone. For the event receiving list, please configure in "Event Action" page (refer to section 4.1.5).

Step 1 Choose SolarPower Configuration >> SMS Setting. Refer to Diagram 4-1-3.

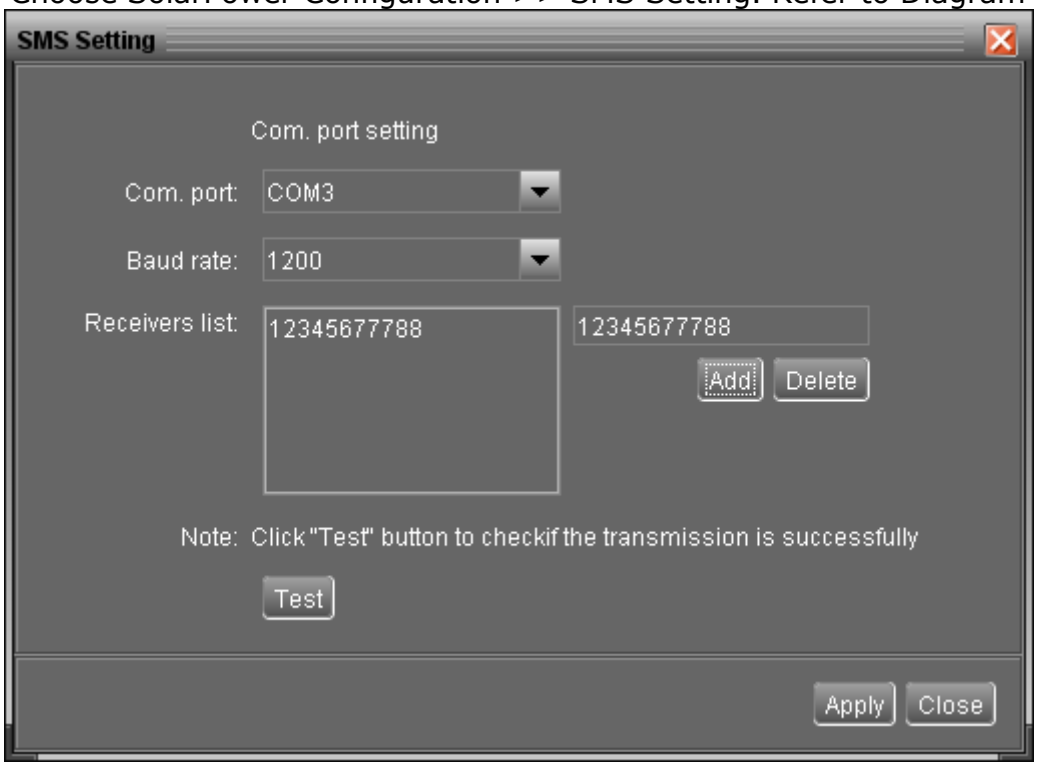


Diagram 4-1-3

Step 2 Select communication port and baud rate.

Step 3 Enter mobile phone numbers in "Phone no." column and click "Add" button to refresh the Receivers list. To delete numbers, simply select phone no. from "Receivers list" and click "Delete".

Step 4 Click "Apply" button to save all changes. The "Test" button can be used to send a test SMS to make sure all setting is correct. If all parameters are set up correctly, system will send a test message to all receivers and a successful message will pop up. (Refer to Diagram 4-1-4) Otherwise, an error dialog will pop up to indicate there is an error in parameter setting. (Refer to Diagram 4-1-5)

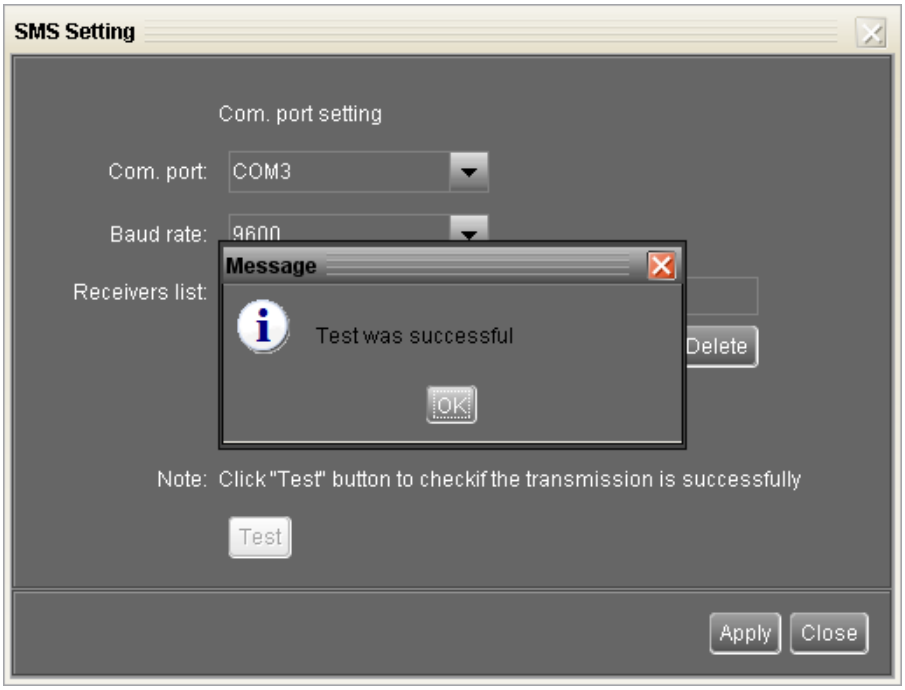


Diagram 4-1-4

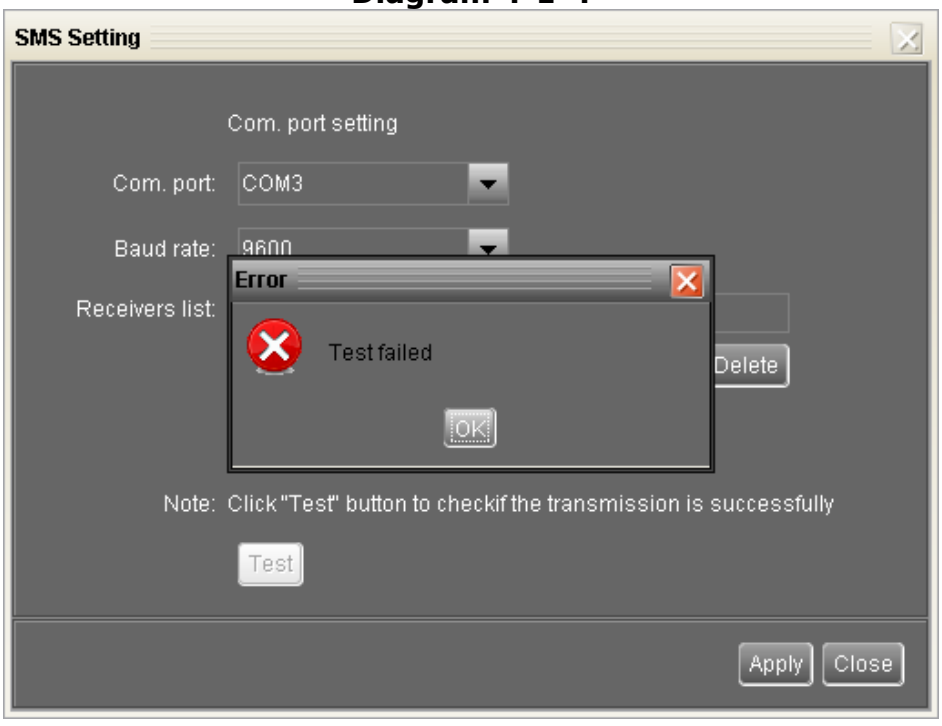


Diagram 4-1-5

NOTE: It's required to plug in a GSM modem if sending a SMS to mobile phone is selected.

4.1.4. E-mail

This configuration is allowed to send an alarm mail from SMTP server. For the event receiving list, please configure in "Event Action" page (refer to section 4.1.5).
To use this function, the e-mail service must be correctly configured in the computer. All columns in this function page are empty in default. This action can't be executed without the SMTP information, e-mail account and password. Besides, the sender account should be allowed for SMTP/POP3 forwarding.

Step 1 Select SolarPower Configuration >> E-mail. Refer to Diagram 4-1-6.

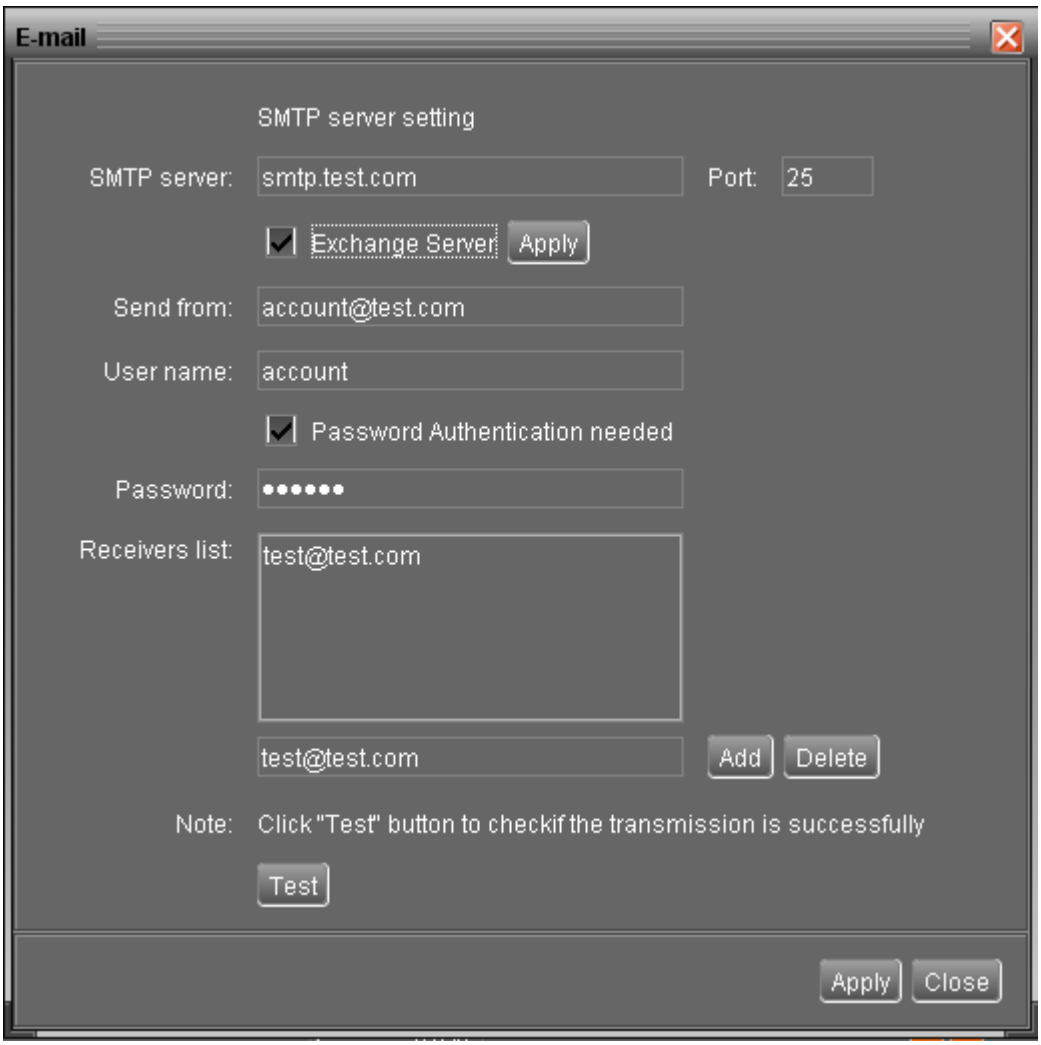


Diagram 4-1-6

Step 2 Enter SMTP server, Port, Send from E-mail address, User name and password. Click checkbox if password authentication is needed to verify password.

NOTE: If using Exchange Server for mailbox system, it's required to configure Exchange server domain name in SMTP server. Beside, please click checkbox of "Exchange server" and click "Apply" button.

Step 3 Enter receivers' e-mail accounts in E-mail column. Then, click "Add" to refresh Receivers list. To delete e-mail account, simply select accounts from Receivers list and click "Delete" button.

Step 4 Click "Apply" to save all changes. The "Test" button can be used to send a test e-mail to all receivers to confirm correct operation. When the test e-mails are successfully sent to specific recipients, a successful message will pop up on the operating personal computer. Otherwise, a failure dialog will pop up to indicate there is an error in parameter setting.

4.1.5. Event action

It's to configure response actions of events. It provides four response actions after events occur.

1. **Event record:** It will record events to data log in software if events occur. This function is selected in default.
2. **Warning message(s):** It will send event message to tray.
3. **SMS:** It will send event message to specific mobile phone numbers after events occur.
4. **E-mail:** It will send event e-mail to assigned e-mail accounts after events occur.

Step 1 Select SolarPower Configuration >> Event action. Refer to Diagram 4-1-7.

Step 2 Select action methods by clicking checkbox.

Step 3 Click "Apply" button to save all configurations.

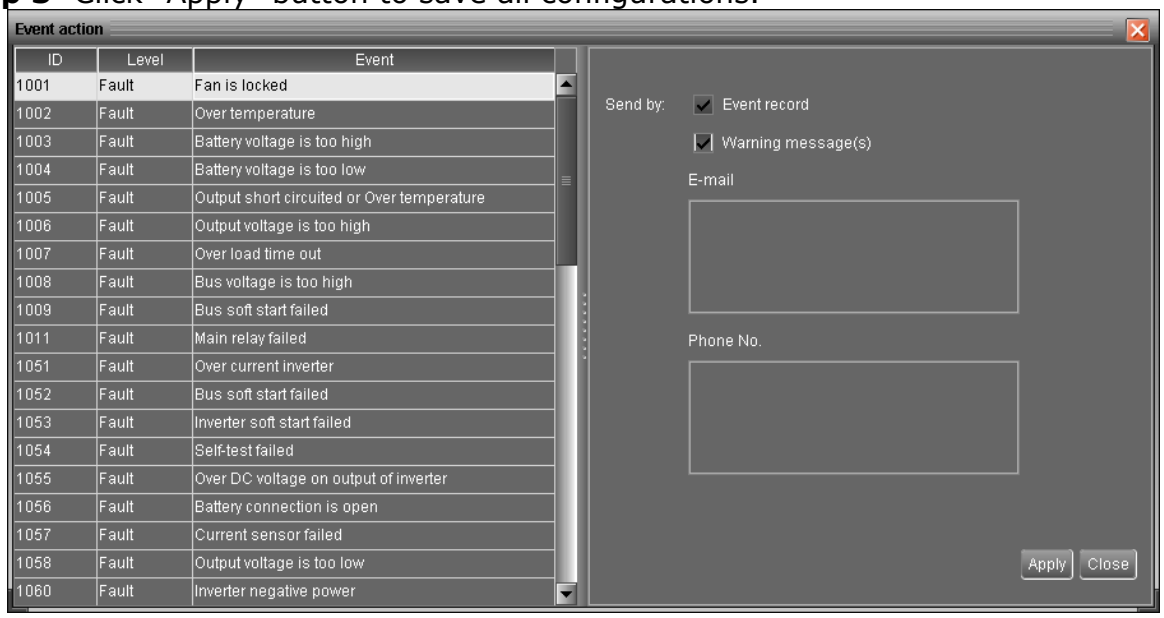


Diagram 4-1-7

NOTE1: If there is any modification in receiver list of SMS or e-mail pages, it's necessary to refresh event action page to reload the updated receiver list.

4.1.6. Com. port Plug and Play Setting

To monitor inverter device in real-time, each com. port will be scanned anytime. In this case, it will occupy communication ports. This function will release some communication ports which are not connected with devices. To avoid any improper operation, in-used communication ports will be displayed in disabled grey icons. Users can select "Allow scanned" to re-scan or "No scanning" to release communication ports based on requirements.

Step 1: Select SolarPower configuration>> Com. port plug and play setting. Refer to Diagram 4-1-8.

Diagram 4-1-8

Step 2: Click "Refresh" to reload the status of com. ports.

Step 3: Click "No scanning" to stop scanning on this com. port. Click "Allow scanned" to start scanning on this com. port.

4.2. Device control

4.2.1. Parameter Setting

This page is to activate some features and set up parameters for inverters.

Select Device Control >> Parameter Setting or select shortcut icon  . Refer to Diagram 4-2-1.

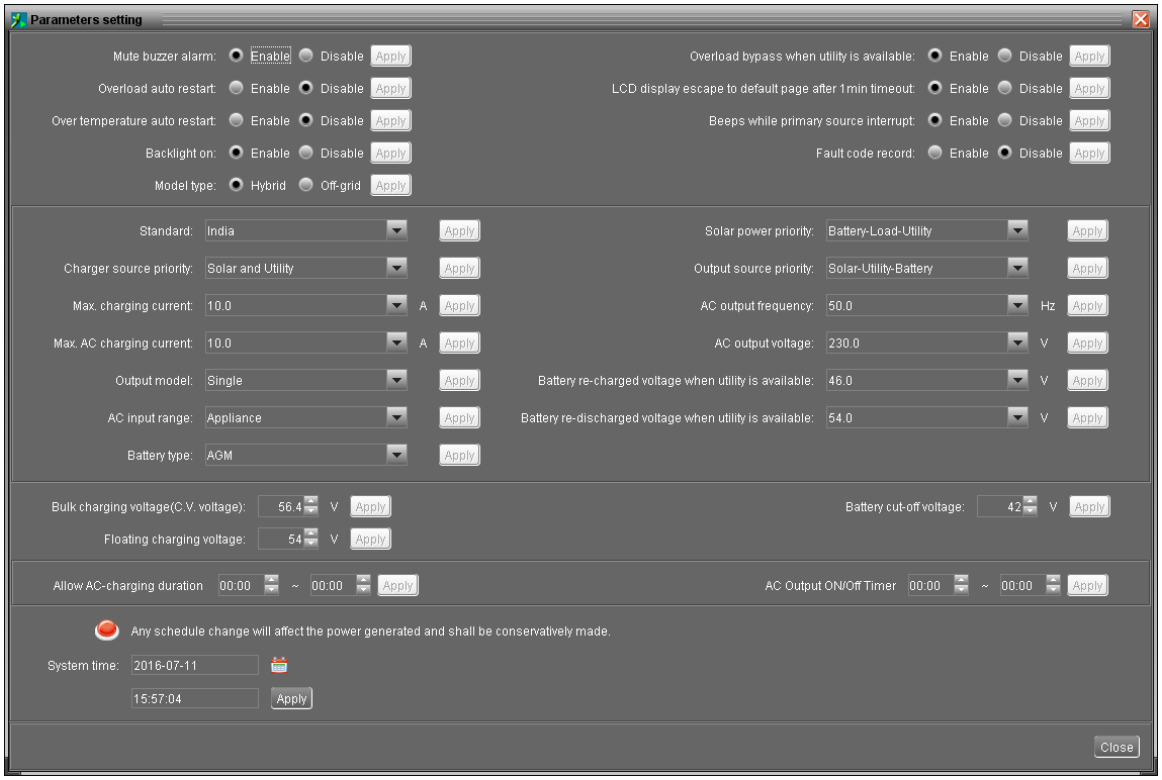


Diagram 4-2-1

NOTE: This screen may vary for different models of inverter.

Step 1 Activate/Shut down functions by clicking "Enable" or "Disable" button. Some parameters are allowed to change the numbers by clicking up-down arrows or modify the numbers directly in the number column.

Step 2 Click "Apply" button to save the settings. Each function setting is saved by clicking each "Apply" button.

- Buzzer alarm: If disabled, buzzer won't be on when alarm/fault occurred. Vice versa.
- Overload auto restart: If disabled, the unit won't be restarted after overload occurs. Vice versa.
- Over temperature auto restart: If disabled, the unit won't be restarted after over-temperature fault is solved. Vice versa.
- Backlight on: If disabled, LCD backlight will be off when panel button is not operated for 1 minute. Vice versa.
- Model type: There are two operation modes to set up for this hybrid inverter, Hybrid and Off-grid. If Hybrid is selected here, this inverter can feed power to the grid and you will find "hybrid type" in production information. If "Off-grid" is selected here, this inverter will not feed power to the grid and you will find "Off-grid type" in product information.
- Overload bypass when utility is available: If enabled, unit will be transferred to line mode when overload happens in battery mode. Vice versa.

- LCD screen returns to default display screen after 1 min.: If enable, LCD screen will return to default display screen after no button is pressed in one minute. Vice versa.
- Beeps while primary source interrupts: If enabled, buzzer will alarm when primary source is abnormal. Vice versa.
- Fault code record: If enabled, fault code will be recorded in the inverter when any fault happens.
- Standard: There are two options: India and Germany.
  - ✓ India standard: If "india" is selected, it allows feed-in grid voltage range at 195.5 ~ 253VAC and feed-in grid frequency range at 49~51Hz.
  - ✓ Germany standard: If "Germany" is selected, it allows feed-in grid voltage range at 184~264.5VAC and feed-in grid frequency range at 47.5~51.5Hz.
- Charger source priority: Click up-down arrows to set up the priority of charger source. There are 3 options: solar first, Solar and Utility and Solar only. See product manual for the details of these options. Refer to Diagram 4-2-2.

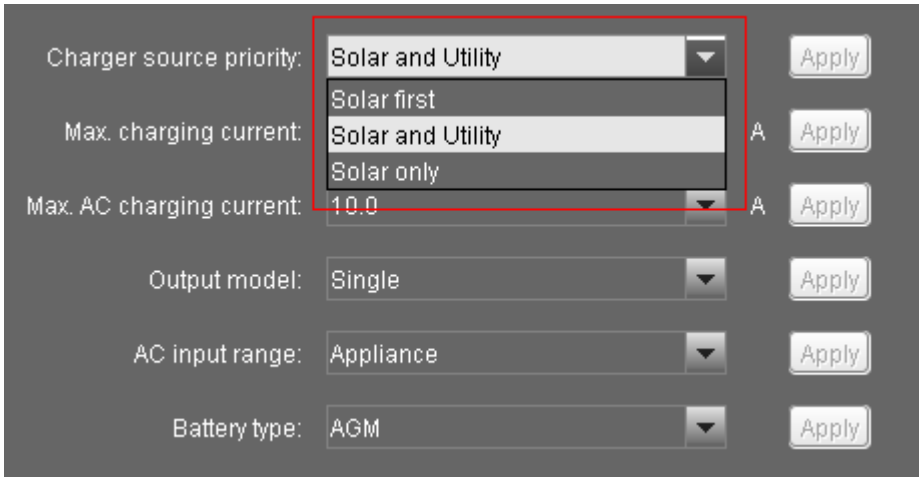


Diagram 4-2-2

- Max. charging current: Click arrow to set up maximum charging current. Maximum charging current in different inverter model may vary. Please refer to product manual for the details.
- Max. AC charging current: Click arrow to set up AC charging current. For the detailed setting, please check inverter manual.
- Output mode: In this setting, the options will vary based on different inverter models. Refer to Diagram 4-2-3.
  - ■ Single: This inverter is set for singe operation.
  - ■ Parallel: This inverter is set for parallel operation.
  - ■ Phase R of 3 phase output: This inverter is set to support connected loads in phase R of 3 phase output.
  - ■ Phase S of 3 phase output: This inverter is set to support connected loads in

phase S of 3 phase output.

- Phase T of 3 phase output: This inverter is set to support connected loads in phase T of 3 phase output.

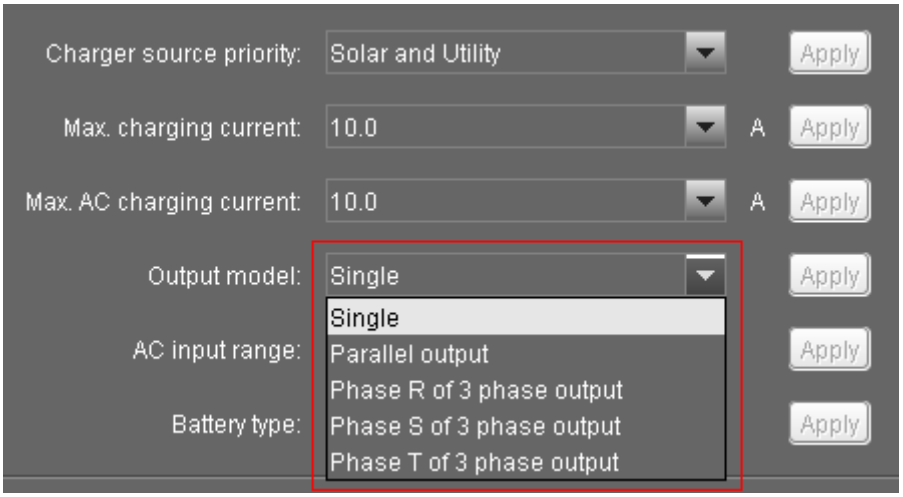


Diagram 4-2-3

- AC input range: Click up-down arrows to set up suitable input range for connected devices. When selecting "Appliance", it's allowed to connect with home appliances. When selecting "UPS", it's allowed to connect with personal computer. For the detailed input range for connected devices, please check product manual. Refer to Diagram 4-2-4.

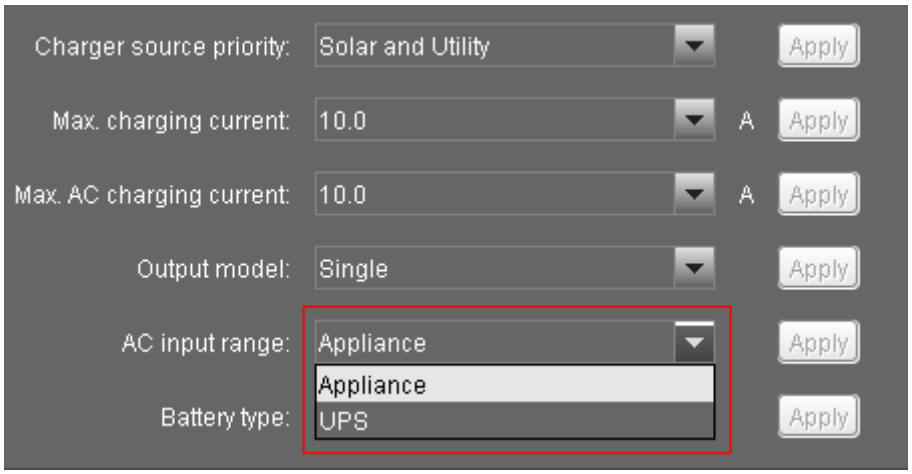


Diagram 4-2-4

- Battery type: Select connected battery type. There are three options AGM ,Flooded and User. Please refer to product manual for charging parameter for these two battery types. Refer to Diagram 4-2-5.

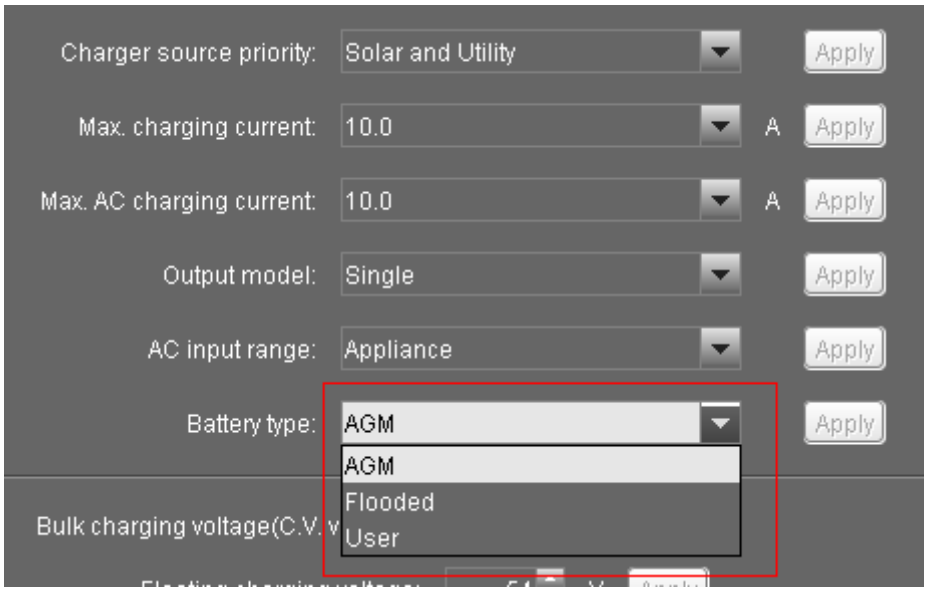


Diagram 4-2-5

- Solar power priority: There are two options including Battery-Load-Utility and Load-Battery-Utility. Please refer to product manual and Diagram 4-2-6.

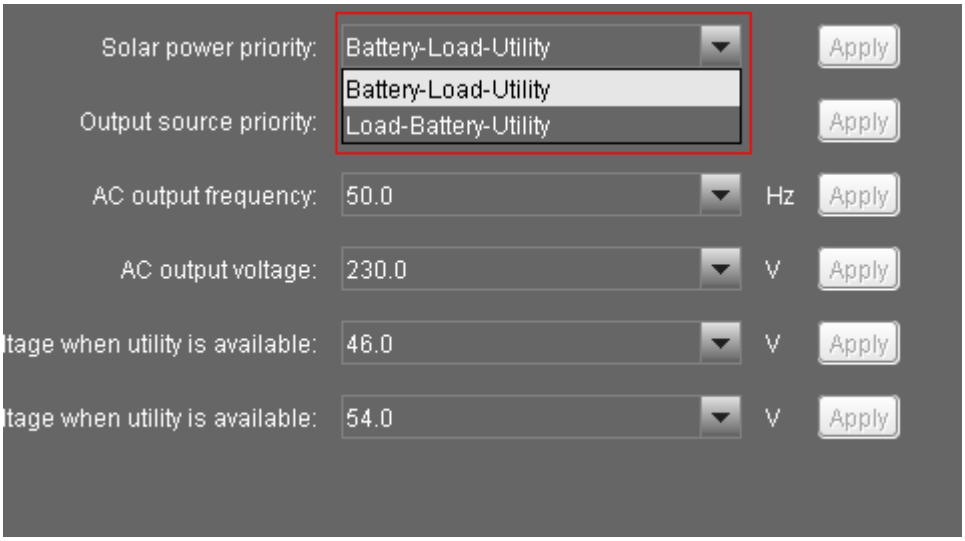


Diagram 4-2-6

- Output source priority: Click up-down arrows to set up the priority of output source. There are 2 options: Solar-Utility-Battery and Solar-Battery-Utility. See product manual for the details of these options. Refer to Diagram 4-2-7.

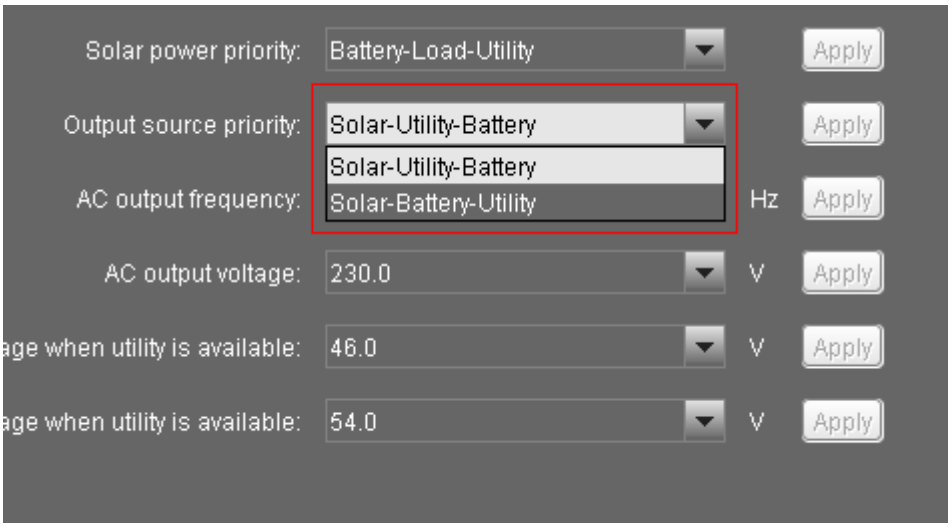


Diagram 4-2-7

- AC output frequency: Nominal output frequency, 50Hz and 60Hz selectable.
- AC output voltage: Click arrow button to select output voltage in battery mode.
- Battery re-charged voltage when utility is available: Click arrow to set up low battery voltage point. If "Solar-Utility-Battery" is selected in output source priority, the inverter will transfer output source to grid when battery voltage drop to low battery voltage point.
- Battery re-discharged voltage when utility is available: When battery voltage is higher than this setting voltage, battery will be allowed to discharge.
- Bulk charging voltage (C.V. voltage): Click arrow to set up bulk charging voltage. Please refer to product manual for the recommended bulk charging voltage based on connected battery type.
- Float charging voltage: Click arrow to set up float charging voltage. Please refer to product manual for the recommended float charging voltage based on connected battery type.
- Battery cut-off voltage: In battery mode, when battery voltage is lower than cut-off voltage point, inverter will shut down battery and transfer to fault mode.
- Allow AC-charging duration: It's a period to allow AC to charge battery. If setting as 00:00~00:00, it means AC charger operates all-time.
- AC output On/Off timer: It is to set up AC output daily on and off time. If setting as 00:00 / 00:00, it means AC output timer function is disabled.
- System time: It presents the device time zone. Any modification may affect the calculation of power generation. Please conservatively make any change.

4.2.2. Restore to the defaults

This function is allowed to restore all settings back to default values.

Select Device control >> Restore to the defaults. Refers to Diagram 4-2-8.

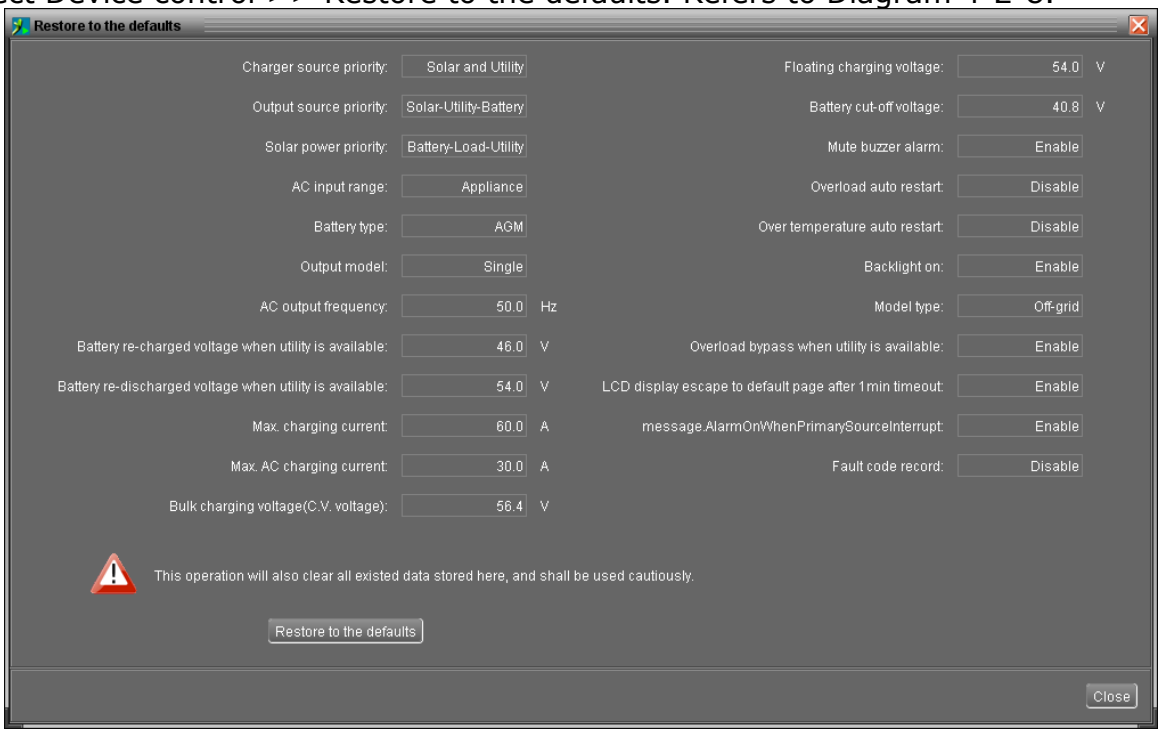


Diagram 4-2-8

NOTE: This screen may vary for different model of inverter.

4.3. View

4.3.1. Power generation log data

This function is to browse, calculate, or delete power generation data in the datasheets or chart formats.

- **Datasheets**

Select View >>Power generation log data>>Datasheets or click shortcut icon  . Refer to Diagram 4-3-1.

Select browsed device and period. Then, click "Browse" to get result.

- **"Export excel"**: When selected and click "Export, it will save listed table to local PC in .xls file.
- **"Delete":** Select specific data and click "Delete" button to delete the record.
- **"Export":** Click "Export" button to save listed table to local PC in .PDF file.

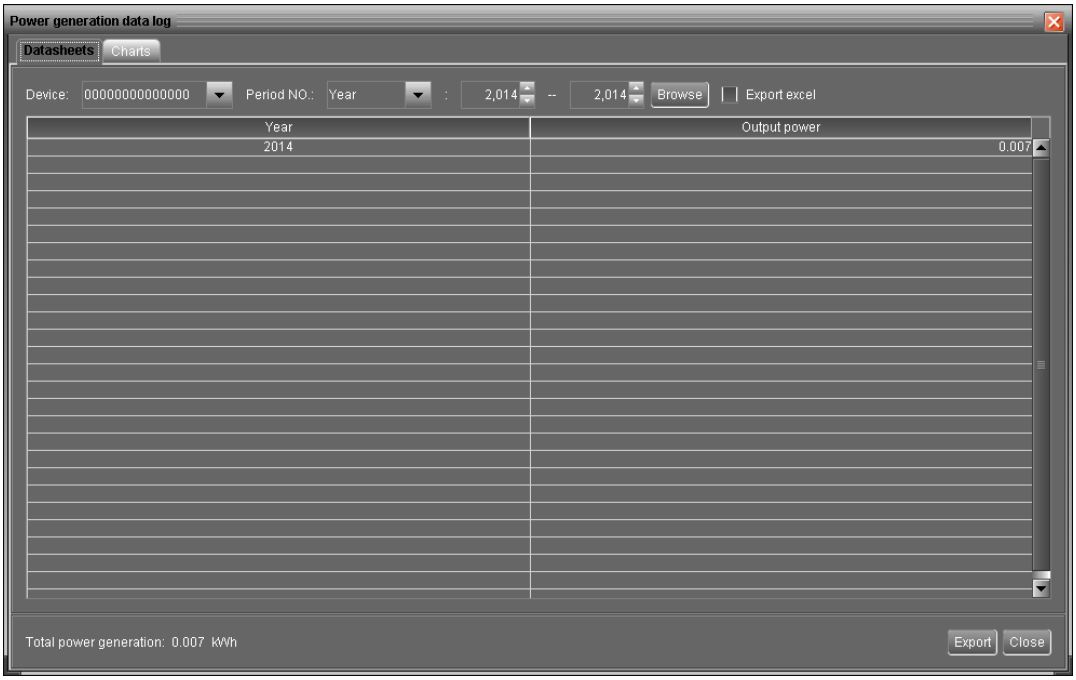


Diagram 4-3-1

- **Charts**

Select View >> Power generation log data >> Charts. Refer to Diagram 4-3-2.

Select browsed device and period. Click “Browse” to get result.

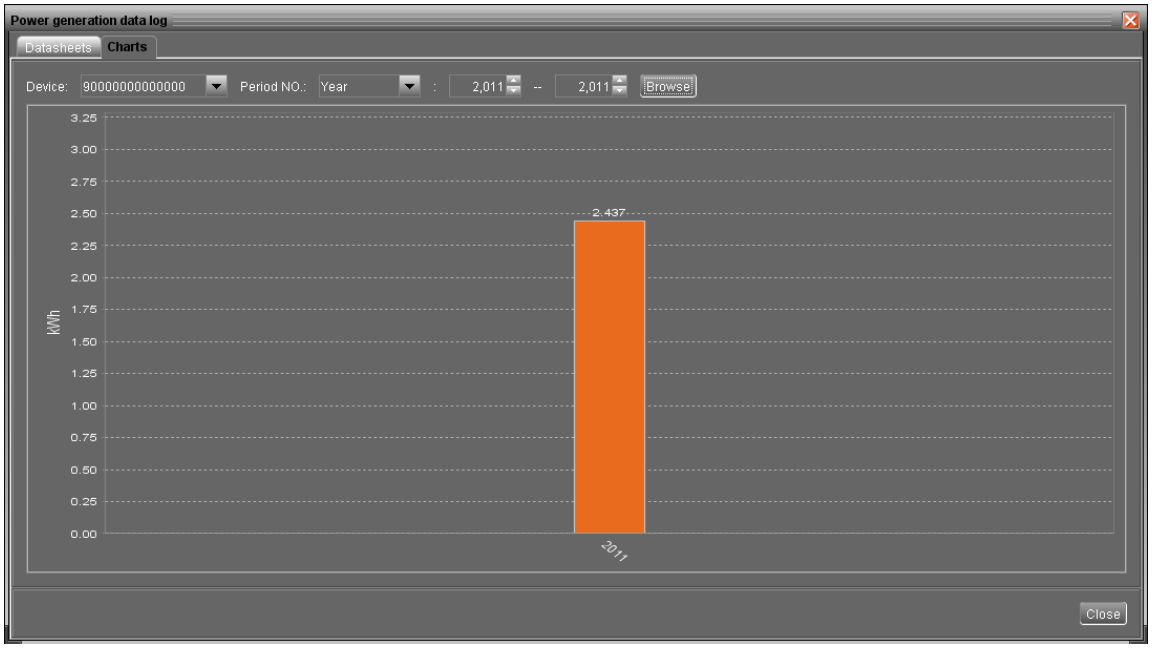


Diagram 4-3-2

4.3.2. Data

This function is to browse the working data of inverter saved in table or chart format.

- Datasheets

Select View >>Data>>Datasheets or click shortcut icon  . Refer to Diagram 4-3-3.
Select browsed device and period to display in the screen. Click "Browse" to get result.

- **"Print":** Print the listed data table.
- **"Delete":** Select specific data and click "Delete" button to remove the record.
- **"Delete all":** Click "Delete All" button to remove all records in the listed table.
- **"Export":** Click "Export" button to save listed table to local PC in .PDF file.
- **"Export Excel":** When selected and click "Export", it will save listed table to local PC in .xls file.

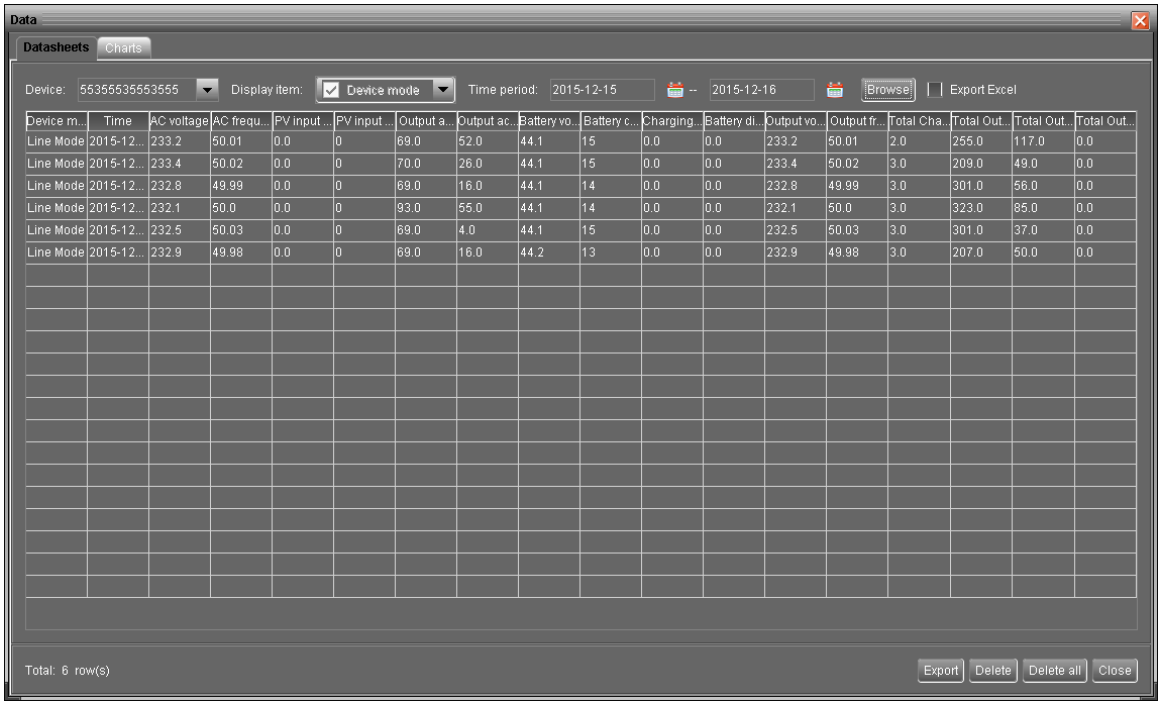


Diagram 4-3-3

- **Charts**

Select View >>Data>>Charts. Refer to Diagram 4-3-4.
Select browsed device and period. Then, click "Browse" to get the result.

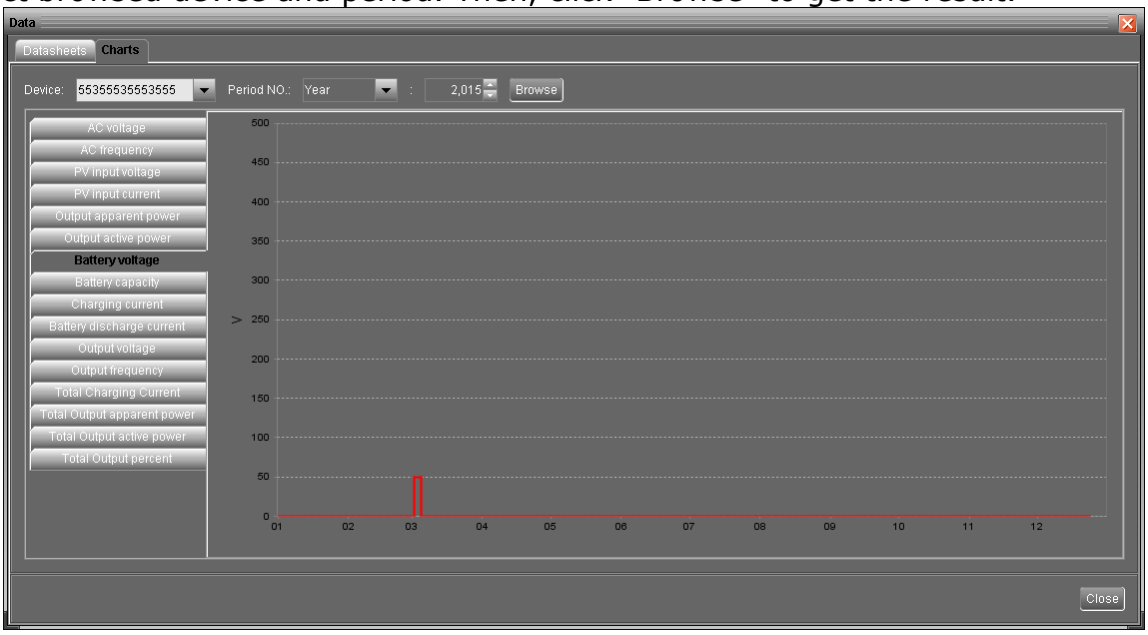


Diagram 4-3-4

4.3.3. Event log

Select View >>Event log or click shortcut icon  to enter event log.
It's to browse event history according to selected time duration. It lists all detailed information and statistics for history events. Refer to Diagram 4-3-5.

- **"Delete":** Select specific data and click "Delete" button to remove the record.
- **"Delete all":** Click "Delete All" button to remove all records in the listed table.
- **"Export":** Click "Export" button to save listed table to local PC in .PDF file.
- **"Export Excel":** When selected and click "Export", it will save listed table to local PC in .xls file.

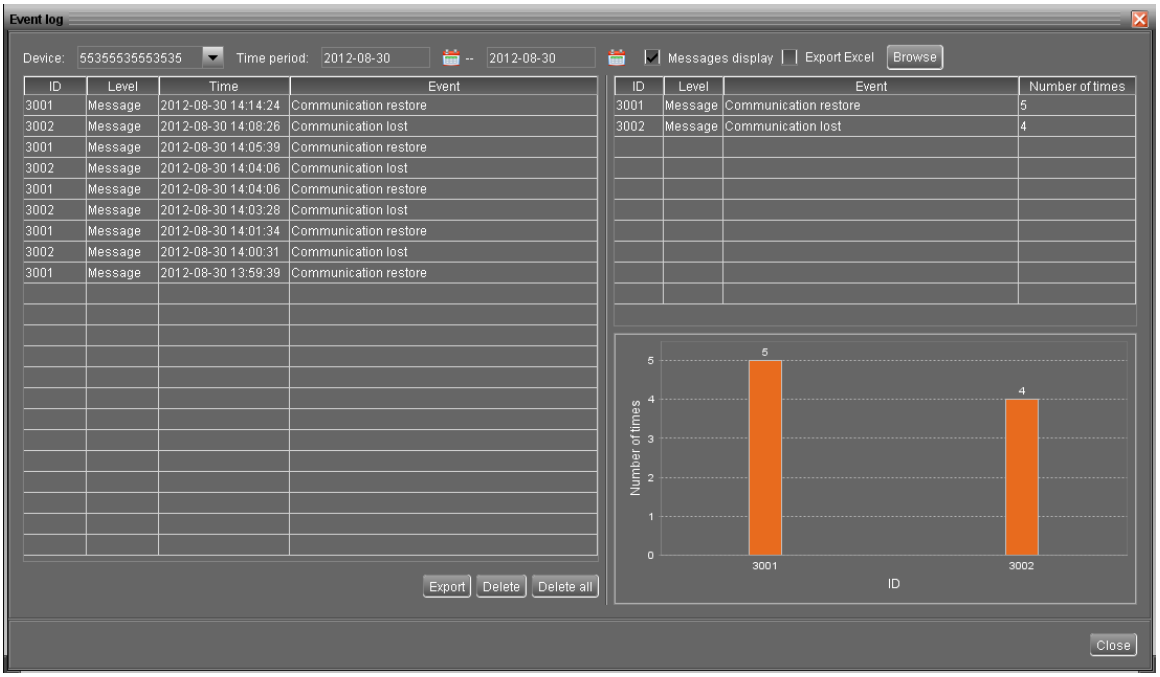


Diagram 4-3-5

4.3.4. Fault data log

Select View >>Fault data log. Refer to Diagram 4-3-6.

It's to record the latest fault event occurring on the inverter.

- **"Delete":** Select specific data and click "Delete" button to remove the record.
- **"Delete all":** Click "Delete All" button to remove all records on the listed table.
- **"Export":** Click "Export" button to save listed table to local PC in .PDF file.
- **"Export Excel"**: When selected and click "Export", it will save listed table to local PC in .xls file.

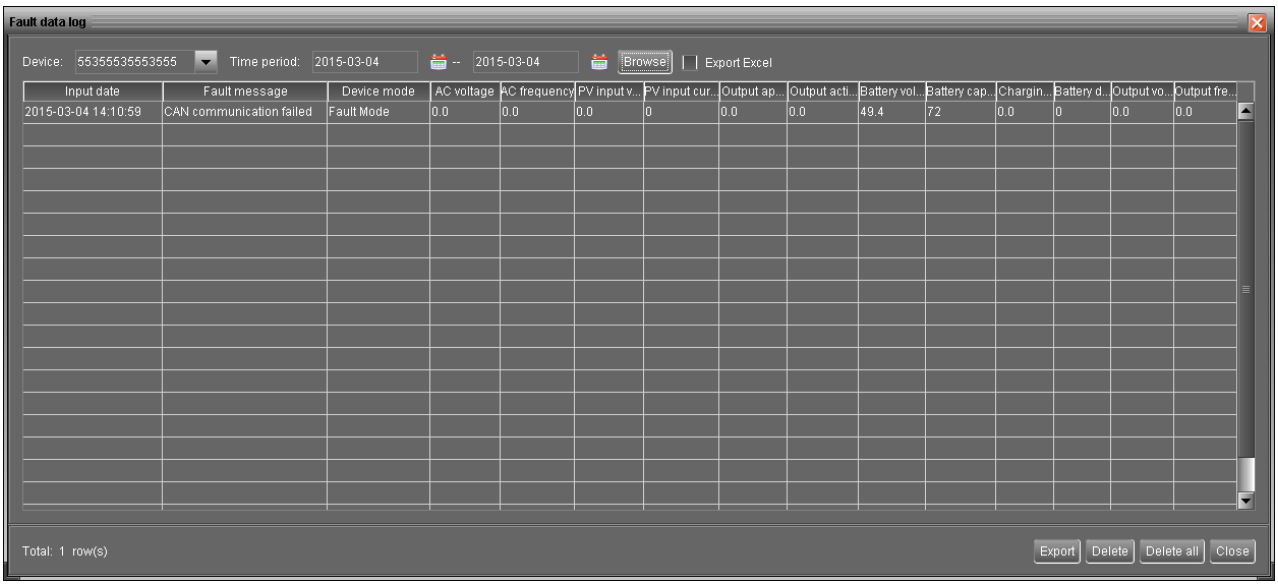


Diagram 4-3-6

4.3.5. Monitored Device Information

This screen will display basic information of monitored device, including Product information, rated information and purchasing information.

Select View >> Monitored Device Information or click shortcut icon  . Refer to Diagram 4-3-7.

- Product information: It includes Model type, Topology, Main CPU processor version, Slave 1 CPU version and Slave 2 CPU version.
- Rated information: It includes nominal AC input voltage, nominal AC current, nominal output voltage, nominal output current, nominal output frequency, nominal output active power, nominal output apparent power and rated battery voltage.
- Purchasing information: It includes Purchasing date, Warranty for device, Device P/N, and so on.

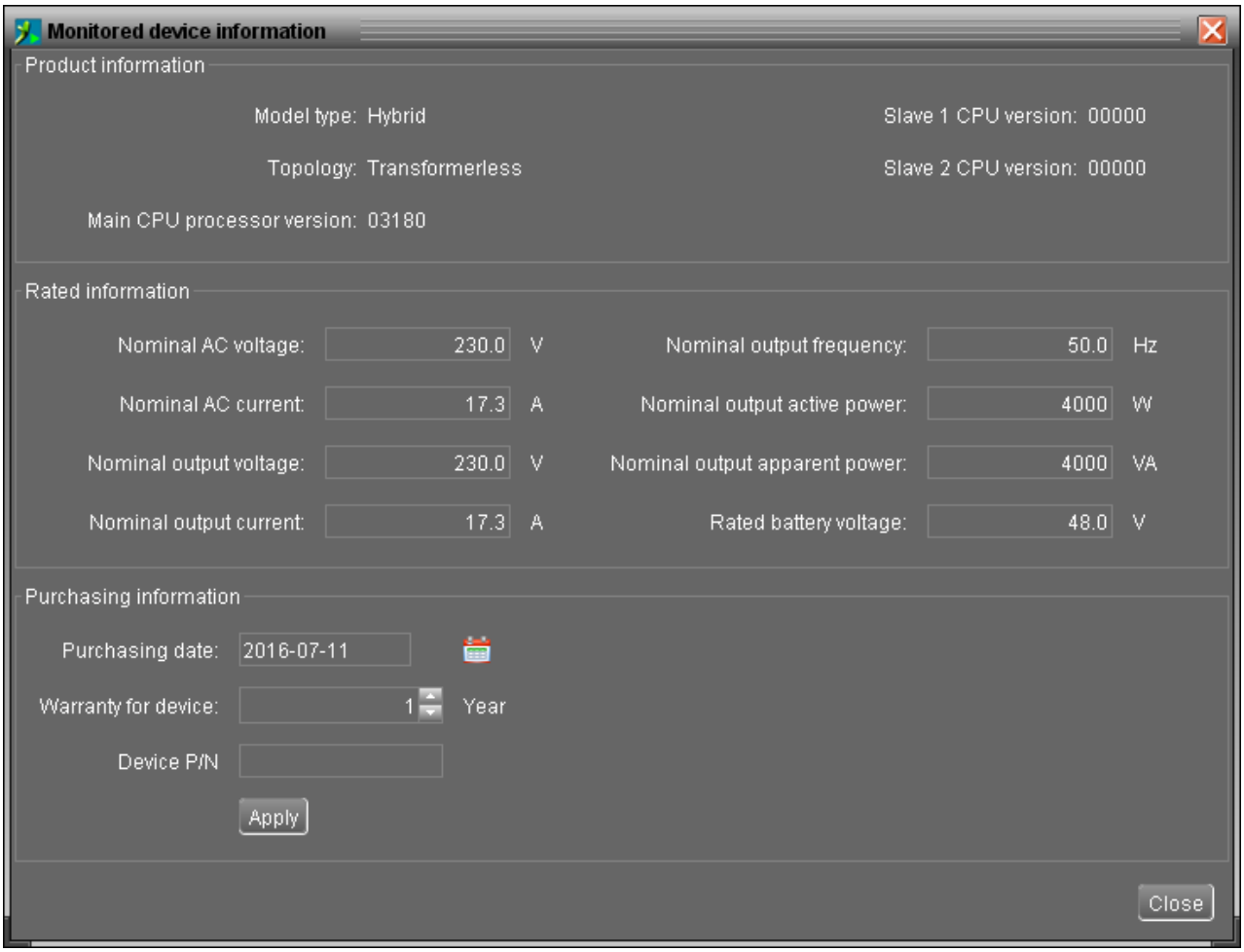


Diagram 4-3-7

4.4. Log in and Log out

This shortcut icon  is to display the login status. When icon  is displayed, it means user status is guest. When icon  is displayed, it means user logins as administrator.

Click icon  and enter password to login the software. The default password is "administrator". Refer to Diagram 4-4-1.

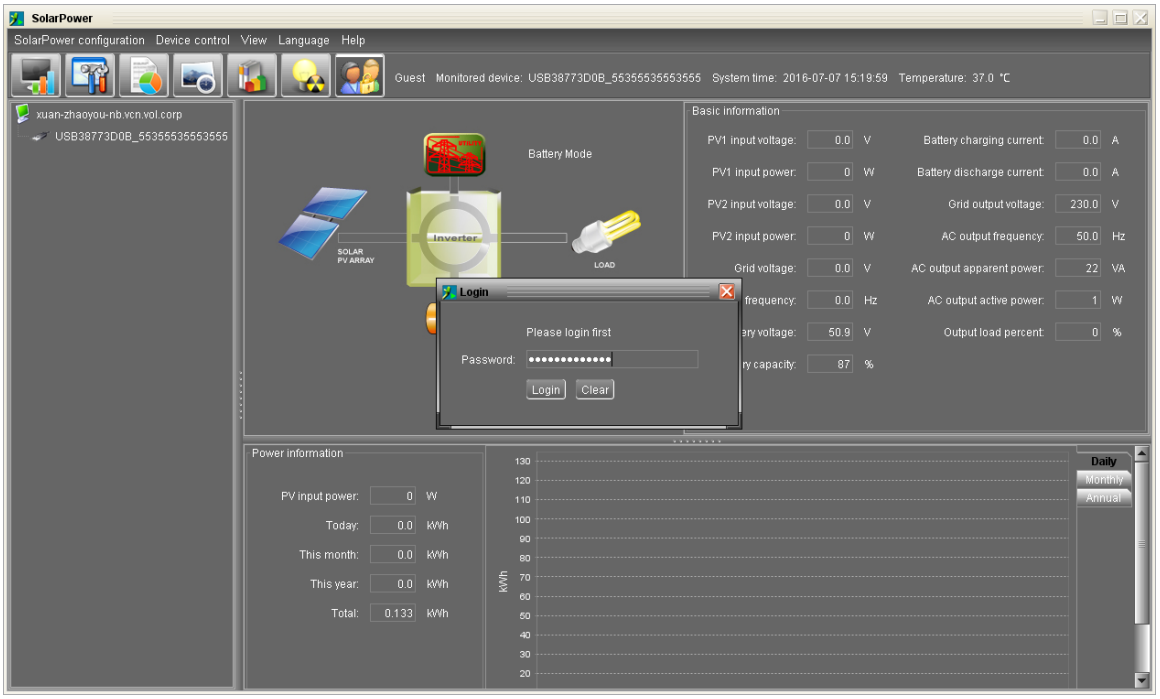


Diagram 4-4-1

Click icon  to log out. Then, the status will become "guest". Refer to Diagram 4-4-2.

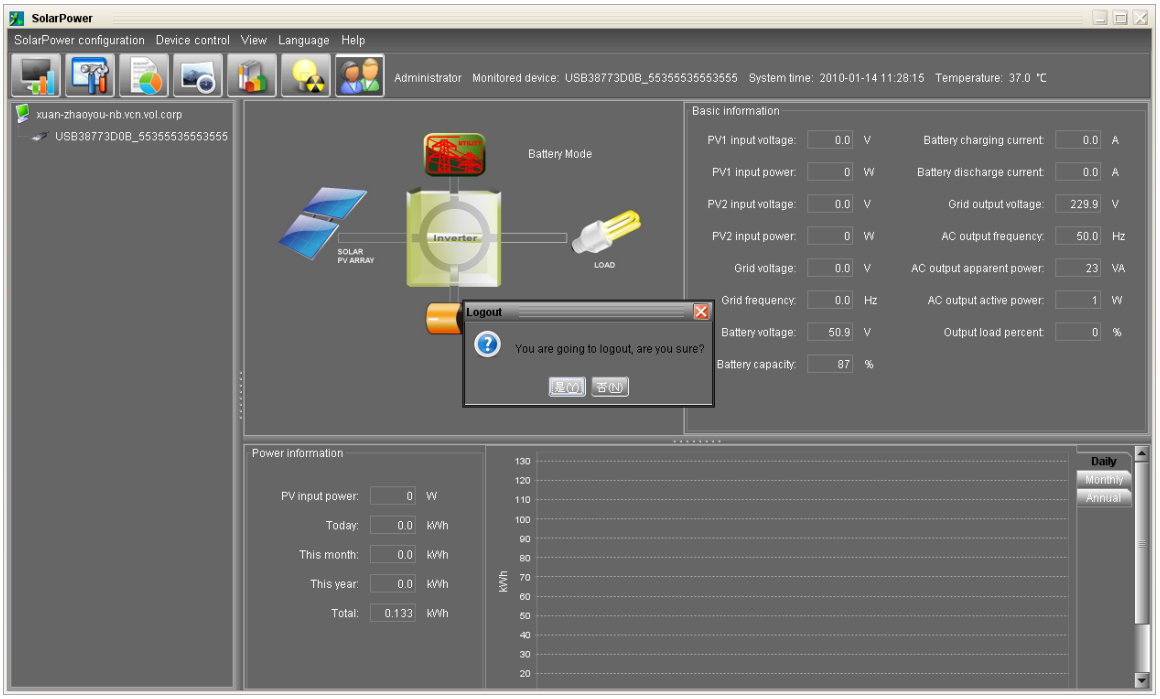


Diagram 4-4-2

4.5. Language

Currently, software offers some languages for selection:

√ Chinese (Simplified)

√ Chinese (Traditional)

√ English

√ German

√ Italian

√ Polish

√ Portuguese

√ Russian

√ Spanish

√ Ukrainian

√ French

√ Turkish

√ Japanese

When you use the software at the first time, it will search a proper language to display according to your OS language.

4.6. Help

- **About**: Click "Help" menu and select "About" item. It represents the copyright information about software
- **Help**: Click "Help" menu and select "Online help" item. It will open the help manual. Before operating software, please read the manual carefully.