SolarPower

User Manual

Suitable for:

- 5KW/ 4KW Grid-tie inverter with energy storage
- 5KW/ 4KW Off-Grid inverter

Management Software for Solar Inverter

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1. SolarPower Overview

1.1 Introduction

SolarPower is a smart solar inverter monitoring software to monitor multiple devices via USB and Serial port at the same time. The major functions of SolarPower monitoring software include data log for devices, power generation statistics, alarm messages, fault messages and parameter settings 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 and amount calculation for energy saving
- Supports online upgrade and manually upgrade

2. SolarPower Install and Uninstall

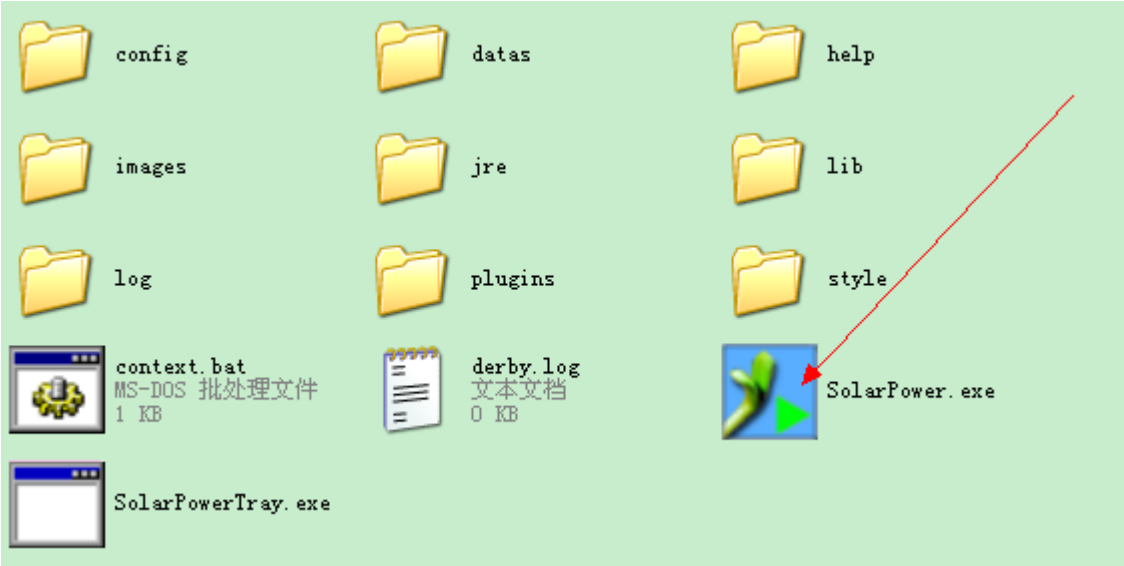
2.1 System Requirement

- 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/7/8/10 (32bit &x64bit)
  - 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(x64bit)

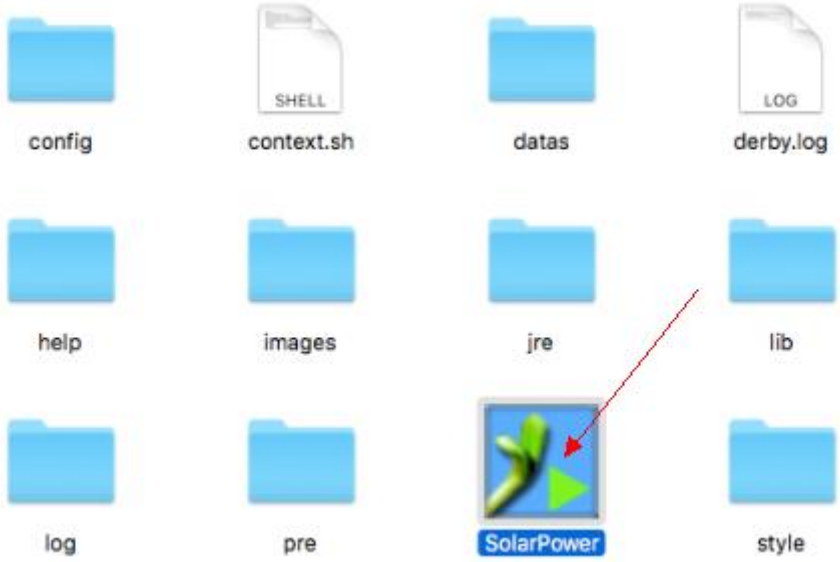
2.2 Software Install

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.

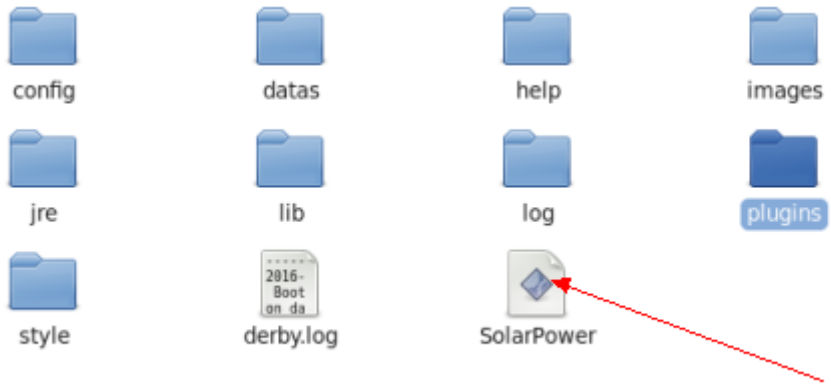
Windows Version:



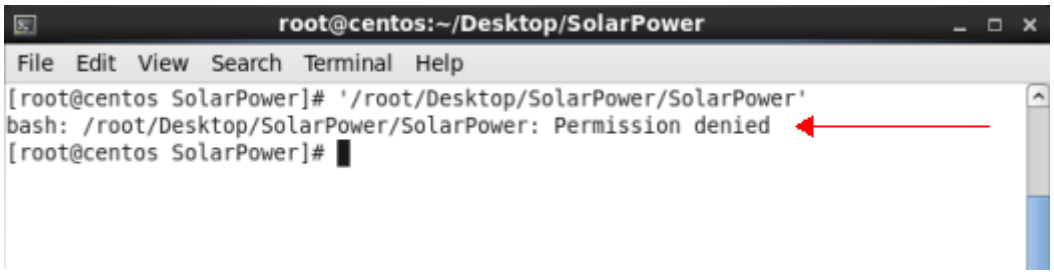
Macosx Version:



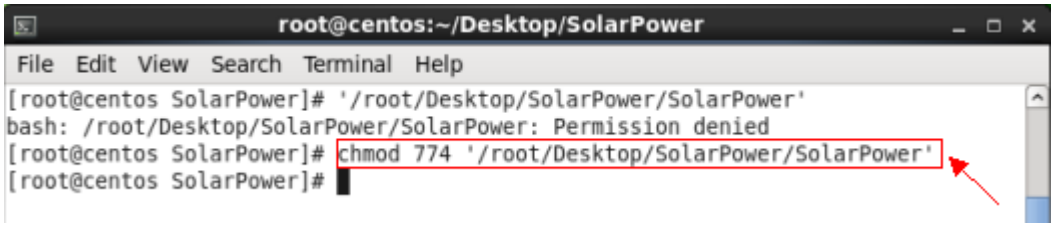
Linux Version:



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. Then, it will start the software and display a service icon located in tray. It will pop up function menu by clicking right button of the mouse. Refer to below diagram 3-2.

Diagram 3-1

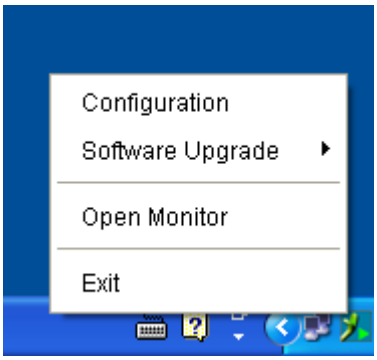


Diagram 3-2

3.2 Configuration

3.2.1 Configuration

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

- Specify the URL to update files: This is the directory to online update software. Please do not change it unless it's instructed by software vendor.
- Save files to: The directory to save files.
- 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 below steps for configuration:
  1. Select "Apply the proxy configuration".
  2. Enter IP address and port of server.
  3. If ID identification is requested, click "Enable authentication" and enter User Name and Password.
- Connection test: Click this button to test if all configurations are set up well.

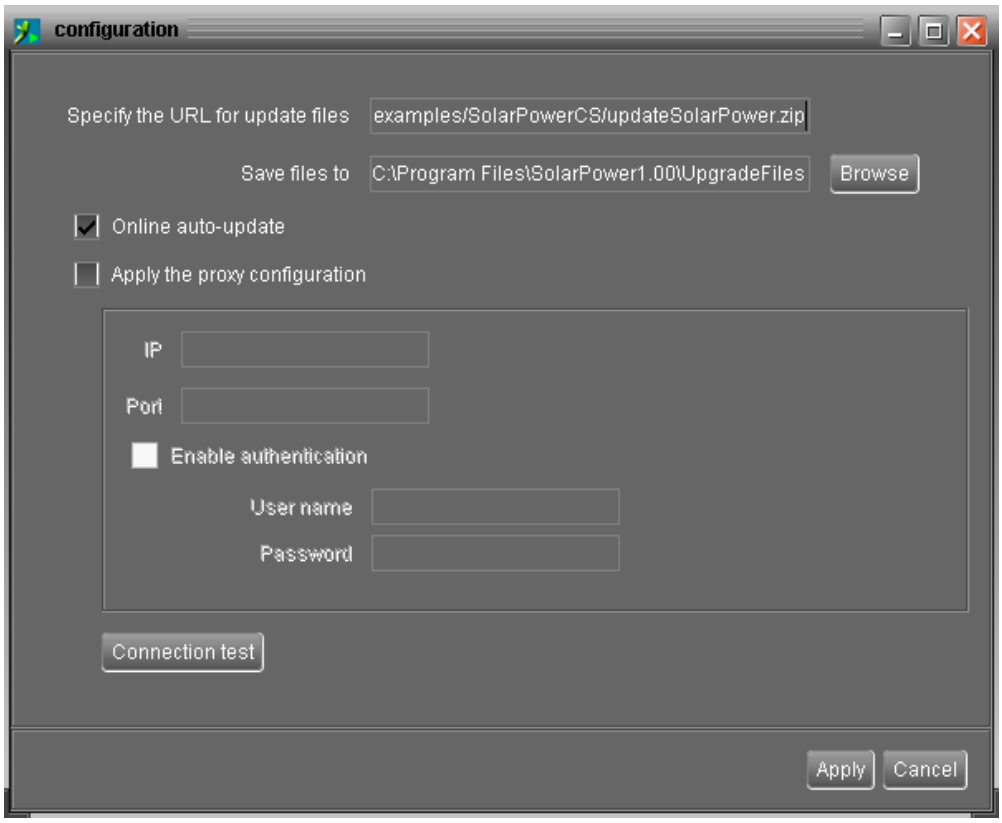


Diagram 3-3

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 upgrade includes online upgrade and manually upgrade.

- Online Upgrade:

  Click "Online Upgrade" to search the latest software version. If there is new version, it will automatically download and upgrade. Refer to Diagram 3-4.

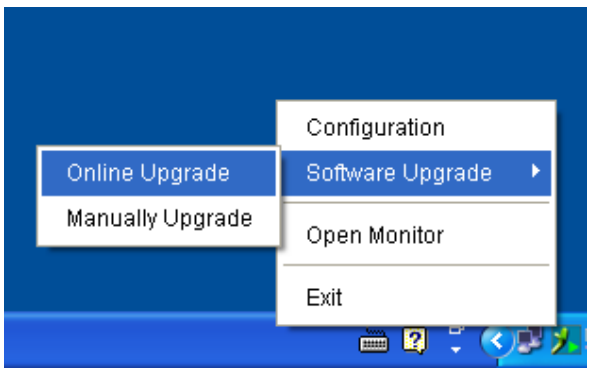


Diagram 3-4

- Manually Upgrade:

Users can manually upgrade the software. Follow below steps:

1. Click "Manually Upgrade" from function menu. Refer to Diagram 3-5.

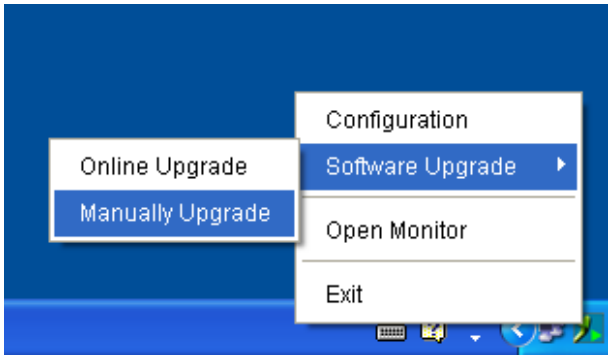


Diagram 3-5

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

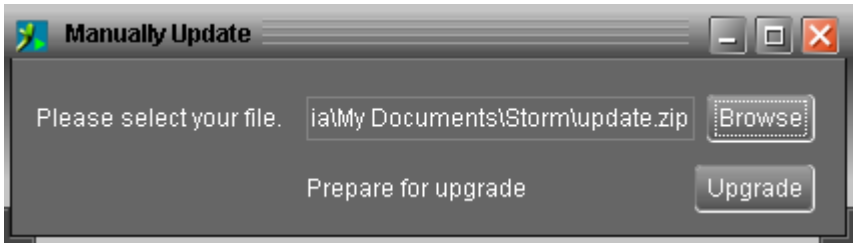


Diagram 3-6

3.4 Icon and Software Status

- When connecting devices, and will rotate as an animation.
- When receiving warning message with devices connected, will flash for reminder.
- When receiving warning message without devices connected, will flash for reminder.

NOTE: Refer to Diagram 3-7 for warning message board. Users can check message board for event list.

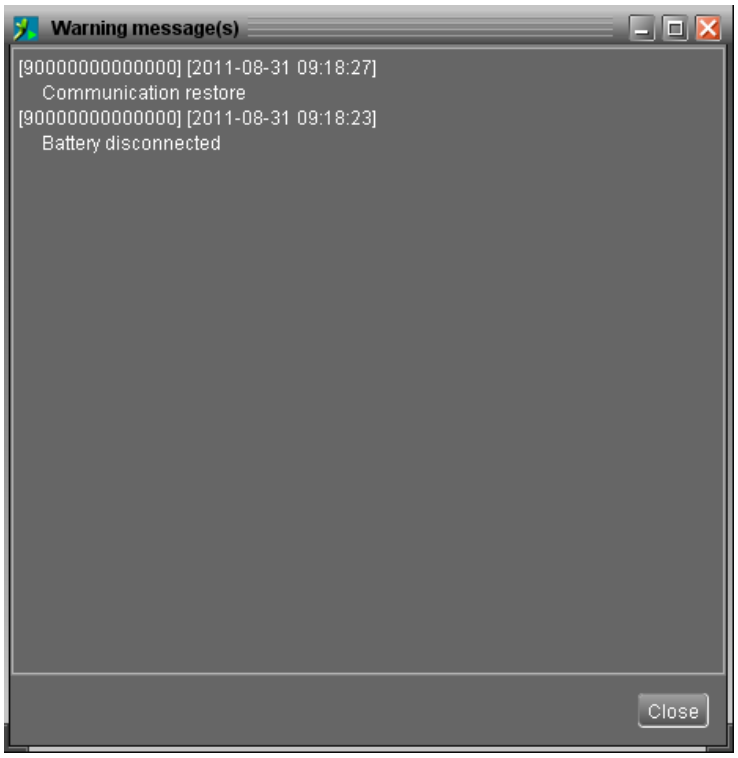


Diagram 3-7

3.5 Open Monitor

Click "Open Monitor" to enter main screen of this software.

3.6 Exit

Click "Exit" to exist service application.

4. SolarPower GUI Interface

SolarPower GUI Interface has five sections as marked in the illustration below:

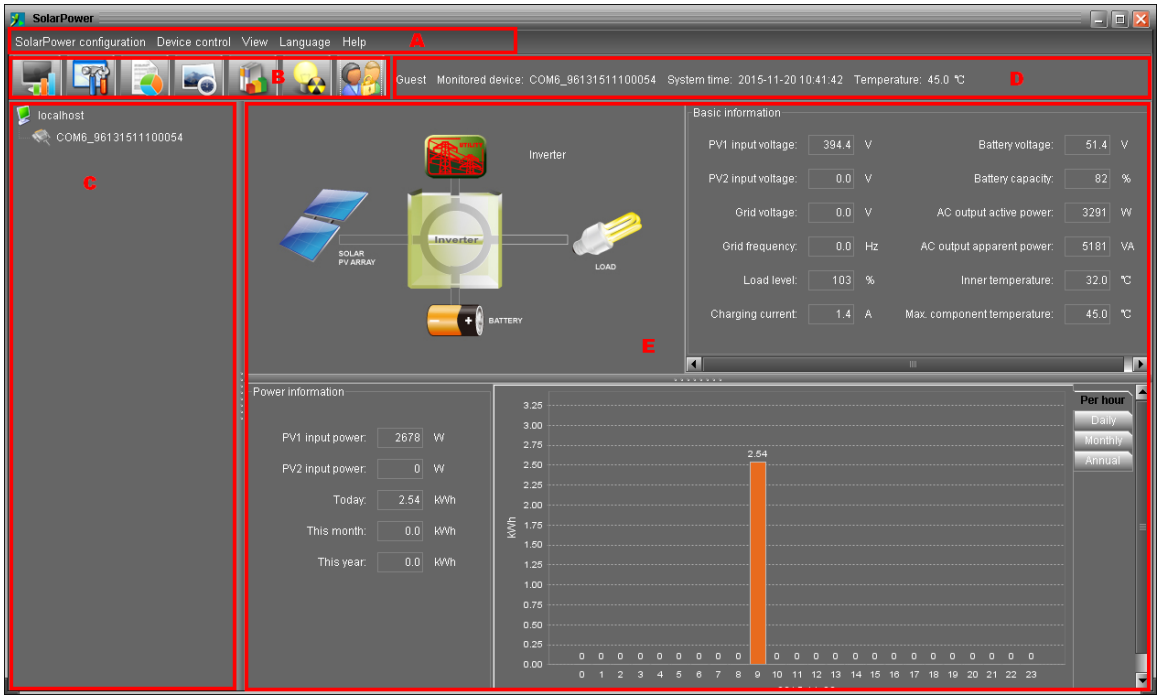


Diagram 4-1

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

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

C. Device Navigation indicates all detected devices.

D. Current Monitoring Information displays User ID, monitored device ID, time and temperature.

E. Main Client Area

This function is to display power flow, basic information and power generation of current monitored solar inverter. Refer to Diagram 4-2.

Diagram 4-2

1. Power flow:

It will display real-time power flow with running color bar. Power flow chart includes solar module icon, solar inverter icon, battery icon*, load icon* and the utility icon. Solar module icon presents the numbers of MPP tracker defined by solar inverter.

NOTE: Battery and load icon will not present only when this device is set as grid-tie mode.

There are three operation modes can be set up via this software. Below is operation power flow description. Operation mode setting can be configured in MyPower Management. Please refer to 4.2.1 section.

- **Grid-tie Operation:**

  When this device is successfully connected to the grid, there will be power flow animation from solar module icon to the utility icon. SolarPower will report and have animation during normal operation. If any fault or abnormal occurs, Power flow animation will stop and represent icon will flash.

- **Grid-tie with backup Operation:**

  There are three power sources in On-grid with backup mode, PV power, battery power and utility power.

  Charging mode: Only PV power exists to charge battery. There will be power flow animation from solar modules to the battery

  Line mode: Utility power exists or is available during this mode. All possible power flows are described as below.

1. If PV power and battery energy are not available, utility will provide power to loads directly. There will be power flow animation from solar module icon to the load icon.
2. If only utility power exists, it will charge battery and provide power to the load. There will be power flow animation from utility icon to battery and load icons.
3. If only PV power exists without battery connected, it will provide power the load. If there is remaining power, it will feed-in to the grid. There will be power flow animation from PV module icon to load icon and to the utility icon.
4. If PV power is sufficient but battery power is insufficient, PV power will charge the battery, provide power to the load and feed in to the grid. There will be power flow animation from PV module icon to battery, to load icon and to utility icon.
5. If PV power is weak, utility exists and battery power is insufficient, PV power and utility power will charge battery at the same time. Besides, utility power will provide power to the load. There will be power flow animation from PV module and utility icons to battery icon and another power flow from utility icon to load icon.

Inverter mode: Utility power is not available or not connected during this mode. All possible power flows are described as below.

1. If PV power is not available, battery power will provide power to the load. There will be power flow animation from battery icon to load icon.
2. If PV power is available and sufficient, PV power will charge battery and provide power to load. There will be power flow animation from PV module icon to battery and load icons.
3. If PV power is not sufficient, PV power and battery power will provide power to the load at the same time. There will be power flow from PV module and battery icons to load icon.

Fault mode: When a fault occurs in solar inverter, the icon of solar inverter will flash until the fault is solved.

- **Off-Grid Operation:**

There is no power feed-in to the grid. Utility (or generator) becomes one of power sources.

Bypass with PV charging mode: If PV power is sufficient, it will charge the battery and AC power will provide power to load. One power flow animation is from PV module icon to battery icon and another one is from utility icon to load icon.

Bypass with AC charging mode: If PV power is insufficient, AC power will charge the battery and provide power to load. There will power flow animation

from utility icon to battery and load icons.

Inverter mode: Utility power is not available or not connected. All possible power flows are described as below.

1. If PV power is not available, battery power will provide power to the load. There will be power flow animation from battery icon to load icon.
2. If PV power is available and sufficient, PV power will charge battery and provide power to load. There will be power flow animation from PV module icon to battery and load icons.
3. If PV power is not sufficient, PV power and battery power will provide power to the load at the same time. There will be power flow from PV module and battery icons to load icon.

Standby mode: Only PV power is available. There is no load connection and no utility and battery power available during this mode.

Standby with PV charging mode: PV power will charge the battery. There will be power flow animation from PV module icon to battery icon.

Standby with AC charging mode: AC power will charge the battery. There will be power flow animation from utility icon to battery icon.

Fault mode: When a fault occurs in solar inverter, the icon of solar inverter will flash until the fault is solved.

2. Basic Information:

This page is to display current working data for monitored inverter. The major displayed information includes grid voltage, grid frequency, PV input voltage, output current and so on.

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 hourly power generation on current date when selecting “per hour”.
- 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”.

NOTE: This screen may be different for different types of solar inverters.

4.1 SolarPower Configuration

4.1.1 Basic

This page is to set basic display parameters. Select SolarPower Configuration>>Basic. Refer to Diagram 4-3.

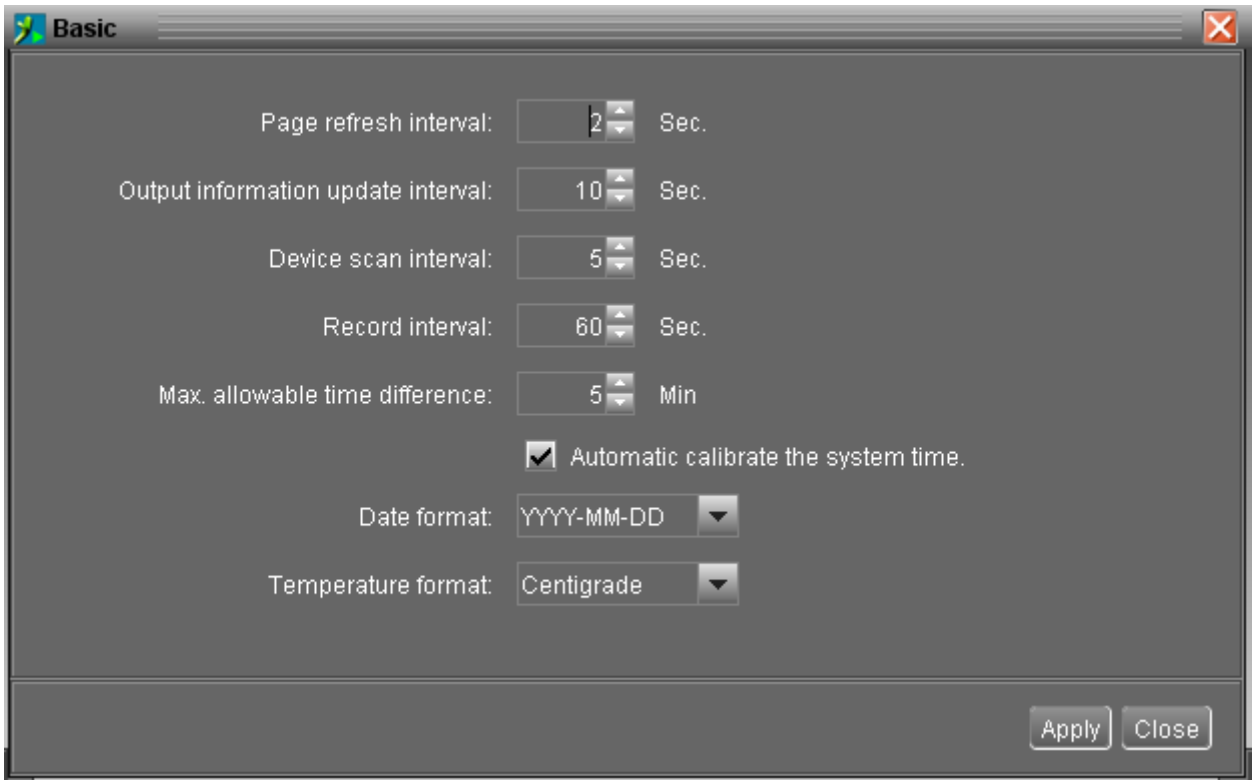


Diagram 4-3

1. Page refresh interval: This interval time will determine how long 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 long 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 long 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 long 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 (°C) and Fahrenheit (°F). The default setting is Centigrade (°C).

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

4.1.2 Password

It's password setting for administrator only. Before operating and configuring the software, please login first and modify the password. The default password is "**administrator**" at first log in. As a "guest" status, user only can browse solar inverter status and information without controlling or modifying any settings.

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

Diagram 4-4

Step 2 Enter old password, new password, and re-type new password to modify password for administrator. The 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 for entering SMS receiver list. In the event of an alarm occurring, a message about Solar Inverter status will be sent to the specified users via mobile phone. For the event receiving list, please configure in "Event Action" column (refer to section 4.1.5).

Step 1 Choose SolarPower Configuration >> SMS Setting. Refer to Diagram 4-5.

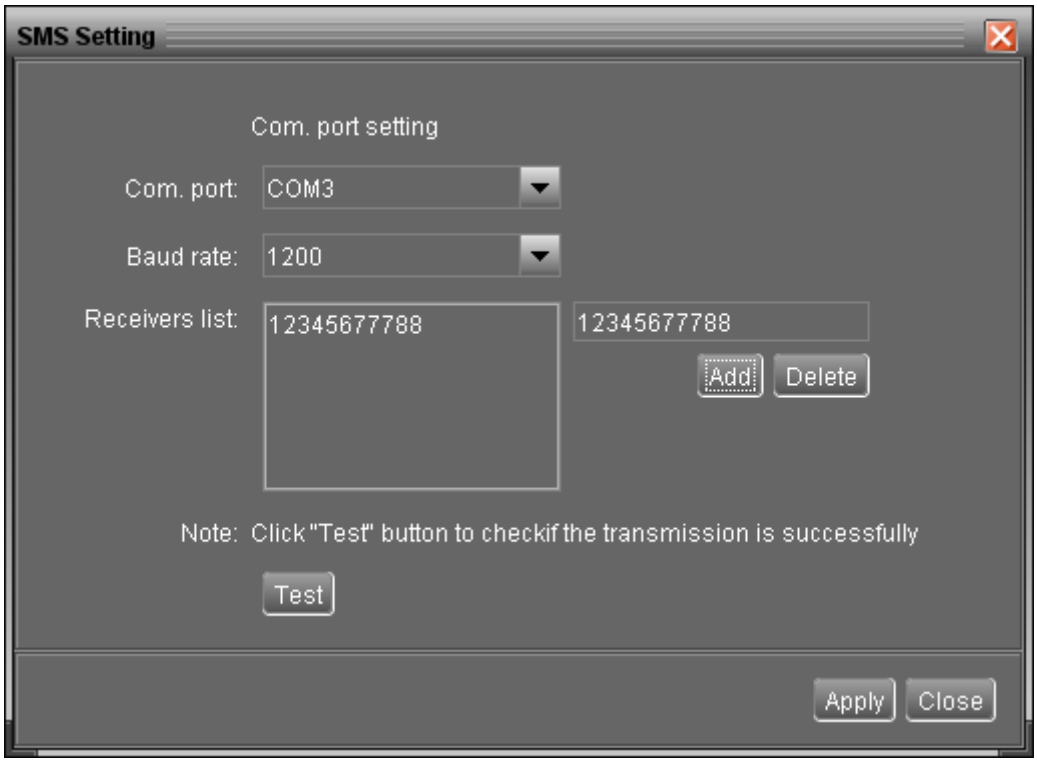


Diagram 4-5

Step 2 Select communication port and baud rate.

Step 3 Enter mobile phone numbers in "Phone no." column and click "Add" button to add phone no. in 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 confirm the correct operation. If all parameters are set up correctly, system will send a test message to all receivers and pop up a successful message. Refer to Diagram 4-6. Otherwise, it will pop up a failure dialog to indicate there is an error for parameter setting. Refer to Diagram 4-7.

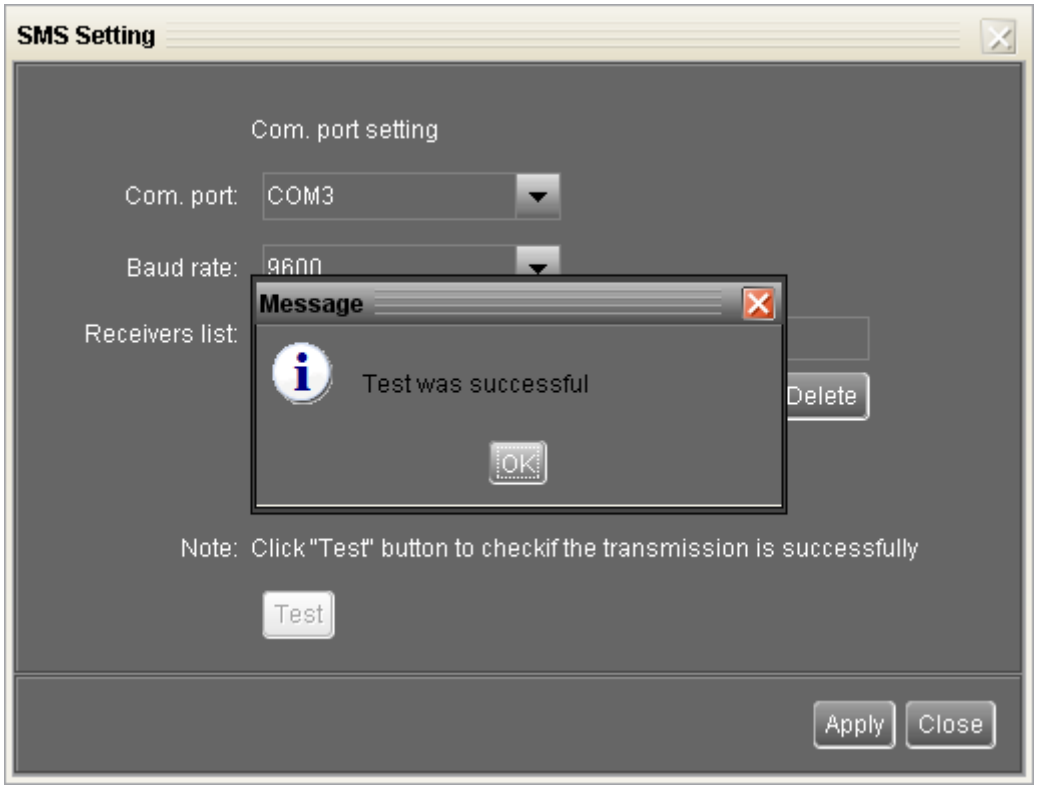


Diagram 4-6

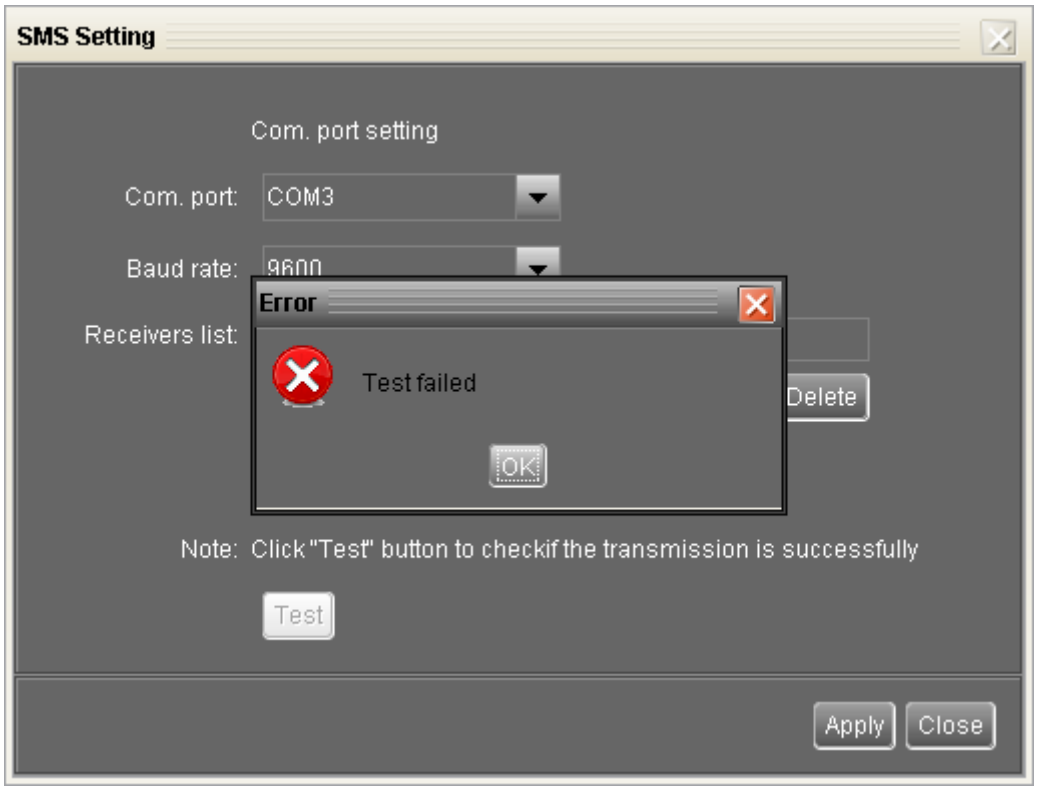


Diagram 4-7

NOTE: It's required to plug-in GSM Modem if sending SMS to mobile phone.

4.1.4 E-mail

It is allowed to send an alarm mail by SMTP server. For the event receiving list, please configure it in "Event Action" column (refer to section 4.1.5).

To use this function, e-mail service must be configured correctly. All values in this function page are default empty. This action can't be executed without 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 4-8.

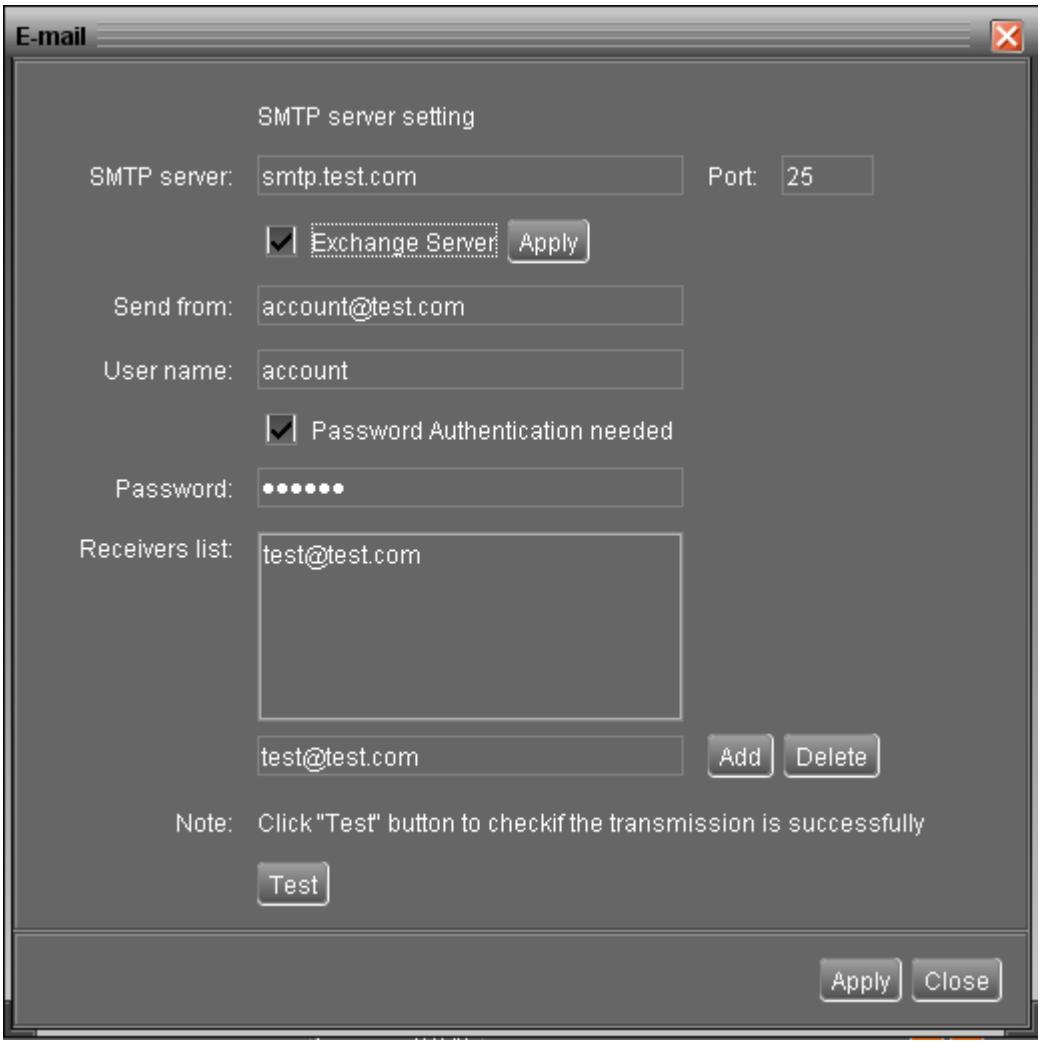


Diagram 4-8

Step 2 Enter SMTP server, Port, Sender E-mail address, User name and password. Click checkbox of "Password Authentication needed" for password verify.

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

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

Step 4 Click "Apply" button 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, it will pop up a successful message on operated PC. Otherwise, it will pop up a failure dialog to indicate there is an error for parameter setting.

4.1.5 Event action

It's to configure response actions for events occurring in solar inverter. There are four response actions provided after events occur.

1. Event record: It will record event to data log in software after events occur. This event is default selected.

2. Warning message(s): It will send event message to system 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 actions. Refer to Diagram 4-9.

Step 2 Select action methods by clicking checkbox.

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

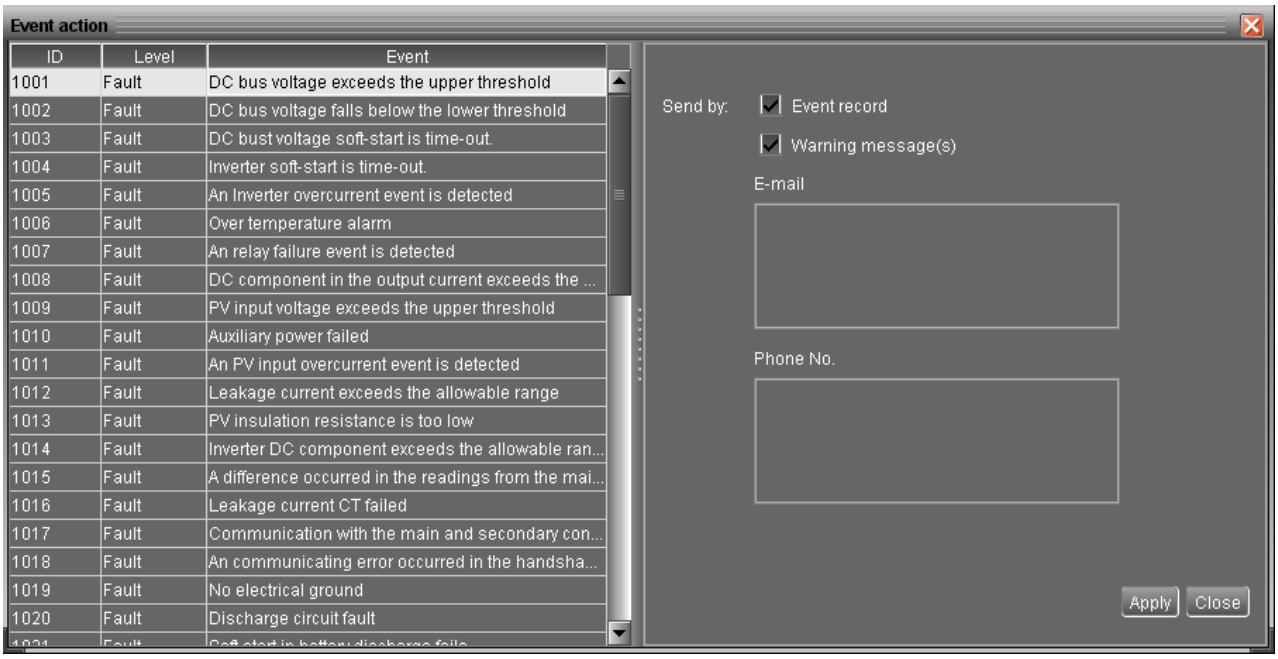


Diagram 4-9

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

NOTE2: Event list may be different based on different types of solar inverters.

4.1.6 Com. port Plug And Play Setting

To real-time monitor solar inverter device, the software will scan each com. port anytime. In this way, it will occupy com. port. This function will release some com. ports which are not connected to solar inverters. To avoid any improper operation, in-used com. ports will display in disabled grey texts. Users can select "Allow scanned" to re-scan or "No scanning" to release com. ports based on their requirements.

Step 1: Select SolarPower configuration>> Com.port plug and play setting. Refer to Diagram 4-10.

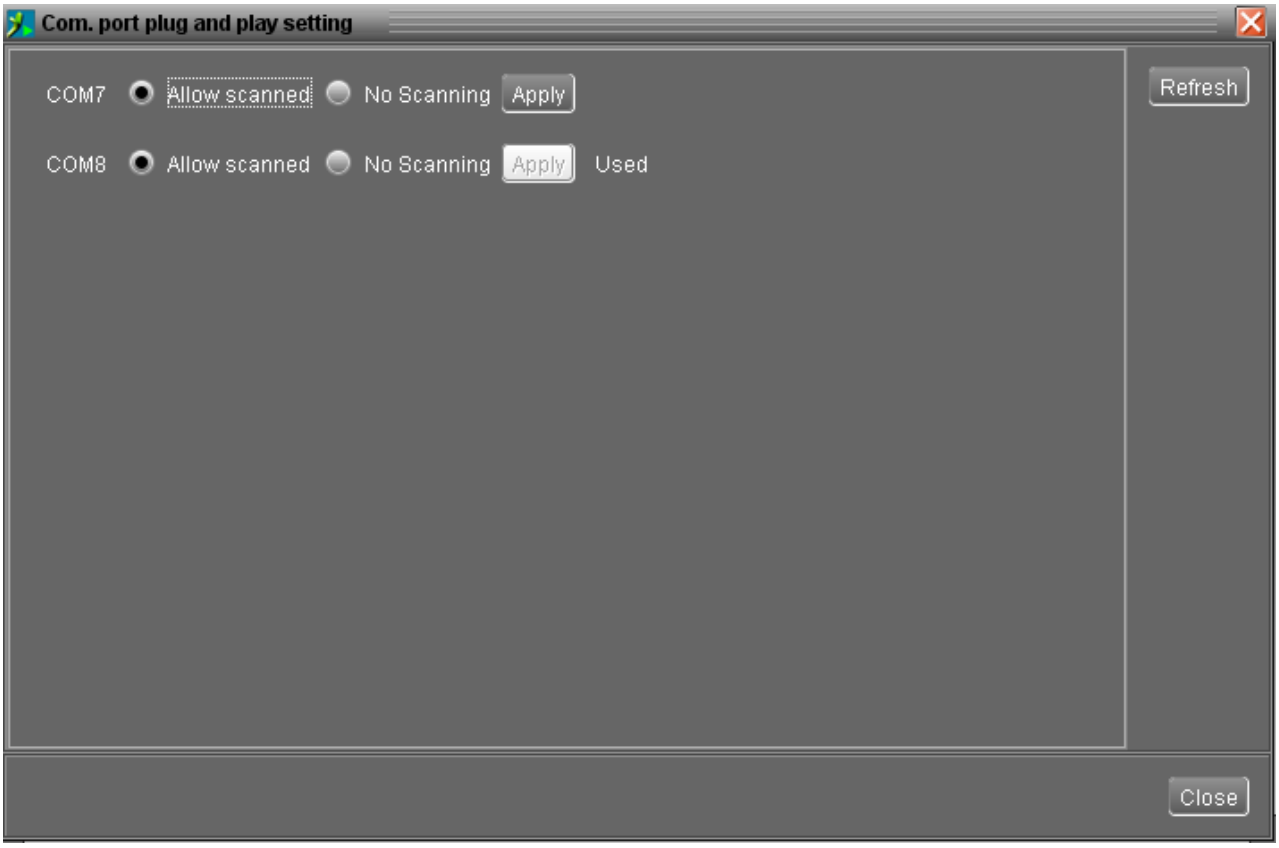


Diagram 4-10

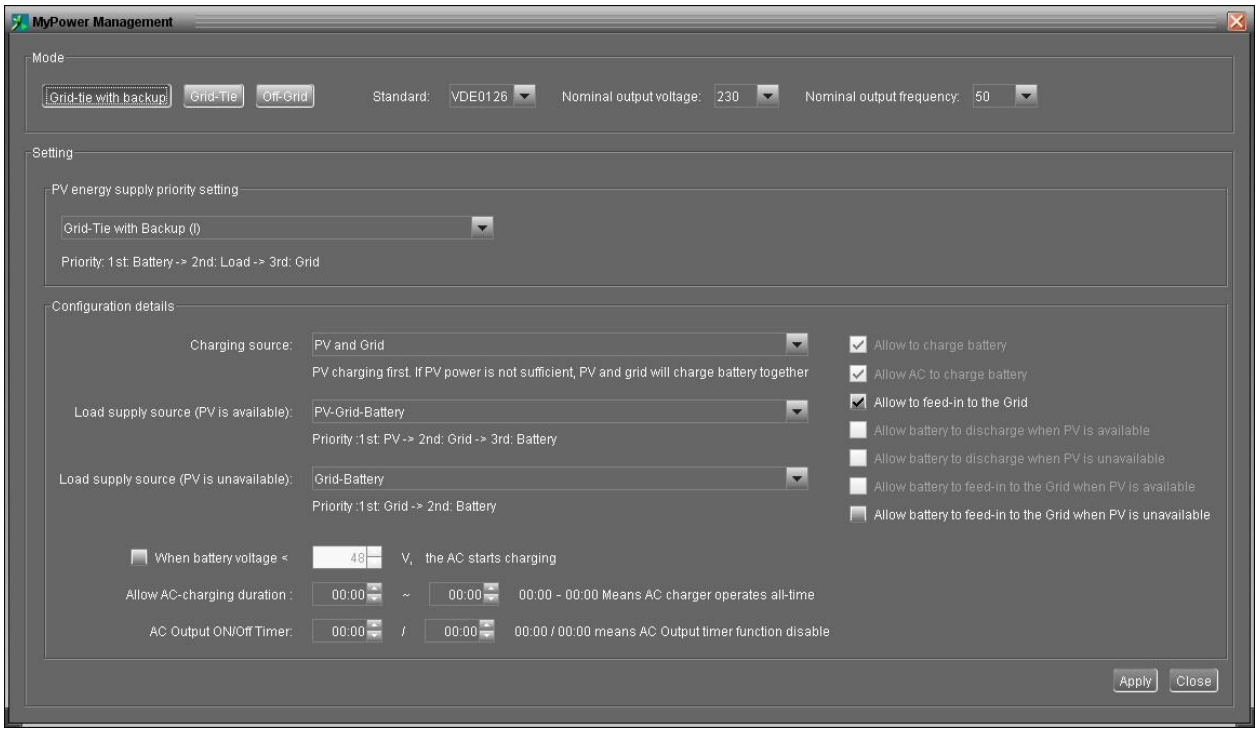
Step 2: Click "Refresh" to reload the statuses of all com. ports.

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 MyPower Management

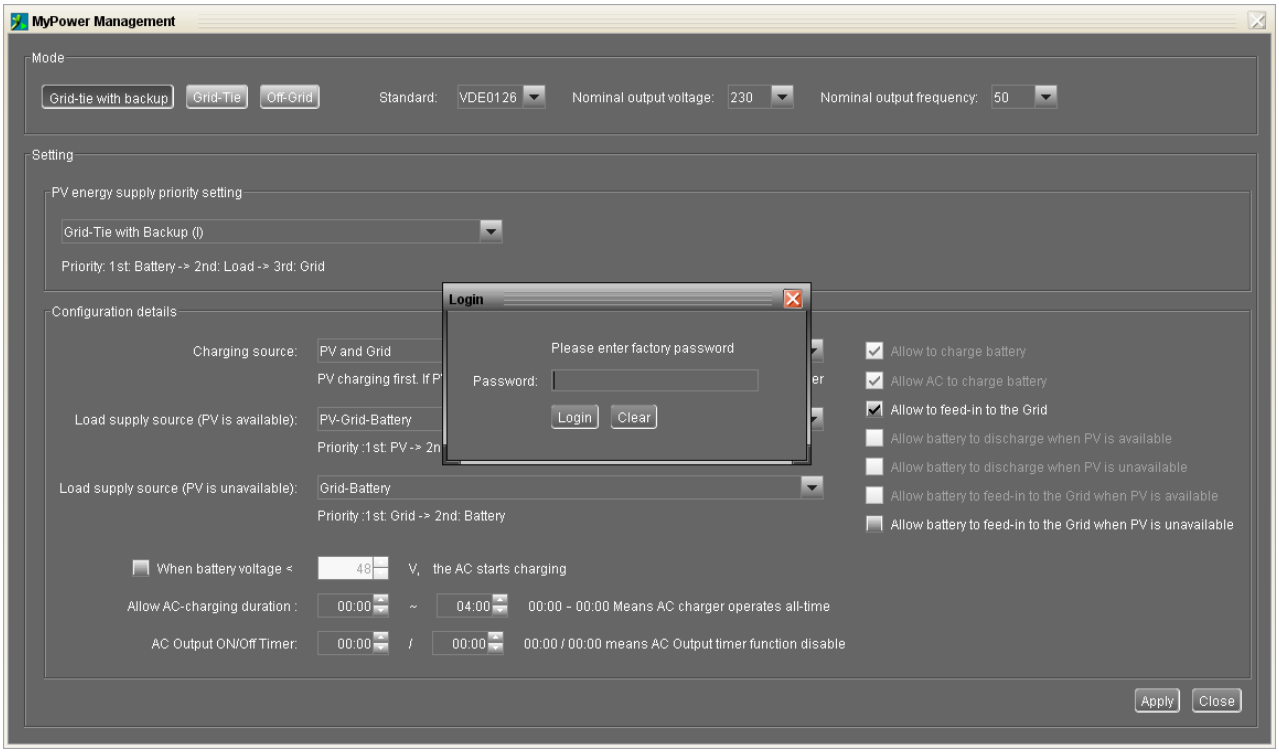
It is to set up inverter operation mode and personalized interface. Select Device Control>>MyPower Management. Refer to below diagram.



4.2.1.1 Mode

There are three operation modes: Grid-tie with backup, Grid-Tie and Off-Grid.

- Grid-tie with backup: PV power can feed-in back to grid, provide power to the load and charge battery. There are four options available to select in this mode: Grid-tie with backup I, II, III, IV. In this mode, users can configure PV power supply priority, charging source priority and load supply source priority. However, when Grid-tie with backup IV option is selected in PV energy supply priority, the inverter is only operated between two working logics based on defined peak time and off-peak time of electricity. Only peak time and off-peak time of electricity are able to set up for optimized electricity usage.
- Grid-Tie: PV power only can feed-in back to grid.
- Off-Grid: PV power only provides power to the load and charge battery.



Standard: It will list local grid standard. It’s requested to have factory password to make any modifications. Please check local dealer only when this standard change is requested.

CAUTION: Wrong setting could cause the unit damage or not working.

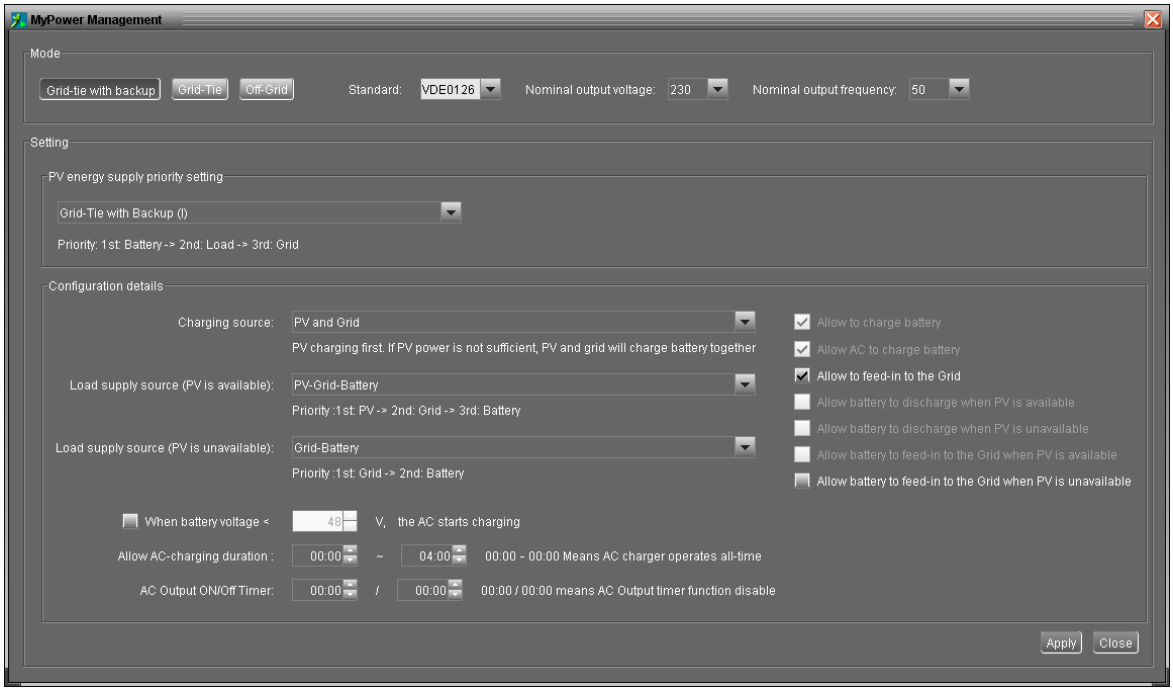
Nominal Output Voltage: There are 5 options for high voltage system to select, 240V, 230V, 220V, 208V and 202V.

Nominal Output Frequency: There are 2 options to select, 50HZ or 60HZ.

4.2.1.2 Setting

Grid-tie with backup

- Grid-tie with backup (I) :



PV energy supply priority setting: 1st Battery, 2nd Load and 3rd Grid.

PV power will charge battery first, then provide power to the load. If there is any remaining power left, it will feed-in to the grid.

Battery charging source:

1. PV and Grid: It's allowed to charge battery from PV power first. If it's not sufficient, grid will charge battery.
2. PV only: It is only allow PV power to charge battery.
3. None: It is not allowed to charge battery no matter it's from PV power or grid.

Load supply source:

When PV power is available: 1st PV, 2nd Grid, 3rd Battery

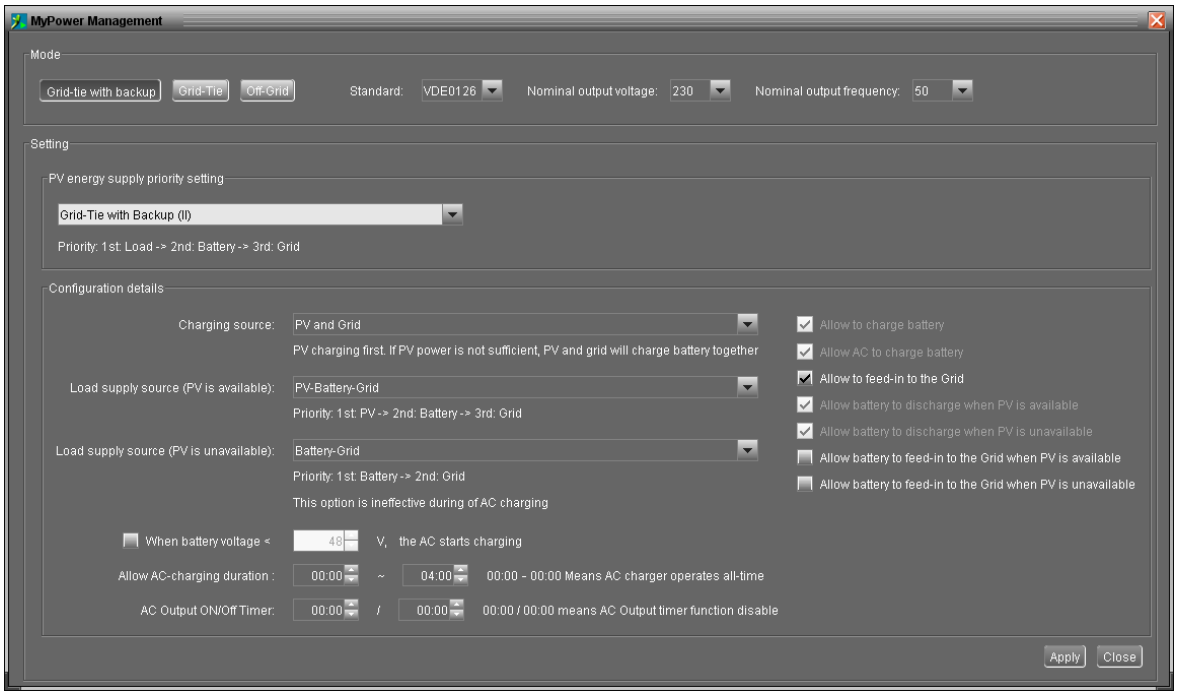
If battery is not fully charged, PV power will charge battery first. And remaining PV power will provide power to the load. If it's not sufficient, grid will provide power to the load. If grid is not available at the same time, battery power will back up.

When PV power is not available:

1. 1st Grid, 2nd Battery: Grid will provide power to the load at first. If grid is not available, battery power will provide power backup.
2. 1st Battery, 2nd Grid: Battery power will provide power to the load at first. If battery power is running out, grid will back up the load.

   NOTE: This option will become ineffective during AC charging time and the priority will automatically become 1st Grid and 2nd Battery order. Otherwise, it will cause battery damage.

- Grid-tie with backup (II) :



PV energy supply priority setting: 1st Load, 2nd Battery and 3rd Grid.

PV power will provide power to the load first. Then, it will charge battery. If there is any remaining power left, it will feed-in to the grid.

Battery charging source:

1. PV and Grid: It's allowed to charge battery from PV power first. If it's not sufficient, grid will charge battery.
2. PV only: It is only allow PV power to charge battery.
3. None: It is not allowed to charge battery no matter it's PV power or grid.

Load supply source:

When PV power is available:

1. 1st PV, 2nd Battery, 3rd Grid

PV power will provide power to the load first. If it's not sufficient, battery power

will provide power to the load. When battery power is running out or not available, grid will back up the load.

2. 1st PV, 2nd Grid, 3rd Battery

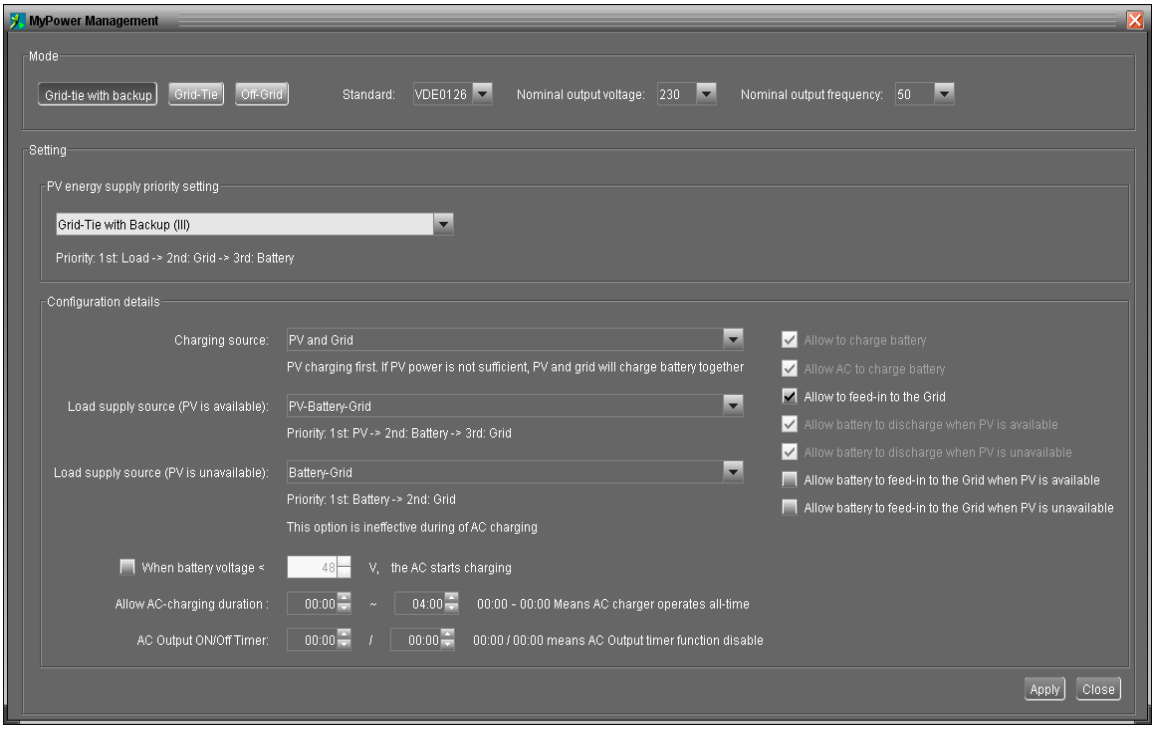
PV power will provide power to the load first. If it's not sufficient, grid will provide power to the load. If grid is not available at the same time, battery power will back up.

When PV power is not available:

1. 1st Grid, 2nd Battery: Grid will provide power to the load at first. If grid is not available, battery power will provide power backup.
2. 1st Battery, 2nd Grid: Battery power will provide power to the load at first. If battery power is running out, grid will back up the load

   NOTE: This option will become ineffective during AC charging time and the priority will automatically become 1st Grid and 2nd Battery order. Otherwise, it will cause battery damage.

- Grid-tie with backup (III):



PV energy supply priority setting: 1st Load, 2nd Grid and 3rd Battery

PV power will provide power to the load first. If there is more PV power available, it will feed-in to the grid. If feed-in power reaches max. feed-in power setting, the remaining power will charge battery.

NOTE: The max. feed-in grid power setting is available in parameter setting. Please refer to section 4-2-2.

Battery charging source:

1. PV and Grid: It's allowed to charge battery from PV power first. If it's not sufficient, grid will charge battery.
2. PV only: It is only allow PV power to charge battery.
3. None: It is not allowed to charge battery no matter it's PV power or grid.

Load supply source:

When PV power is available:

1. 1st PV, 2nd Battery, 3rd Grid

PV power will provide power to the load first. If it's not sufficient, battery power will provide power to the load. When battery power is running out or not available, grid will back up the load.

2. 1st PV, 2nd Grid, 3rd Battery

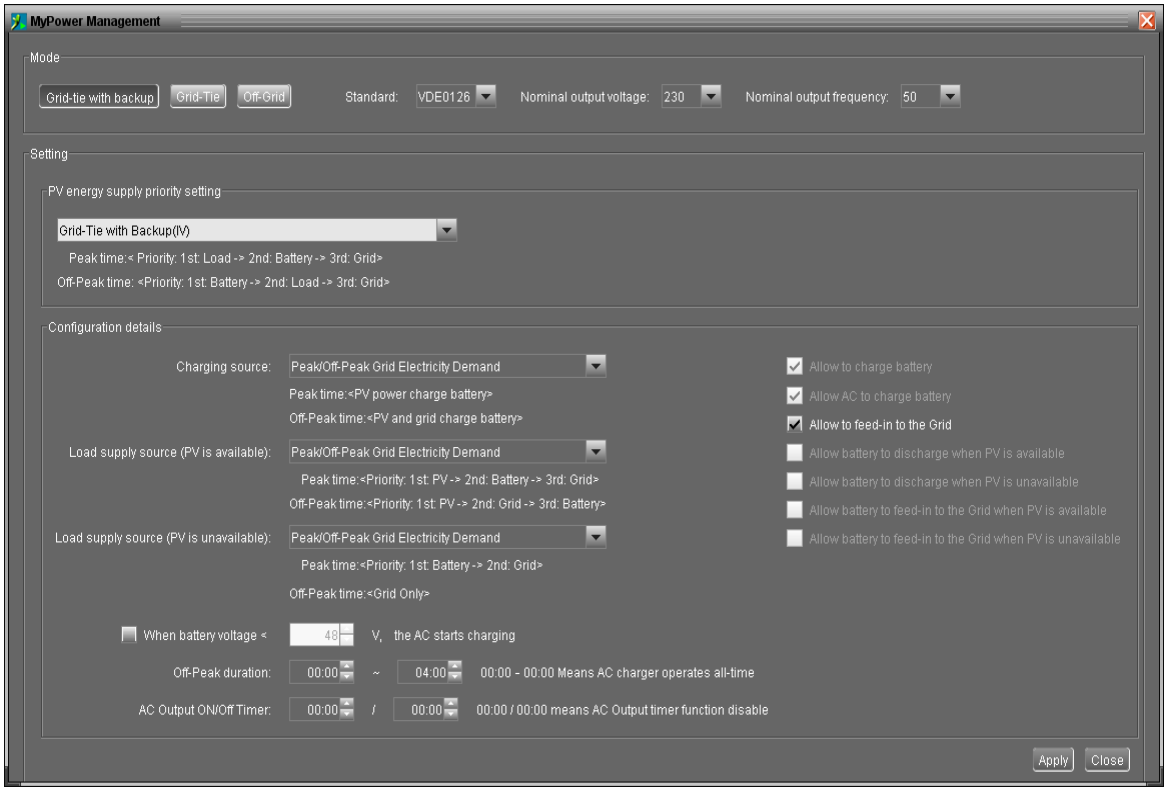
PV power will provide power to the load first. If it's not sufficient, grid will provide power to the load. If grid is not available at the same time, battery power will back up.

When PV power is not available:

1. 1st Grid, 2nd Battery: Grid will provide power to the load at first. If grid is not available, battery power will provide power backup.
2. 1st Battery, 2nd Grid: Battery power will provide power to the load at first. If battery power is running out, grid will back up the load.

   NOTE: This option will become ineffective during AC charging time and the priority will automatically become 1st Grid and 2nd Battery order. Otherwise, it will cause battery damage.

- Grid-tie with backup (IV): Users are only allowed to set up peak time and off-peak electricity demand.



Working logic under peak time:

PV energy supply priority: 1st Load, 2nd Battery and 3rd Grid

PV power will provide power to the load first. If PV power is sufficient, it will charge battery next. If there is remaining PV power left, it will feed-in to the grid. Feed-in to the grid is default disabled.

Battery charging source: PV only

Only after PV power fully supports the load, the remaining PV power is allowed to charge battery during peak time.

Load supply source: 1st PV, 2nd Battery, 3rd Grid

PV power will provide power to the load first. If PV power is not sufficient, battery power will back up the load. If battery power is not available, grid will provide the load. When PV power is not available, battery power will supply the load first. If battery power is running out, grid will back up the load.

Working logic under off-peak time:

PV energy supply priority: 1st Battery, 2nd Load and 3rd Grid

PV power will charge battery first. If PV power is sufficient, it will provide power to the loads. The remaining PV power will feed to the grid.

NOTE: The max. feed-in grid power setting is available in parameter setting. Please refer to section 4-2-2.

Battery charging source: PV and grid charge battery

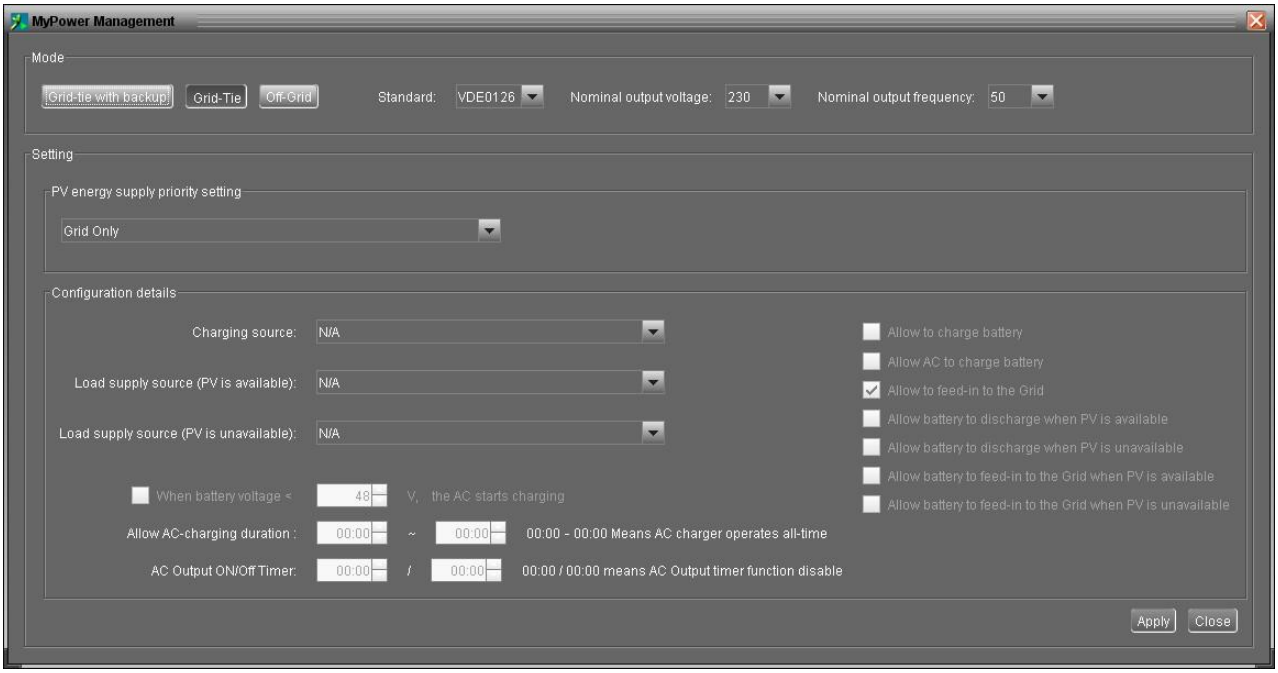
PV power will charge battery first during off-peak time. If it's not sufficient, grid will charge battery.

Load supply source: 1st PV, 2nd Grid, 3rd Battery

When battery is fully charged, remaining PV power will provide power to the load first. If PV power is not sufficient, grid will back up the load. If grid power is not available, battery power will provide power to the load.

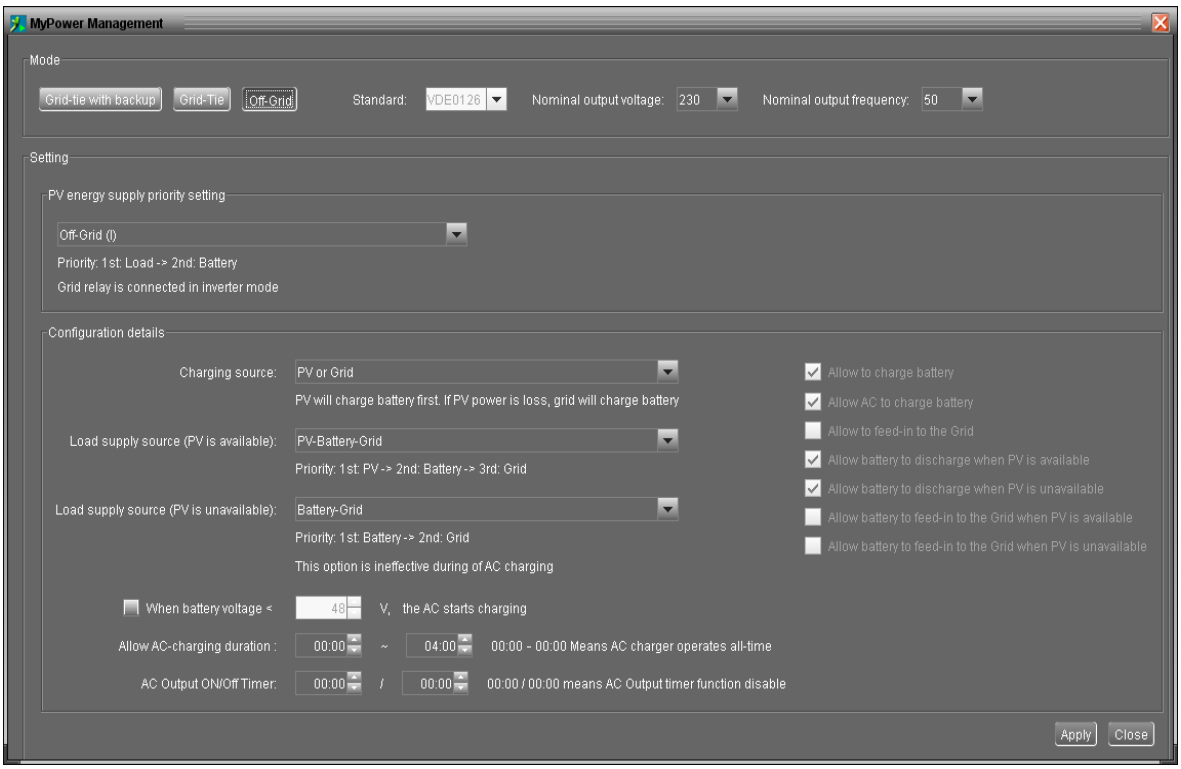
Grid-Tie

Under this operation mode, PV power only feeds-in to the grid. No priority setting is available.



Off-Grid

- Off-Grid (I):



PV energy supply priority setting: 1st Load, 2nd Battery

PV power will provide power to the load first and then charge battery. Feed-in to the grid is not allowed under this mode. At the same time, the grid relay is connected in Inverter mode. That means the transfer time from inverter mode to battery mode will be less than 15ms. Besides, it will avoid overload fault because grid can supply load when connected load is over nominal output power.

Battery charging source:

1. PV or Grid: If there is remaining PV power after supporting the loads, it will charge battery first. Only until PV power is not available, grid will charge battery.
2. PV only: It is only allow PV power to charge battery.
3. None: It is not allowed to charge battery no matter it's PV power or grid.

Load supply source:

When PV power is available:

1. 1st PV, 2nd Battery, 3rd Grid

PV power will provide power to the load first. If it's not sufficient, battery power will provide power to the load. When battery power is running out or not available, grid will back up the load.

2. 1st PV, 2nd Grid, 3rd Battery

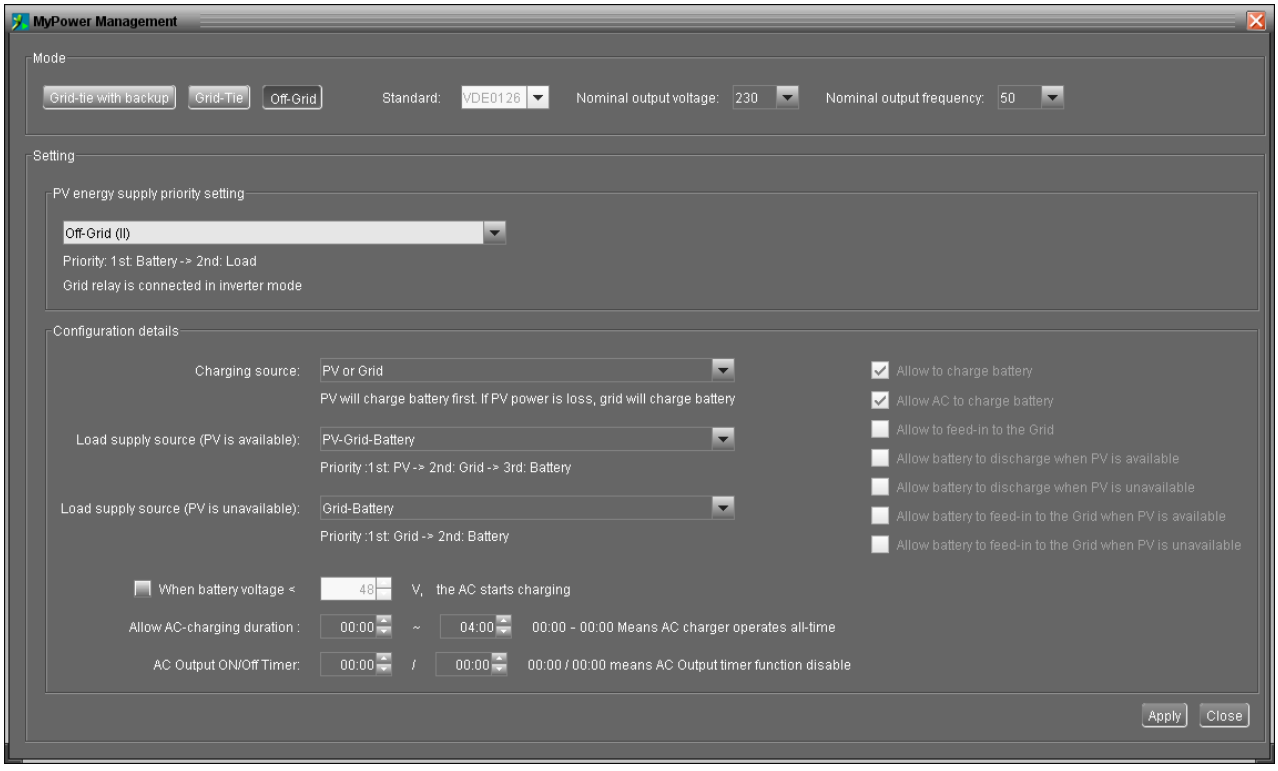
PV power will provide power to the load first. If it's not sufficient, grid will provide power to the load. If grid is not available at the same time, battery power will back up.

When PV power is not available:

1. 1st Grid, 2nd Battery: Grid will provide power to the load at first. If grid is not available, battery power will provide power backup.
2. 1st Battery, 2nd Grid: Battery power will provide power to the load at first. If battery power is running out, grid will back up the load.

   NOTE: This option will become ineffective during AC charging time and the priority will automatically become 1st Grid and 2nd Battery order. Otherwise, it will cause battery damage.

- Off-Grid (II)



PV energy supply priority setting: 1st Battery, 2nd Load

PV power will charge battery first. After battery is fully charged, if there is remaining PV power left, it will provide power to the load. Feed-in to the grid is not allowed under this mode. At the same time, the grid relay is connected in Inverter mode. That means the transfer time from inverter mode to battery mode will be less than 15ms. Besides, it will avoid overload fault because grid can supply load when connected load is over nominal output power.

Battery charging source:

1. PV or Grid: If there is remaining PV power after supporting the loads, it will charge battery first. Only until PV power is not available, grid will charge battery.
2. PV only: It is only allow PV power to charge battery.
3. None: It is not allowed to charge battery no matter it's PV power or grid.

NOTE: It's allowed to set up AC charging duration.

Load supply source:

When PV power is available: 1st PV, 2nd Grid, 3rd Battery

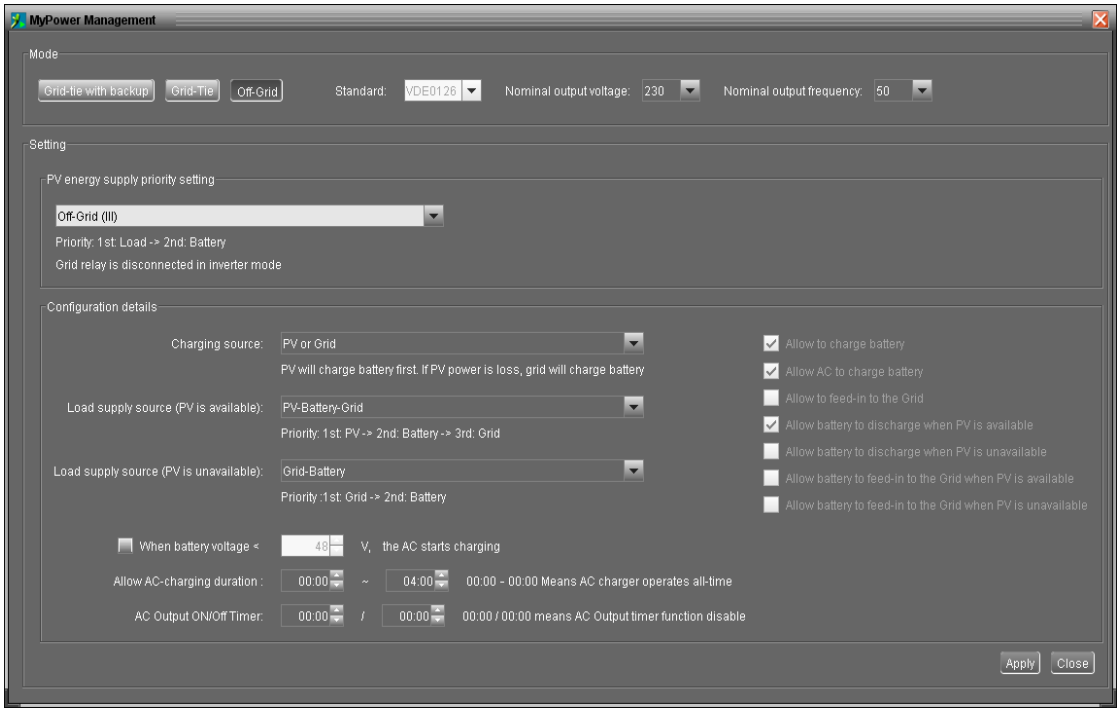
PV power will provide power to the load first. If it's not sufficient, grid will provide power to the load. If grid is not available at the same time, battery power will back up.

When PV power is not available:

1. 1st Grid, 2nd Battery: Grid will provide power to the load at first. If grid is not available, battery power will provide power backup.
2. 1st Battery, 2nd Grid: Battery power will provide power to the load at first. If battery power is running out, grid will back up the load.

   NOTE: This option will become ineffective during AC charging time and the priority will automatically become 1st Grid and 2nd Battery order. Otherwise, it will cause battery damage.

- Off-Grid (III)



PV energy supply priority setting: 1st Load, 2nd Battery

PV power will provide power to load first and then charge battery. Feed-in to the grid is not allowed under this mode. The grid relay is NOT connected in Inverter mode. That means the transfer time from inverter mode to battery mode will be about 15ms. If connected load is over nominal output power and grid is available, this inverter will allow grid to provide power to the loads and PV power to charge battery. Otherwise, this inverter will activate fault protection.

Battery charging source:

1. PV or Grid: If there is remaining PV power after supporting the loads, it will charge battery first. Only until PV power is not available, grid will charge battery.
2. PV only: It is only allow PV power to charge battery.
3. None: It is not allowed to charge battery no matter it's PV power or grid.

NOTE: It's allowed to set up AC charging duration.

Load supply source:

When PV power is available: 1st PV, 2nd Battery, 3rd Grid

PV power will provide power to the load first. If it's not sufficient, battery power will back up the load. Only after battery power is running, Grid will back up the load.

When PV power is not available:

1. 1st Grid, 2nd Battery: Grid will provide power to the load at first. If grid is not available, battery power will provide power backup.
2. 1st Battery, 2nd Grid: Battery power will provide power to the load at first. If

battery power is running out, grid will back up the load.

NOTE: This option will become ineffective during AC charging time and the priority will automatically become 1st Grid and 2nd Battery order. Otherwise, it will cause battery damage.

AC Charging Setup

When selected, after battery voltage is lower than setting (xx.x V), AC will start to charge battery. When this condition is selected, it's allowed to enter setting voltage. Otherwise, it's impossible to enter any values.

Allow AC charging duration: It's a period time to allow AC (grid) to charge battery. When the duration is set up as 0:00-00:00, it means no time limitation for AC to charge battery.

AC output ON/Off Timer: Set up on/off time for AC output of inverter. If setting it as 00:00/00:00, this function is disabled.

Allow to charge battery: This option is automatically determined by setting in "Charging source". It's not allowed to modify here. When "NONE" is selected in charging source section, this option becomes unchecked as grey text.

Allow AC to charge battery: This option is automatically determined by setting in "Charging source". It's not allowed to modify here. When "Grid and PV" or "Grid or PV" is selected in charging source section, this option is default selected. Under Grid-tie mode, this option is invalid.

Allow to feed-in to the Grid: This option is only valid under Grid-tie and Grid-tie with backup modes. Users can decide if this inverter can feed-in to the grid.

Allow battery to discharge when PV is available: This option is automatically determined by setting in "Load supply source (PV is available)". When "Battery" is higher priority than "Grid" in Load supply source (PV is available), this option is default selected. Under Grid-tie, this option is invalid.

Allow battery to discharge when PV is unavailable: This option is automatically determined by setting in "Load supply source (PV is unavailable)". When "Battery" is higher priority than "Grid" in Load supply source (PV is unavailable), this option is default selected. Under Grid-tie mode, this option is invalid.

Allow battery to feed-in to the Grid when PV is available: This option is only valid in Grid-tie with backup II or Grid-tie with backup III modes.

Allow battery to feed-in to the Grid when PV is unavailable: This option is only valid in all options of Grid-tie with backup mode.

4.2.2 Parameter Setting

Select Device Control >> Parameter Setting or select shortcut icon . It will display available parameter settings when setting operation mode.

NOTE: This screen may be different for different mode settings of solar inverters.

When setting in Grid-tie with backup mode or Grid-tie mode, some parameters are related to local grid standard and can't be modified without factory password. Please refer to red squares in Diagrams 4-11A and 4-11B. Any mis-setting could cause inverter damage or not working. Please check local dealers for the details. Refer to Diagram 4-12C for off-grid setting mode.

Step 1 Select the functions by clicking "Enable" or "Disable" button. Or 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.

Diagram 4-11A (Grid-Tie with Backup mode)

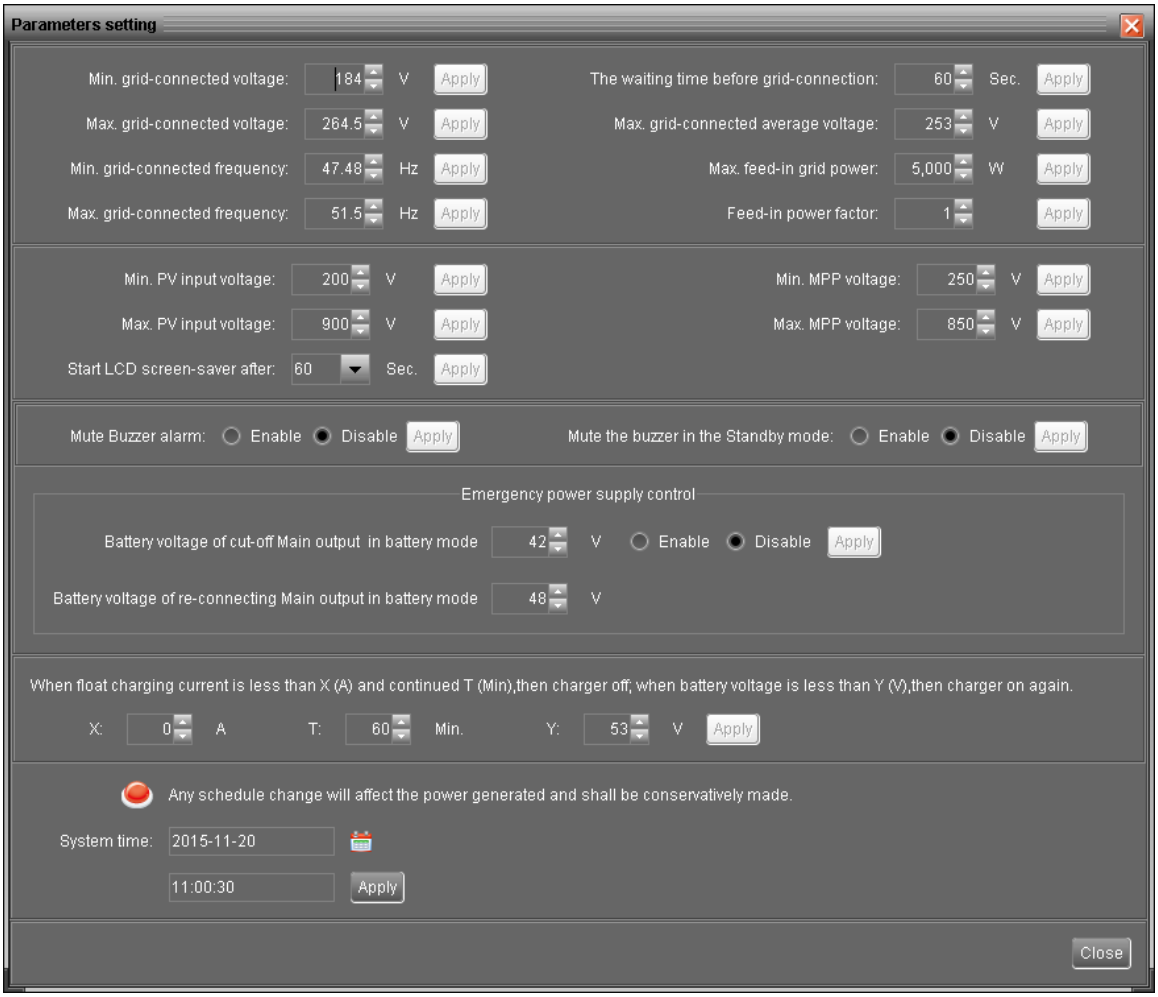


Diagram 4-11B (Grid-Tie mode)

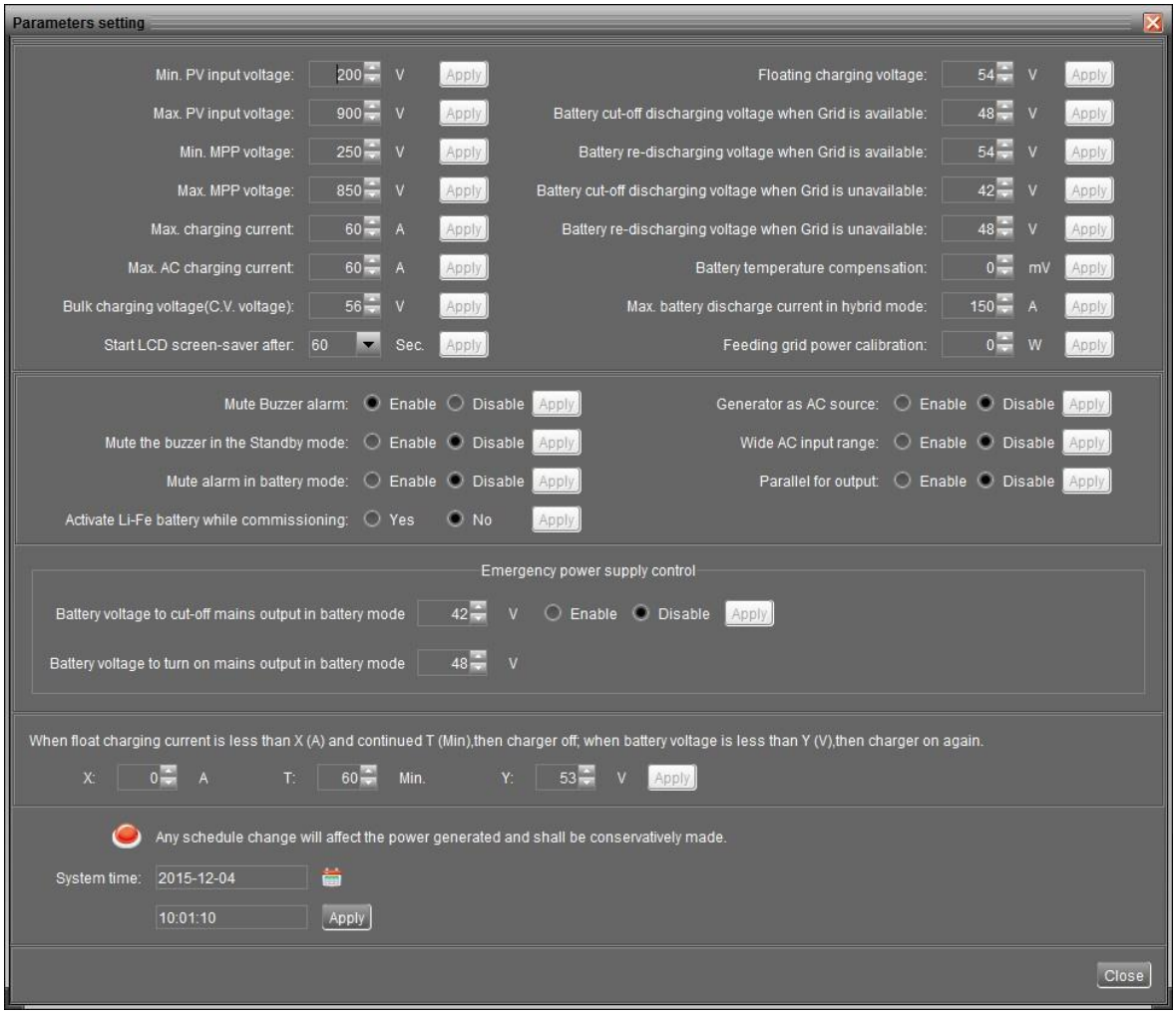
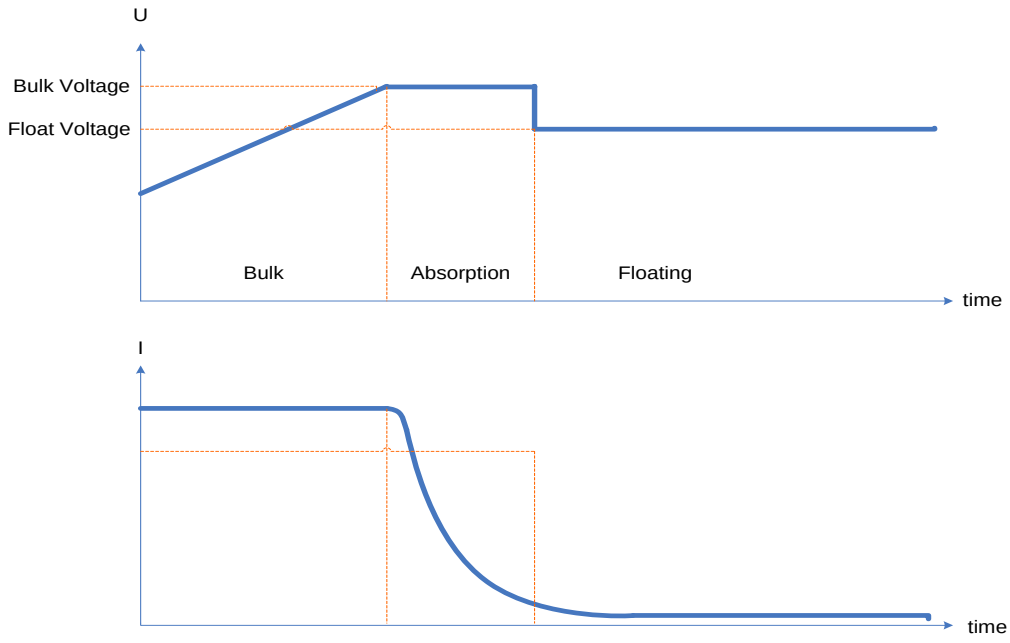


Diagram 4-11C (Off-Grid mode)

- Min. grid-connected voltage: The acceptable low voltage point for solar inverter with grid connected.
- Max. grid-connected voltage: The acceptable high voltage point for solar inverter with grid connected.
- Min. grid-connected frequency: The acceptable low frequency point for solar inverter with grid connected.
- Max. grid-connected frequency: The acceptable high frequency point for solar inverter with grid connected.
- The waiting time before grid-connection:
- Max. grid-connected average voltage: When the average voltage is higher than this setting, it will be identified as the utility is abnormal.
- Max. feed-in grid power: Maximum power to feed-in to the grid.
- Feed-in power factor: setting range is -0.99~-0.90 and 0.90~1.00.
- Min. PV input voltage: The acceptable low voltage point for PV terminals when grid connection is established successfully.

- Max. PV input voltage: The acceptable high voltage point for PV terminals when grid connection is established successfully.
- Min. MPP voltage: The acceptable low voltage point from solar module.
- Max. MPP voltage: The acceptable high voltage point from solar module.
- Max. charging current: The acceptable high charging current point.
- Max. AC charging current: The maximum acceptable charging current from AC. If this AC charging current is higher than max. charging current, max. charging current will be set up as real charging current.
- Bulk charging voltage (C.V. voltage): Please check battery spec to set up this figure.
- Floating charging voltage: Please check battery spec to set up this figure.

  The curve of Bulk charging voltage (C.V. voltage) and Floating charging voltage are listed as below:



- Start LCD screen-saver after: The maximum duration time to activate LCD backlight.
- Battery cut-off discharging voltage when Grid is available: It’s to set up battery cut-off discharge voltage when grid is available.
- Battery re-discharging voltage when Grid is available: It’s to set up battery re-charging voltage when grid is available.
- Battery cut-off discharging voltage when Grid is unavailable: It’s to set up battery cut-off discharging voltage when grid is not available.
- Battery re-discharging voltage when Grid is unavailable: It’s to set up battery re-discharging voltage when grid is not available.
- Battery temperature compensation: It’s to adjust charging voltage based on 2V/cell when battery temperature is changing between 0~50°C. All charging settings are

based on 25°C. If setting battery temperature compensation as 5mV, charging voltage will be reduced by the following formula.

(T-25) * (Battery voltage with serial connection / 2) * 5mV

For example, 3-phase inverter with 48VDC under 30°C environment.

(30 – 25) * (48VDC / 2 V/cell) * 5 mV = 600mV. Then, when battery temperature is higher 5°C, charging voltage will be reduced 600mV. Vice versa.

- Feeding grid power calibration: This function allows to calibrate inverter output power to meet demanding power for connected load and avoid overflow to the grid.
- Max. battery discharge current in hybrid mode: It allows to set up maximum battery discharge current in grid-tie and grid-tie with backup mode operation.
- Mute Buzzer alarm: If it’s activated, when fault or warning occurs, it will not sound. Vice versa.
- Mute the buzzer in the Standby mode: If it’s activated, the buzzer will not sound when the device is in the standby mode. Vice versa.
- Mute the buzzer in battery mode: If it’s activated, the buzzer will not sound when the device is in the Battery mode. Vice versa.
- Generator as AC source: If enabled, the unit is able to accept generator as AC power source. When this function is enabled, it’s recommended to enable “Wide AC input voltage range” item.
- Activate Li-Fe battery while commissioning: If yes is selected, Li-Fe battery will be activated while commissioning.
- Wide AC input range: If disabled, the acceptable AC input voltage range will be determined by setting voltage between min. grid-connected voltage and max. grid-connected voltage and setting frequency between min. grid-connected frequency and max. grid-connected frequency. If enabled, AC input voltage range will become 170V ~ 280V. The acceptable frequency range become 40Hz ~ 55Hz for 50 Hz system and 55Hz ~ 65Hz for 60 Hz system. When either AC input voltage or AC input frequency is beyond the grid-connected setting range, it’s not allowed to feed-in back to grid. At this time, it’s only available to provide power to loads or charge battery.
- Parallel for output: If it’s enabled, inverter will be set for parallel system. Otherwise, it just works in single model.
- Emergency power supply control: EMS port is available to provide a power source (230V/5A) for emergency lights and load. When “Emergency power supply control” is enabled, EMS port will be active. Even though AC output will be cut off while battery voltage drops, EMS port can still offer output power for emergency use.
- When float charging current is less than X (A) and lasts T (Min), then charger is off. When battery voltage is less than Y (V), then charger is on again.
- System time: It presents the device time zone. Any modification may affect the

calculation of power generation. Please conservatively make any change.

NOTE: All parameter setting should be made at standby mode.

4.2.3 Restore to the defaults

This function will restore all settings to the default and clear all data in database. Therefore, please conservatively execute this function.

Select Device control >> Restore to the defaults. Refers to Diagram 4-12A for grid-tie with backup mode and Diagram 4-12B for Off-Grid mode.

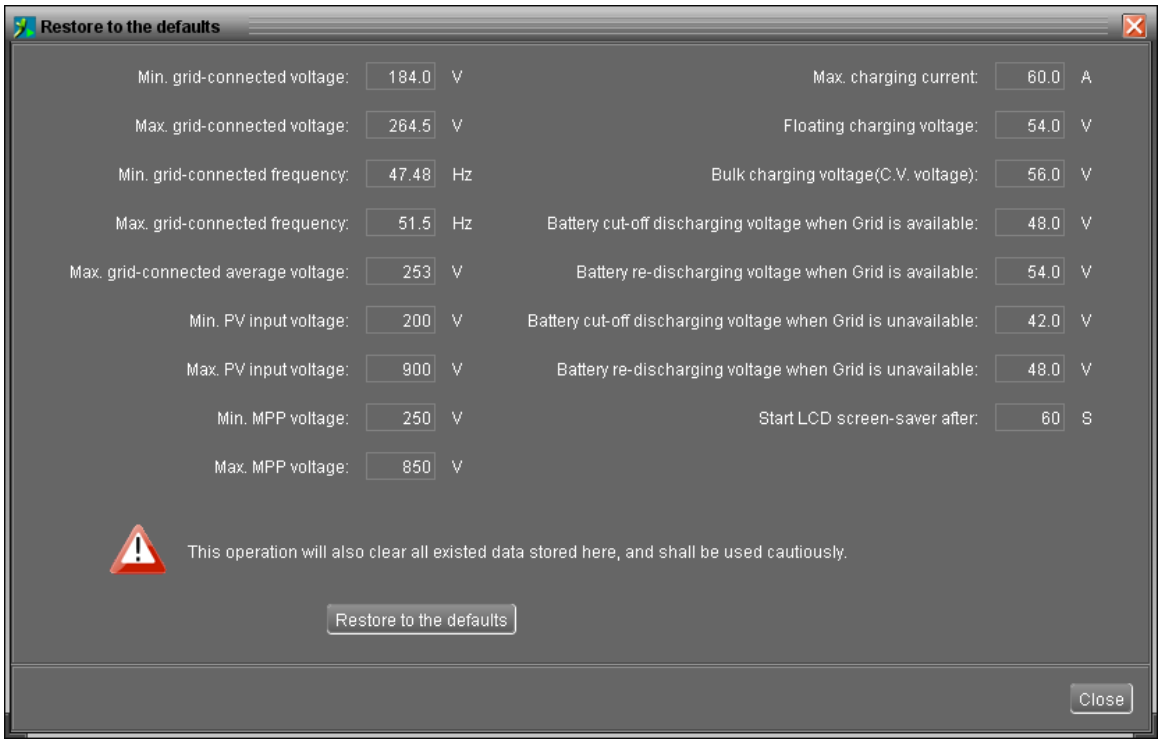


Diagram 4-12A (Grid-tie with backup)

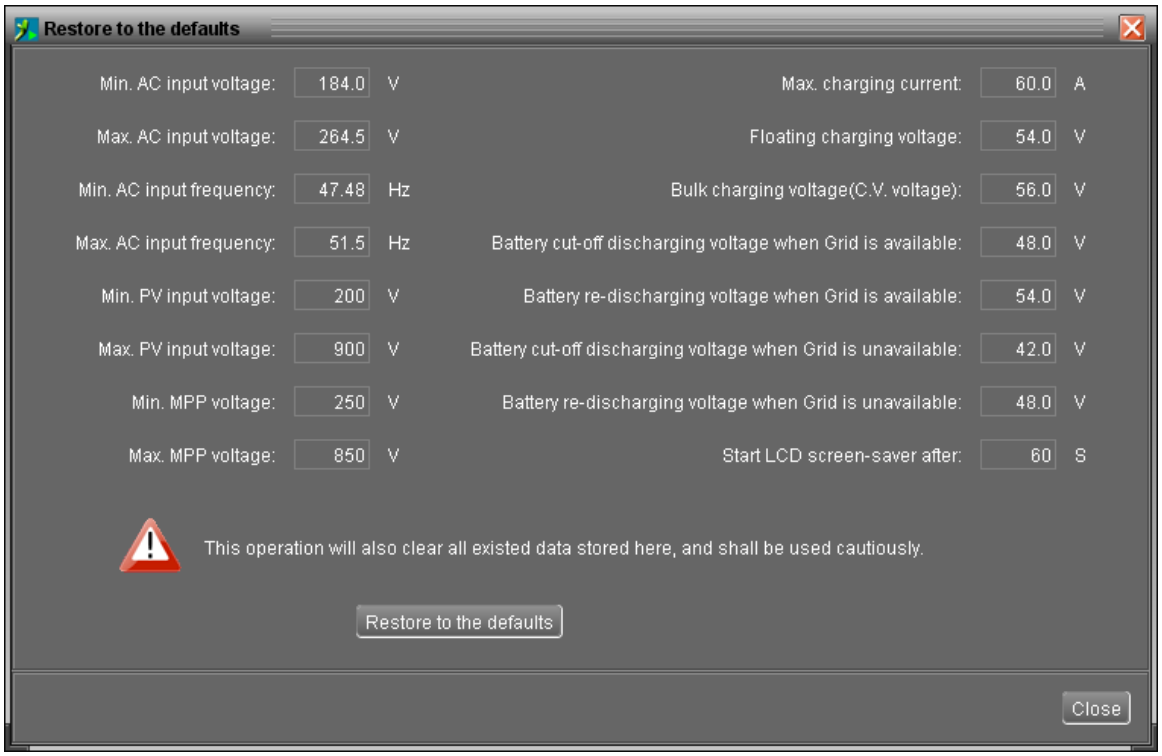


Diagram 4-12B (Off-Grid)

NOTE: This screen may be different for different settings of solar inverters.

4.2.4 Output synchronization data

This function will retrieve saved data in selected solar inverter units to re-save in the database. It can be saved either automatically or manually.

Select Device control >>Output synchronization data. Refer to Diagram 4-13.

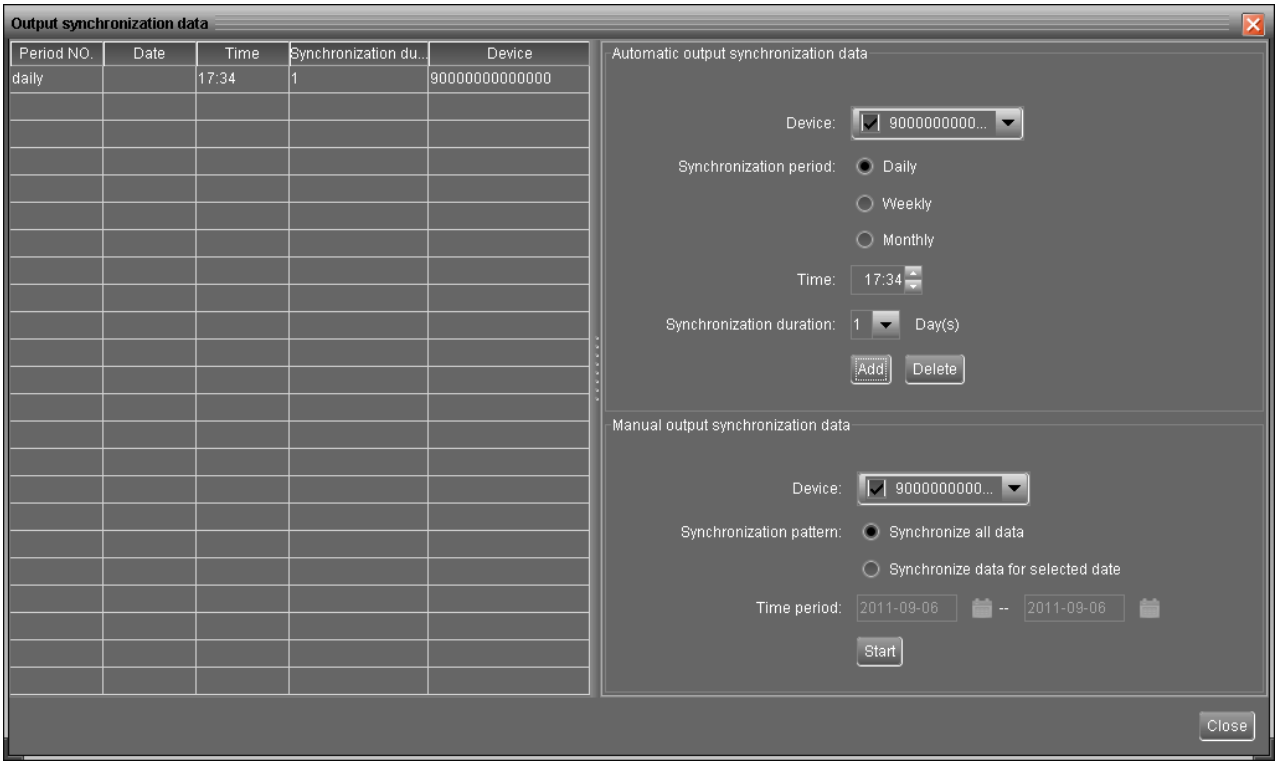


Diagram 4-13

Automatic output synchronization data

- Select device
- Set frequency (daily, weekly, monthly, and time) to automatically sync output data.
- Add schedule into calendar by clicking "Add" button. Every device is only applied one sync schedule.
- Delete schedule by selecting one schedule from the list and clicking "delete" button to remove.

Manual output synchronization data

- Select device
- There are two patterns to sync data.

Synchronize all data: It will save data of selected devices to the database immediately.

Synchronize data for selected date: It will save data of selected devices to the database during indicating period.

NOTE: No matter it's automatic or manual sync, this action is only applied to unsaved data before. If users want to update output data during specific time period, then please delete the data record of this period from power generation log first.

4.2.5 Real-time control

It's to real-time control AC output and activate Li-Fe battery.

Select Device control >> Real-time control. Refer to Diagram 4-14.

Diagram 4-14

- AC output control: Turn on or turn off AC output immediately when clicking "Apply" button.
- Activate Li-Fe Battery now: To activate Li-Fe battery when clicking "Yes" button. Please be aware AC output will be cut off when this action is executed if "Activate Li-Fe battery while commissioning" is selected in parameter setting. AC output will be restored after this action is executed completely.

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 4-15.

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.

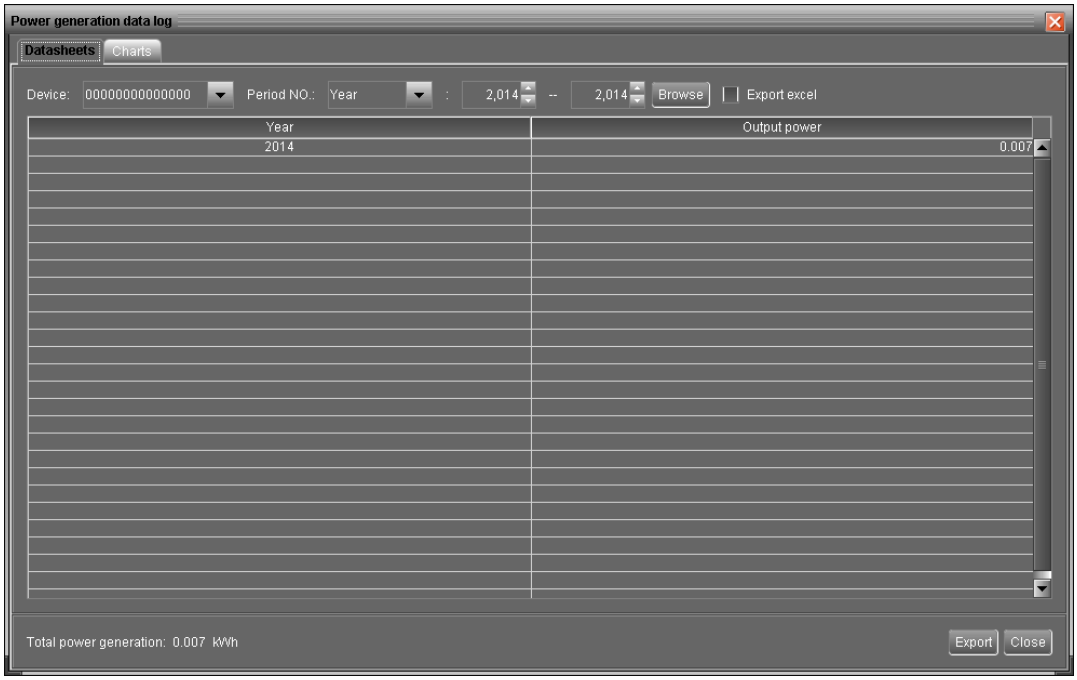


Diagram 4-15

- **Charts**

Select View >> Power generation log data >> Charts. Refer to Diagram 4-16.

Select browsed device and period. Click "Browse" to get result.

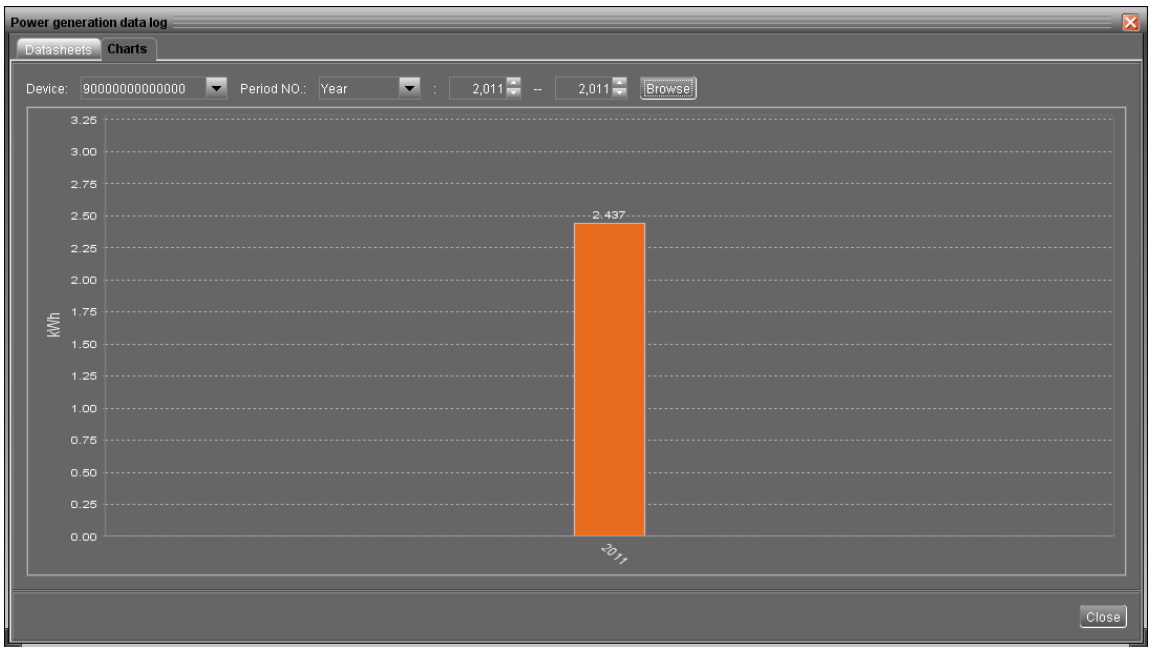

Power generation data log
Datasheets
Charts
Device:
90000000000000
Period NO.:
Year
2,011
--
2,011
Browse
3.25
3.00
2.75
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
kWh
2.437
2011
Close

Diagram 4-16

4.3.2 Data

This function is to browse the working data of solar inverter saved in datasheets or chart formats.

- Datasheets

Select View >>Data>>Datasheets or click shortcut icon . Refer to Diagram 4-17.

Select browsed device and period to display in the screen. Click "Browse" to get result.

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

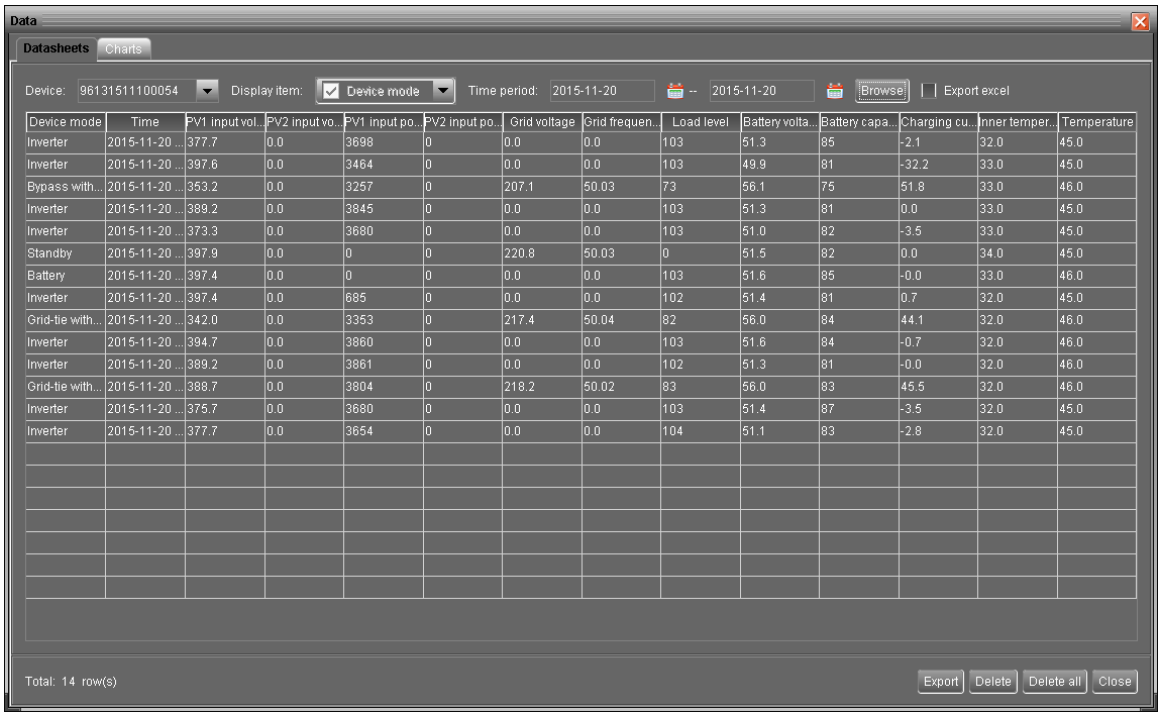


Diagram 4-17

- **Charts**

Select View >>Data>>Charts. Refer to Diagram 4-18.

Select browsed device and period and then click "Browse" to get the result.

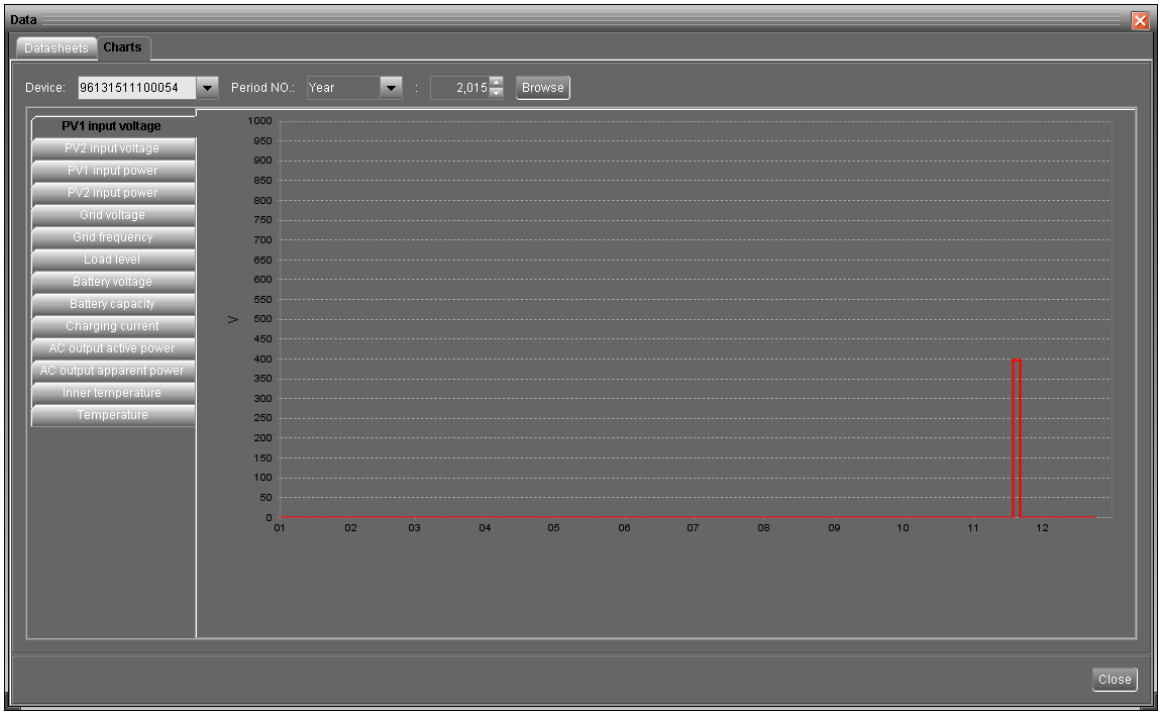


Diagram 4-18

4.3.3 Fault data log

Fault data log is to record last data before any fault occurs in solar inverter.

Select View >>Fault data log or click shortcut icon . Refer to Diagram 4-19.

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

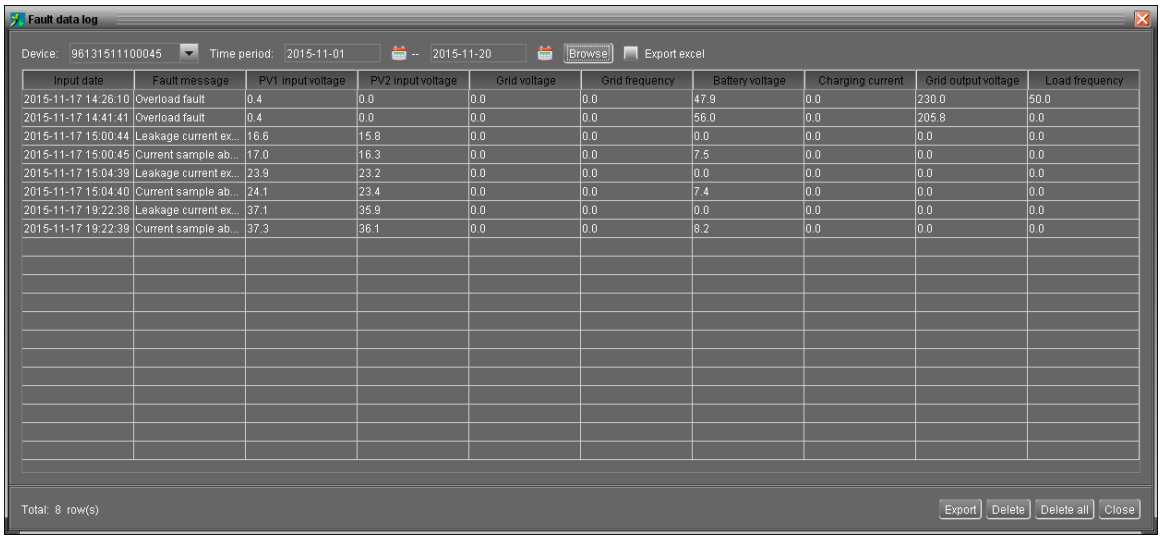


Diagram 4-19

4.3.4 Event log

It's to record history events. Users can browse event list according to date. It lists all detailed information and statistics for history events. Refer to Diagram 4-20.

Select View >>Event log or click shortcut icon to enter event log.

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

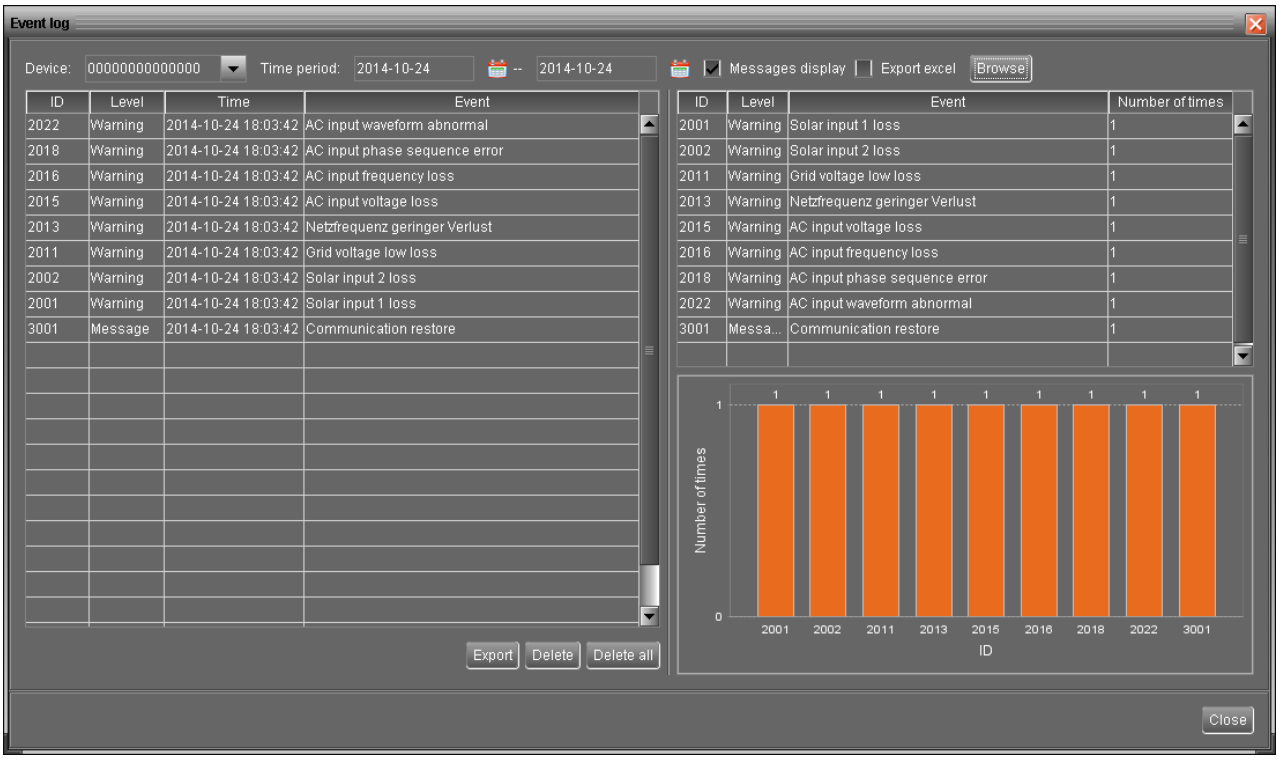


Diagram 4-20

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 4-21.

- Product information: including Model type, Topology, Main CPU processor version, Secondary CPU processor version, Output phase, Nominal input voltage, Nominal output voltage, and so on.

- Rated information: including nominal output power, min. AC input voltage, max. AC input voltage, min. AC input frequency, max. AC input frequency, max. PV input current, rated battery voltage, nominal grid-connected voltage, nominal grid-connected frequency, Nominal grid-connected current, max. input current for each PV and number of maximum-power-tracing units. These listed information will be different based on different mode setting for inverter.
- Purchasing information: including Purchasing date, Warranty for device, Device P/N, and so on.

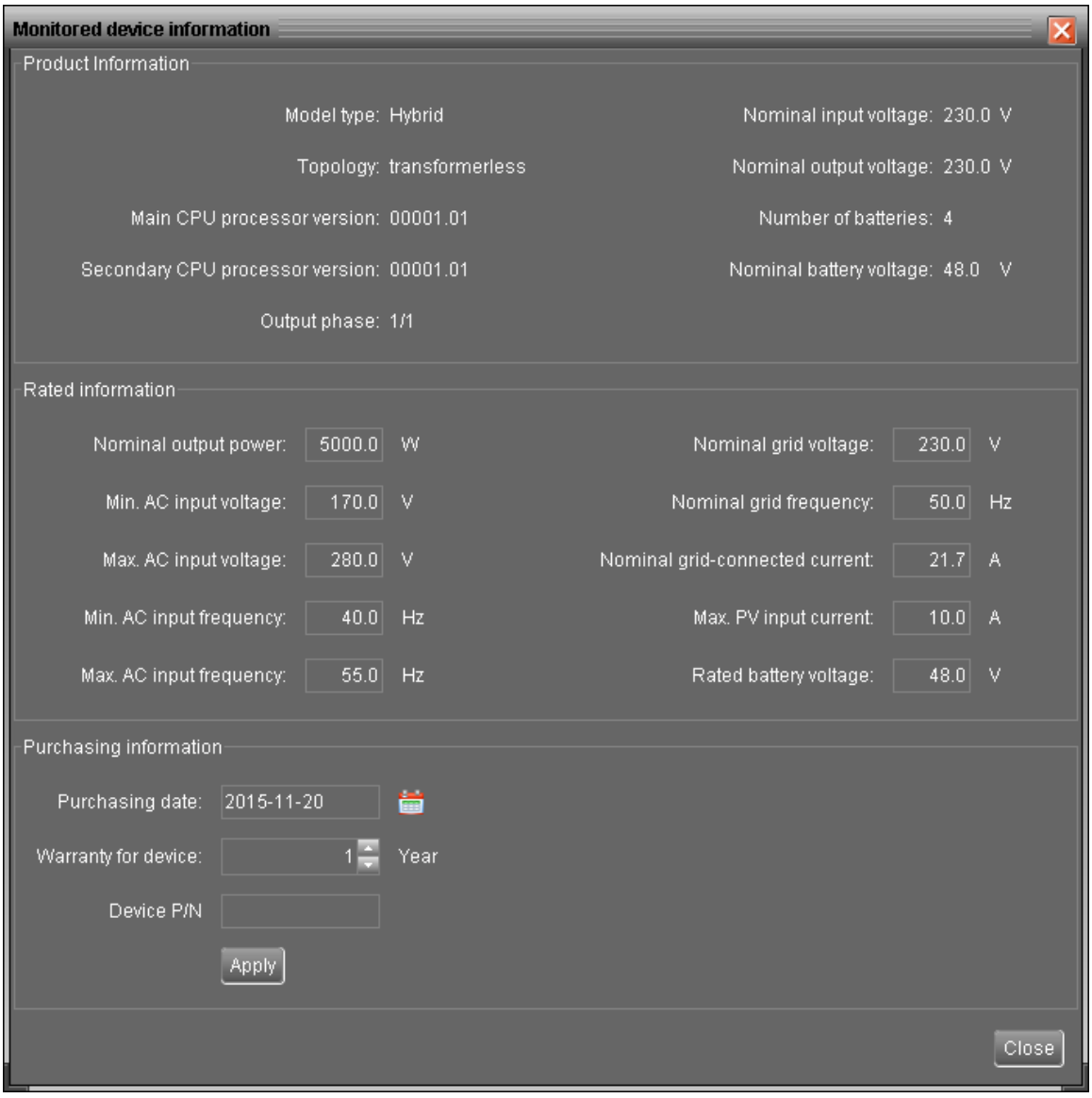


Diagram 4-21

NOTE: This screen may be different for different settings of solar inverters.

4.4 Login and Logout

Icon to display users don’t log in SolarPower

Icon to display users has logged in SolarPower

Click icon and enter password to log in the software. The default password is "administrator". Refer to Diagram 4-22.

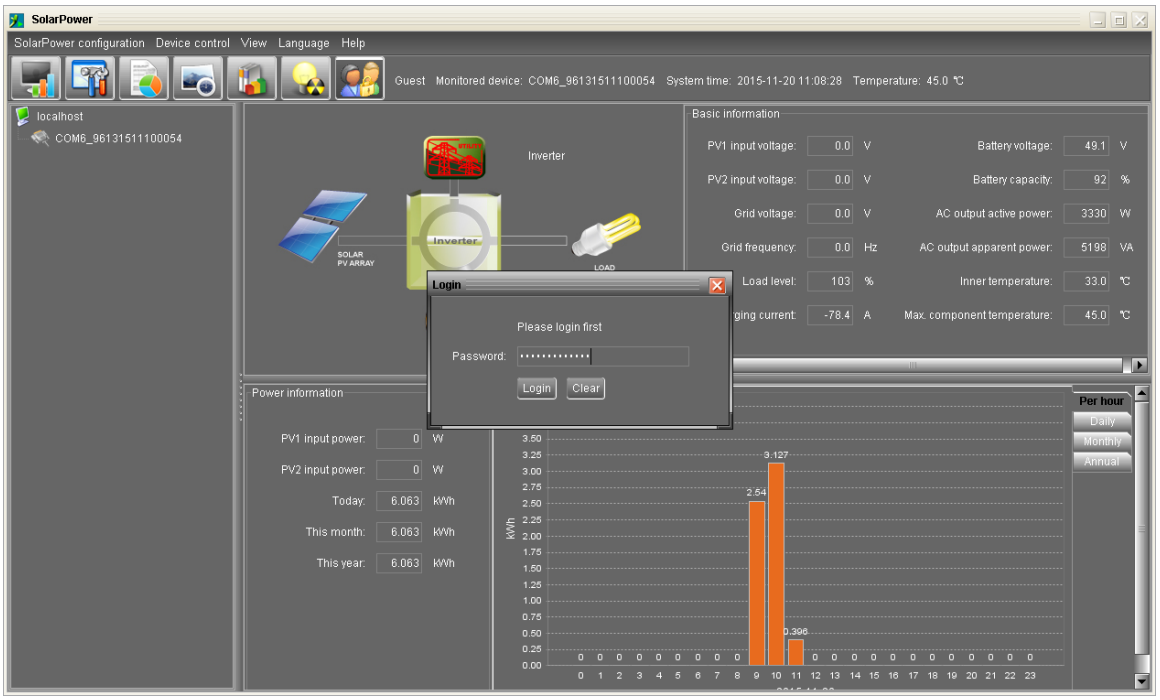


Diagram 4-22

Click icon to log out. Refer to Diagram 4-23.

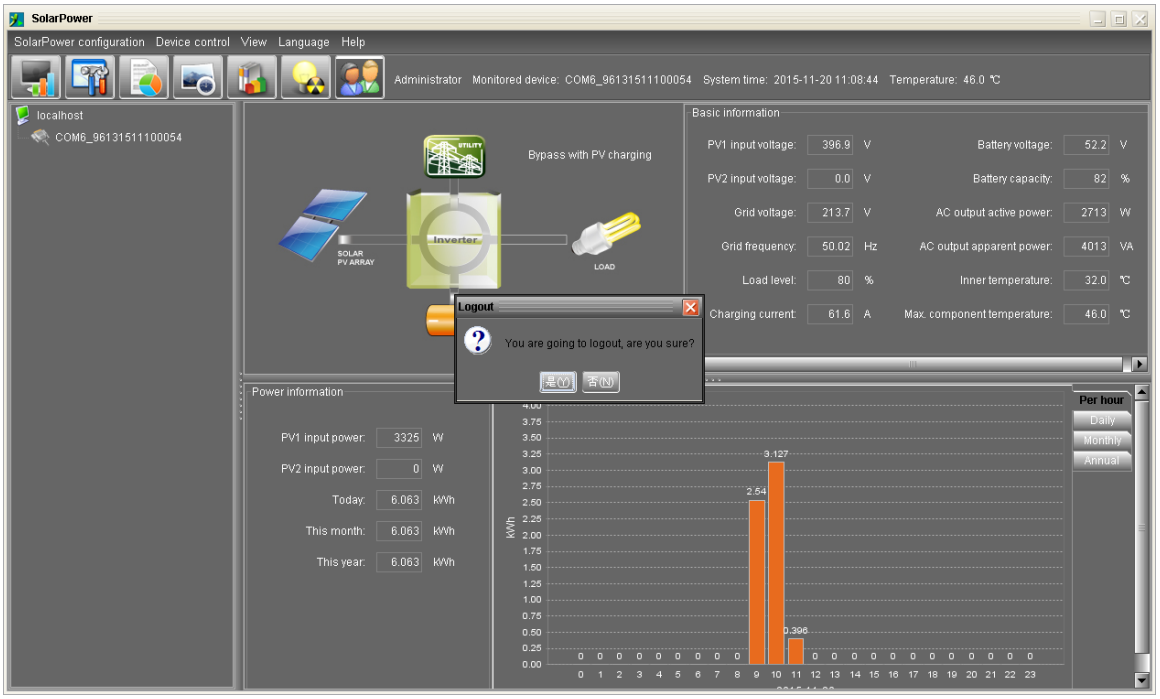


Diagram 4-23

4.5 Language

Currently, this software offers 13 languages for selection:

√ Chinese (Simplified)

√ Chinese (Traditional)

√ English

√ German

√ Italian

√ Polish

√ Portuguese

√ Russian

√ Spanish

√ Ukrainian

√ French

√ Turkish

√ Japanese

When first using the software, it will display proper language according to 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 manual carefully.