

SolarPower

User Manual

Suitable Products:

- Three-phase grid-tie inverter with energy storage
- Three-phase off-Grid 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

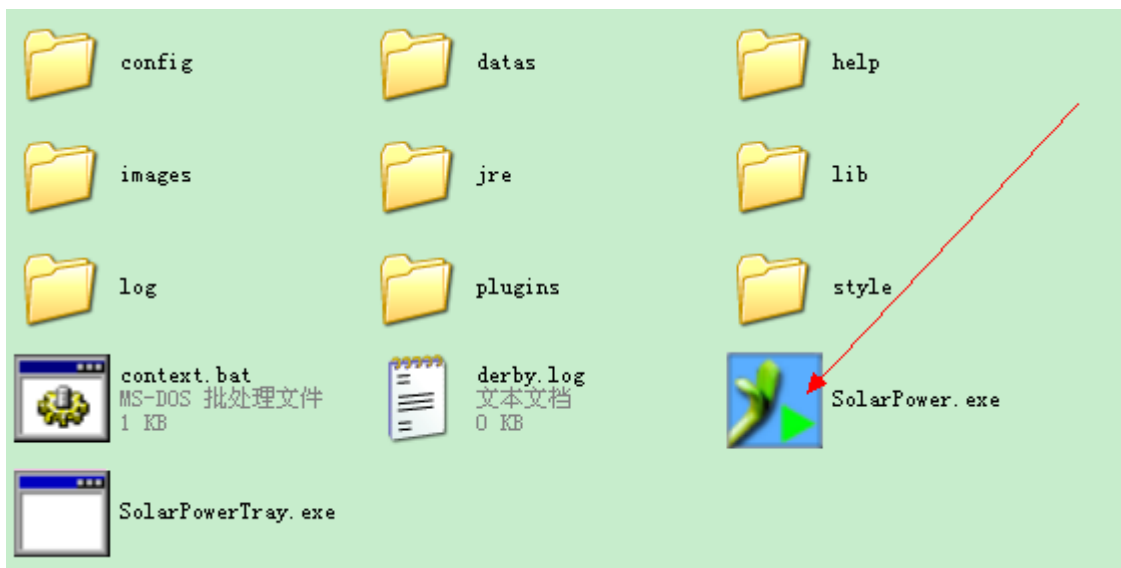
- 512 MB physical memory at least (1 GB is recommended)
- 2GB hard disk space at least
- Administrator authority is required
- More than 32-bit colors and 1280 x 800 or above resolution display is recommended
- An available communication port is needed
- Platforms supported by software are listed below:
 - Windows 2003/XP/Vista/2008 (32bit &x64bit)
 - Windows 7/8 (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 10.6(x64bit)
- Mac OS 10.7(x64bit)
- Mac OS 10.8(x64bit)
- Mac OS 10.9(x64bit)
- Mac OS 10.10(x64bit)

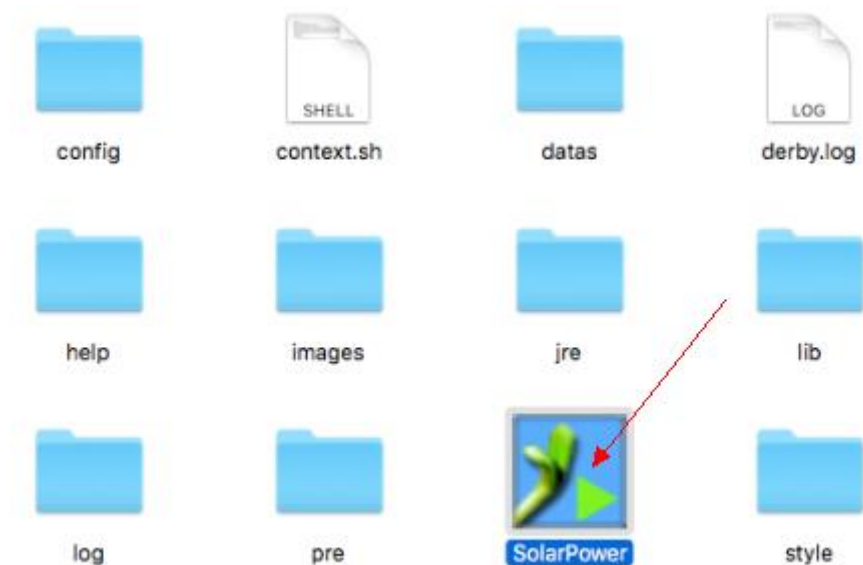
2.2 Software Install

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:



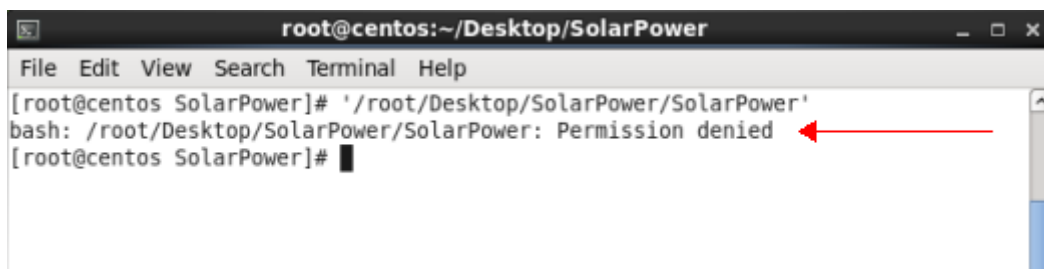
Macosx Version:



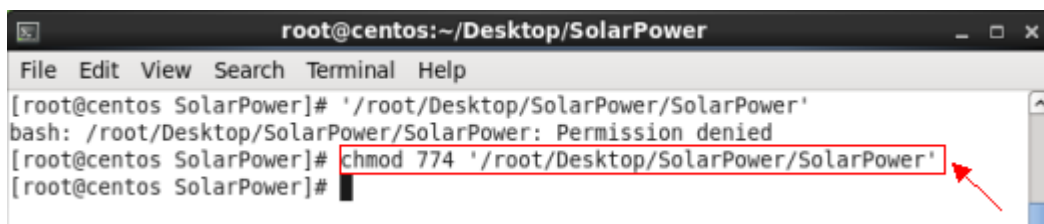
Linux Version:



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

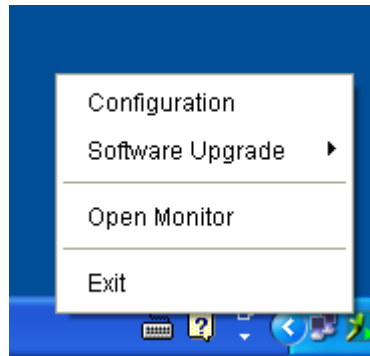


Diagram 3-2

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.

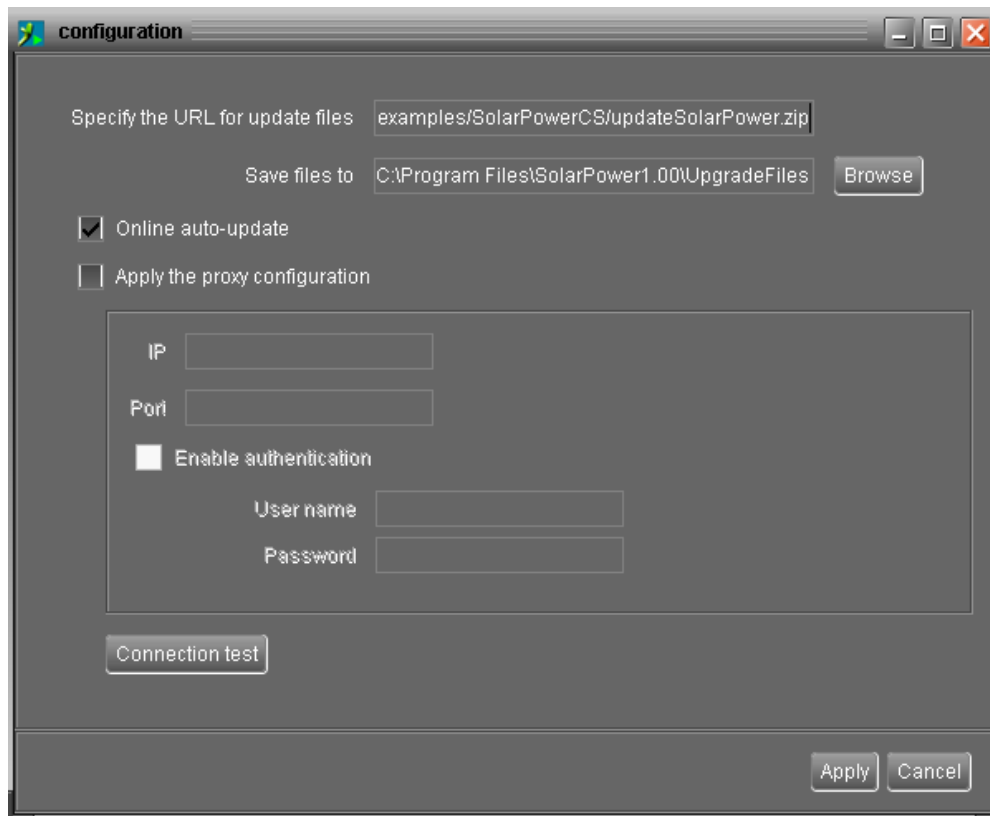


Diagram 3-3

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.

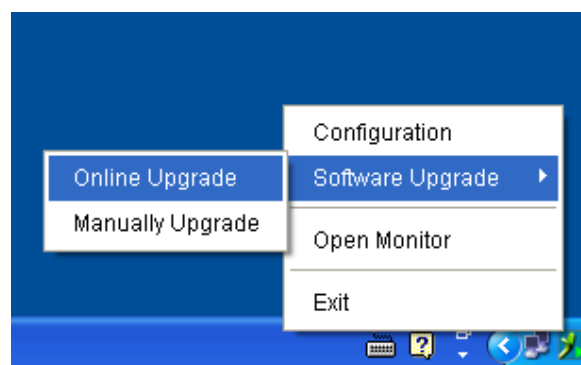


Diagram 3-4

- Manually Upgrade:

Users can manually upgrade the software. Follow below steps:

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

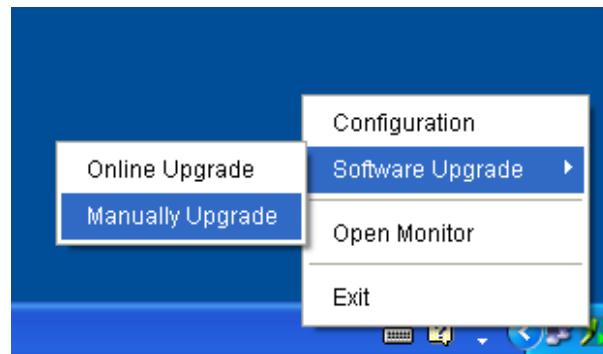


Diagram 3-5

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

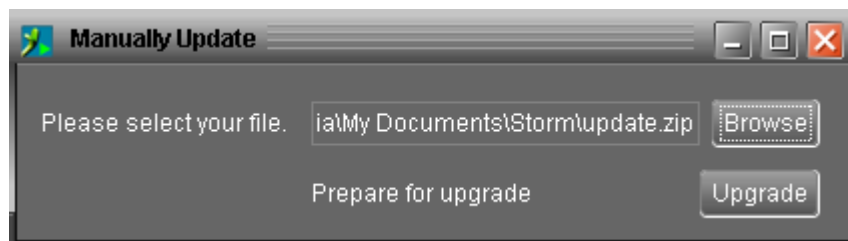






Diagram 3-6

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.

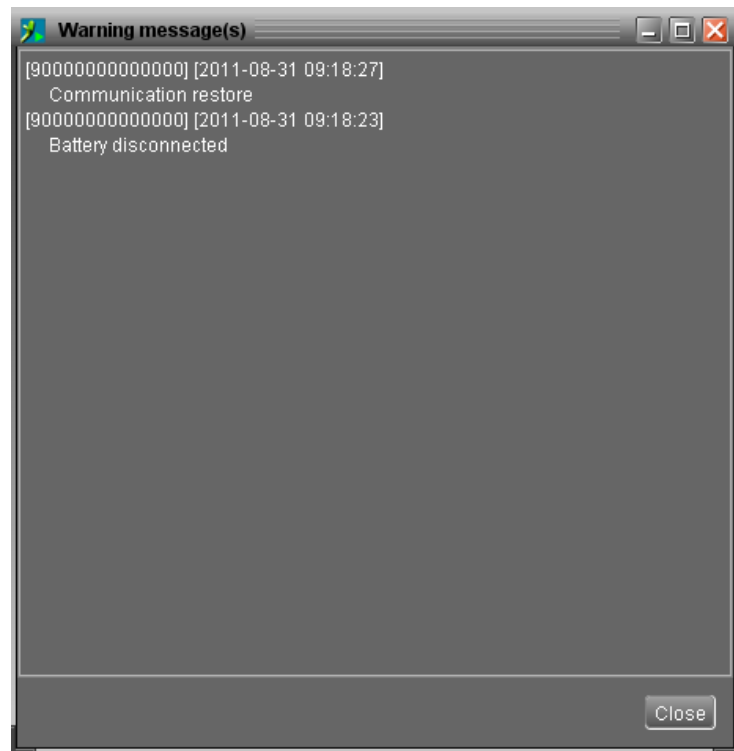


Diagram 3-7

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:

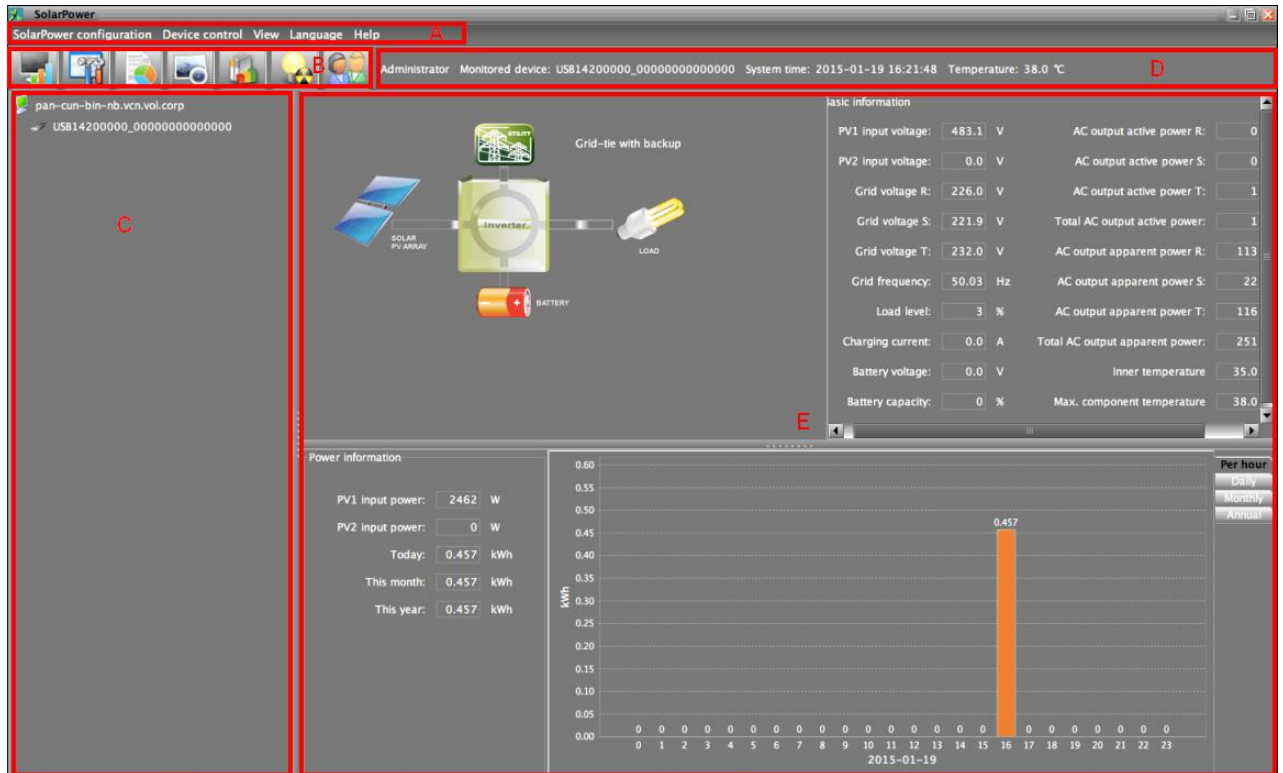


Diagram 4-1

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.

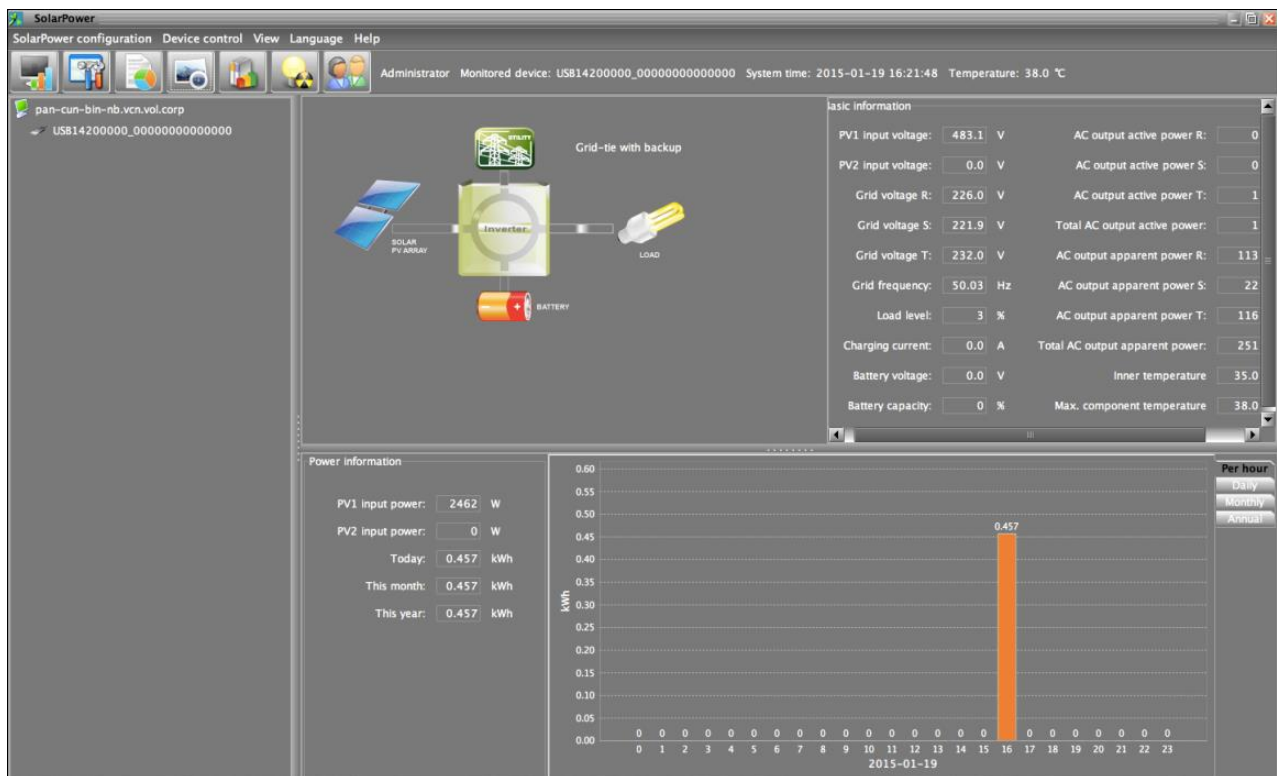


Diagram 4-2

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:

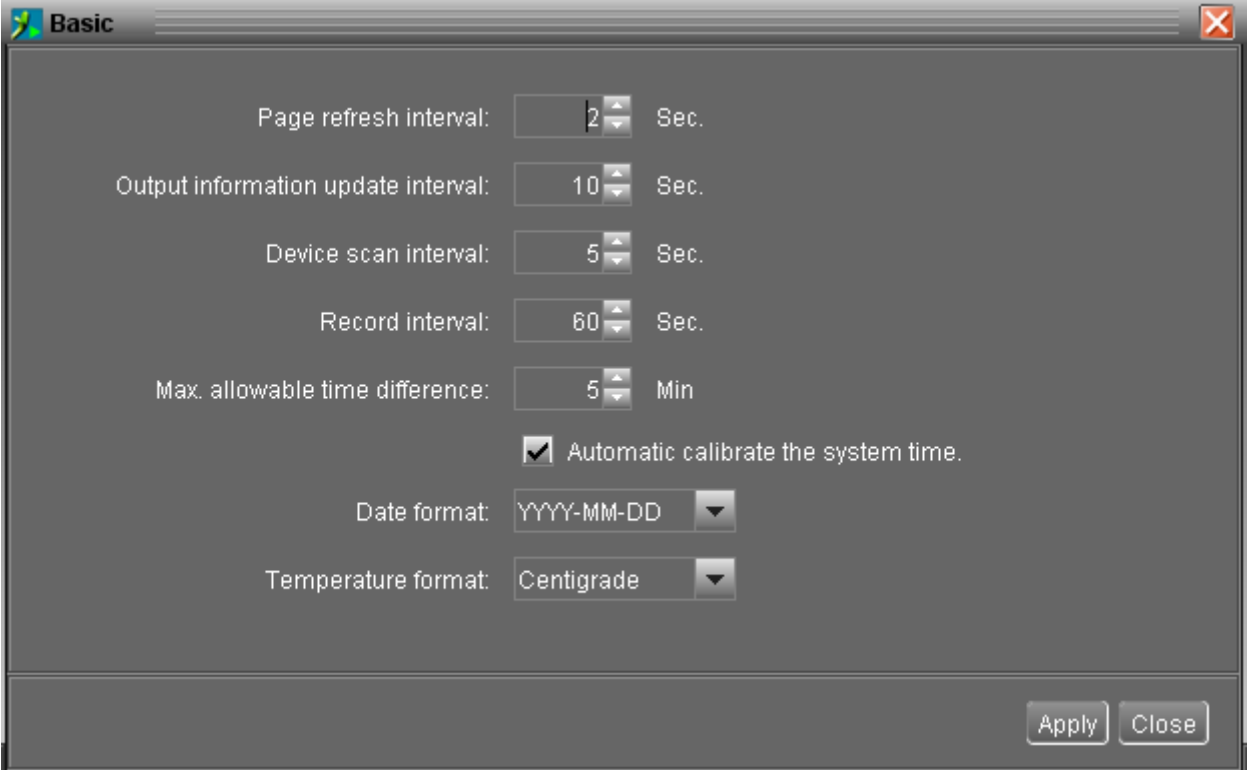
- Display hourly power generation on current date when selecting "per hour".
- Display daily power generation in current month when selecting "daily".
- Display monthly power generation in current year when selecting "monthly".
- Display annual power generation so far this year when selecting "annual".

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.



The screenshot shows a configuration window titled "Basic". It contains the following settings:

- Page refresh interval: 2 Sec.
- Output information update interval: 10 Sec.
- Device scan interval: 5 Sec.
- Record interval: 60 Sec.
- Max. allowable time difference: 5 Min
- ☒ Automatic calibrate the system time.
- Date format: YYYY-MM-DD
- Temperature format: Centigrade

Buttons: Apply, Close

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.

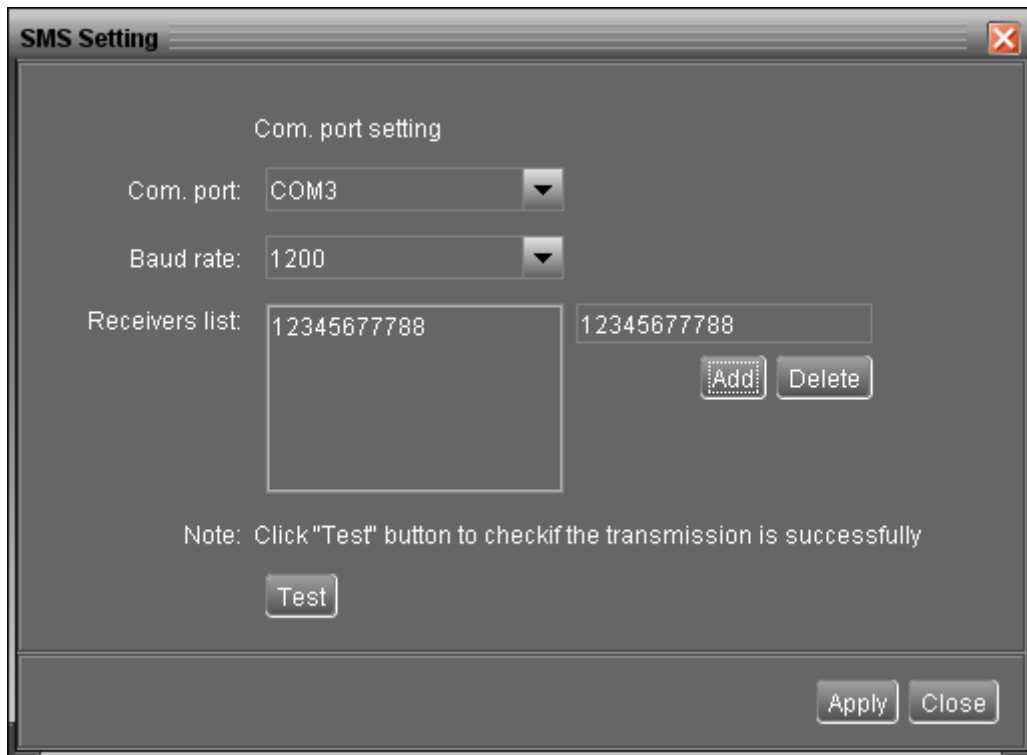


Diagram 4-5

- 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.

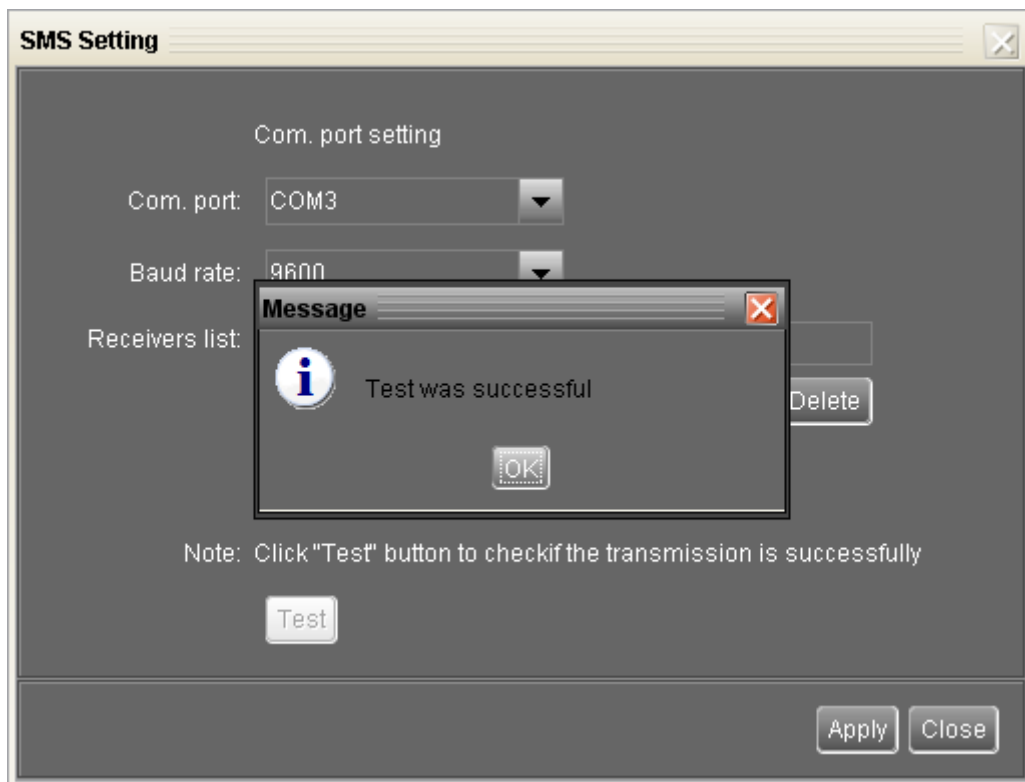


Diagram 4-6

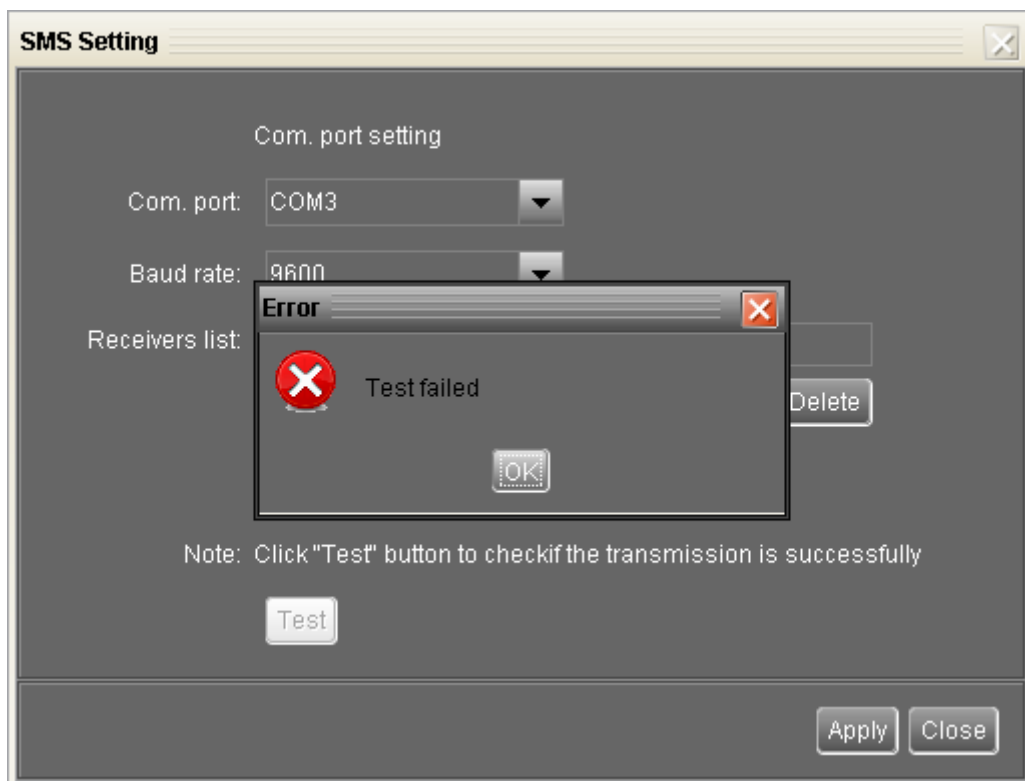


Diagram 4-7

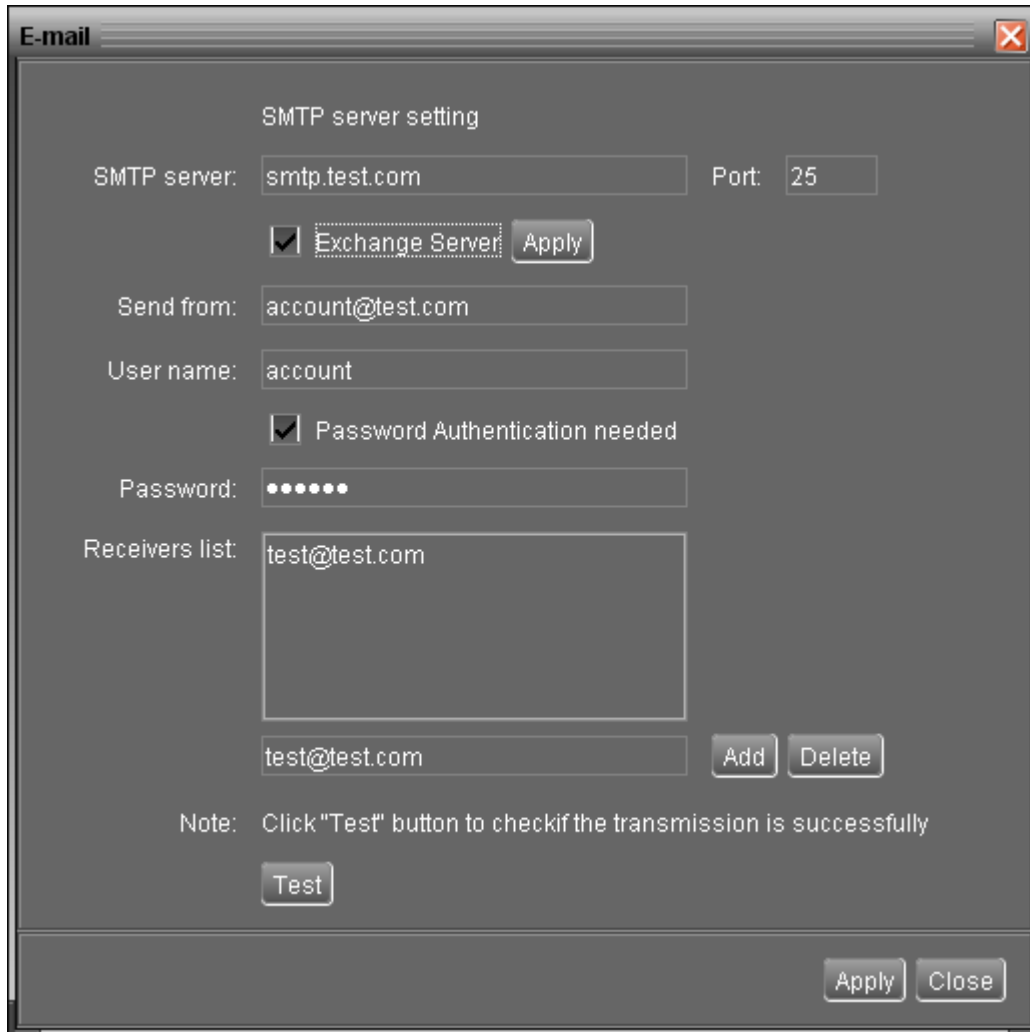
NOTE: It's required to plug-in GSM Modem if sending SMS to mobile phone.

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.



The screenshot shows a window titled "E-mail" with a close button in the top right corner. The window contains the following fields and controls:

- SMTP server setting**: A label above the SMTP server and Port fields.
- SMTP server**: A text input field containing "smtp.test.com".
- Port**: A text input field containing "25".
- Exchange Server**: A checkbox that is checked, with an "Apply" button next to it.
- Send from**: A text input field containing "account@test.com".
- User name**: A text input field containing "account".
- Password Authentication needed**: A checkbox that is checked.
- Password**: A text input field with masked characters (dots).
- Receivers list**: A text area containing "test@test.com".
- Add/Delete buttons**: Two buttons located below the receivers list, with "test@test.com" entered in a small input field above them.
- Note**: A text label stating "Click 'Test' button to check if the transmission is successfully".
- Test button**: A button located below the note.
- Apply/Close buttons**: Two buttons located at the bottom right of the window.

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.

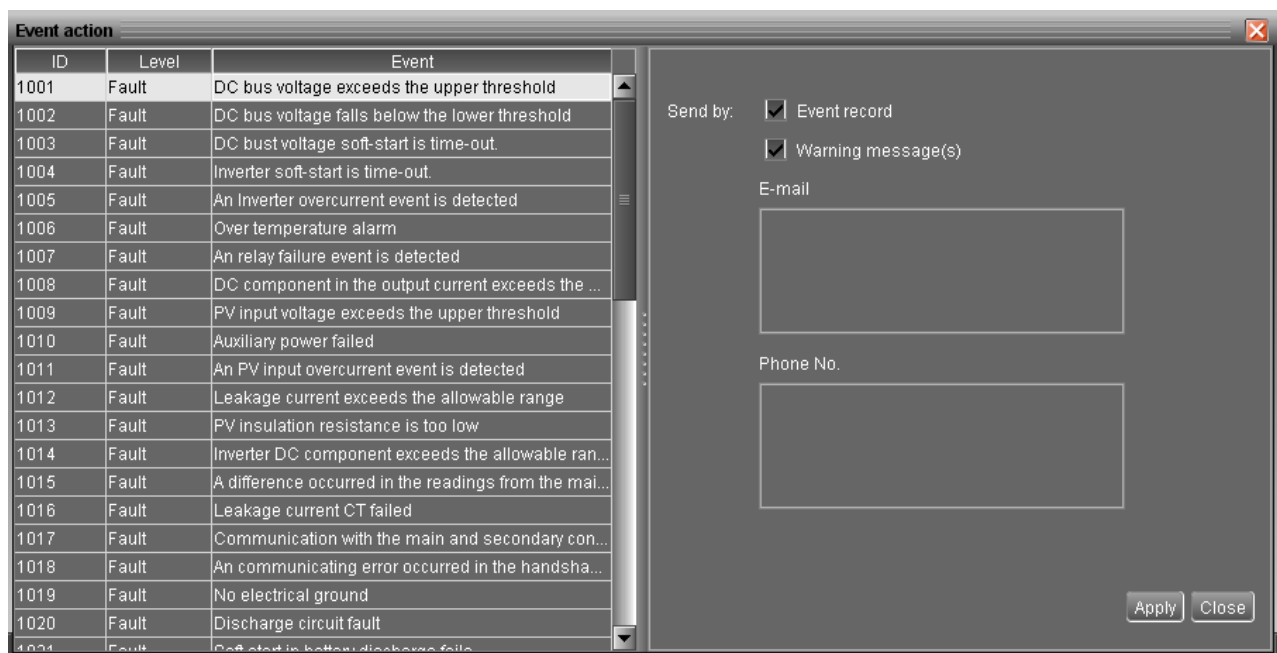


Diagram 4-9

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.

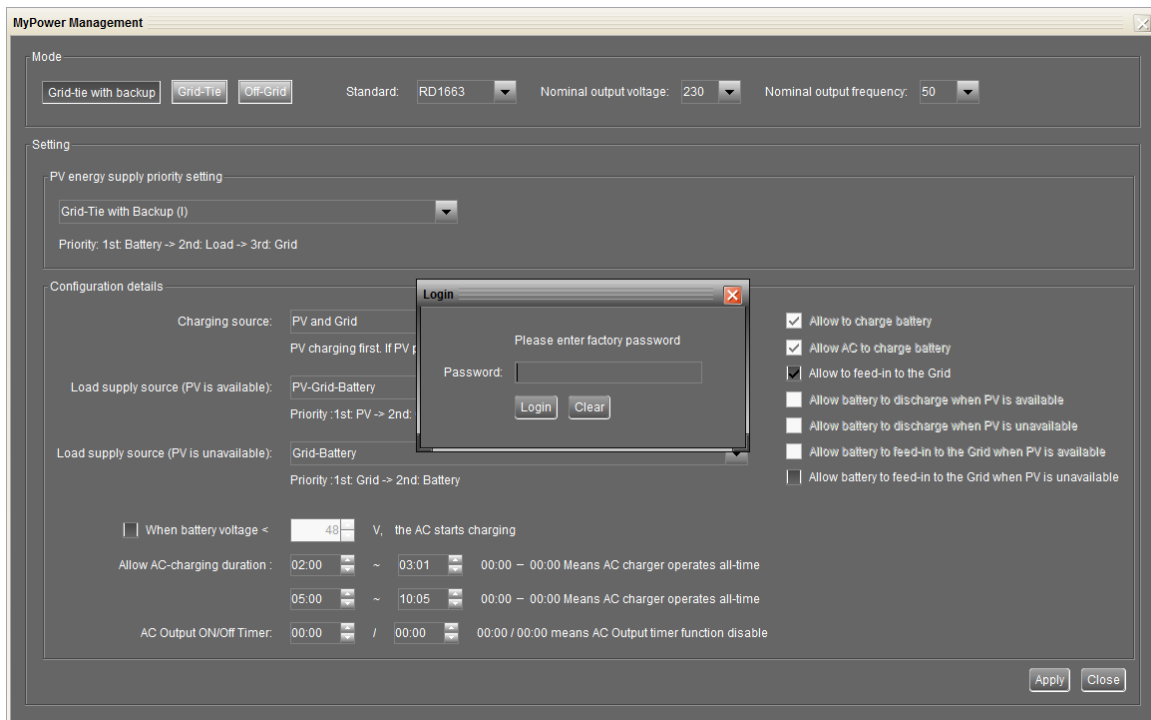
The screenshot shows the 'MyPower Management' window with the following settings:

- Mode:** 'Grid-tie with backup' is selected. Other options are 'Grid-Tie' and 'Off-Grid'.
Standard: VDE0126
Nominal output voltage: 230
Nominal output frequency: 50
- Setting:**
PV energy supply priority setting: 'Grid-Tie with Backup (I)' is selected.
Priority: 1st: Battery -> 2nd: Load -> 3rd: Grid
- Configuration details:**
Charging source: 'PV and Grid' is selected.
PV charging first. If PV power is not sufficient, PV and grid will charge battery together.
Load supply source (PV is available): 'PV-Grid-Battery' is selected.
Priority: 1st: PV -> 2nd: Grid -> 3rd: Battery
Load supply source (PV is unavailable): 'Grid-Battery' is selected.
Priority: 1st: Grid -> 2nd: Battery
Checkboxes:
☒ Allow to charge battery
☒ Allow AC to charge battery
☒ Allow to feed-in to the Grid
☐ Allow battery to discharge when PV is available
☐ Allow battery to discharge when PV is unavailable
☐ Allow battery to feed-in to the Grid when PV is available
☐ Allow battery to feed-in to the Grid when PV is unavailable
When battery voltage < 48 V, the AC starts charging
Allow AC-charging duration: 02:00 ~ 03:01 00:00 - 00:00 Means AC charger operates all-time
05:00 ~ 10:05 00:00 - 00:00 Means AC charger operates all-time
AC Output ON/Off Timer: 00:00 / 00:00 00:00 / 00:00 means AC Output timer function disable

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.

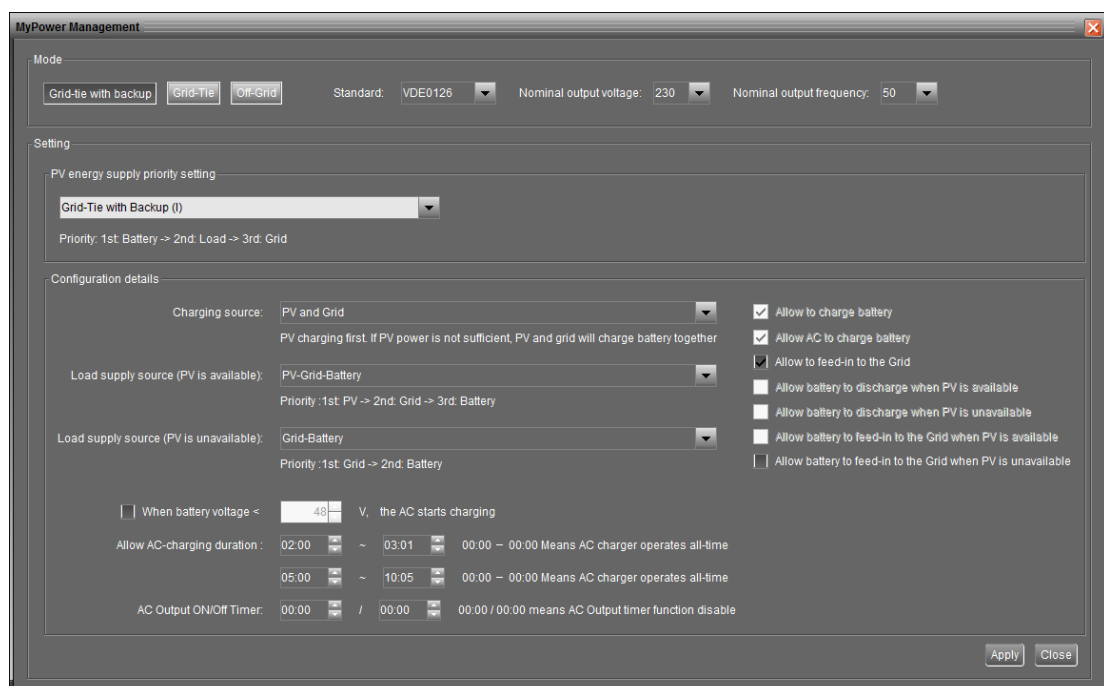
Nominal Output Voltage: There are 5 options for high voltage system to select, 240V, 230V, 220V, 208V and 202V.

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.

NOTE: It's allowed to set up AC charging duration. For the detailed setting, please check **AC Charging Setup**.

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) :

The screenshot shows the 'MyPower Management' software window. The 'Mode' section has three tabs: 'Grid-tie with backup' (selected), 'Grid-Tie', and 'Off-Grid'. Below the tabs, there are settings for 'Standard' (VDE0126), 'Nominal output voltage' (230), and 'Nominal output frequency' (50). The 'Setting' section has a dropdown menu for 'PV energy supply priority setting' set to 'Grid-Tie with Backup (II)', with a note 'Priority: 1st Load -> 2nd Battery -> 3rd Grid'. The 'Configuration details' section contains several settings: 'Charging source' is set to 'PV and Grid' with a note 'PV charging first. If PV power is not sufficient, PV and grid will charge battery together'; 'Load supply source (PV is available)' is set to 'PV-Battery-Grid' with a note 'Priority: 1st PV -> 2nd Battery -> 3rd Grid'; 'Load supply source (PV is unavailable)' is set to 'Battery-Grid' with a note 'Priority: 1st Battery -> 2nd Grid' and 'This option is ineffective during of AC charging'. There are checkboxes for 'Allow to charge battery' (checked), 'Allow AC to charge battery' (checked), 'Allow to feed-in to the Grid' (checked), 'Allow battery to discharge when PV is available' (checked), 'Allow battery to discharge when PV is unavailable' (checked), 'Allow battery to feed-in to the Grid when PV is available' (unchecked), and 'Allow battery to feed-in to the Grid when PV is unavailable' (unchecked). At the bottom, there are settings for 'When battery voltage < 48 V, the AC starts charging', 'Allow AC-charging duration' (02:00 ~ 03:01 and 05:00 ~ 10:05), and 'AC Output ON/Off Timer' (00:00 / 00:00). The 'Apply' and 'Close' buttons are at the bottom right.

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.

NOTE: It's allowed to set up AC charging duration. For the detailed setting, please check **AC Charging Setup**.

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):

The screenshot shows the 'MyPower Management' window with the 'Grid-tie with backup' mode selected. The 'Setting' tab is active, showing the 'PV energy supply priority setting' as 'Grid-Tie with Backup (III)' with a priority of '1st: Load -> 2nd: Grid -> 3rd: Battery'. The 'Configuration details' section shows 'Charging source' as 'PV and Grid' (with a note: 'PV charging first. If PV power is not sufficient, PV and grid will charge battery together'), 'Load supply source (PV is available)' as 'PV-Battery-Grid' (with a note: 'Priority: 1st PV -> 2nd: Battery -> 3rd: Grid'), and 'Load supply source (PV is unavailable)' as 'Battery-Grid' (with a note: 'Priority: 1st Battery -> 2nd: Grid'). There are checkboxes for 'Allow to charge battery', 'Allow AC to charge battery', 'Allow to feed-in to the Grid', 'Allow battery to discharge when PV is available', 'Allow battery to discharge when PV is unavailable', 'Allow battery to feed-in to the Grid when PV is available', and 'Allow battery to feed-in to the Grid when PV is unavailable'. A section for 'When battery voltage < 48 V, the AC starts charging' is also visible, along with 'Allow AC-charging duration' and 'AC Output ON/Off Timer' settings.

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.

NOTE: It's allowed to set up AC charging duration. For the detailed setting, please check **AC Charging Setup**.

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:

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

The screenshot shows the 'MyPower Management' software window. The 'Mode' section has three buttons: 'Grid-tie with backup' (selected), 'Grid-Tie', and 'Off-Grid'. Below these are dropdowns for 'Standard' (VDE0126), 'Nominal output voltage' (230), and 'Nominal output frequency' (50). The 'Setting' section has a dropdown for 'PV energy supply priority setting' set to 'Grid-Tie with Backup(IV)', with sub-text for 'Peak time' and 'Off-Peak time'. The 'Configuration details' section includes dropdowns for 'Charging source', 'Load supply source (PV is available)', and 'Load supply source (PV is unavailable)', all set to 'Peak/Off-Peak Grid Electricity Demand'. To the right are checkboxes for 'Allow to charge battery', 'Allow AC to charge battery', 'Allow to feed-in to the Grid', and several options for battery discharge and feed-in. At the bottom, there are time settings for 'Off-Peak duration' and 'AC Output ON/Off Timer'.

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.

The screenshot shows the 'MyPower Management' software window. The 'Mode' section has three buttons: 'Grid-tie with backup', 'Grid-Tie' (which is selected), and 'Off-Grid'. Below these are dropdown menus for 'Standard' (set to VDE0126), 'Nominal output voltage' (set to 230), and 'Nominal output frequency' (set to 50). The 'Setting' section contains a 'PV energy supply priority setting' dropdown menu set to 'Grid Only'. The 'Configuration details' section includes three dropdown menus for 'Charging source', 'Load supply source (PV is available)', and 'Load supply source (PV is unavailable)', all set to 'N/A'. To the right of these are several checkboxes: 'Allow to charge battery', 'Allow AC to charge battery', 'Allow to feed-in to the Grid' (checked), 'Allow battery to discharge when PV is available', 'Allow battery to discharge when PV is unavailable', 'Allow battery to feed-in to the Grid when PV is available', and 'Allow battery to feed-in to the Grid when PV is unavailable'. Below these are three time-related settings: 'When battery voltage < 48 V, the AC starts charging' (checked), 'Allow AC-charging duration' (set to 02:00 ~ 03:01), and 'AC Output ON/Off Timer' (set to 00:00 / 00:00). At the bottom right are 'Apply' and 'Close' buttons.

NOTE: It's allowed to set up AC charging duration. For the detailed setting, please check **AC Charging Setup**.

Off-Grid

- Off-Grid (I):

The screenshot shows the 'MyPower Management' software window. The 'Mode' section has three buttons: 'Grid-tie with backup', 'Grid-Tie', and 'Off-Grid', with 'Off-Grid' selected. Below these are dropdowns for 'Standard' (VDE0126), 'Nominal output voltage' (230), and 'Nominal output frequency' (50). The 'Setting' section shows 'PV energy supply priority setting' set to 'Off-Grid (I)', with a note 'Priority: 1st Load -> 2nd: Battery' and 'Grid relay is connected in inverter mode'. The 'Configuration details' section includes 'Charging source' (PV or Grid), 'Load supply source (PV is available)' (PV-Battery-Grid), and 'Load supply source (PV is unavailable)' (Battery-Grid). It also features checkboxes for various battery and AC charging options, and a section for 'AC charging duration' with time ranges.

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 10KW.

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. For the detailed setting, please check **AC Charging Setup**.

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)

The screenshot shows the 'MyPower Management' software window. The 'Mode' section has three buttons: 'Grid-tie with backup', 'Grid-Tie', and 'Off-Grid', with 'Off-Grid' selected. Below these are dropdowns for 'Standard' (VDE0126), 'Nominal output voltage' (230), and 'Nominal output frequency' (50). The 'Setting' section shows 'PV energy supply priority setting' set to 'Off-Grid (II)', with 'Priority: 1st Battery -> 2nd Load' and 'Grid relay is connected in inverter mode'. The 'Configuration details' section includes 'Charging source' set to 'PV or Grid' with a note 'PV will charge battery first. If PV power is loss, grid will charge battery', and 'Load supply source (PV is available)' set to 'PV-Grid-Battery' with 'Priority: 1st PV -> 2nd: Grid -> 3rd: Battery'. There are checkboxes for 'Allow to charge battery' (checked), 'Allow AC to charge battery' (checked), and several other options related to feed-in and discharge. At the bottom, there are fields for 'When battery voltage < 48 V, the AC starts charging', 'Allow AC-charging duration' (02:00 to 03:01), and 'AC Output ON/Off Timer' (00:00 / 00:00).

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 10KW.

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. For the detailed setting, please check **AC Charging Setup**.

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)

The screenshot shows the 'MyPower Management' software window. The 'Mode' section has three buttons: 'Grid-tie with backup', 'Grid-Tie', and 'Off-Grid' (which is selected). Below these are dropdowns for 'Standard' (VDE0126), 'Nominal output voltage' (230), and 'Nominal output frequency' (50). The 'Setting' section shows 'PV energy supply priority setting' set to 'Off-Grid (III)', with a note: 'Priority: 1st Load -> 2nd Battery' and 'Grid relay is disconnected in inverter mode'. The 'Configuration details' section includes: 'Charging source' set to 'PV or Grid' with a note 'PV will charge battery first. If PV power is loss, grid will charge battery'; 'Load supply source (PV is available)' set to 'PV-Battery-Grid' with a note 'Priority: 1st PV -> 2nd Battery -> 3rd Grid'; and 'Load supply source (PV is unavailable)' set to 'Grid-Battery' with a note 'Priority: 1st Grid -> 2nd Battery'. On the right, there are checkboxes for: 'Allow to charge battery' (checked), 'Allow AC to charge battery' (checked), 'Allow to feed-in to the Grid' (unchecked), 'Allow battery to discharge when PV is available' (checked), 'Allow battery to discharge when PV is unavailable' (unchecked), 'Allow battery to feed-in to the Grid when PV is available' (unchecked), and 'Allow battery to feed-in to the Grid when PV is unavailable' (unchecked). At the bottom, there are settings for 'When battery voltage < 48 V, the AC starts charging', 'Allow AC-charging duration' (02:00 ~ 03:01 and 05:00 ~ 10:05), and 'AC Output ON/Off Timer' (00:00 / 00:00). 'Apply' and 'Close' buttons are at the bottom right.

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 10KW 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. For the detailed setting, please check **AC Charging Setup**.

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. Maximum two charging periods are able to set up. 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.

Select Device Control >> Parameter Setting2, Relevant setting items of factory parameters can be set.

NOTE: This screen may vary 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 4-11D. Any mis-setting could cause damage to inverter or not work. Please check local dealers for the details. Refer to Diagram 4-11A for **Grid-Tie with Backup mode**. Refer to Diagram 4-11B for **Grid-Tie mode**. Refer to Diagram 4-11C for off-grid mode. Refer to Diagram 4-11D for **Grid-Tie with Backup mode** and **Grid-Tie mode under the factory parameters setting**. This setting is not available under Off-Grid 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.

Parameters setting

Min. PV input voltage: 300 V	Apply	Battery cut-off discharging voltage when grid is available: 51 V	Apply
Max. PV input voltage: 860 V	Apply	Battery re-discharging voltage when Grid is available: 53 V	Apply
Min. MPP voltage: 365 V	Apply	Battery cut-off discharging voltage when grid is unavailable: 48 V	Apply
Max. MPP voltage: 850 V	Apply	Battery re-discharging voltage when Grid is unavailable: 48.5 V	Apply
Max. charging current: 10 A	Apply	Battery temperature compensation: 0.2 mV	Apply
Max. AC charging current: 30 A	Apply	Max. battery discharge current in hybrid mode: 300 A	Apply
Bulk charging voltage(C.V. voltage): 54 V	Apply	Feeding grid power calibration R: -500 W	Apply
Floating charging voltage: 53 V	Apply	Feeding grid power calibration S: 0 W	Apply
Start LCD screen-saver after: 60 Sec.	Apply	Feeding grid power calibration T: 0 W	Apply

Mute buzzer alarm: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	Apply	Wide AC input range: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	Apply
Mute the buzzer in the Standby mode: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	Apply	Parallel for output: <input type="radio"/> Enable <input checked="" type="radio"/> Disable	Apply
Mute alarm in battery mode: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	Apply	Output Neutral line grounding in battery mode: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	Apply
Activate Li-Fe battery while commissioning: <input checked="" type="radio"/> Yes <input type="radio"/> No	Apply	BMS battery connect: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	Apply
Generator as AC source: <input type="radio"/> Enable <input checked="" type="radio"/> Disable	Apply		

When float charging current is less than X (A) and continued T (Min),then charger off; when battery voltage is less than Y (V),then charger on again.

X: 0 A T: 60 Min. Y: 53 V Apply

Any schedule change will affect the power generated and shall be conservatively made.

System time: 2020-10-13 17:44:58 Apply

Close

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

Parameters setting

Min. PV input voltage: 300 V	Apply	Min. MPP voltage: 365 V	Apply
Max. PV input voltage: 860 V	Apply	Max. MPP voltage: 850 V	Apply
Start LCD screen-saver after: 60 Sec.	Apply		

Mute buzzer alarm: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	Apply	Output Neutral line grounding in battery mode: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	Apply
Mute the buzzer in the Standby mode: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	Apply	BMS battery connect: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	Apply

When float charging current is less than X (A) and continued T (Min),then charger off; when battery voltage is less than Y (V),then charger on again.

X: 0.1 A T: 60 Min. Y: 53 V Apply

Any schedule change will affect the power generated and shall be conservatively made.

System time: 2020-12-14 11:46:03 Apply

Close

Diagram 4-11B (Grid-Tie mode)

Parameters setting

Min. PV input voltage: 300 V <input type="button" value="Apply"/>	Battery cut-off discharging voltage when grid is available: 51 V <input type="button" value="Apply"/>
Max. PV input voltage: 860 V <input type="button" value="Apply"/>	Battery re-discharging voltage when Grid is available: 53 V <input type="button" value="Apply"/>
Min. MPP voltage: 365 V <input type="button" value="Apply"/>	Battery cut-off discharging voltage when grid is unavailable: 48 V <input type="button" value="Apply"/>
Max. MPP voltage: 850 V <input type="button" value="Apply"/>	Battery re-discharging voltage when Grid is unavailable: 48.5 V <input type="button" value="Apply"/>
Max. charging current: 10 A <input type="button" value="Apply"/>	Battery temperature compensation: 0.2 mV <input type="button" value="Apply"/>
Max. AC charging current: 30 A <input type="button" value="Apply"/>	Max. battery discharge current in hybrid mode: 300 A <input type="button" value="Apply"/>
Bulk charging voltage(C.V. voltage): 54 V <input type="button" value="Apply"/>	Feeding grid power calibration R: -500 W <input type="button" value="Apply"/>
Floating charging voltage: 53 V <input type="button" value="Apply"/>	Feeding grid power calibration S: 0 W <input type="button" value="Apply"/>
Start LCD screen-saver after: 60 Sec. <input type="button" value="Apply"/>	Feeding grid power calibration T: 0 W <input type="button" value="Apply"/>

Mute buzzer alarm: <input checked="" type="radio"/> Enable <input type="radio"/> Disable <input type="button" value="Apply"/>	Wide AC input range: <input checked="" type="radio"/> Enable <input type="radio"/> Disable <input type="button" value="Apply"/>
Mute the buzzer in the Standby mode: <input checked="" type="radio"/> Enable <input type="radio"/> Disable <input type="button" value="Apply"/>	Parallel for output: <input type="radio"/> Enable <input checked="" type="radio"/> Disable <input type="button" value="Apply"/>
Mute alarm in battery mode: <input checked="" type="radio"/> Enable <input type="radio"/> Disable <input type="button" value="Apply"/>	Output Neutral line grounding in battery mode: <input checked="" type="radio"/> Enable <input type="radio"/> Disable <input type="button" value="Apply"/>
Activate Li-Fe battery while commissioning: <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="button" value="Apply"/>	BMS battery connect: <input checked="" type="radio"/> Enable <input type="radio"/> Disable <input type="button" value="Apply"/>
Generator as AC source: <input checked="" type="radio"/> Enable <input type="radio"/> Disable <input type="button" value="Apply"/>	

When float charging current is less than X (A) and continued T (Min),then charger off; when battery voltage is less than Y (V),then charger on again.

X: 0 A T: 60 Min. Y: 53 V

Any schedule change will affect the power generated and shall be conservatively made.

System time: 2020-10-13

17:44:58

Diagram 4-11C (Off-Grid mode)

Parameters setting 2

Min. grid-connected voltage: 184 V <input type="button" value="Apply"/>	Grid connected reactive power: -60 Var <input type="button" value="Apply"/>
Max. grid-connected voltage: 264.5 V <input type="button" value="Apply"/>	Max. grid-connected average voltage: 253 V <input type="button" value="Apply"/>
Min. grid-connected frequency: 47.48 Hz <input type="button" value="Apply"/>	Max. feed-in grid power: 6,000 W <input type="button" value="Apply"/>
Max. grid-connected frequency: 51.5 Hz <input type="button" value="Apply"/>	Feed-in power factor: 1 <input type="button" value="Apply"/>
The waiting time before grid-connection: 60 Sec. <input type="button" value="Apply"/>	

Overvoltage recovery point: 253 V <input type="button" value="Apply"/>	Frist order overvoltage protection time: 60 ms <input type="button" value="Apply"/>
Undervoltage recovery point: 195.5 V <input type="button" value="Apply"/>	Frist order undervoltage protection time: 60 ms <input type="button" value="Apply"/>
Overfrequency recovery point: 50.05 Hz <input type="button" value="Apply"/>	Second order overvoltage protection time: 60 ms <input type="button" value="Apply"/>
Underfrequency recovery point: 47.52 Hz <input type="button" value="Apply"/>	Second order undervoltage protection time: 60 ms <input type="button" value="Apply"/>
Second order overvoltage protection point: 264.5 V <input type="button" value="Apply"/>	Frist order overfrequency protection time: 60 ms <input type="button" value="Apply"/>
Second order undervoltage protection point: 184 V <input type="button" value="Apply"/>	Frist order underfrequency protection time: 60 ms <input type="button" value="Apply"/>
Second order overfrequency protection point: 51.5 Hz <input type="button" value="Apply"/>	Second order overfrequency protection time: 60 ms <input type="button" value="Apply"/>
Second order underfrequency protection point: 47.48 Hz <input type="button" value="Apply"/>	Second order underfrequency protection time: 60 ms <input type="button" value="Apply"/>

Over voltage derating: <input type="radio"/> Enable <input checked="" type="radio"/> Disable <input type="button" value="Apply"/>	High voltage ride through: <input type="radio"/> Enable <input checked="" type="radio"/> Disable <input type="button" value="Apply"/>
Under frequency drop power: <input checked="" type="radio"/> Enable <input type="radio"/> Disable <input type="button" value="Apply"/>	AC charging soft start: <input type="radio"/> Enable <input checked="" type="radio"/> Disable <input type="button" value="Apply"/>
Low voltage ride through: <input checked="" type="radio"/> Enable <input type="radio"/> Disable <input type="button" value="Apply"/>	

Over frequency derating: ☒ Enable ☐ Disable

Drop rated power point: 50.6 Hz Trigger delay time: 40 ms

Drop rated power slope: 43 %

Reactive power automatic control enable: ☐ Enable ☒ Disable

Maximum reactive power response: 4,844 Var Reduce rated power point 3: 236.9 V

Reduce rated power point 1: 214.1 V Reduce rated power point 4: 246.1 V

Reduce rated power point 2: 222.9 V

Auto-adjustable PF value with power

Auto-adjustment starts when power rate reaches 89 % ☐ Enable ☒ Disable

Minimum PF value when power percentage reaches 100% -0.93

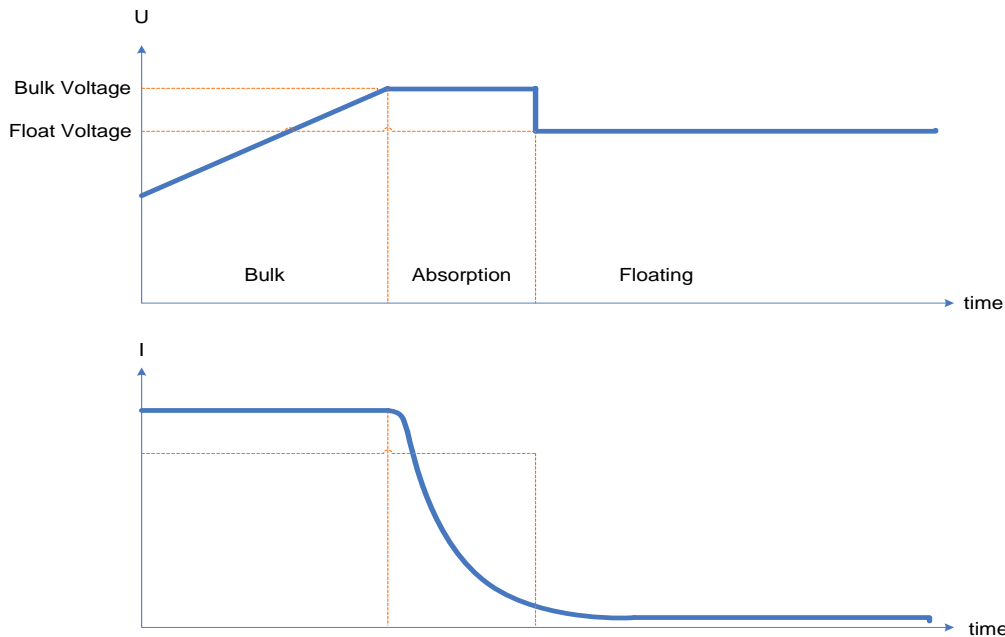
Diagram 4-11D (Factory and second-order parameter settings)

- Min. grid-connected voltage: It shows the acceptable low voltage point for solar inverter with grid connected.
- Max. grid-connected voltage: It shows the acceptable high voltage point for solar inverter with grid connected.
- Min. grid-connected frequency: It shows the acceptable low frequency point for solar inverter with grid connected.
- Max. grid-connected frequency: It shows the acceptable high frequency point for solar inverter with grid connected.
- The waiting time before grid-connection: It shows how long it will wait 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: It shows the maximum power to feed-in to the grid.
- Feed-in power factor: It shows the setting range is -0.99~-0.90 and 0.90~1.00.
- Min. PV input voltage: It shows what the acceptable low voltage point for PV terminals is when grid connection is established successfully.
- Max. PV input voltage: It shows what the acceptable high voltage point for PV terminals is when grid connection is established successfully.
- Min. MPP voltage: It shows the acceptable low voltage point from solar module.
- Max. MPP voltage: It shows the acceptable high voltage point from solar module.
- Max. charging current: It shows the acceptable high charging current point.
- Max. AC charging current: It shows 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 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.

$$(T-25) * (\text{Battery voltage with serial connection} / 2) * 5\text{mV}$$

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

$(30 - 25) * (48\text{VDC} / 2 \text{ V/cell}) * 5 \text{ mV} = 600\text{mV}$. Then, when battery temperature is higher than 5°C, charging voltage will be reduced to 600mV. Vice versa.

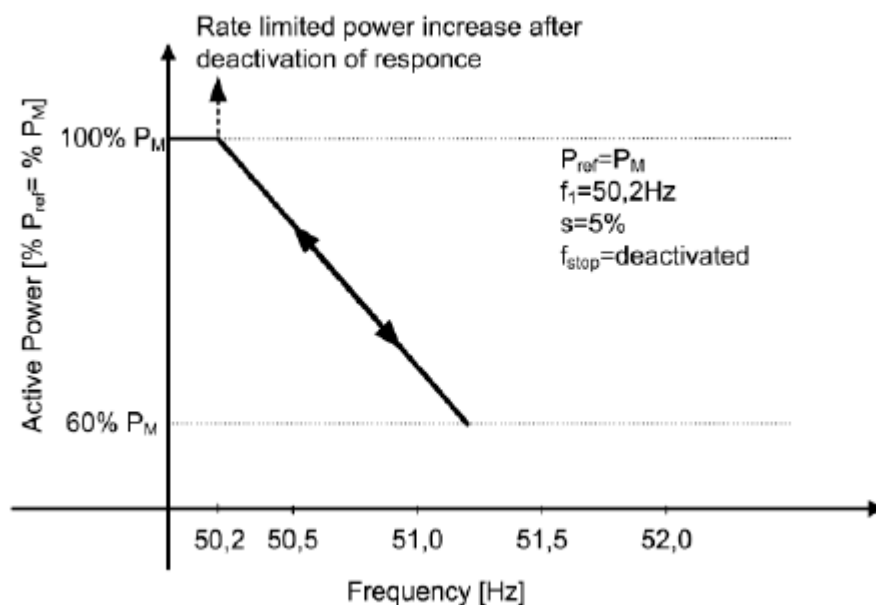
- Feeding grid power calibration R/S/T: This function allows calibrate inverter output power to meet demanding power for connected load and avoid overflow of the grid. R/S/T means R phase/S phase/T phase.
- Max. battery discharge current in hybrid mode: It allows to set up maximum battery discharge current 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 back to the 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.
- Output neutral line grounding in battery mode: The output N wire is grounded in battery mode
- BMS battery connect enable: After enabled, the inverter will synchronize the battery charge and discharge parameter settings according to the BMS communication information.
- 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 time zone of the device. Any modification may affect the calculation of power generation. Please conservatively make any change.
- Overvoltage recovery point: Grid-connected overvoltage recovery voltage point
- Undervoltage recovery point: Grid-connected undervoltage recovery voltage point
- Overfrequency recovery point: Grid-connected overfrequency recovery frequency

point

- Underfrequency recovery point: Grid-connected underfrequency recovery frequency point
- Second order overvoltage protection point: Grid-connected second order overvoltage protection point
- Second order undervoltage protection point: Grid-connected second order undervoltage protection point
- Second order overfrequency protection point: Grid-connected overfrequency second-order protection point
- Second order underfrequency protection point: Grid-connected underfrequency second-order protection point
- First order overvoltage protection time: Grid-connected first-order overvoltage protection time
- First order undervoltage protection time: Grid-connected first-order under-voltage protection time
- Second order overvoltage protection time: Grid-connected second-order under-voltage protection time
- Second order undervoltage protection time: Grid-connected second-order undervoltage protection time
- First order overfrequency protection time: Grid-connected first-order over-frequency protection time
- First order underfrequency protection time: Grid-connected first-order under-frequency protection time
- Second order overfrequency protection time: Grid-connected second-order over-frequency protection time
- Second order underfrequency protection time: Grid-connected second-order under-frequency protection time
- Over voltage derating P(U): Overvoltage derating P(U) enable: When the grid voltage exceeds the derating point required by the regulations, the inverter will reduce the grid-connected power.
- Under frequency drop power: Under-frequency loading enable: The inverter will increase the grid-connected power after the grid frequency is lower than the set value required by regulations.
- Low voltage ride through: Low voltage ride through enable: After enabled, the inverter can accept short-term mains low voltage (different laws and regulations require that the time to send voltage points are inconsistent) and remain on the grid.
- High voltage ride through: After being enabled, the inverter can accept low and high

voltage of the mains for a short period of time (different laws and regulations require that the time to send the voltage point is inconsistent) and remain on the grid.

- AC charging soft start enable (only available on VDE4105): After enabled, the charging power soft-starts at a slope of 10%/min according to the requirements of VDE105.
- Over frequency derating $P(f)$ enable: The inverter will reduce the grid-connected power after the grid frequency exceeds the derating point required by regulations
- Drop rated power point: Over-frequency derating response frequency point (corresponding to over-frequency derating function $P(f)$)
- Drop rated power slope: Over-frequency derating slope (corresponding to over-frequency derating function $P(f)$)
- Trigger delay time: Over-frequency derating response delay (corresponding to the over-frequency derating function $P(f)$)



- Reactive power automatic control enable: The inverter will feed back reactive power to the grid based on the mains voltage. See the graphic above for the specific curve.
- Maximum reactive power response: Maximum response reactive power Q_{max} (corresponding to the reactive power compensation function $Q(U)$ according to the grid voltage)
- Reduce rated power point 1: Voltage response point X1 (corresponding to the reactive power compensation function $Q(U)$ according to the grid voltage)
- Reduce rated power point 2: Voltage response point X2 (corresponding to the reactive power compensation function $Q(U)$ according to the grid voltage)
- Reduce rated power point 3: Voltage response point X3 (corresponding to the

reactive power compensation function $Q(U)$ according to the grid voltage)

- Reduce rated power point 4: Voltage response point X4 (corresponding to the reactive power compensation function $Q(U)$ according to the grid voltage)

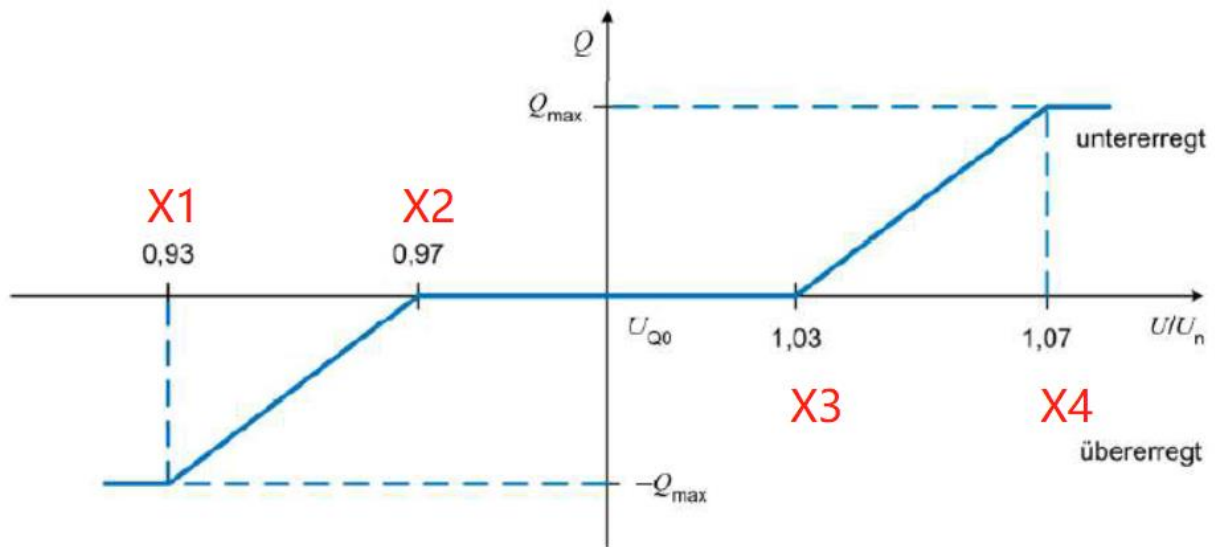


Bild 7 – Standard- $Q(U)$ -Kennlinie

- Auto-adjustable PF value with power: It's allowed to auto adjust power factor value along with power rating. After this function is enabled, please set up the active percentage for power rating from 1% to 100%.

Minimum PF value when power percentage reaches 100%: Please set up minimum PF value from -0.99 to -0.90.

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. Refer to Diagram 4-12A for grid-tie with backup mode and Diagram 4-12B for Off-Grid mode.

Parameter	Value	Unit
Min. grid-connected voltage:	184.0	V
Max. grid-connected voltage:	264.5	V
Min. grid-connected frequency:	47.48	Hz
Max. grid-connected frequency:	51.5	Hz
Max. grid-connected average voltage:	253	V
Min. PV input voltage:	300	V
Max. PV input voltage:	900	V
Min. MPP voltage:	350	V
Max. MPP voltage:	800	V
Max. charging current:	60.0	A
Floating charging voltage:	54.0	V
Bulk charging voltage(C.V. voltage):	56.0	V
Battery cut-off discharging voltage when Grid is available:	48.0	V
Battery re-discharging voltage when Grid is available:	54.0	V
Battery cut-off discharging voltage when Grid is unavailable:	42.0	V
Battery re-discharging voltage when Grid is unavailable:	48.0	V
Start LCD screen-saver after:	60	S

This operation will also clear all existed data stored here, and shall be used cautiously.

Restore to the defaults

Close

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

Parameter	Value	Unit
Min. AC input voltage:	175.0	V
Max. AC input voltage:	280.0	V
Min. AC input frequency:	47.5	Hz
Max. AC input frequency:	52.5	Hz
Min. PV input voltage:	300	V
Max. PV input voltage:	900	V
Min. MPP voltage:	350	V
Max. MPP voltage:	800	V
Max. charging current:	60.0	A
Floating charging voltage:	54.0	V
Bulk charging voltage(C.V. voltage):	56.0	V
Battery cut-off discharging voltage when Grid is available:	48.0	V
Battery re-discharging voltage when Grid is available:	54.0	V
Battery cut-off discharging voltage when Grid is unavailable:	42.0	V
Battery re-discharging voltage when Grid is unavailable:	48.0	V
Start LCD screen-saver after:	60	S

This operation will also clear all existed data stored here, and shall be used cautiously.

Restore to the defaults

Close

Diagram 4-12B (Off-Grid)

NOTE: This screen may vary 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 4-14

- 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.

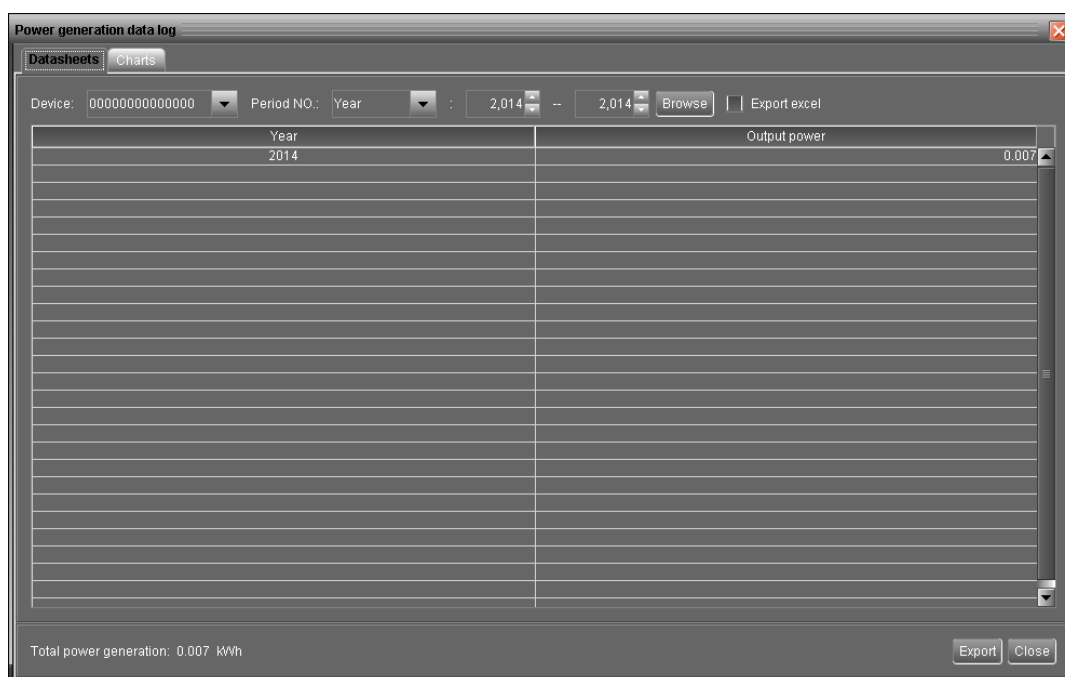


Diagram 4-15

- **Charts**

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

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

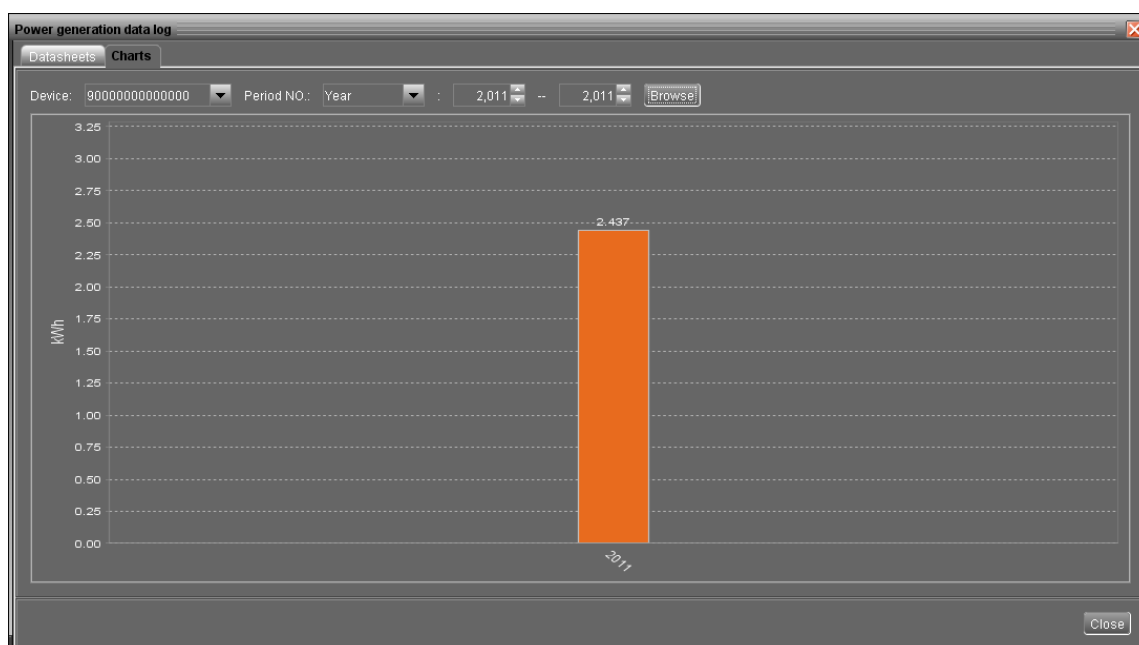


Diagram 4-16

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.

Data														
Datasheets														
Device: 00000000000000		Display item: <input checked="" type="checkbox"/> Device mode		Time period: 2014-10-24		2014-10-24		<input type="button" value="Browse"/>		<input type="button" value="Export excel"/>				
Device mode	Time	PV1 input v...	PV2 input v...	PV1 input p...	PV2 input p...	Grid voltage...	Grid voltage...	Grid voltage...	Grid freque...	Load level	Battery volt...	Battery cap...	Charging c...	Temperature
Grid-tie wit...	2014-10-2...	488.3	361.9	4797	3982	230.3	215.4	237.1	49.97	0	55.9	98	28.0	58.0
Grid-tie wit...	2014-10-2...	597.9	568.0	0	2065	226.2	226.8	231.1	49.97	0	56.0	98	28.0	59.0
Grid-tie wit...	2014-10-2...	488.1	483.9	4792	4866	228.3	227.5	232.2	49.96	0	56.0	99	27.3	60.0
Grid-tie wit...	2014-10-2...	490.0	487.8	4793	4865	228.3	226.8	231.3	49.93	0	56.0	98	28.7	60.0
Grid-tie wit...	2014-10-2...	490.0	485.6	4792	4868	228.3	226.4	231.6	50.0	0	56.0	98	28.0	60.0
Grid-tie wit...	2014-10-2...	488.1	483.2	4791	4867	227.0	225.5	230.9	49.98	0	56.0	98	28.7	60.0
Grid-tie wit...	2014-10-2...	494.2	487.6	4797	4867	227.7	225.5	231.3	49.97	0	56.0	98	28.7	60.0
Grid-tie wit...	2014-10-2...	491.8	483.9	4787	4862	227.5	226.2	230.9	49.96	0	56.0	98	28.0	60.0
Grid-tie wit...	2014-10-2...	483.2	488.1	4792	4862	226.6	226.2	230.5	49.98	0	56.0	98	28.0	60.0
Grid-tie wit...	2014-10-2...	489.8	486.1	4797	4868	227.3	225.5	230.0	49.97	0	56.0	98	28.7	60.0
Grid-tie wit...	2014-10-2...	485.7	486.6	4798	4870	228.3	214.6	235.2	49.98	0	56.0	98	28.7	60.0
Grid-tie wit...	2014-10-2...	485.7	483.9	4798	4868	227.9	225.1	231.8	49.95	0	56.0	98	28.7	60.0
Grid-tie wit...	2014-10-2...	489.8	486.1	4788	4862	227.0	225.8	231.1	49.92	0	56.0	98	28.7	60.0
Grid-tie wit...	2014-10-2...	489.8	487.6	4798	4868	227.9	225.5	232.2	49.94	0	56.0	98	28.0	60.0
Grid-tie wit...	2014-10-2...	485.7	483.9	4798	4872	226.6	224.9	231.3	49.95	0	56.0	98	28.7	60.0
Grid-tie wit...	2014-10-2...	489.8	489.8	4793	4868	227.9	222.1	234.3	50.0	0	56.0	98	28.0	60.0
Grid-tie wit...	2014-10-2...	483.2	490.0	4796	4866	227.5	228.1	231.6	49.95	0	56.0	97	29.4	60.0
Grid-tie wit...	2014-10-2...	489.8	487.8	4797	4866	228.1	226.8	231.8	49.95	0	56.0	97	29.4	60.0
Grid-tie wit...	2014-10-2...	483.2	485.6	4797	4869	228.8	220.8	233.9	49.98	0	56.0	97	30.1	60.0
Grid-tie wit...	2014-10-2...	487.4	491.7	4793	4869	227.9	227.0	231.3	49.94	0	56.0	97	30.1	60.0
Grid-tie wit...	2014-10-2...	494.2	483.9	4790	4868	227.7	226.4	232.6	49.99	0	56.0	97	30.1	59.0
Grid-tie wit...	2014-10-2...	494.2	483.9	4794	4871	226.8	226.4	232.4	50.01	0	56.0	97	30.1	60.0
Total: 50 row(s)														
										<input type="button" value="Export"/>	<input type="button" value="Delete"/>	<input type="button" value="Delete all"/>	<input type="button" value="Close"/>	

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.

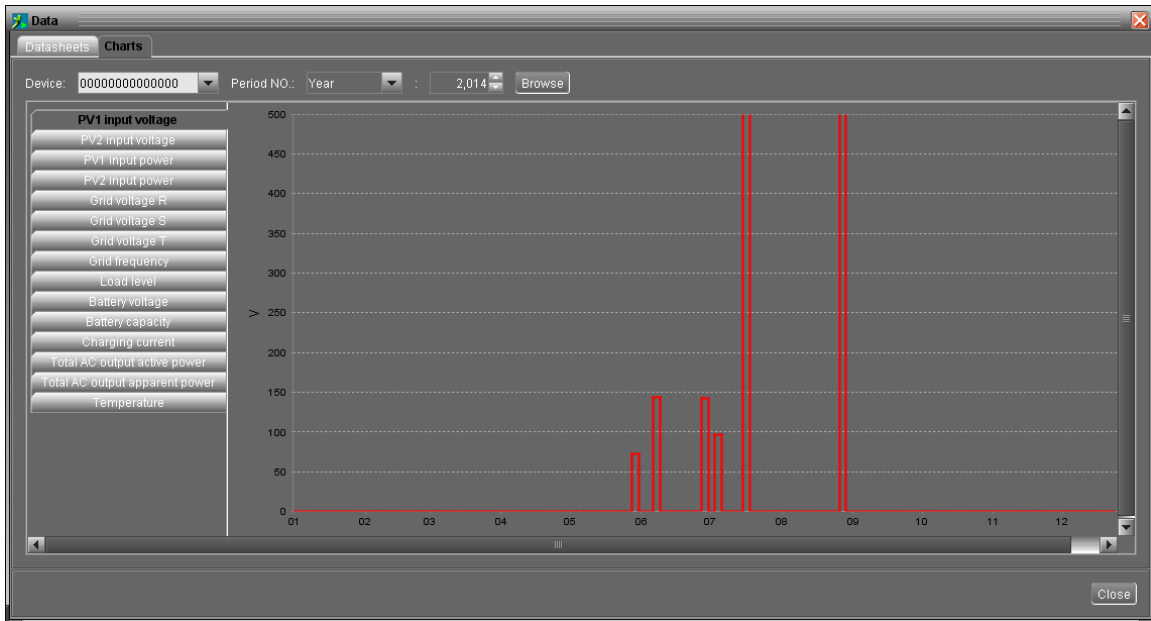


Diagram 4-18

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.

Fault data log

Device: 00000000000000 Time period: 2014-10-24 -- 2014-10-24 [Browse] [Export excel]

Input date	Fault message	PV1 input volt...	PV2 input volt...	Grid voltage R	Grid voltage S	Grid voltage T	Grid frequency	Battery voltage	Charging curr...	Grid output vo...	Grid output vo...	Grid output vo...	Load frequency
2014-10-24 ...	Leakage curr...	72.0	71.3	0.0	0.0	0.0	0.0	14.9	0.0	0.0	0.0	0.0	0.0
2014-10-24 ...	Current sam...	72.0	71.3	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
2014-10-24 ...	Leakage curr...	72.0	71.3	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
2014-10-24 ...	Current sam...	71.8	71.3	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
2014-10-24 ...	Leakage curr...	72.0	71.3	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
2014-10-24 ...	Current sam...	71.8	71.3	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
2014-10-24 ...	Leakage curr...	71.8	71.3	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
2014-10-24 ...	Current sam...	71.8	71.3	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
2014-10-24 ...	Leakage curr...	71.8	71.3	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
2014-10-24 ...	Current sam...	71.8	71.3	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
2014-10-24 ...	Leakage curr...	71.8	71.3	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0

Total: 11 row(s)

[Export] [Delete] [Delete all] [Close]

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.

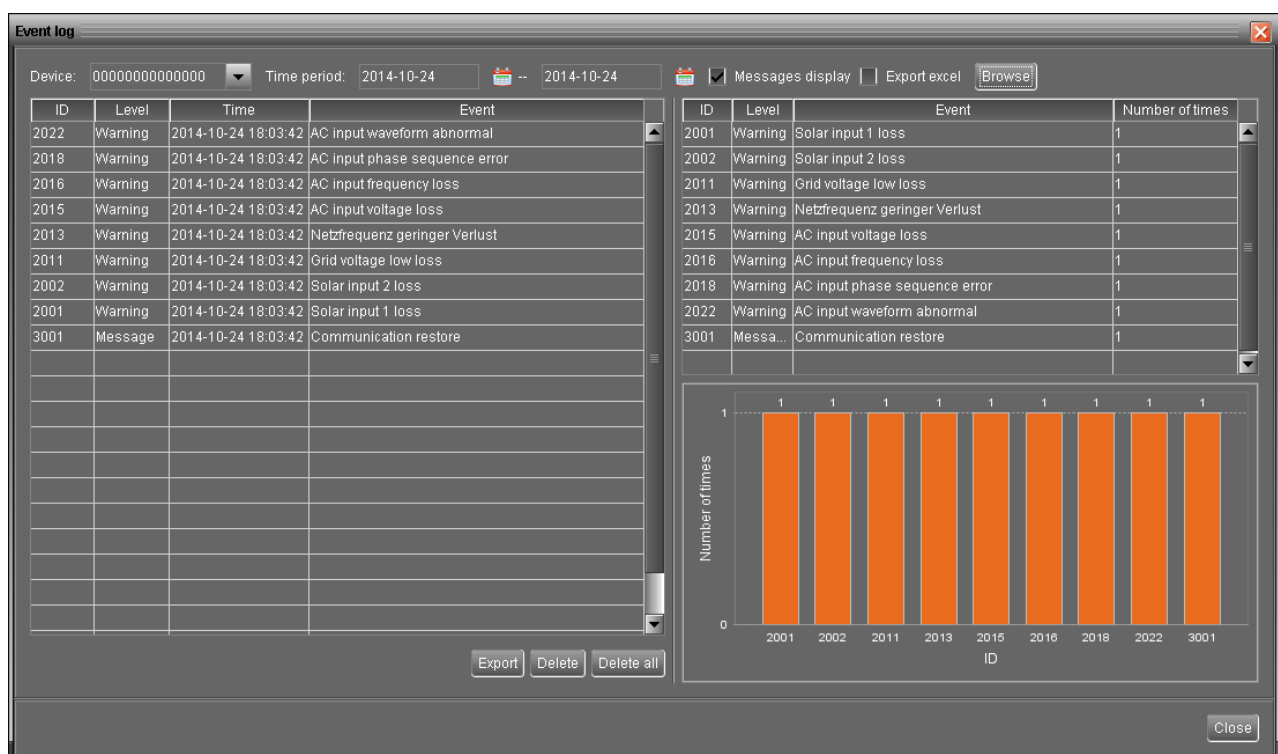


Diagram 4-20

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.

Monitored device information

Product Information

Model type: Hybrid	Nominal input voltage: 230.0 V
Topology: transformerless	Nominal output voltage: 230.0 V
Main CPU processor version: 00001.01	Number of batteries: 4
Secondary CPU processor version: 00001.01	Nominal battery voltage: 48.0 V
Output phase: 3/3	

Rated information

Nominal output power: 10000.0 W	Nominal grid voltage: 230.0 V
Min. AC input voltage: 170.0 V	Nominal grid frequency: 50.0 Hz
Max. AC input voltage: 280.0 V	Nominal grid-connected current: 43.4 A
Min. AC input frequency: 40.0 Hz	Max. PV input current: 18.7 A
Max. AC input frequency: 55.0 Hz	Rated battery voltage: 48.0 V

Purchasing information

Purchasing date: 2015-01-19

Warranty for device: 1 Year

Device P/N:

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.

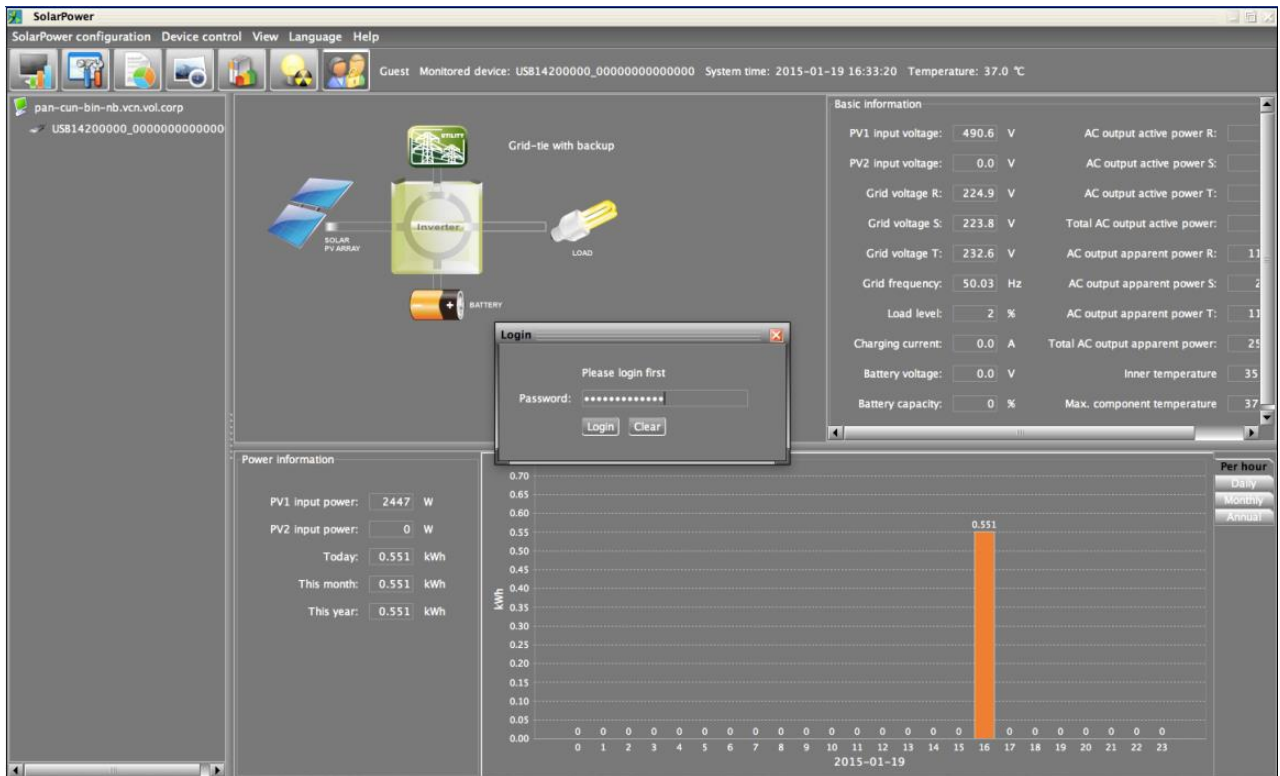



Diagram 4-22

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

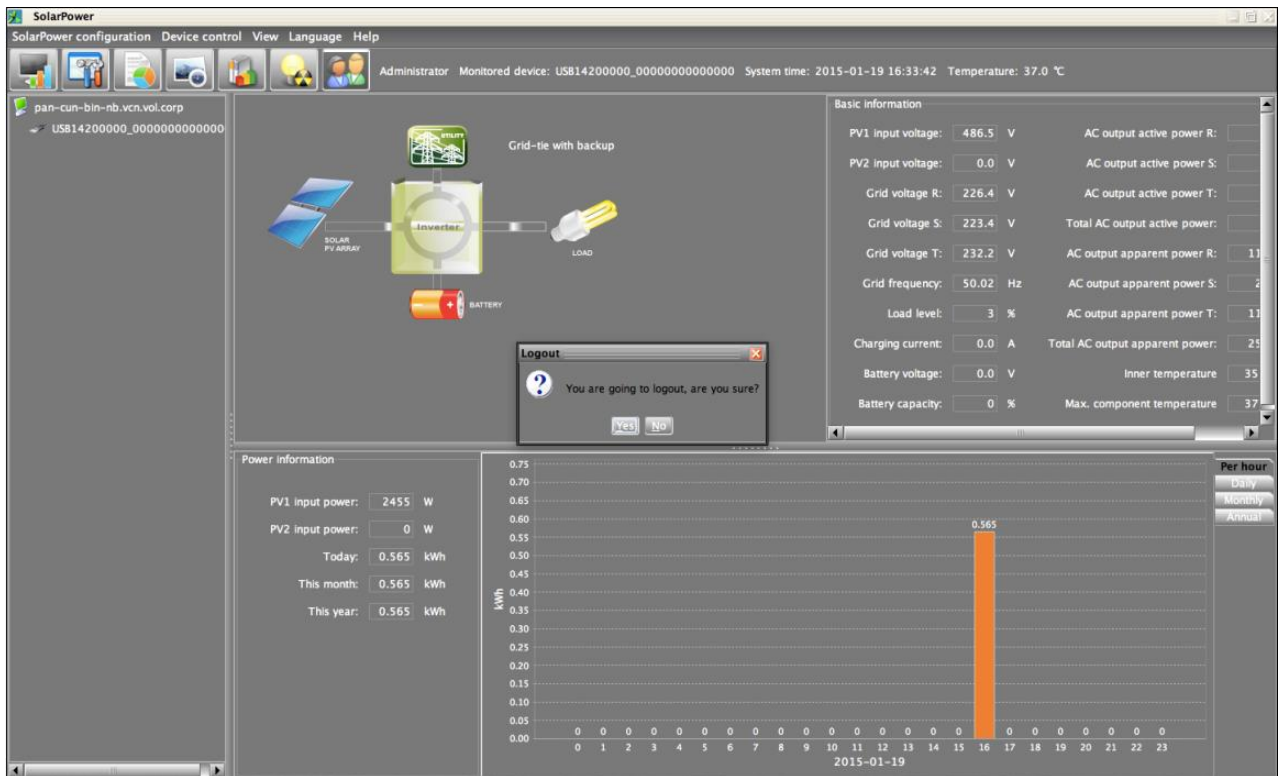


Diagram 4-23

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.