User Manual

WatchPower

Management Software for Inverter

Table of Contents

1. WatchPower Overview

1.1. Introduction

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

1.2. Features

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

2. WatchPower 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 XP/2000/2003/Vista/2008 (32-bit & 64-bit)
  - ➢ Windows 7/8 (32-bit & 64-bit)
  - ➢ Windows SBS 2011
  - ➢ Linux RedHat 8, 9
  - ➢ Linux RedHat Enterprise AS3, AS5, AS6 (32-bit)
  - ➢ Linux RedHat Enterprise AS6 (64-bit)
  - ➢ Linux RedHat Enterprise 5.2 (32-bit & 64-bit)
  - ➢ Linux SUSE 10 (32-bit & 64-bit)
  - ➢ Linux Cent OS 5.4 (32-bit)
  - ➢ Linux Ubuntu 8.X, 9.X, 10.X (32-bit)
  - ➢ Linux Ubuntu 10.X (64-bit)
  - ➢ Linux Ubuntu 12.04 (32-bit & 64-bit)
  - ➢ Linux Fedora 5
  - ➢ Linux OpenSUSE 11.2 (32-bit & 64-bit)
  - ➢ Linux Debian 5.x, 6.x (32-bit)
  - ➢ Linux Debian 6.x (64-bit)

2.2. Software Install

Step 1 After clicking install, it will display the installation in process. Refer to the diagram 2-1.
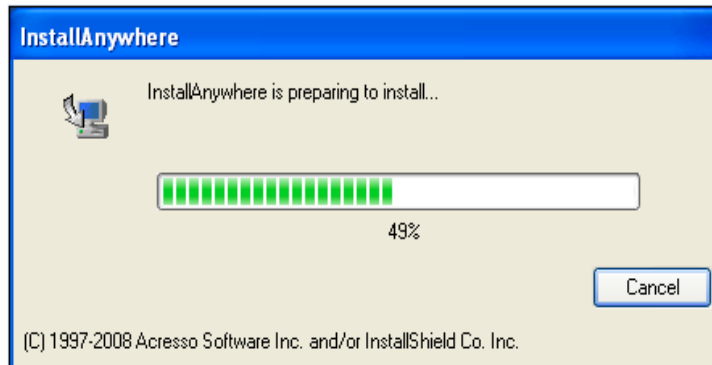

Diagram 2-1

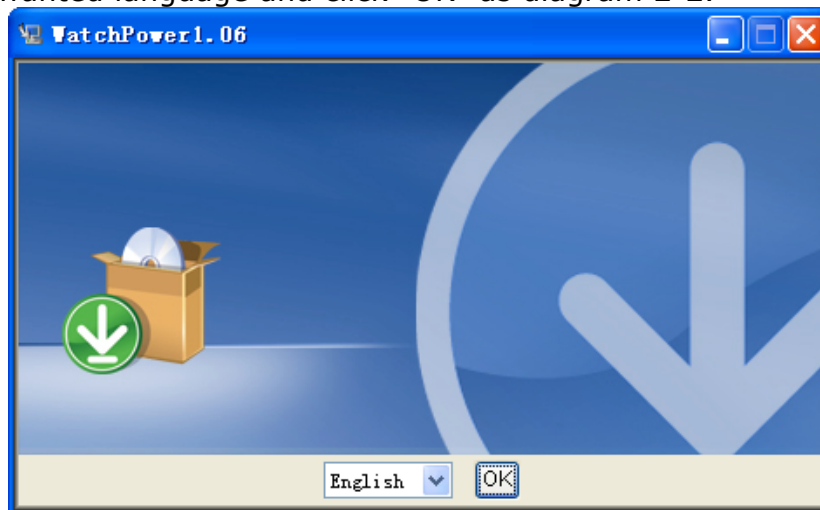**Step 2** Choose wanted language and click "OK" as diagram 2-2.

Diagram 2-2

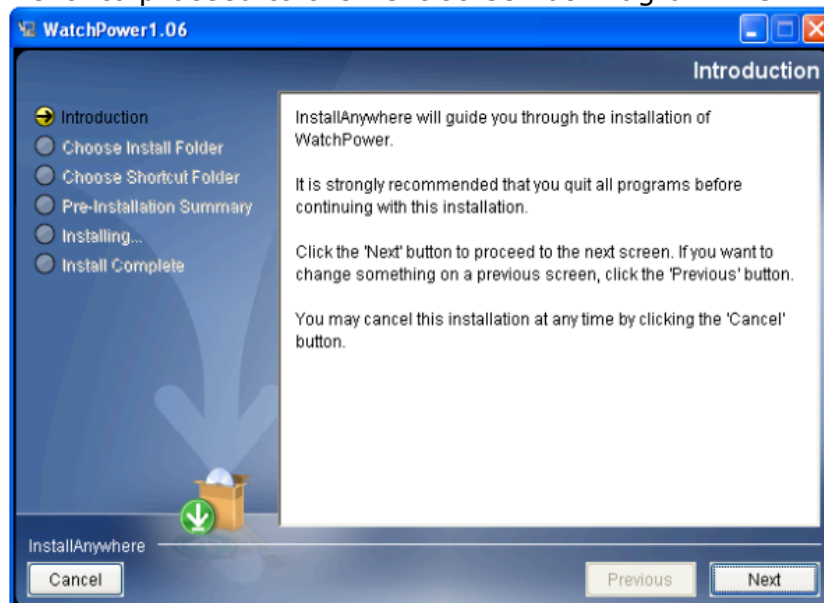**Step 3** Click "Next" to proceed to the next screen as Diagram 2-3.

Diagram 2-3

Step 4 Click "Choose" button to change the default folder. After choosing the installed folder, click "Next" button. Refer to the following diagram 2-4.
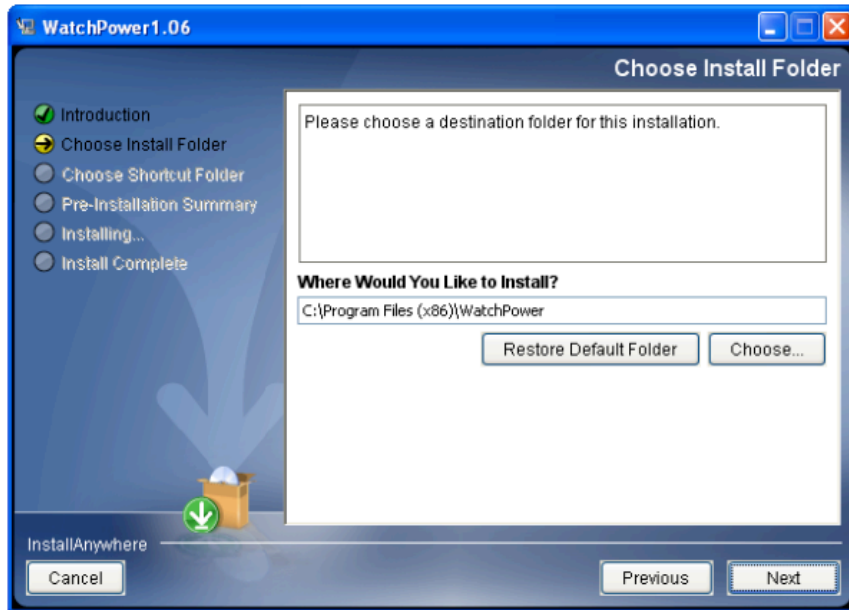

Diagram 2-4

Step 5 Choose the shortcut folder and click "Next" button. Refer to the following diagram 2-5.
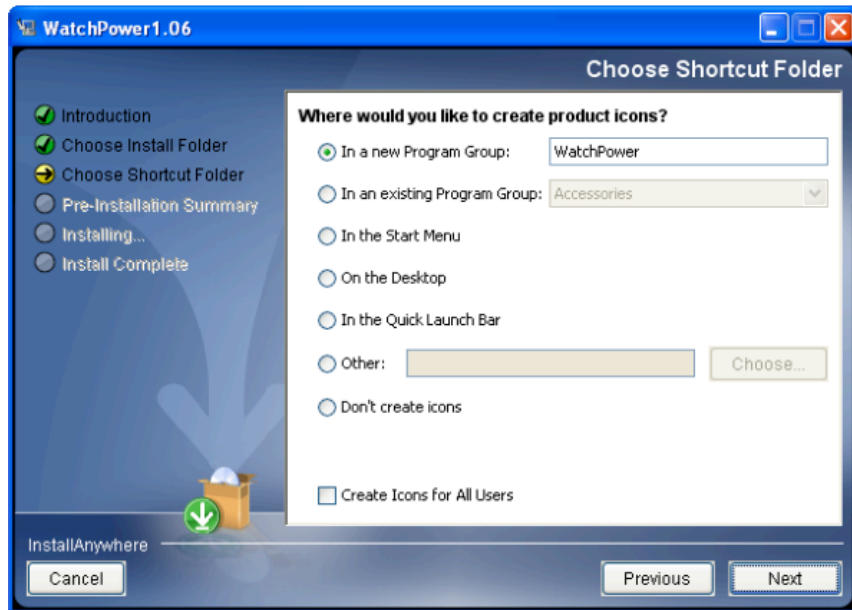

Diagram 2-5

Step 6 It will display the software summary before installation. Click "Install" button to start the installation and refer to Diagram 2-6.
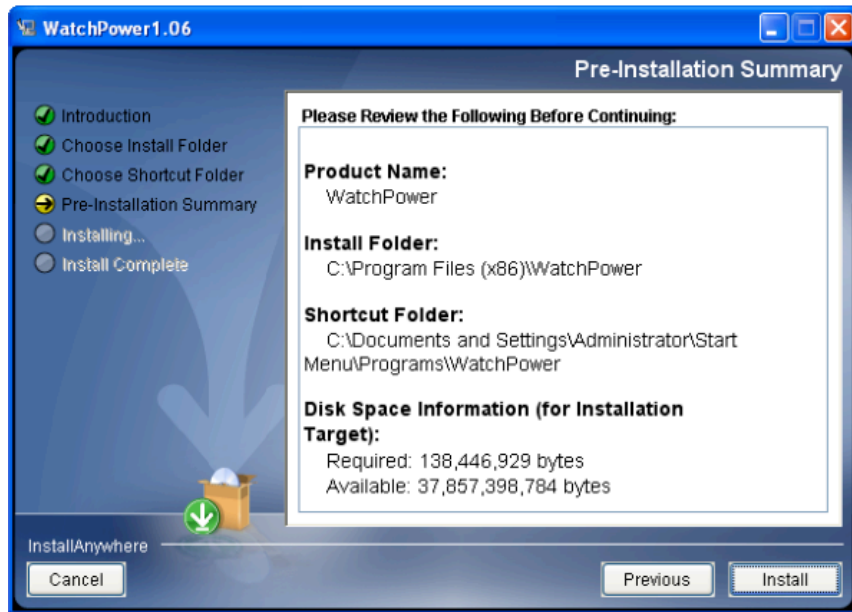
Diagram 2-6

Step 7 Installation is processing. Refer to Diagram 2-7.

Diagram 2-7

Step 8 Click "Done" button to confirm the installation completely. Refer to Diagram 2-8.
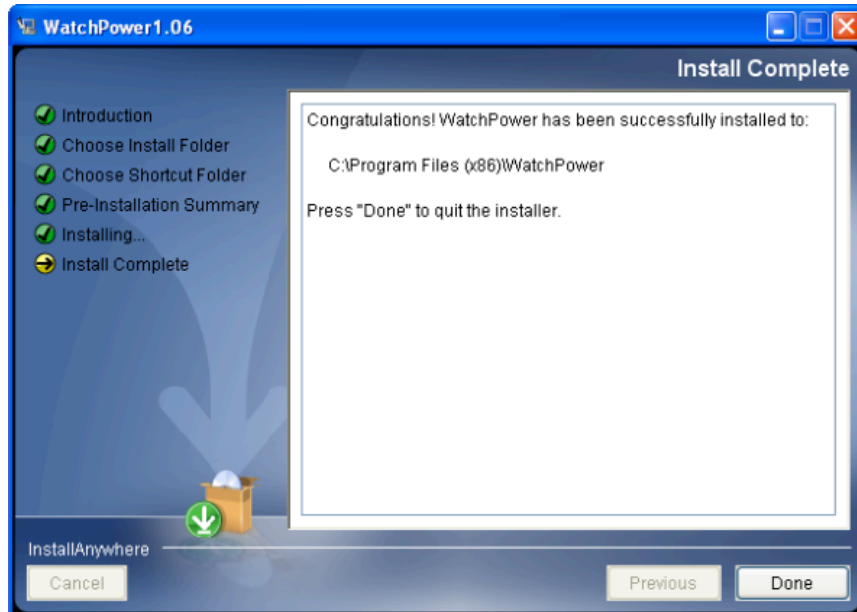

Diagram 2-8

Note: Please uninstall the previous version before installing the new version software.

2.3. Software Uninstall

Please choose Start >> All Programs >> WatchPower >> Uninstall. Then, follow the on-screen instruction to uninstall the software.

Note: Before uninstalling software, you must stop all software programs first and log in as "Administrator"! Otherwise, it can't be uninstalled completely.

3. Tray Application

3.1. Startup

The Installer will leave a shortcut icon called "WatchPower" on your desktop. Refer to Diagram 3-1. Simply double click the shortcut icon. 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.
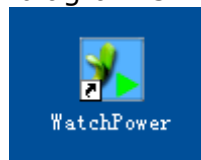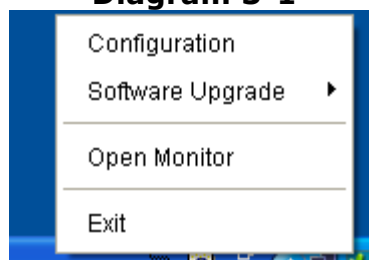

Diagram 3-1

Diagram 3-2

3.2. Configuration

3.2.1. Software Upgrades

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

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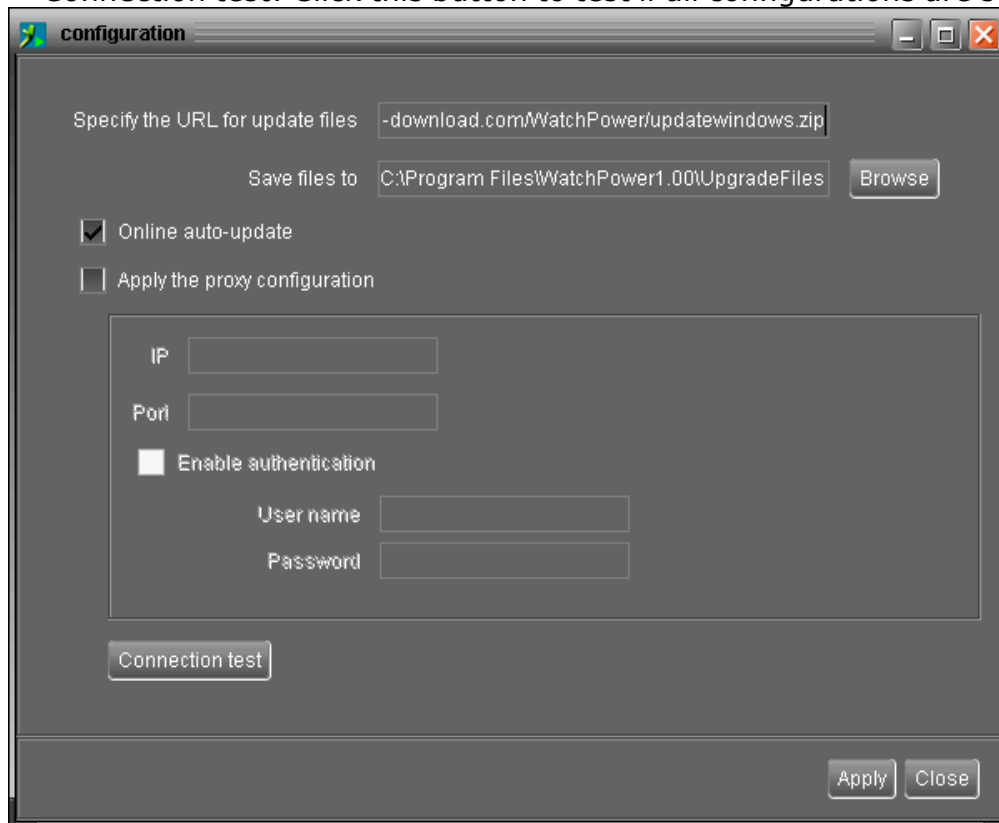

Diagram 3-3

3.2.2. Configuration Saved

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

3.3. Software Upgrade

Software upgrades includes online upgrade and manually upgrade.

- Online Upgrade:
  Click "Online Upgrade" to search the latest software version. If there is new

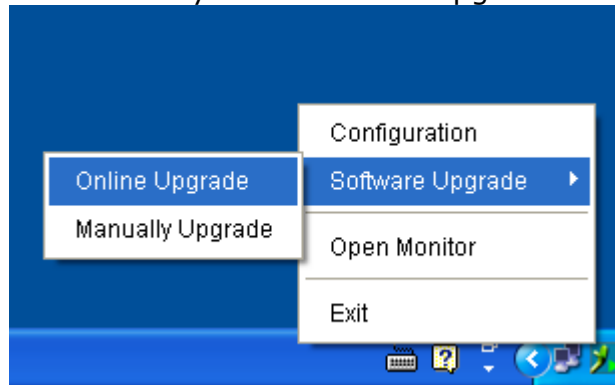version, it will automatically download and upgrade. Refer to Diagram 3-4.

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.
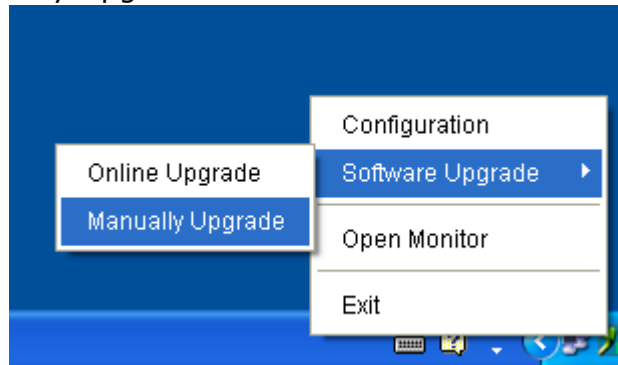
Diagram 3-5

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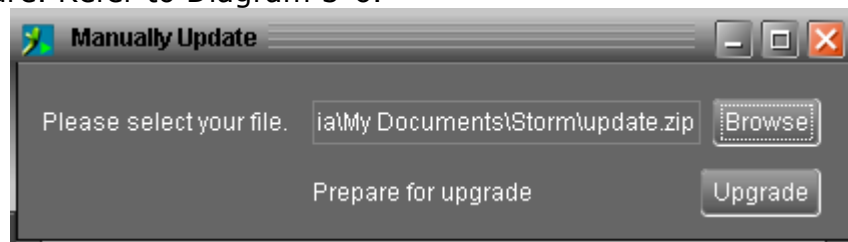
Diagram 3-6

3.4. Icon and Software Status

- Connecting devices: 🎽 and 🎽 will rotate as an animation
- When receiving event message with devices connected: 🎽 will flash for reminder
- When receiving event message without devices connected: 🎽 will flash for reminder

3.5. Message Board

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

7
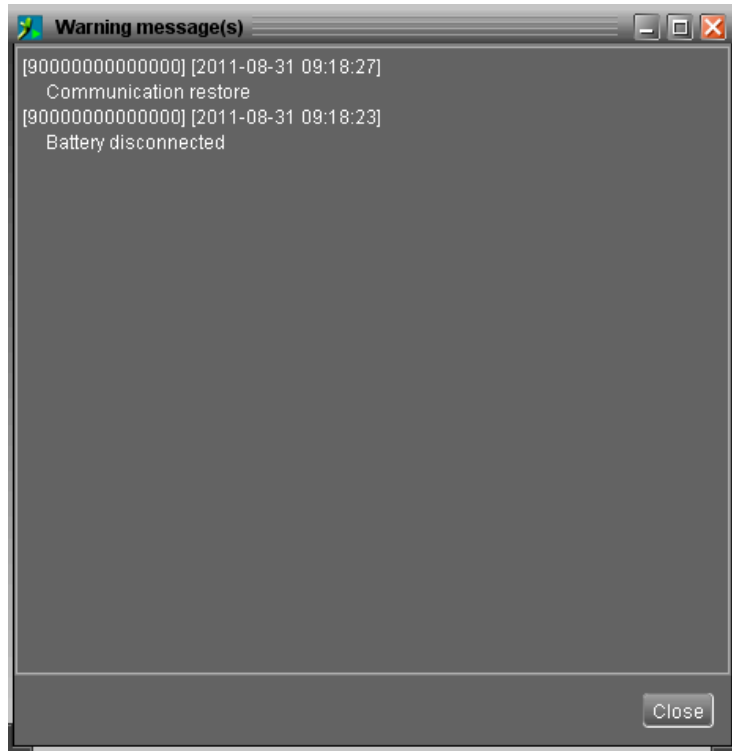
Diagram 3-7

3.6. Exit

Click "Exit" to exist service application.

4. GUI Interface

There are five sections in GUI interface as marked in the illustration below:
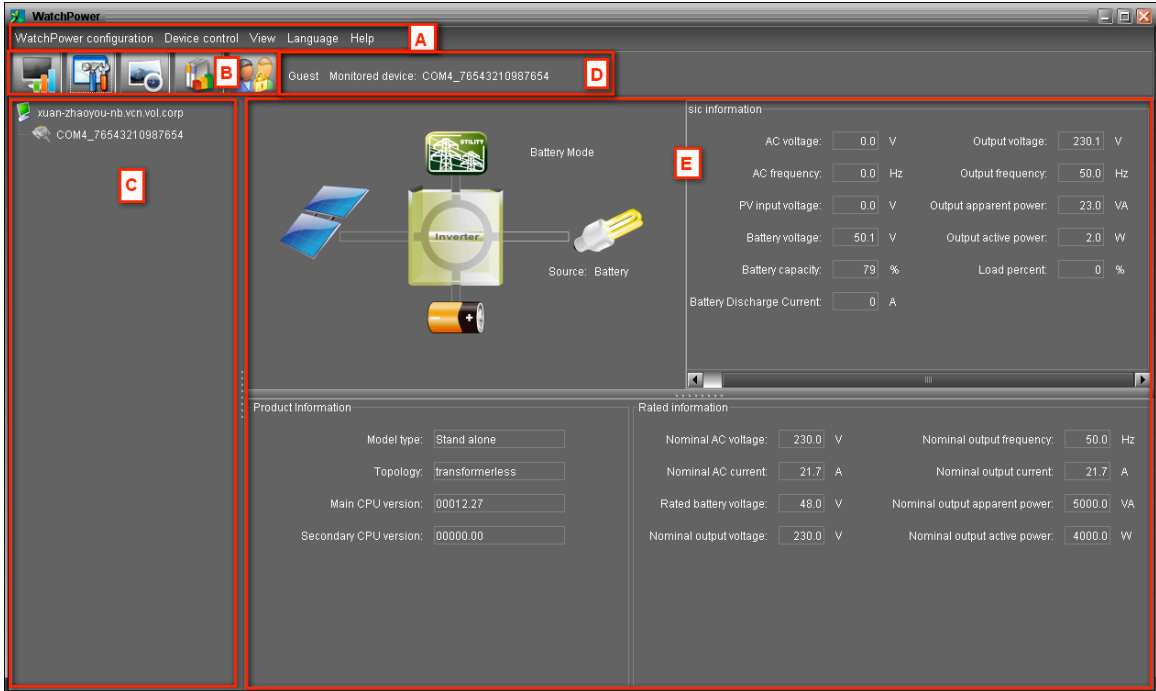
Diagram 4-1

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

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

C. **Inverter Navigation** indicates all devices.

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

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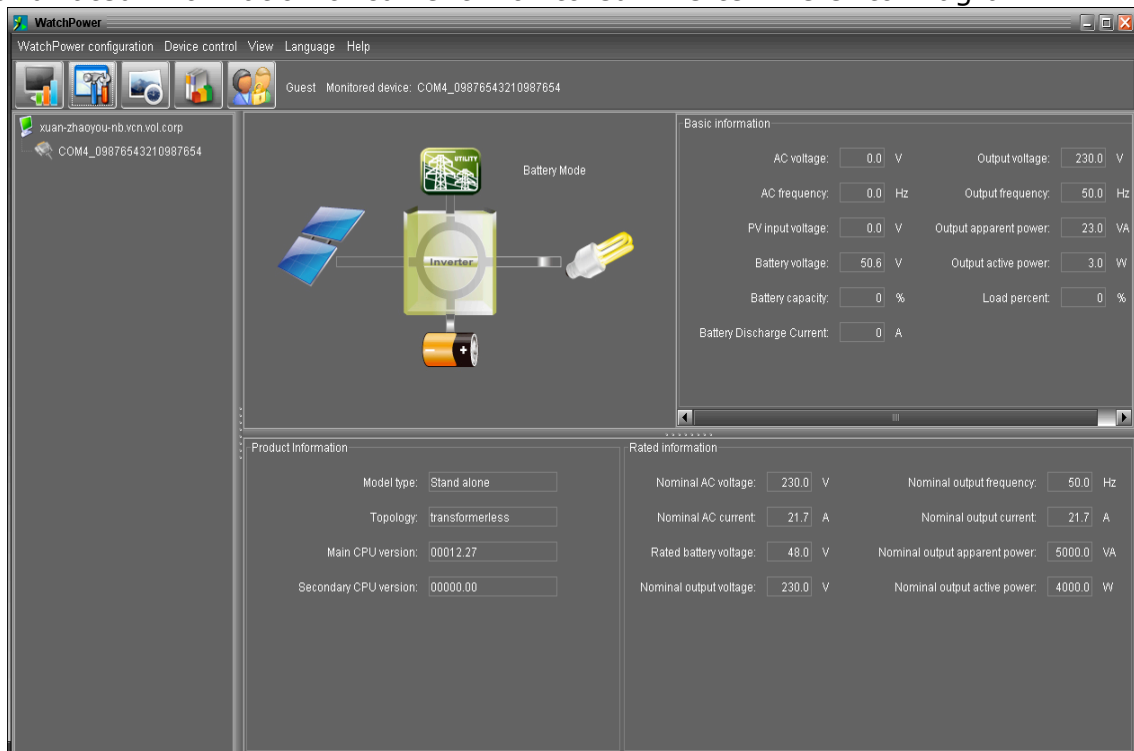
Diagram 4-2

1. Power flow:

There are five device icons: solar panel, battery, inverter, load and the utility. It displays dynamic power flow with these five device icons.

➢ Power on and Standby mode: Inverter won't power the load until "ON" switch is pressed. Qualified utility or PV source can charge battery in standby mode.
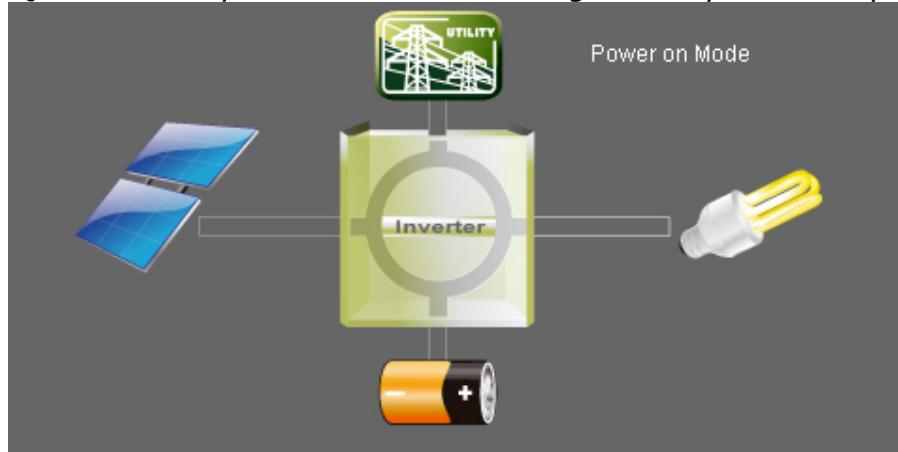
Power on Mode
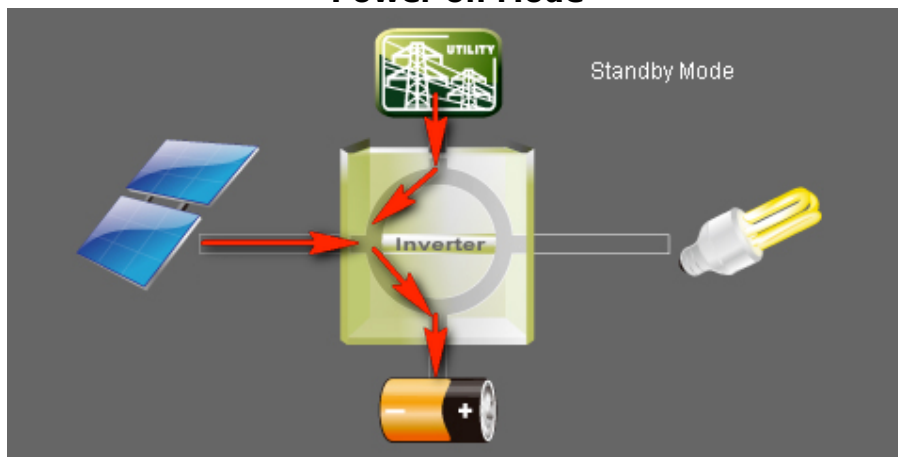
Standby Mode

➢ Line mode: Inverter will power the load from utility. Qualified utility or PV source can charge battery.
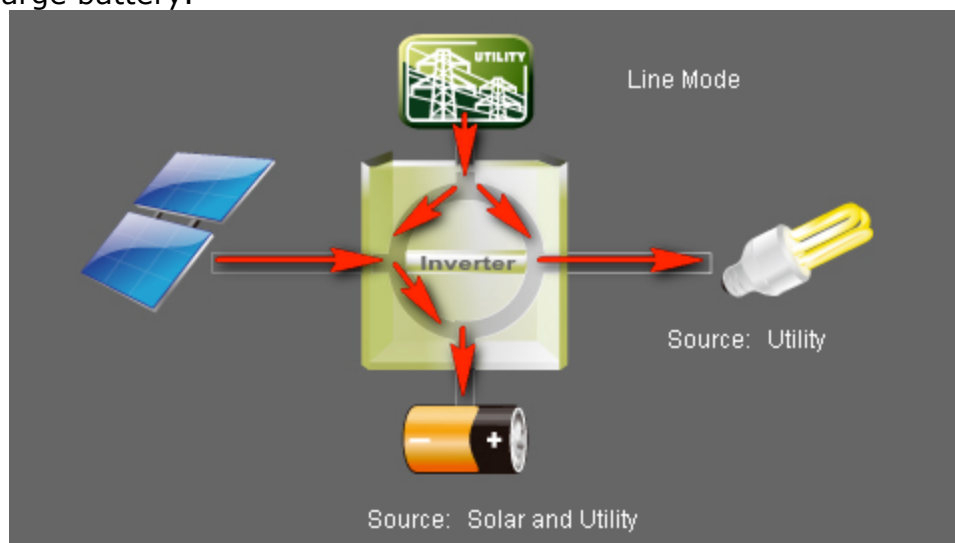
Line Mode

➢ Battery mode: Inverter will power the load from battery or PV panel. Only PV source can charge battery.
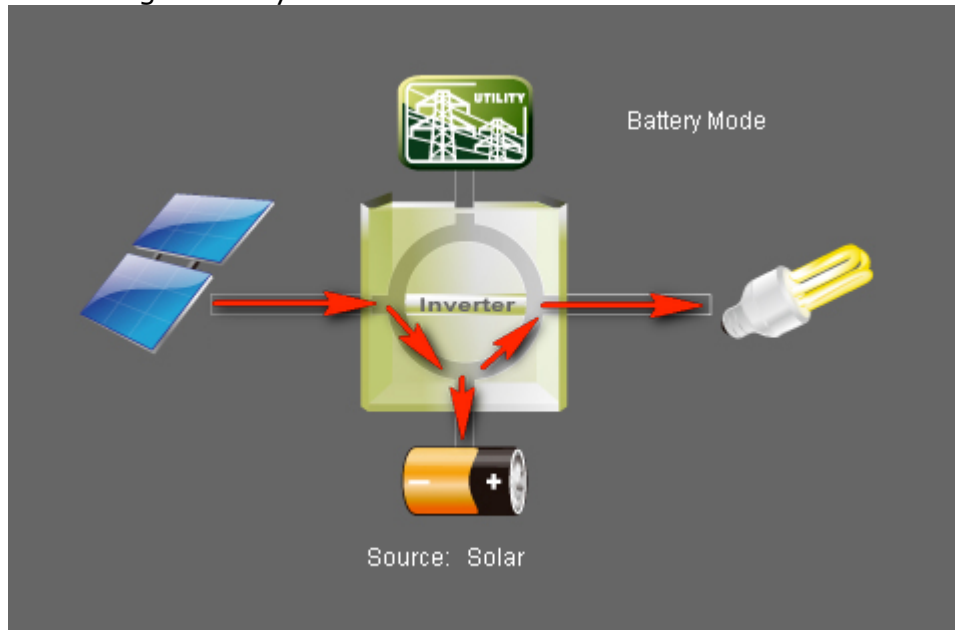
Battery Mode

➢ Fault mode: Some faults occurred in inverter and no power output is generated from inverter. Qualified utility or PV source still can charge battery.
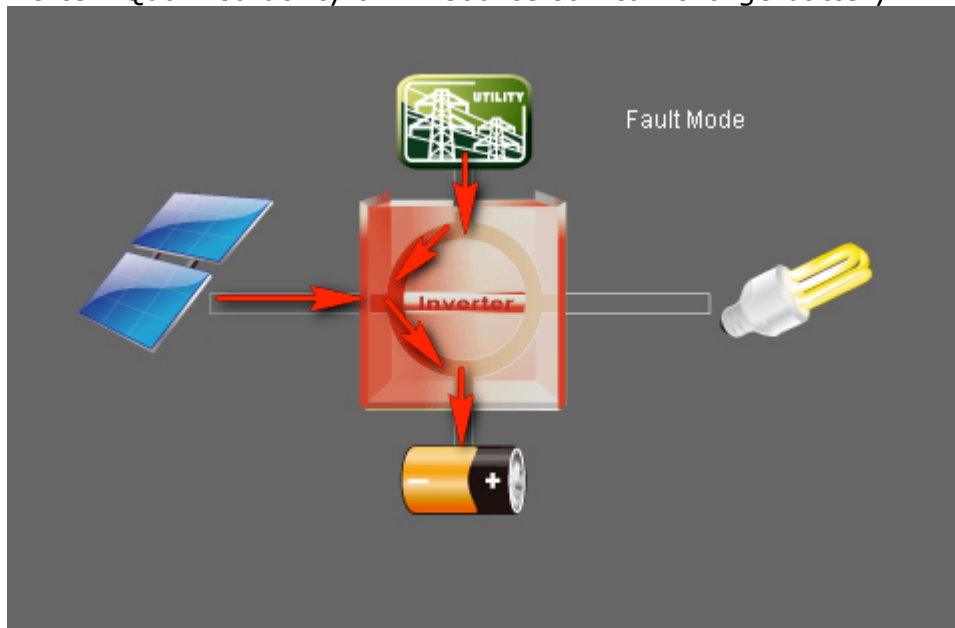
Fault Mode

2. Basic Information:

It displays information of AC voltage, AC frequency, PV input voltage, Battery voltage, Battery capacity, Charging current, Output voltage, Output frequency, Output apparent power, Output active power and Load percent.

3. Product information:

Product information displays Mode type, Topology, Main CPU version and Secondary CPU version.

4. Rated information:

Rated information displays information of Nominal AC voltage, Nominal AC current,

Rated battery voltage, Nominal output voltage, Nominal output frequency, Nominal output current, Nominal output apparent power and Nominal output active power.

4.1. WatchPower Configuration

4.1.1. Basic

It is to set up parameters for display. Select WatchPower Configuration>>Basic. Refer to Diagram 4-3.
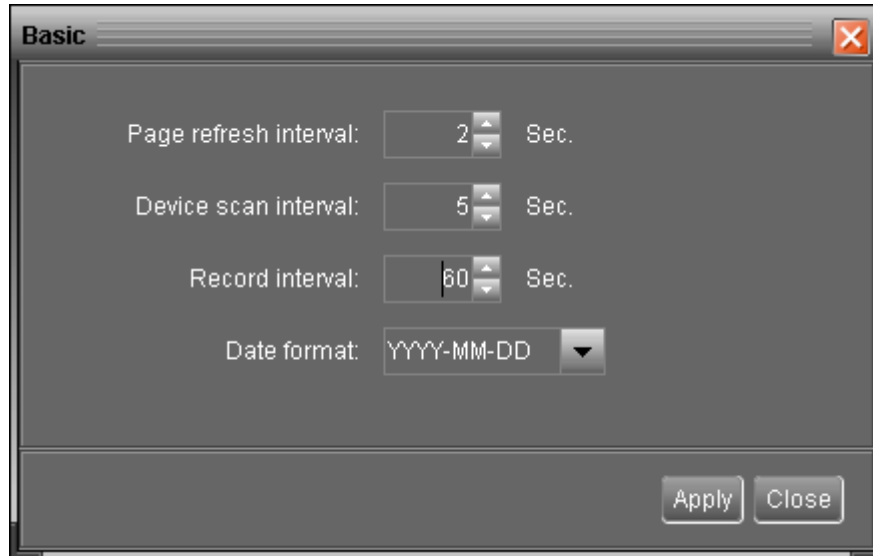
Diagram 4-3

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. Devices scan interval: This interval time will determine how long to scan connected devices. The setting range is from 5 to 600 seconds. The default setting is 5 seconds.
3. Record interval: This interval time will determine how long to record monitoring data of inverters 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.
4. 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".

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

4.1.2. Password

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

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

Diagram 4-4

Step 2 Enter old password, new password and re-type new password to confirm new password. The new password should be at least 6 digits. Then, click "Apply" button to successfully modify password for administrator.

NOTE1: Simply click "Login" button on the top right corner to log in the software.
NOTE2: If password is forgotten, it's necessary to re-install the software.

4.1.3. SMS Setting

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

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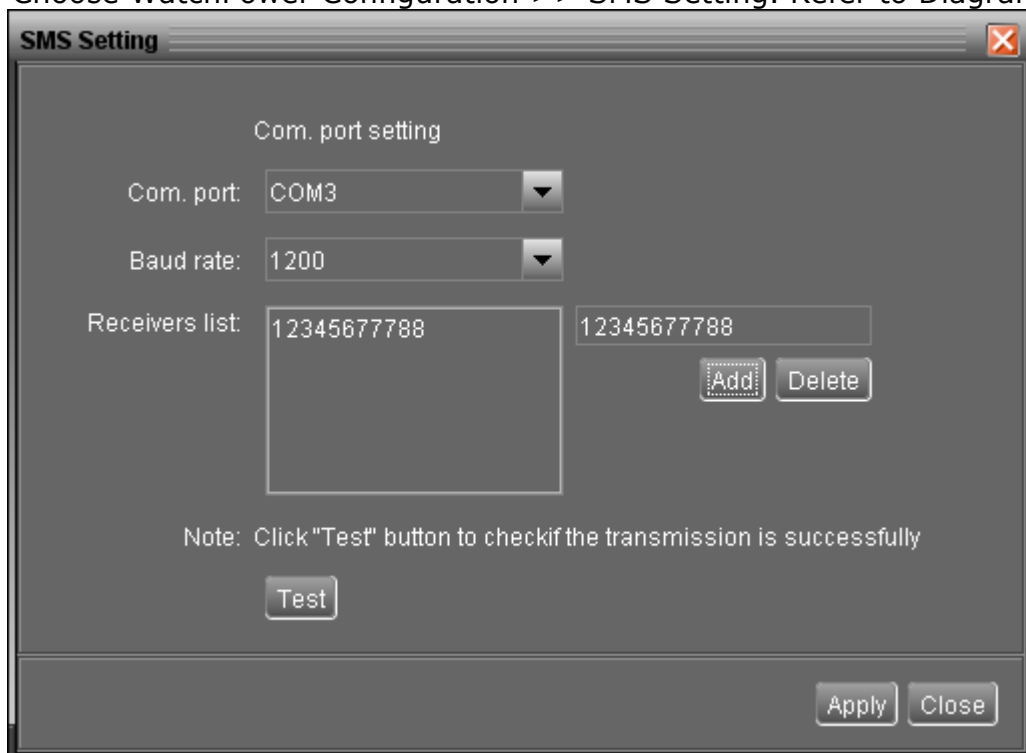
Diagram 4-5

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 make sure all setting is correct. 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)
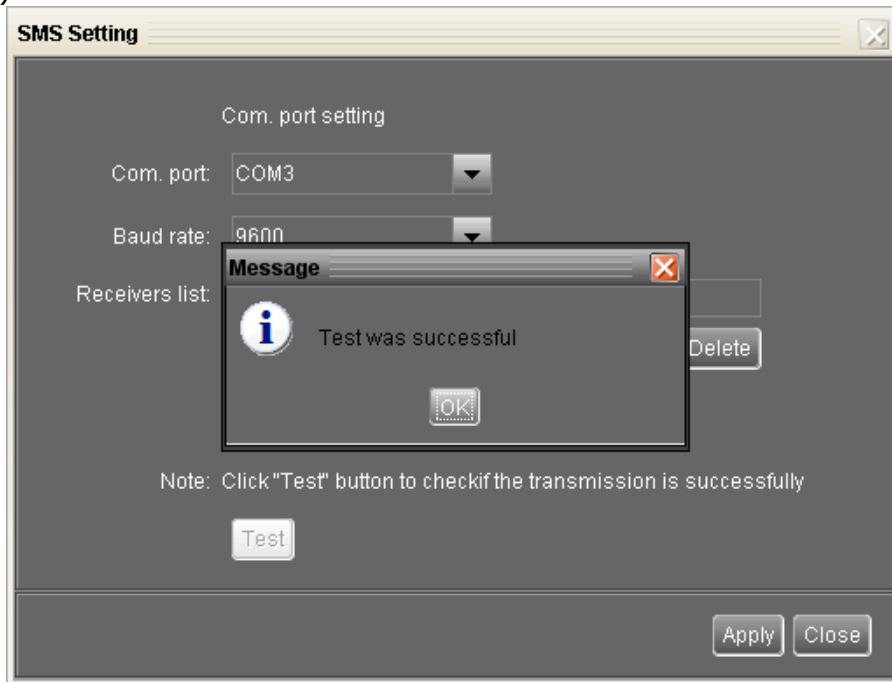
Diagram 4-6
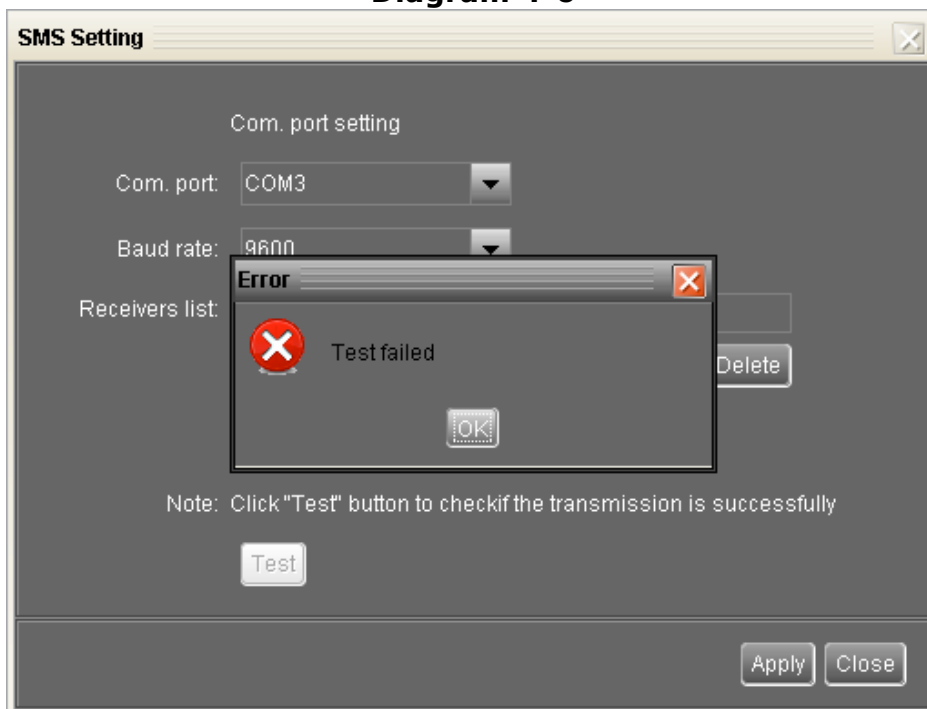
Diagram 4-7
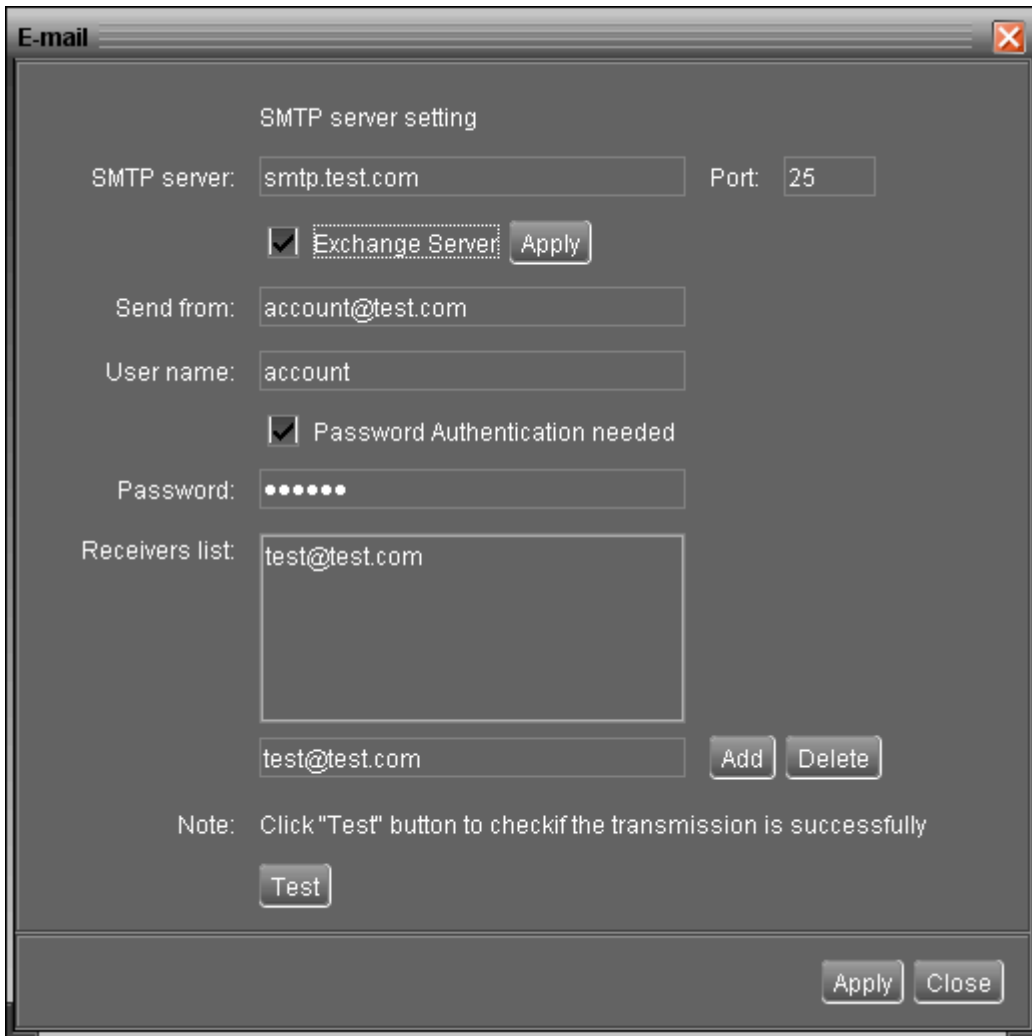
NOTE: It's required to plug in a GSM modem if sending a SMS to mobile phone.

4.1.4. E-mail

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

Step 1 Select WatchPower Configuration >> E-mail. Refer to Diagram 4-8.

Diagram 4-8

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

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

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

Step 4 Click "Apply" to save all changes. The "Test" button can be used to send a test e-mail to all receivers to confirm correct operation. When the test e-mails are successfully sent to specific recipients, it will pop up a successful message on operated personal computer. 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. It provides four response actions after events occur.

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

2. Warning message(s): It will send event message to tray.

3. SMS: It will send event message to specific mobile phone numbers after events occur.

4. E-mail: It will send event e-mail to assigned e-mail accounts after events occur.

Step 1 Select WatchPower 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.

ID	Level	Event
1001	Fault	Fan locked fault
1002	Fault	Battery voltage high fault
1003	Fault	Over load fault
2001	Fault	Bus Over
2002	Fault	Bus Under
2003	Fault	Bus Soft Fail
2004	Warning	LINE_FAIL
2005	Warning	OPVShort
2006	Fault	Inverter voltage too low
2007	Fault	Inverter voltage too high
2008	Fault	Over temperature
2009	Warning	Fan locked alarm
2010	Warning	Battery voltage high alarm
2011	Warning	Battery low alarm
2013	Warning	Battery under shutdown
2014	Warning	Battery de-rating
2015	Warning	Over load alarm
2016	Warning	Eeprom fault
3001	Message	Communication restore

Send by: ☑ Event record
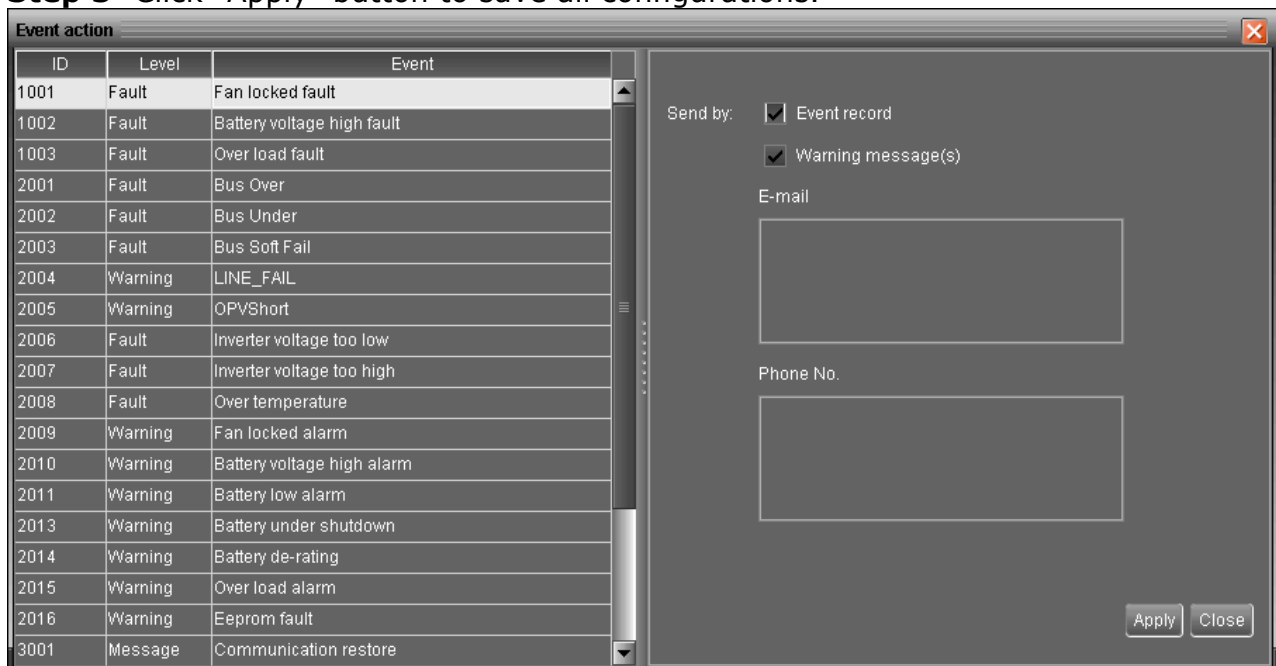☑ Warning message(s)
E-mail
Phone No.
Apply   Close

Diagram 4-9

NOTE1: When modifying receiver list in SMS or e-mail pages, it's necessary to refresh event action page to reload the updated receiver list.

4.1.6. Com. port Plug And Play Setting

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

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

Diagram 4-10

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

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

4.1.7. Modbus Serial Setting

This function is to set Modbus communication port with PCs that connected to Modbus card via RS232/RS485 converter. The settings include Modbus port, Baud rate, data bit, stop bit, parity and each Device ID in Modbus network.

Step 1   Select WatchPower configuration>> Modbus serial setting. Refer to Diagram 4-11.

Step 2   Select Modbus port to connect PC.

Step 3   Select "Device ID" of connected inverter in Modbus network.

Step 4   Select "Baud rate" of com. port. The default setting is 19200.

Step 5   Modify "Data bit" of com. port. The default setting is 8.

Step 6   Modify "Stop bit" of com. port. The default setting is 1.

Step 7   Modify "Parity". The default setting is NONE.

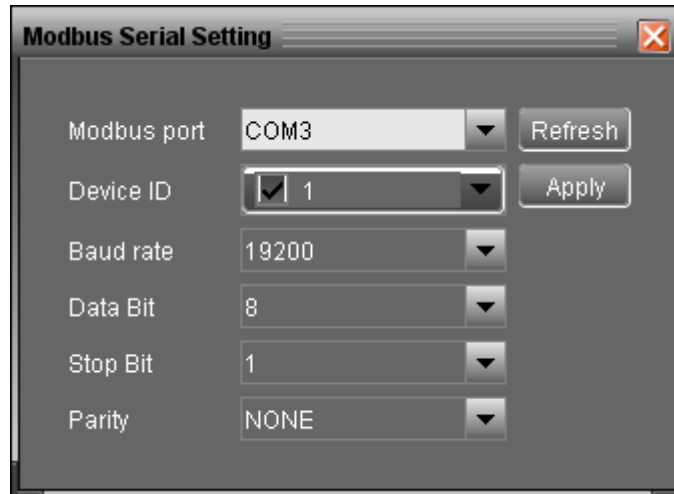**Step 8**   Click "Apply" button to save all changes.

Diagram 4-11

NOTE1: Click "Refresh" button to refresh the port list.

NOTE2: WatchPower supports multiple com. ports in multiple Modbus networks.

NOTE3: All configurations will be changed based on different port selection in Step 2.

NOTE4: The default device ID of inverter is 1.

NOTE5: If none of device ID is selected, it will be identified as not connecting with any Modbus network.

NOTE6: If monitoring multiple Modbus networks, please repeat from step 2 to step 7 to set all ports.

4.2.   Device control

4.2.1. Parameter Setting

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

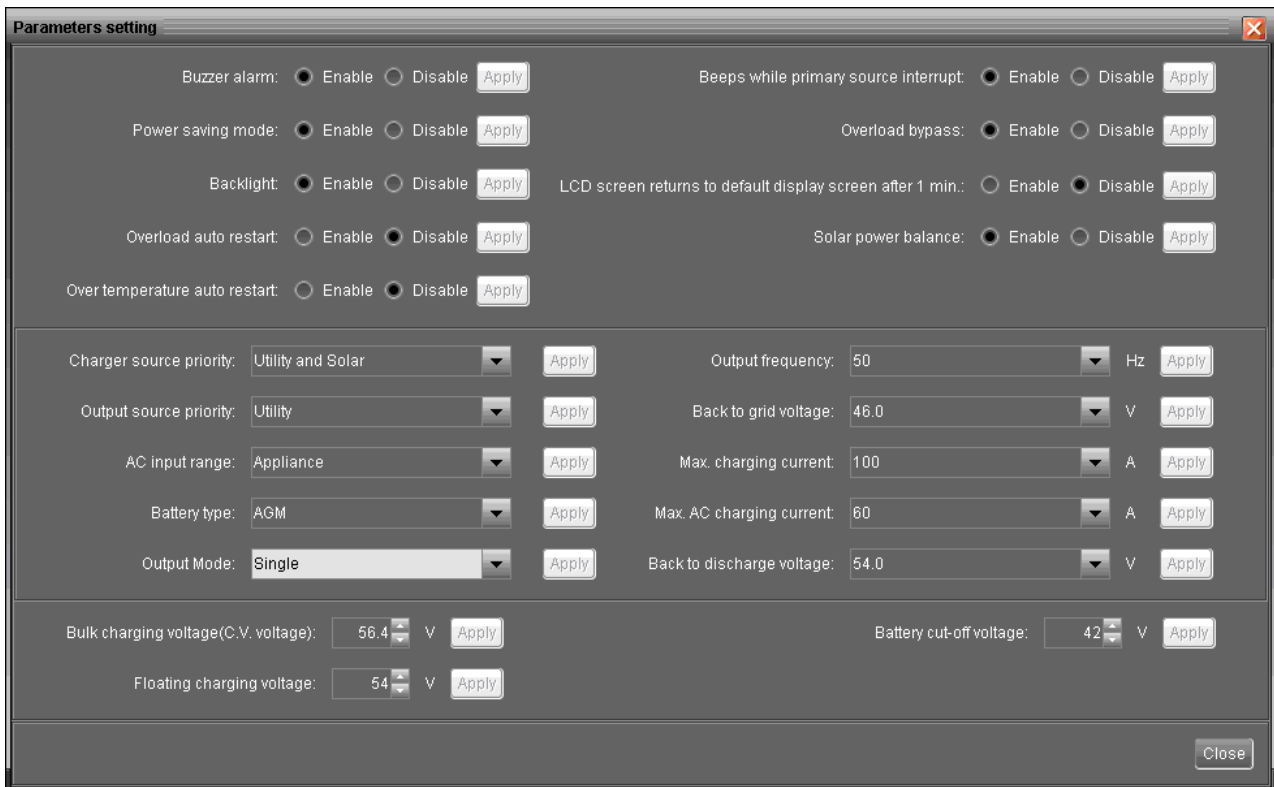Select Device Control >> Parameter Setting or select shortcut icon. Refer to Diagram 4-12.

Diagram 4-12

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

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

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

● Buzzer alarm: If disabled, buzzer won't be on when alarm/fault occurred. Vice versa.

● Power saving mode: If disabled, output will be on continuously when device is operated in battery mode. If enabled, inverter output will be on or off depending on connected loads detected or not. If the load is not detected, the output of inverter will be off until load reaches a certain level. Check product manual for more details.

● Backlight: If disabled, LCD backlight will be off when panel button is not operated for 1 minute. Vice versa.

● Overload auto restart: If disabled, the unit won't be restarted after overload occurs. Vice versa.

● Over temperature auto restart: If disabled, the unit won't be restarted after over-temperature fault is solved. Vice versa.

● Beeps while primary source interrupt: If enabled, buzzer will alarm when primary source is abnormal. Vice versa.

- Overload bypass: If enabled, unit will transfer to line mode when overload happened in battery mode. Vice versa.

- LCD screen returns to default display screen after 1 min.: If enable, LCD screen will return to default display screen after no button is pressed in one minute. Vice versa.

- Solar power balance: This function is only available for 4KVA/5KVA models. When enabled, solar input power will be automatically adjusted according to connected load power. If disabled, solar input power will be the same to max. battery charging power no matter how much loads are connected.
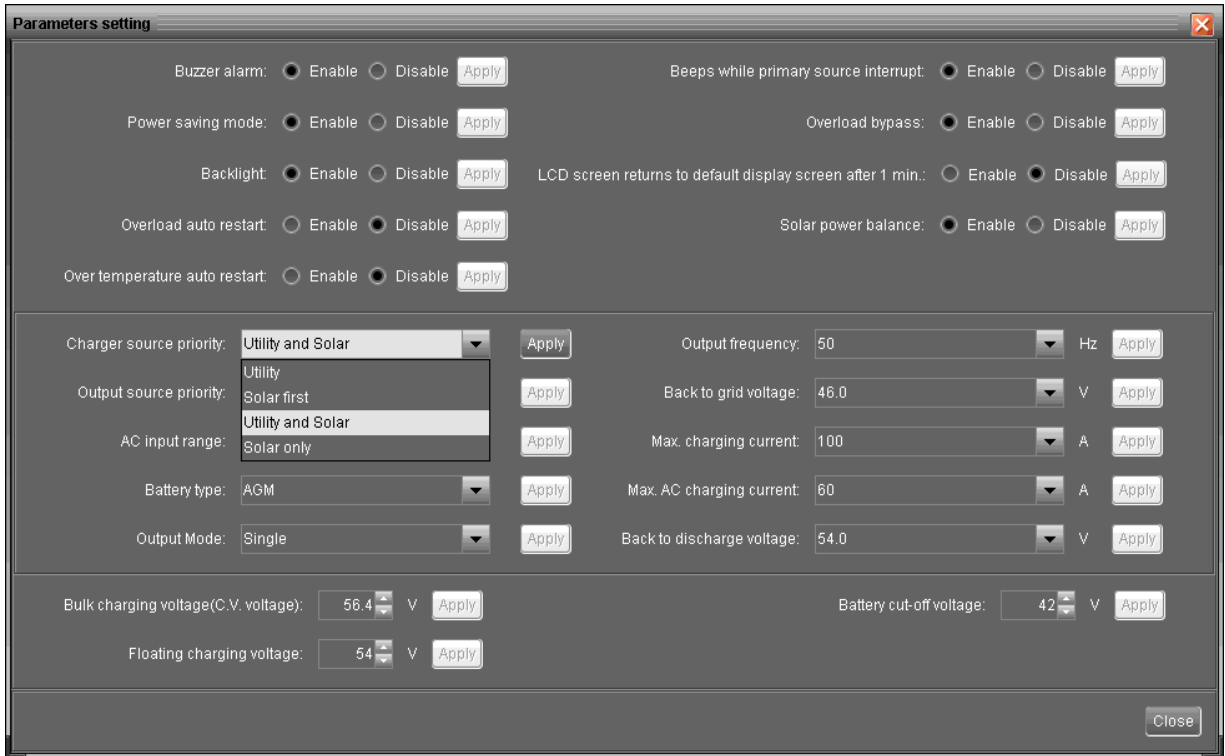

Diagram 4-13

- Charger source priority: Click up-down arrows to set up charger source priority. There are 4 options: utility first, solar first, solar and utility and Solar only. See product manual for the details of these options. Refer to Diagram 4-13.
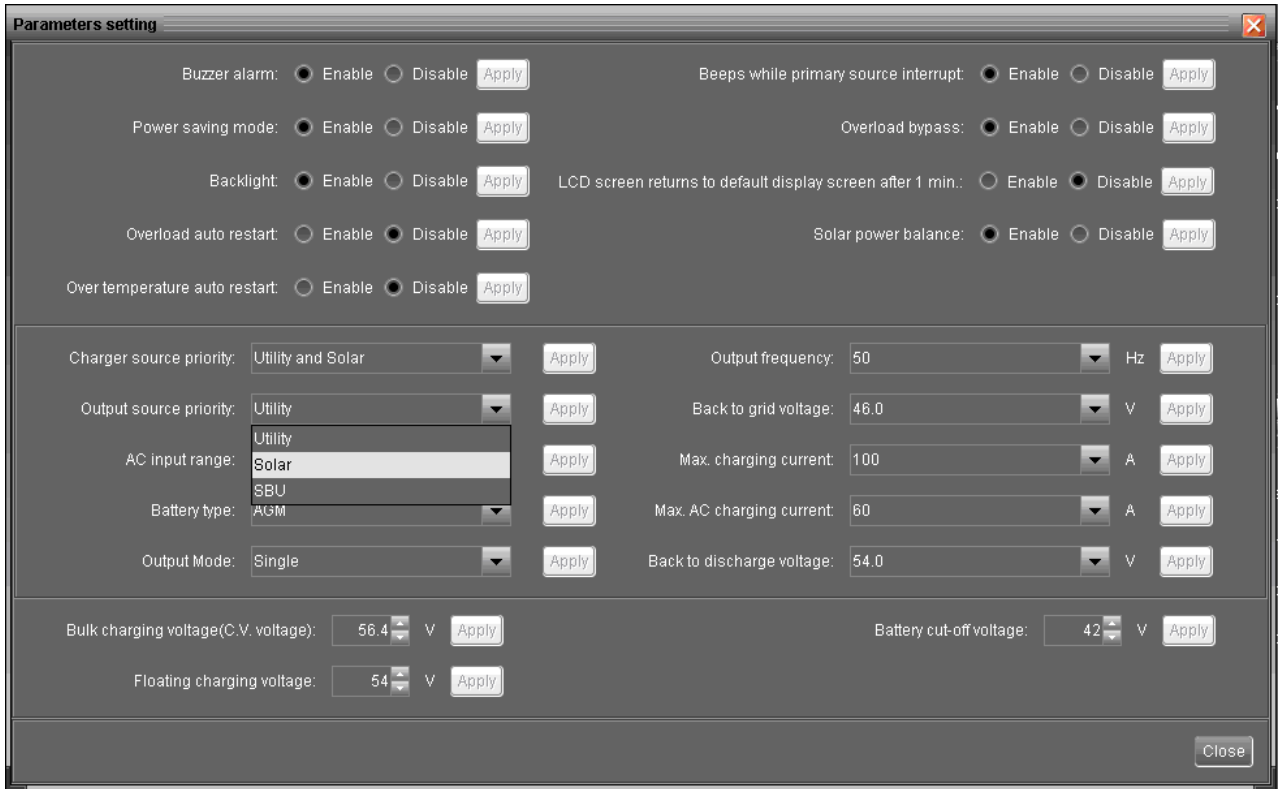
Diagram 4-14

- Output source priority: Click up-down arrows to set up output source priority. There are 3 options: utility first, solar first and SBU. See product manual for the details of these options. Refer to Diagram 4-14.
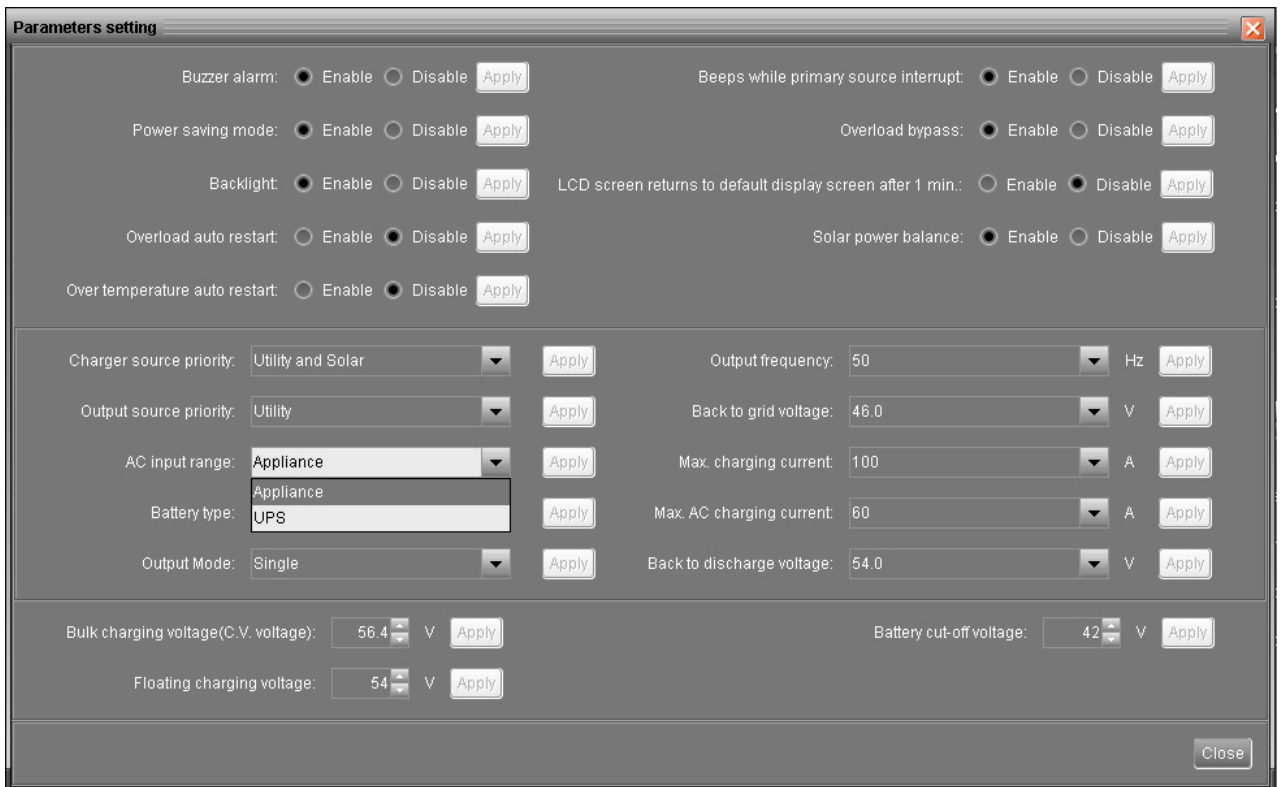

Diagram 4-15

- AC input range: Click up-down arrows to set up suitable input range for connected devices.　When selecting "Appliance", it's allowed to connect home appliances. When selecting "UPS", it's allowed to connect personal computer. For the detailed input range for connected devices, please check product manual. Refer to Diagram 4-15.
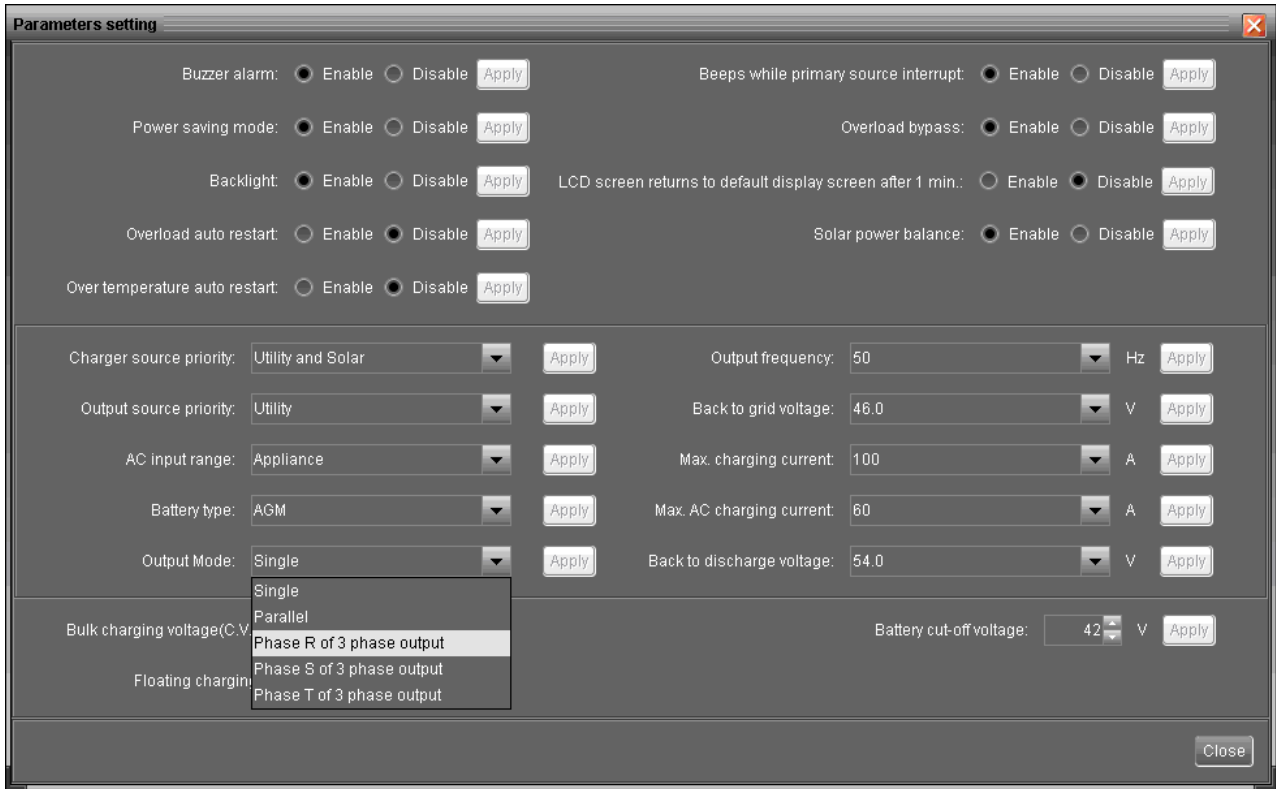

Diagram 4-16

- Battery type: Select connected battery type. There are two options, AGM and Flooded. Please refer to product manual for charging parameter for these two battery types.

- Output mode: In this setting, the options will be different based on different inverter models. Refer to Diagram 4-16.

  - Single: This inverter is set for singe operation.

  - Parallel: This inverter is set for parallel operation.

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

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

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

- Output frequency: Nominal output frequency, 50Hz and 60Hz selectable.

- Back to grid voltage: Click up-down arrow to set up low battery voltage point. If

"SBU" is selected in output source priority, the inverter will transfer output source to grid when battery voltage drop to low battery voltage point.

● Max. charging current: Click up-down arrow to set up maximum charging current. Maximum charging current in different inverter model may be different. Please refer to product manual for the details.

● Max. AC charging current: Click up-down arrow to set up AC charging current. For the detailed setting, please check inverter manual.

● Back to discharge voltage: When battery voltage is higher than this setting voltage, battery will be allowed to discharge.

● Bulk charging voltage: Click up-down arrow to set up bulk charging voltage. Please refer to product manual for the recommended bulk charging voltage based on connected battery type.

● Float charging voltage: Click up-down arrow to set up float charging voltage. Please refer to product manual for the recommended float charging voltage based on connected battery type.

● Battery cut-off voltage: In battery mode, when battery voltage is lower than cut-off voltage point, inverter will shut down battery and transfer to fault mode.

4.2.2. Restore to the defaults

This function is allowed to restore all settings back to default value and clear all data in database.

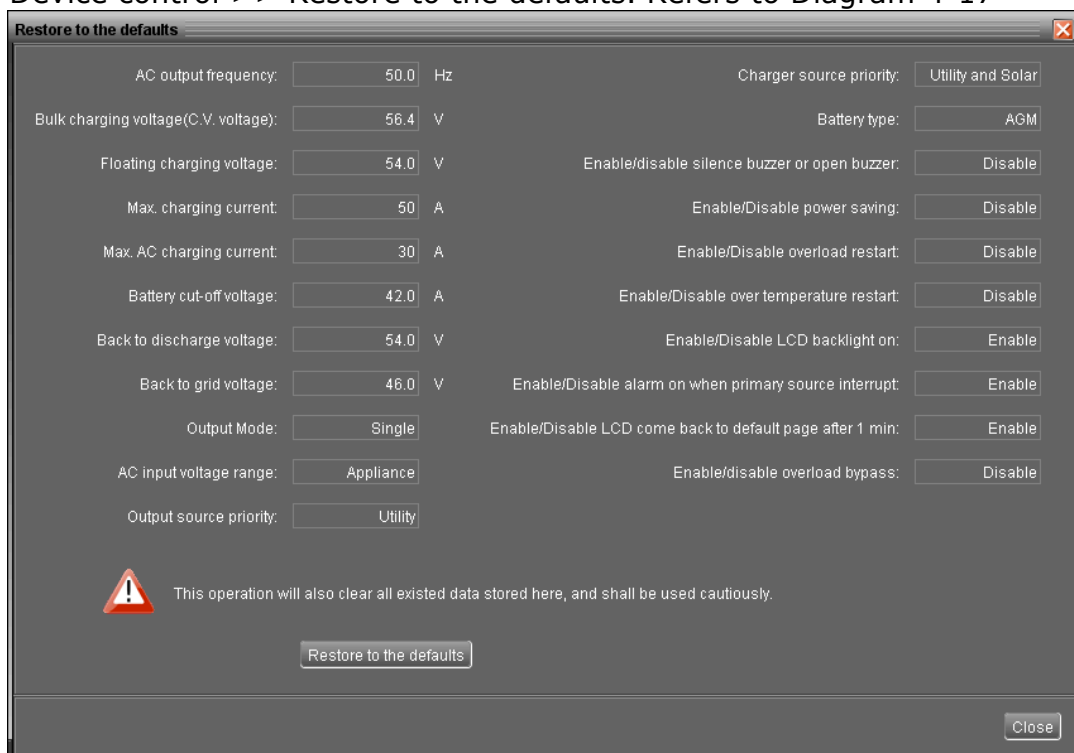Select Device control >> Restore to the defaults. Refers to Diagram 4-17

Restore to the defaults

AC output frequency:	50.0	Hz	Charger source priority:	Utility and Solar	
Bulk charging voltage(C.V. voltage):	56.4	V	Battery type:	AGM	
Floating charging voltage:	54.0	V	Enable/disable silence buzzer or open buzzer:	Disable	
Max. charging current:	50	A	Enable/Disable power saving:	Disable	
Max. AC charging current:	30	A	Enable/Disable overload restart:	Disable	
Battery cut-off voltage:	42.0	A	Enable/Disable over temperature restart:	Disable	
Back to discharge voltage:	54.0	V	Enable/Disable LCD backlight on:	Enable	
Back to grid voltage:	46.0	V	Enable/Disable alarm on when primary source interrupt:	Enable	
Output Mode:	Single		Enable/Disable LCD come back to default page after 1 min:	Enable	
AC input voltage range:	Appliance		Enable/disable overload bypass:	Disable	
Output source priority:	Utility				

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

Restore to the defaults

Close

Diagram 4-17

4.3. View

4.3.1. Data

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

● Datasheets

Select View >>Data>>Datasheets or click shortcut icon. Refer to Diagram 4-18.
Select browsed device and period to display in the screen. Click "Browse" to get result.

➢ **"Print":** Print the listed data table.
➢ **"Delete":** Select specific data and click "Delete" button to delete the record.
➢ **"Delete all":** Click "Delete All" button to delete all records in the listed table.
➢ **"Export":** Click "Export" button to save listed table to local PC in .PDF file.

Diagram 4-18

● **Charts**

Select View >>Data>>Charts. Refer to Diagram 4-19.
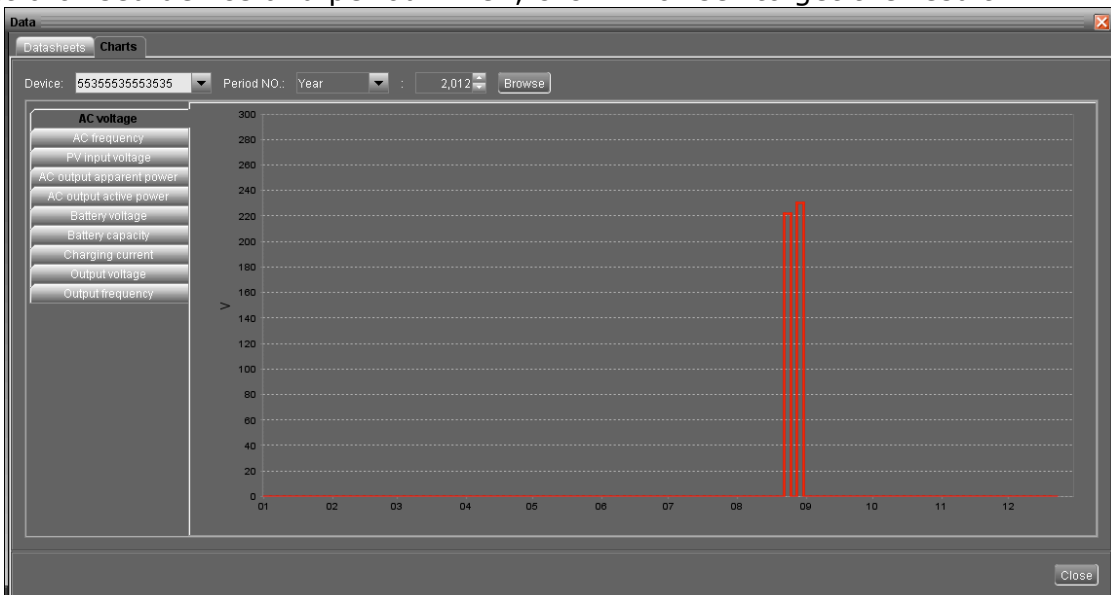Select browsed device and period. Then, click "Browse" to get the result.

Diagram 4-19

4.3.2. Event log

Select View >>Event log or click shortcut icon [icon] to enter event log.
It's to browse history events according to time duration selected. It lists all detailed information and statistics for history events. Refer to Diagram 4-20.

  ➢ **"Delete":** Select specific data and click "Delete" button to delete the record.
  ➢ **"Delete all":** Click "Delete All" button to delete all records in the listed table.
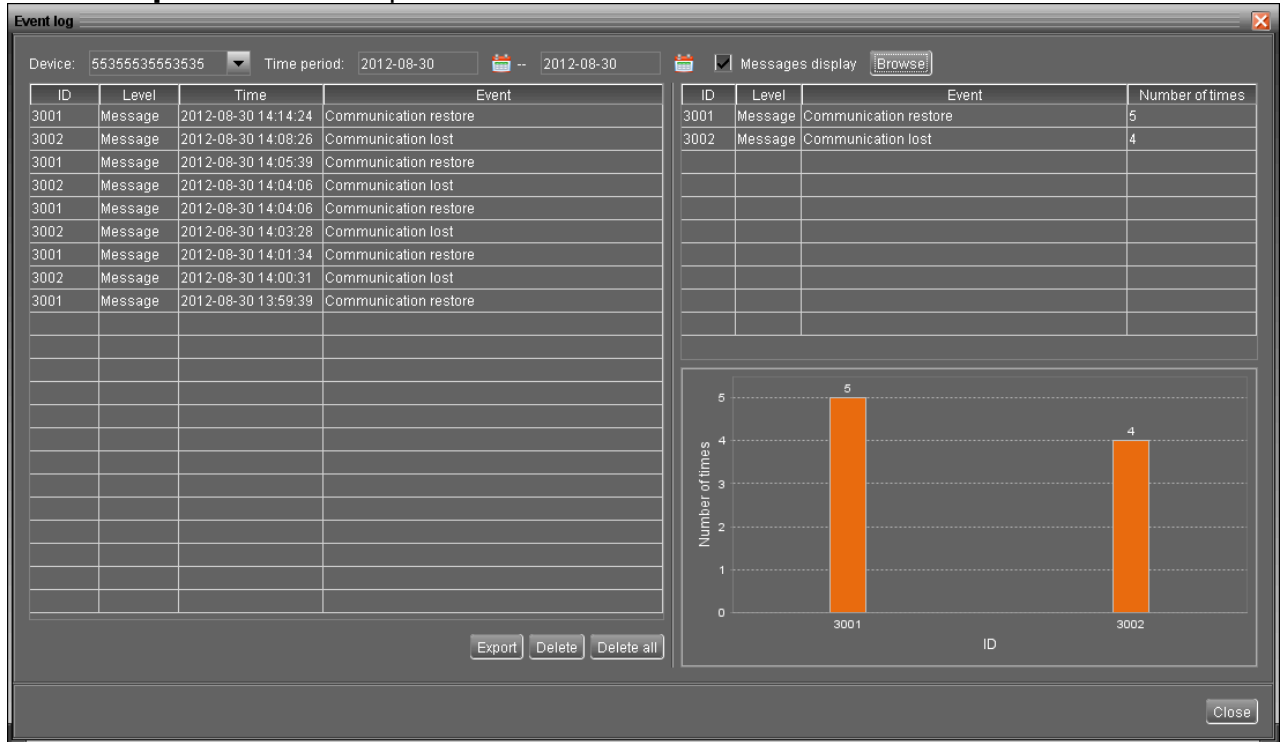 ➢ **"Export":** Click "Export" button to save listed table to local PC in .PDF file.

Diagram 4-20

4.4. Log in and Log out

This short cut icon [icon] is to display the login status. When icon [icon] is displayed, it means user status is guest. When icon [icon] is displayed, it means user logins as administrator.

Click icon [icon] and enter password to login the software. The default password is "administrator". Refer to Diagram 4-21.
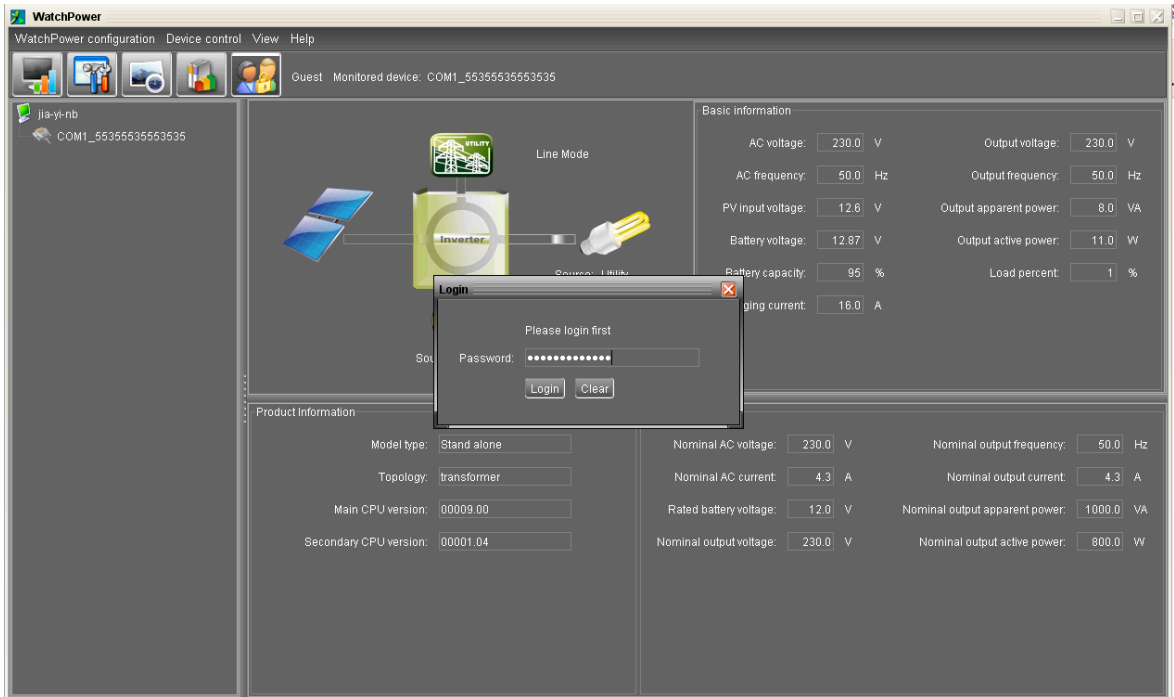
Diagram 4-21

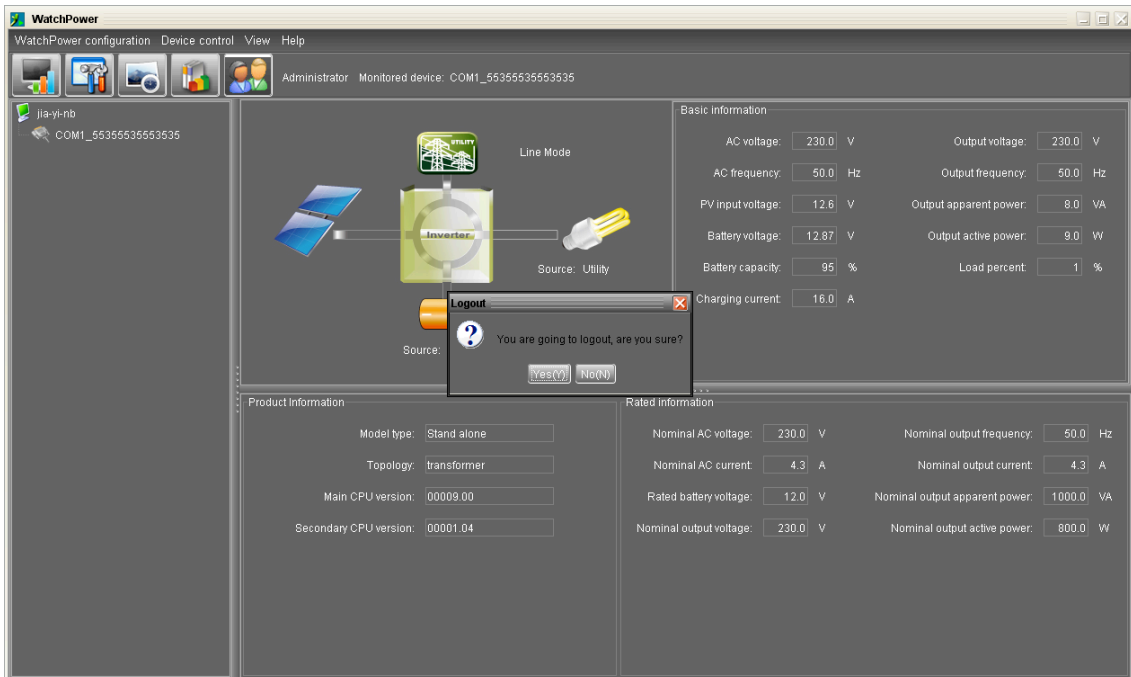Click icon to log out. Then, the status will become to "guest". Refer to Diagram 4-22.

Diagram 4-22

4.5. Language

Currently, software offers some languages for selection:

√ English

√ Polish

When first using the software, it will search proper language to display 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.