



User Manual

iMars WinExpert
solar inverter monitoring software

SHENZHEN INVT ELECTRIC CO., LTD.

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1. WinExpert Introduction

Software name: iMars WinExpert

Software version: V2.0

Software acquisition: please visit INVT solar website at www.invt-solar.com .

Description:

iMars WinExpert, grid-tied inverter and PV system monitoring expert, gives users an overview of their PV systems. iMars WinExpert is designed specifically for grid-tied PV system. Switch on the PC and working with iMars BG series inverters, iMars WinExpert displays and records Real-time parameters and status, historical data and alarm information about the overall PV system and the single inverter. Because of its user-friendly interface, powerful analysis capabilities, failure alarm and information delivery mechanism, iMars WinExpert is the best choice for monitoring the grid-tied PV system.

Technical Features

Multi-level User Management

- Guest, as a primary user, can browse over software settings and PV system parameters;
- Administrator, as a professional user, can change the software settings, modify the system configuration, and so on;

User-friendly Interface

- Simple menu bar and inspection window;
- Can be reduced to the sticker window;
- Visualization of alarm;

Powerful Analysis Capabilities

- kWh performance by day, week, month, year;
- CO2 emission reductions, power generation profit;

More Choice

- Support RS485, Ethernet, WIFI, GPRS communication modes;

Installation environment and functions introduction:

	iMars WinExpert V2.0
Languages	English, Chinese
System Requirements	WIN2000/XP/WIN2003/VISTA/WIN7
Hardware (Minimum Requirements)	1. Processor: PIII 800 MHz (XP), P4 1 GHz (Vista, Windows 7) 2. Main memory: 512 MB (XP), 1 GB (Vista, Windows 7) 3. Free hard drive space: 80GB 4. Resolution: 1024 x 768 pixels
Communication	RS485, Ethernet, WIFI, GPRS
Software Features	1. User login 2. The system generating capacity, economic benefits and environmental benefits 3. Software settings 4. View and print the system information 5. View the inverters information (1) Real-time operating parameters (2) Real-time operating status (3) Historical data (4) Technical parameters of the inverter 6. Add and remove inverters 7. Communication management 8. Help and E-mail system

2. WinExpert Installation

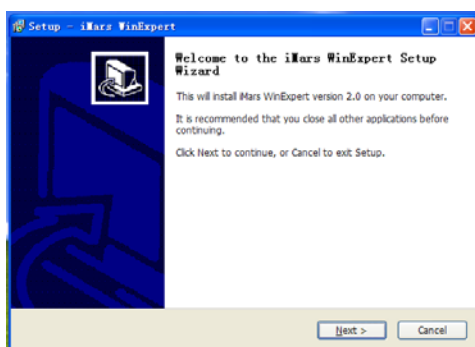
This section focuses on iMars WinExpert-installation under the Windows XP operating system environment.

Downloaded "iMars WinExpert.rar" from www.Invt-solar.com and extract the compressed file, get " iMars WinExpert.exe" installation package.

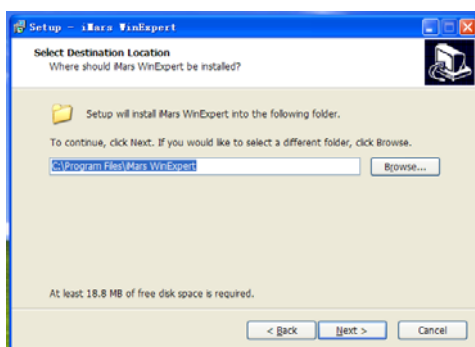


Note: If the iMars WinExpert software is already installed on your computer, in order to prevent data loss, perform regular backups of system generation data; before installing or updating software, backup power generation data. Data backup and recovery operation, please refer to "3. Data Backup and Recovery " content.

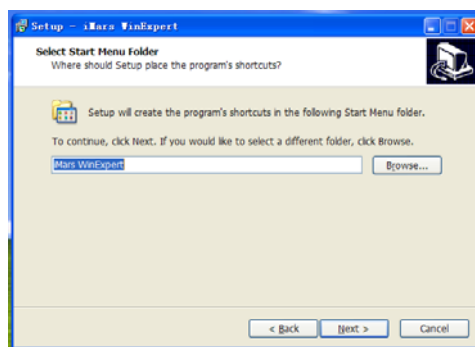
Double-click "iMars WinExpert.exe" , lead to the software installation program.



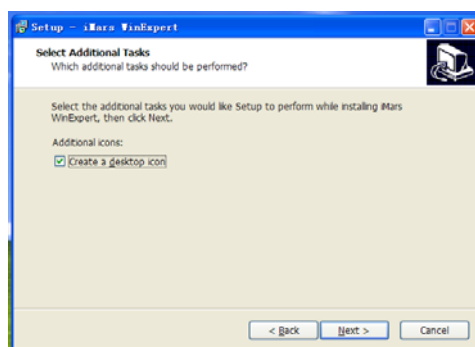
Click "Cancel" to cancel setup; determine the installation, click "Next".



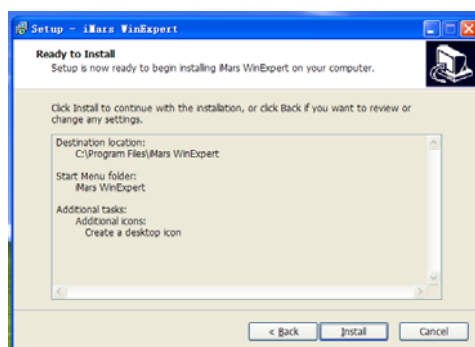
Select the installation path. You can select or edit the installation path, the default installation path is "C:\Program Files\iMars WinExpert". Click "Next" to go on.



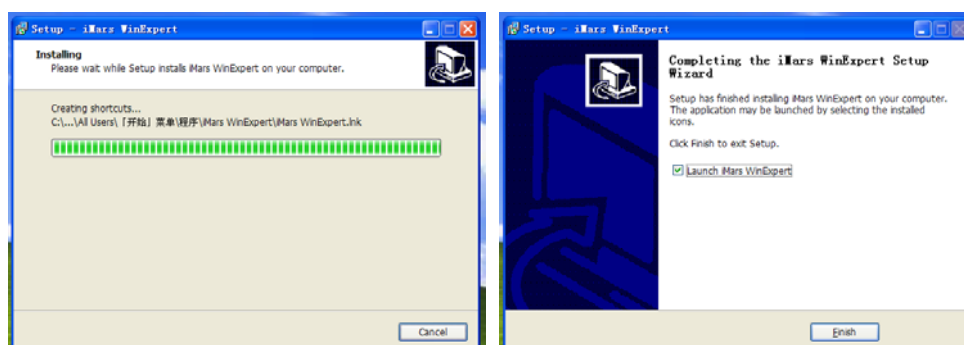
Select the start menu folder, you can keep the default. Click "Next" to the next step.



Create "iMars WinExpert" shortcut for the software startup on the desktop. Click "Next" to the next step.



Confirm the installation configuration list, click "Back" to return to the previous modifications, determine the installation and click "Install" to the next step.



iMars WinExpert software is installed successfully.

3. WinExpert Operation

3.1. Star WinExpert

Once the software is installed, a shortcut "iMars WinExpert" will appear on your computer desktop.



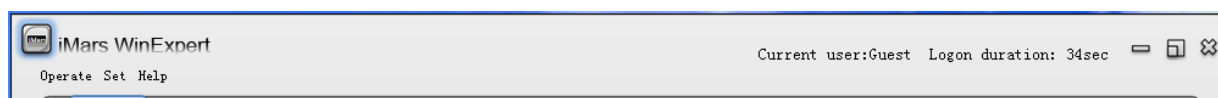
Double-click "iMars WinExpert" icon to launch the solar monitoring software. As the following figure.



The main interface will display when the progress bar reach 100%.

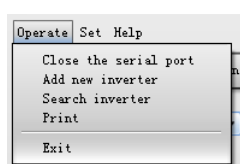
3.2. WinExpert Operation

3.2.1 Software Menu



Monitoring software menu bar include: Operate, Set, Help.

3.2.1.1 "Operate"



"Operate" menu includes 5 options:

- (1) Open/closed serial port (connect/disconnect serial conversion module), can be used to control

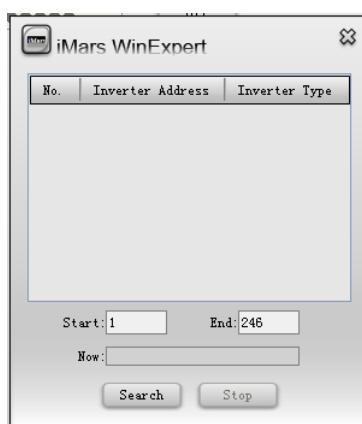
software of communication;

(2) Add a new inverter;



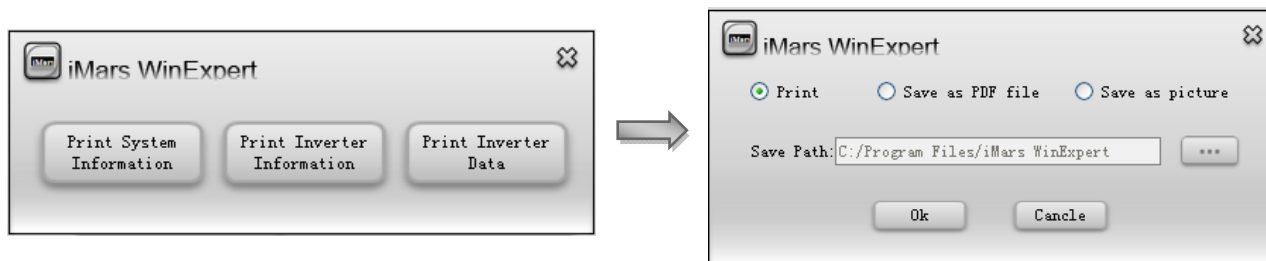
Add a new inverter: inverter custom naming, inverter type selection, the inverter address. Inverter name that already exists can not be used again; inverter address is very important for communication, only a correct inverter address can guarantee communication success, inverter address can only be between 1-246; the options of single-phase and three phase is not effective when communicate successfully for that the monitoring software automatically determines the type of inverter; analog signal built into the software database, the default inverter model is iMars BG5kTL (single-phase).

(3) Search inverter. WinExpert can automatically find all online inverters that has successfully established communication with PC;



Search Inverter: the starting address and ending address can be set; " Now "shows searching state; click on the" Search "button to launch a search engine, online inverters will appear in the list, including address and model of inverters; click the" stop "button to interrupt searching.

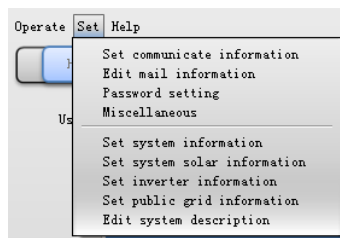
(4) Print. Rrelated data can be printed, saved as a PDF file or a picture;



Print: choosing what to print. The contents can be printed directly, or saved as PDF files or BMP pictures to a Editable file path.

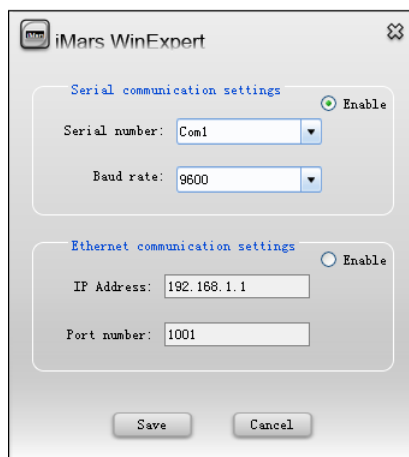
(5) Exit, turn off the program.

3.2.1.2 “Set”



"Set" menu includes 9 options:

(1) Set communicate information



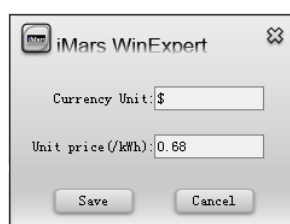
(2) Edit mail information



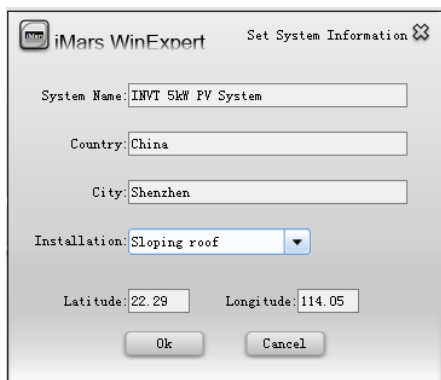
(3) Password setting



(4) Miscellaneous



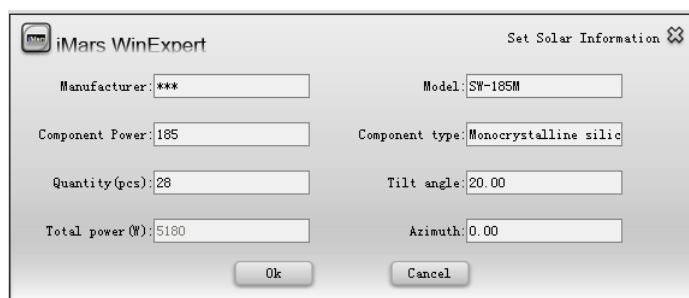
(5) Set system information



The 'Set System Information' dialog box in iMars WinExpert contains the following fields:

- System Name: INVT 5kW PV System
- Country: China
- City: Shenzhen
- Installation: Sloping roof (dropdown menu)
- Latitude: 22.29
- Longitude: 114.05
- Buttons: Ok, Cancel

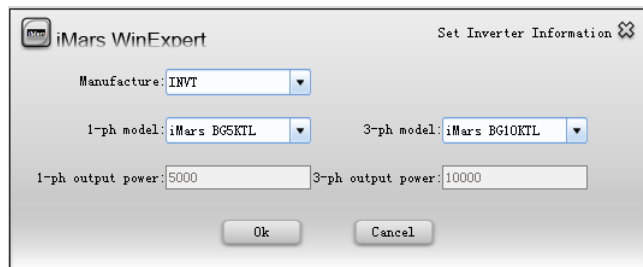
(6) Set PV module information



The 'Set Solar Information' dialog box in iMars WinExpert contains the following fields:

- Manufacturer: ***
- Model: SW-185M
- Component Power: 185
- Component type: Monocrystalline silic
- Quantity(pcs): 28
- Tilt angle: 20.00
- Total power (W): 5180
- Azimuth: 0.00
- Buttons: Ok, Cancel

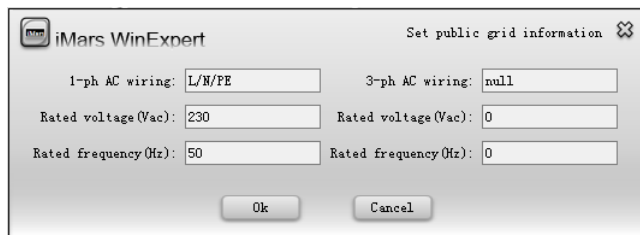
(7) Set inverter information



The 'Set Inverter Information' dialog box in iMars WinExpert contains the following fields:

- Manufacture: INVT (dropdown menu)
- 1-ph model: iMars BG5KTL (dropdown menu)
- 3-ph model: iMars BG10KTL (dropdown menu)
- 1-ph output power: 5000
- 3-ph output power: 10000
- Buttons: Ok, Cancel

(8) Set public grid information



The 'Set public grid information' dialog box in iMars WinExpert contains the following fields:

- 1-ph AC wiring: L/N/PE
- 3-ph AC wiring: null
- Rated voltage (Vac): 230
- Rated voltage (Vac): 0
- Rated frequency (Hz): 50
- Rated frequency (Hz): 0
- Buttons: Ok, Cancel

(9) Edit system description

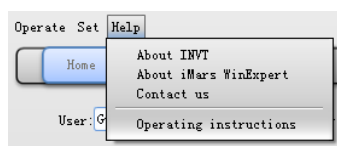


The 'Edit the system description' dialog box in iMars WinExpert contains a text area with the following description:

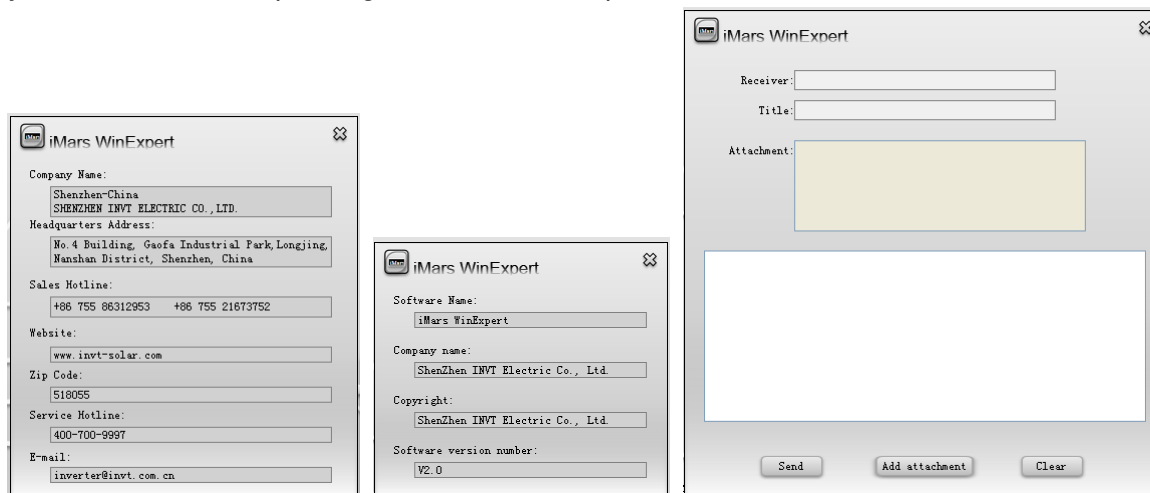
iMars BG5KTL grid-tied solar inverters have been installed On the rooftop of Invt Building.

Buttons: Ok, Cancel

3.2.1.3 “Help”

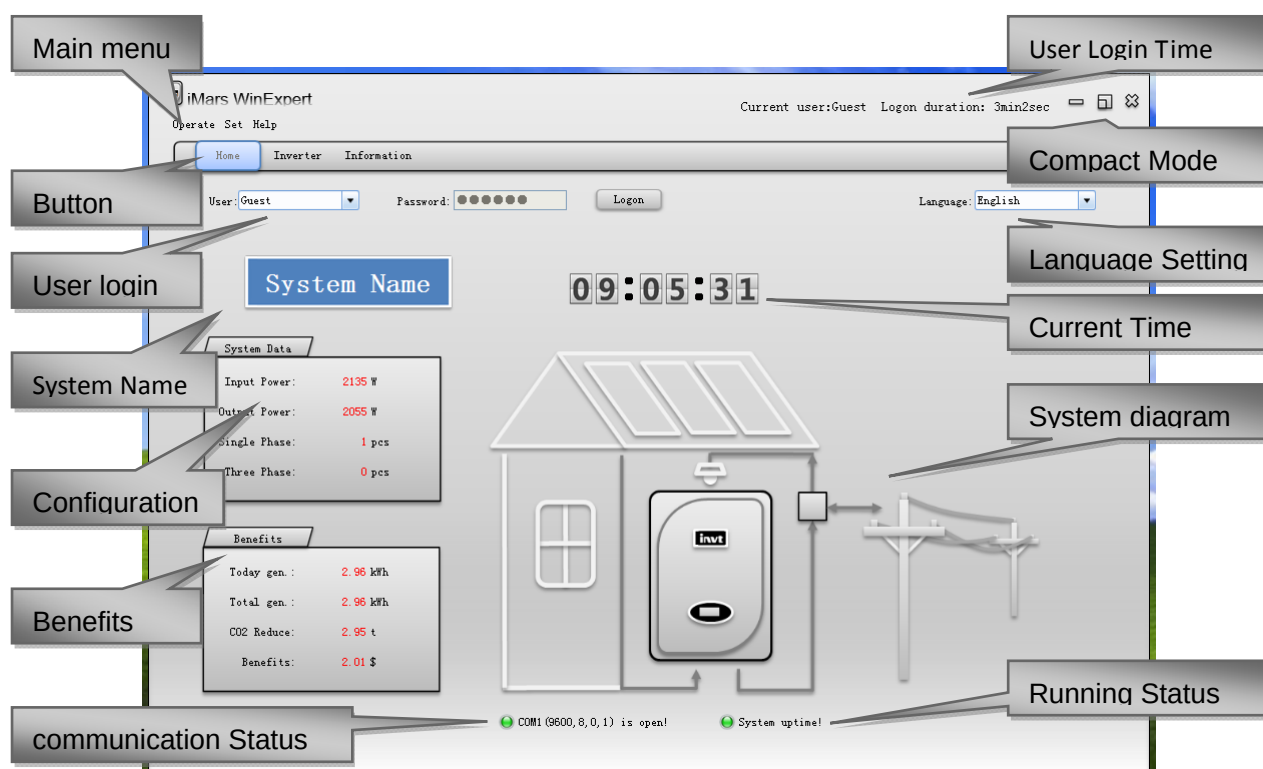


In Help menu, INVT company basic information, as well as iMars WinExpert, can be viewed. There are mail system and software operating instructions in Help menu.



When click on the "contact us" button, an email system (already set up) will be activated.

3.2.2 Main Interface



As the figure above, the main interface shows system running status, communication status and system data. At the same time, language setting and user login dialog box can be found in the main interface.

There are two user levels, Guest and Administrator.

User	Guest	Administrator
Password	Null	Default 123456, can be modified
Permissions	Browse	Browse, Edit
Operational menu	"Operate" search inverter and exit the software; "Help" about INVT, iMars WinExpert, contact us, the operations guide.	"Operation" close serial port, add inverter, search inverter, print and exit the software; "Set" communication, email system, password, currency exchange rates, as well as the systems, PV module, inverter, public grid, system description; "Help" about INVT, iMars WinExpert, contact us, the operations guide.

Guest login without using a password, a feature is only included for viewing system data, cannot operate on inverters. Guest can set the software's language.

Administrator can use the full functionality of the software, the default password is 123456. Administrator can modify password in the menu. If Administrator leaves last 5 minutes without any operation (click or display a dialog box), WinExpert will switch to the Guest interface.

System Name is a general overview of PV systems and can be set in the menu (need Administrator privileges).

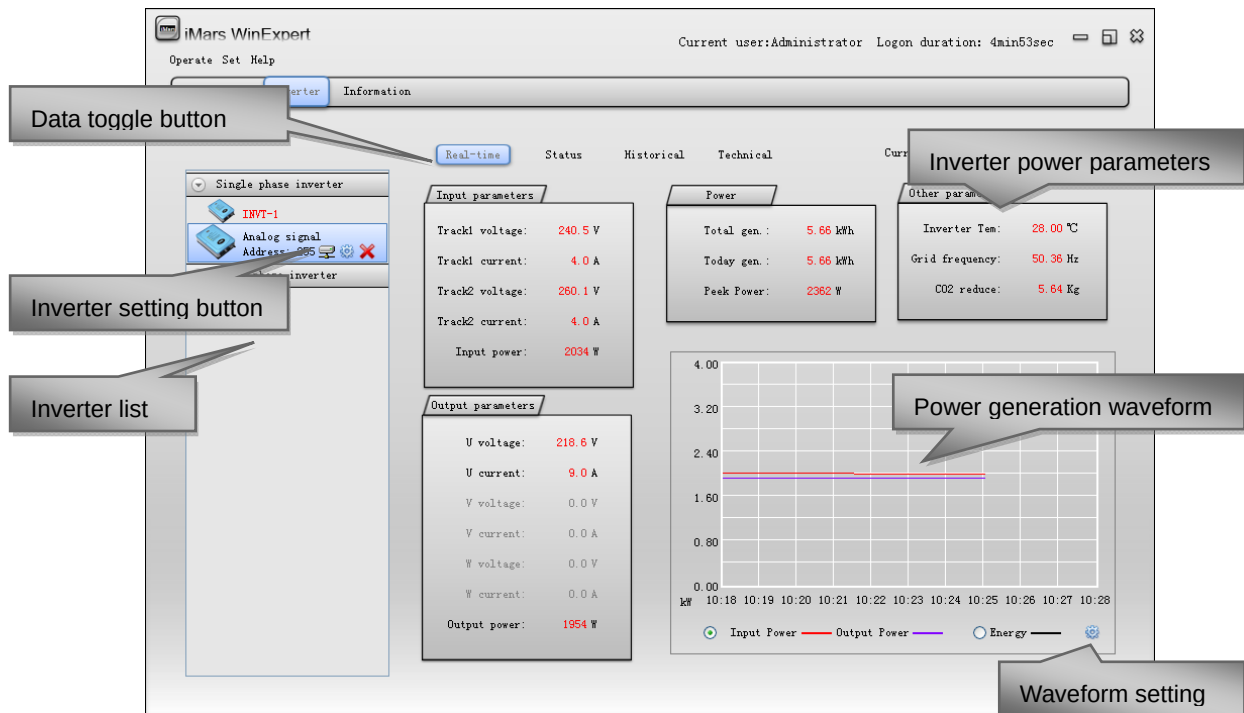
System diagram types include Sloping roofs, Flat roofs, and Flat ground. Each type has a corresponding diagram and can be set through the menu.

System communication status indicators: Green tells successful communication(the serial port is open or the serial port server is connected); Red tells communication fails(the serial port is not open, the serial port is occupied or serial port number is not correct; or software fails to connect serial converter module, the IP address or the communication port setting is not correct).

The system running status indicator: any inverter failure detected by monitoring software, the system operation status display system failure. Green tells normal operation, without any failure; Red tells a system failure (single or multiple inverter failure).

Viewing a specific inverter communication failure, you can switch the page button to the inverter page.

3.2.3 Inverter Interface



3.2.3.1 "Inverter List"

Inverters list displays all inverters of the system. There are single-phase inverter and three-phase inverter. When the inverter is failed to communicate with WinExpert, the inverter name will be displayed in red. Each inverter in the list has three action buttons, from left to right, connect/disconnect button, setting button, and delete button. Three actions that require Administrator permissions:

- (1) Connect / Disconnect button: To control the communication of the inverter, connect / disconnect communication;
 - (2) Setting button: Inverter start/stop operation, set inverter clock, reset inverter settings, clear alarm information;
 - (3) Delete button: Delete the inverter from the list. The analog signal will only respond to the delete button.
- When click on the setting button, the inverter settings dialog box appears. Some of these operations require a "login", only after communicate successfully and enter a correct password, inverter settings can take effect. These operations are shut down, reset, clear alarm, clear statistics, set password and read or write certain sensitive address. However, when communication failed, monitoring software will prompt "The inverter is offline!", all the settings will not take effect or could not be set.

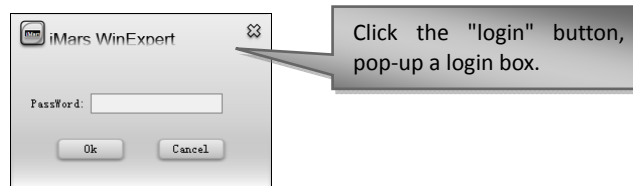
The screenshot shows the 'iMars WinExpert' Inverter Settings dialog box. It includes the following fields and buttons:

- Inverter Name:** A text field containing 'INVT-1'.
- Inverter Location:** A text field.
- Save:** A button.
- Inverter Language:** A dropdown menu set to 'English'.
- Set:** A button.
- Monetary unit:** A dropdown menu set to 'U.S. dollar'.
- Set:** A button.
- Unit price:** A text field set to '0.00'.
- Set:** A button.
- Logon:** A button.
- Shutdown:** A button.
- Reset:** A button.
- Clear alarm:** A button.
- All data:** A button.
- All fault:** A button.
- Clear-stat:** A button.
- Set password:** A button.
- Set T1:** A button.
- Set T2:** A button.
- Read:** A button.
- Write:** A button.

A message box states: "Only after communicate successfully and enter a correct password, inverter settings can take effect."

Inverter setting dialog box has the following features:

(1) implementation of "login" action



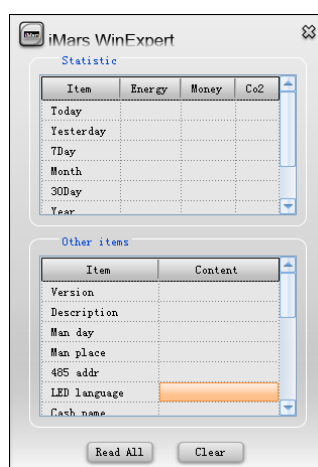
Click "login", enter the password and click "OK", then the software will judge whether the login is successful or not according to the inverter's return, showing in a dialog box.

(2) Inverter operation password setting



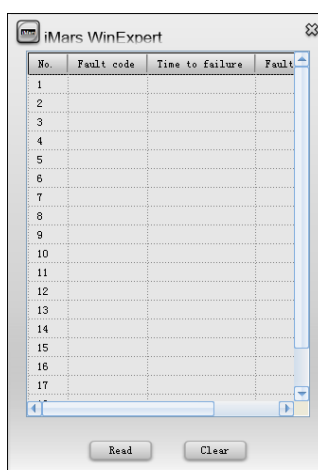
Operation password setting can only be changed after the user login in with a correct original password. Clicking "Set password" will pop up a dialog box, enter the new password and confirm it.

(3) read the inverter data



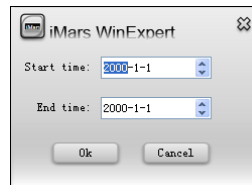
Click "all data", a inverter data dialog will pop up. This action will display inverter parameters, which does not appear in real time parameters page. The "clear" button just clears the form data in the dialog box.

(4) Read inverter fault records



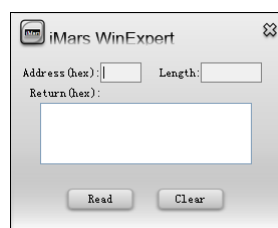
Click "all faults", a inverter fault records dialog box will pop up. Click "read" button, the whole inverter fault information records will display in box. Those fault information have been recorded in the inverter, not the same as those show in the status page. Clicking "clear" button will only clear the data in the dialog box.

(5) Monitoring a time period of data



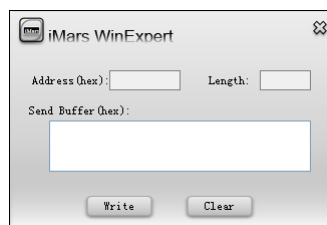
Execute "Set T1" or "Set T2" button, a time setting dialog box will pop up to ask a monitoring period Confirmation. Click "OK" button, the setting order will be sent to the inverter and a return will tell whether the settings successful or not.

(6) Read the inverter data within a specific address



Click "read" button, a dialog box will pop up to ask to complete what data needs to read. The data needed to read will be displayed as hexadecimal in the box. The data length cannot be greater than 20, address is hexadecimal also. If the reading is unsuccessful you will be prompted with the dialog box. This function can not read the data in non-permission address.

(7) Write data to a specific address



Click " write" button,a dialog box will pop up to ask to complete what data needs to write. Fill out the specific address and length of the data, and then input the data to box. The data length cannot be greater than 20 and delimited by a space (such as 00 0F F0) as hexadecimal, address is hexadecimal also. When the data is less than 20 bit, the end is padded with 0; otherwise, delete the end of the data. Whether writing is successful or not will be prompted with a return dialog box.

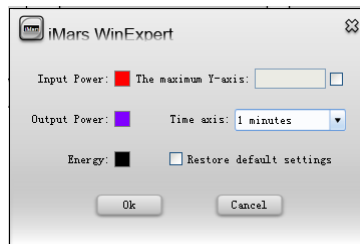
3.2.3.2 “Real-time” Data

Real-time data page displays some important real time data of the inverter, including DC input power and AC output power, generating capacity, carbon dioxide emissions and so on. The more detailed data can be found at inverter list by clicking the settings button, "all the data" in the query.

Data waveform includes input power, output power, power generation, and waveform display can be selected.

Data waveforms can customize settings. Click the waveform setting button, the following dialog box

appears, wavy lines color, the vertical axis maximum value and timeline can be set. The default settings can be restored.



Waveform setting includes waveform line color, the maximum vertical axis, timeline settings. WinExpert recommends leaving the default system settings.

3.2.3.3 "Status" Information

Real time status

- Input under volt.
- Boost fail
- Grid over freq.
- IGBT driver err.
- Fan fault
- Output short
- Input over curr.
- Input over volt.
- Grid under volt.
- Grid over curr.
- Comm. fault
- Clock fault
- Impedance
- Data incnst
- Bus under volt.
- Grid over volt.
- Grid over freq.
- Over temperature
- Leak current fail
- Eeprom fault
- Zero drift
- Power reversed
- Bus over volt.
- Grid under freq.
- Riso low
- Relay fault
- DC inject
- Grid negative phase
- Cnd shut down

2012-06-25 10:37:41
Inverter add to the system
2012-06-25 10:37:41
Communication status chang
Inverter Already connect

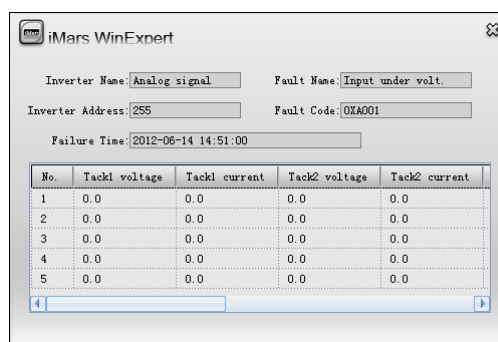
No.	Name of Fault	Fault Code	Failure Time	Caused by
1	Grid under volt.	OXA003	2012-06-14 14:51:00	Caused by
2	Input under volt.	OXA001	2012-06-14 14:51:00	Caused by
3	Clock fault	OXA007	2012-06-14 14:51:00	Caused by

Inverter current fault, green light indicates normal. red represents failure

Inverter operation records, write down the name and execution time of an operation

Fault records list

Inverter status information, displays the real time status of the inverters and failure records. When Inverter failure, the corresponding fault led turns red; when the failure is excluded, till inverter is operating normally, light turns green; when inverter communication is disconnected, fault led original green turns dim, red light is still displayed in red.



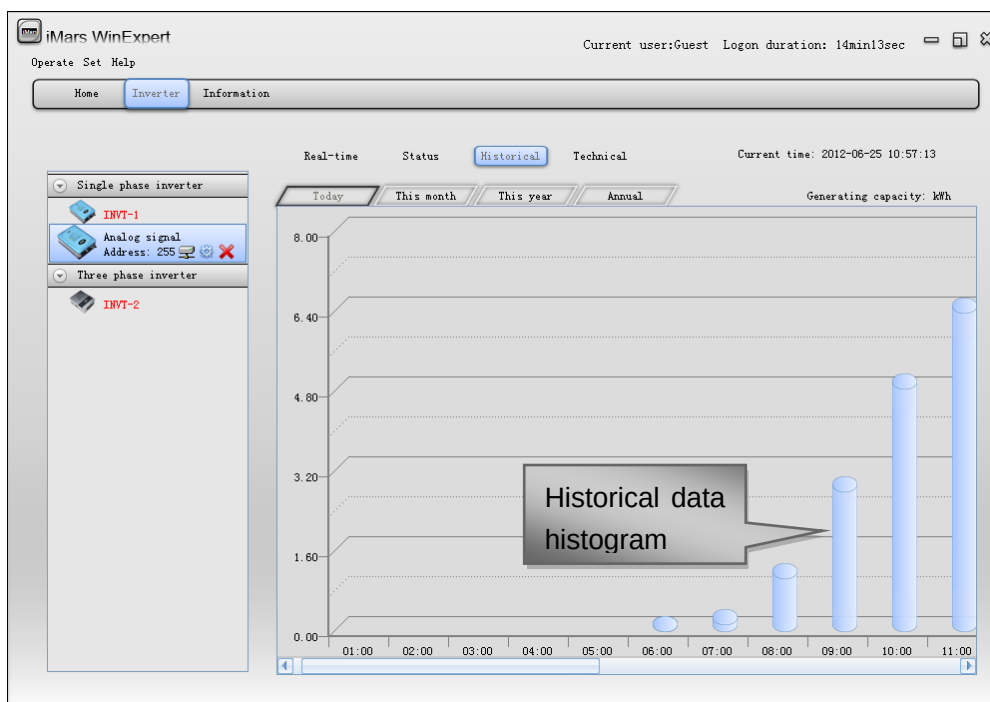
More detailed fault log pop-up dialog box shows the values before the failure occurs, for initially

determining the cause of failure.

Right-click on one fault record will pop up the following selection menu. in the Administrator privileges, the failure records of operations can be deleted.

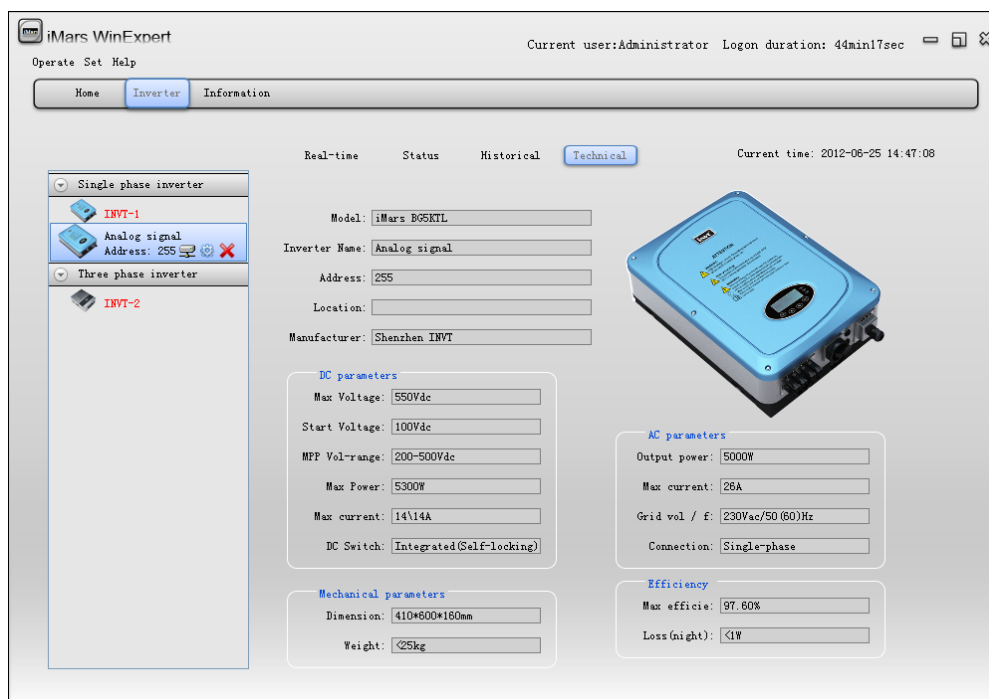
Remove this fault records
Remove all fault records

3.2.3.4 “Historical” Data



Historical data page, showing the inverter data stored in the computer as the form of a histogram, can switch histograms of today, this month, this year and annual generation data.

3.2.3.5 “Technical” Parameters



Inverter technical parameter page , shows the inverter model, electrical function, and mechanical parameters such as shape. When WinExpert and inverter successfully communicate, the technical parameters of the inverter Automatically identified by WinExpert, non-editable; Before WinExpert and inverter successfully communicate, the model of inverter added in the software is defined as BG5KTL (single-phase) or BG10KTR (three-phase), and automatically attach the appropriate parameters. When communicated, WinExpert will automatically update technical parameters.

3.2.4 System Information Interface

System Name	INVT 5kW PV System			Installation site	Sloping roof	
Location	Shenzhen, China		Latitude	22.29N	Longitude	114.05E
Solar cells						
Manufacturer	***		Model	SW-185M		
Component power(W)	185		Component type	Monocrystalline silicon		
Quantity(pcs)	28		Tilt angle	20.00		
Total power(W)	5180		Azimuth	0.00		
PV grid-connected inverter						
Manufacturer	INVT					
1-ph inverter model	iMars BG5KTL		3-ph inverter model	iMars BG10KTL		
Rated output power(W)	5000		Rated output power(W)	10000		
Quantity(pcs)	1		Quantity(pcs)	0		
Public grid						
1-ph AC wiring	L/N/PE		3-ph AC wiring	null		
Rated voltage(Vac)	230		Rated voltage(Vac)	0		
Rated frequency(Hz)	50		Rated frequency(Hz)	0		
Remarks	iMars BG5KTL grid-tied solar inverters have been installed On the rooftop of Invt Building.					

System information page displays details of the system, including system installation location, PV modules, inverters, public grid, as well as notes and other information. System information can be edited in the "Set" menu, and print in the "Operate" menu.

3.2.5 Compact Mode

Today gen. :	22.78 kWh
Total gen. :	22.78 kWh
CO2 Reduce:	22.71 t
Benefits:	15.49 \$

(9600, 8, 0, 1) is open!
System uptime!

Click the Zoom box button in the upper right of any page, WinExpert will switch to compact mode, as shown in the previous figure.

Compact mode: does not have any capabilities, display only the main datas of the system, including system revenue, system data, communications and inverter running conditions. Compact mode pointer button in the upper right of the window top button; click the close button, the software back to the normal display mode.

3.3. Data Backup and Recovery

By daily use of iMars WinExpert solar monitoring software, regular or ad hoc backup of software database is .necessary in response to the unexpected demand for data recovery.

Database backup and recovery methods are as follows:

- (1) Locate the installation folder.

Right-click the "iMars WinExpert" icon on your desktop, select "Properties"; in the Properties dialog box, click the "Find the directory ..." button to automatically navigate to the "iMars WinExpert" software installation folder , such as " C: \ Program Files \ iMars WinExpert ".

- (2) Backup database "data" folder.

In the Installation folder, copied the "data" folder to other storage disk or storage media. For example, built a new file folder named "Invt 5kW PV data backup" in the D drive (or other),and copy the" data "folder or data compression from the Installation folder to the new folder.

- (3) Recovery the database.

Find the data backup folder, copy the backup "data" that previously maked to the monitoring software installation folder, Paste and overwrite the original "data" folder. Note: before recovery the database, make a new backup of data first.

Before the following (without limitation) doings, please make a "data" backup first:

- (1) Regular or irregular system maintenance;
- (2) Install an updated version of "iMars WinExpert" or install the software update package;
- (3) Uninstall iMars WinExpert monitoring software;
- (4) Reinstall or replace the computer operating system;
- (5) Computer repair or replacement of the computer hardware;
- (6) Computer hardware extensions, such as increasing the serial cards, hard disk or memory;
- (7) Adjustment of photovoltaic power generation system communication connection, such as increase or decrease inverters or other equipment that can affect the communication settings.

4. Contact US

Shenzhen China

ShenZhen INVT Electric Co., Ltd.

Address: No.4 Building, Gaofa Industrial Park, Longjing, Nanshan District,Shenzhen, China.

Sales Hotline: +86 755 86312953 +86 755 21673752

E-mail: inverter@invt.com.cn

INVT Company Website: www.invt.com

INVT Solar Website: www.invt-solar.com