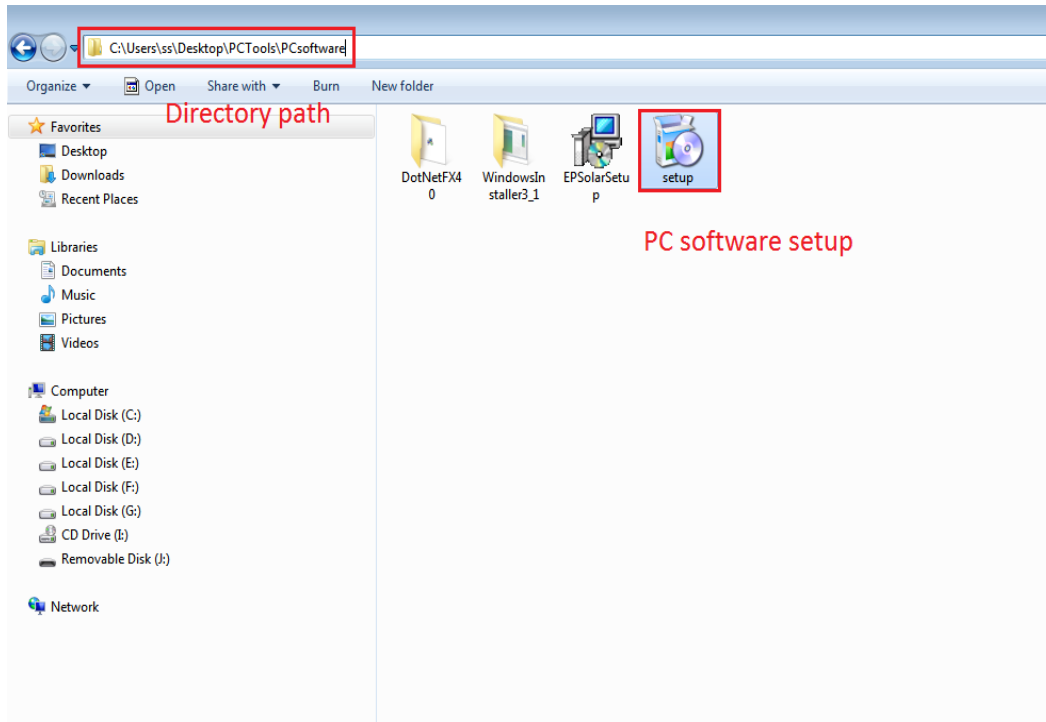# The Setup Steps and Use of Common Software

1 Install the PC common software. Find the setup of PC software, and directory list box is as shown below.

Double click the icon , and then click the button "Next step" according to the tips of the setup guides, at last the PC common software is installed successfully.


2 Connect the communication line between PC and controller. Communication line is special for PC and controller. Use its USB port plug in arbitrary USB port of PC, and the other port plug in corresponding port of controller (RS485 or TTL), the sketch map is as shown below:
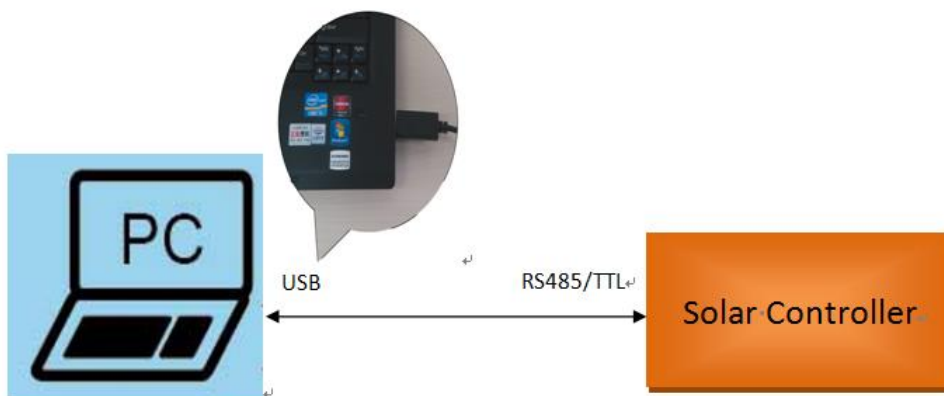

3 Install the driver of communication line. Double click icon file in the setup of driver, system will install the driver of communication automatically, the directory list box of driver is as shown below.

Directory path

Driver setup
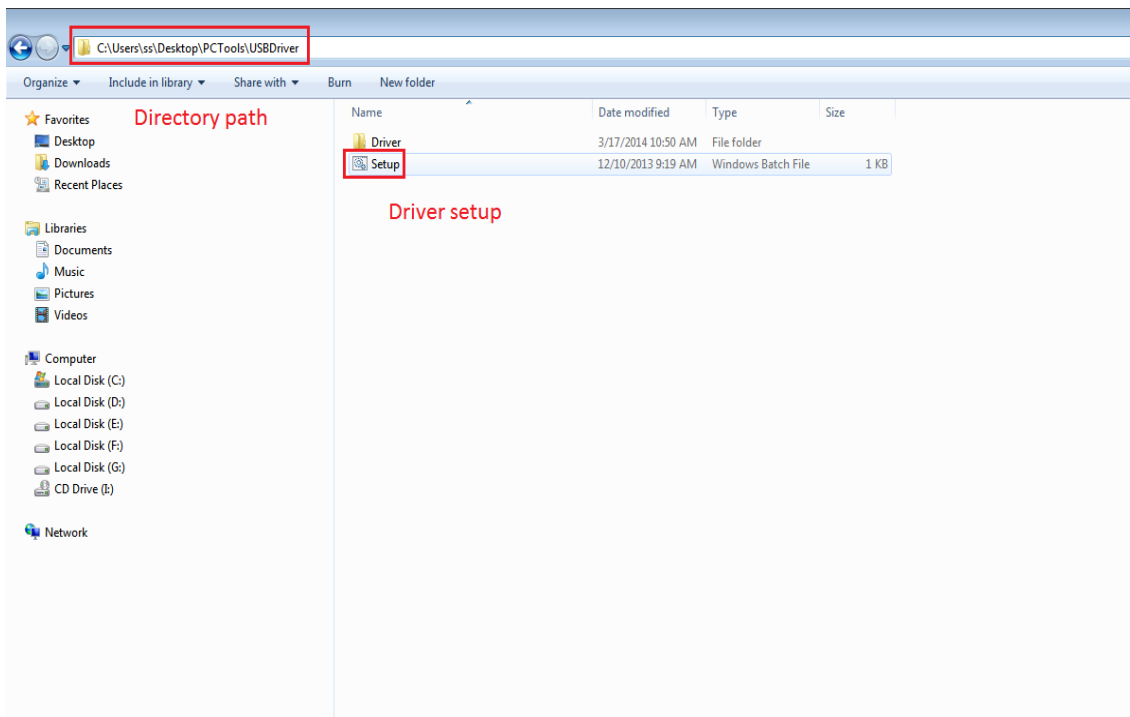
(1)If the model of current line is CC-USB-TTL-150U (you can check model label on the line), you need find the driver information of corresponding line. Double click the information and its attribute dialog pops up as shown below. Please affirm that the state of "RS485" option is not checked in the page of "Port Setting".
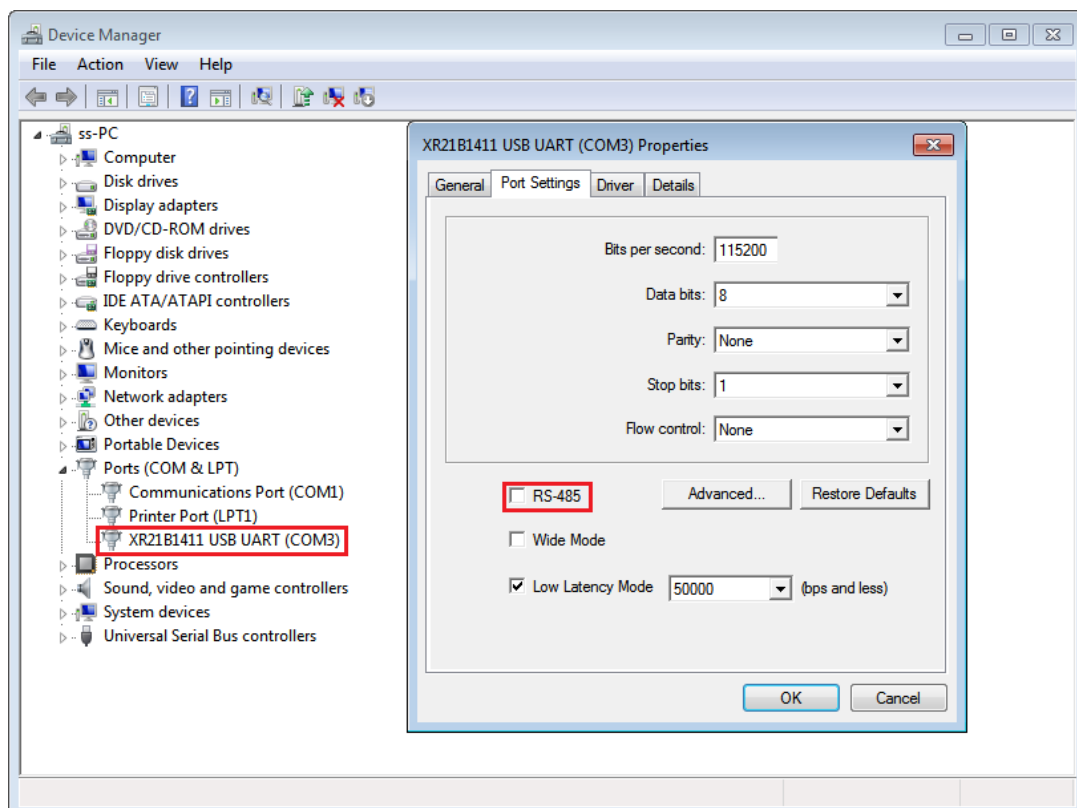
(2)If the model of current line is CC-USB-RS485-150U, you can check the state of "RS485" option as same as CC-USB-TTL-150U The attribute dialog of "Port Setting" pops up as shown below, please affirm that the state of "RS485" option is checked in the page of "Port Setting".
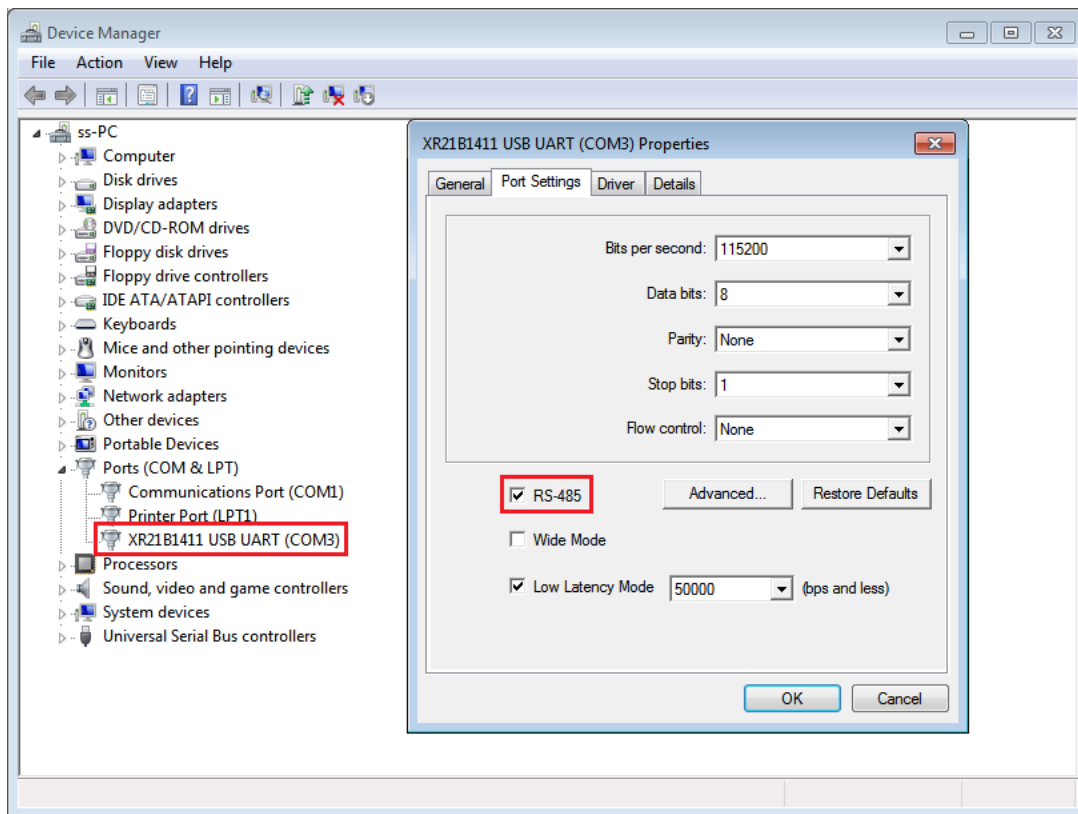
4 Use the PC software. After install the PC software and the driver, you can run PC common software. Click the

"Solar Station Monitor" icon , and enter into the operation steps as below:

(1)" Log In" interface is popped up, the user name and correct password have been filled in, and directly click the button "Log In" to enter the main interface of PC monitoring software. The "Log In" interface and main interface is as shown below:
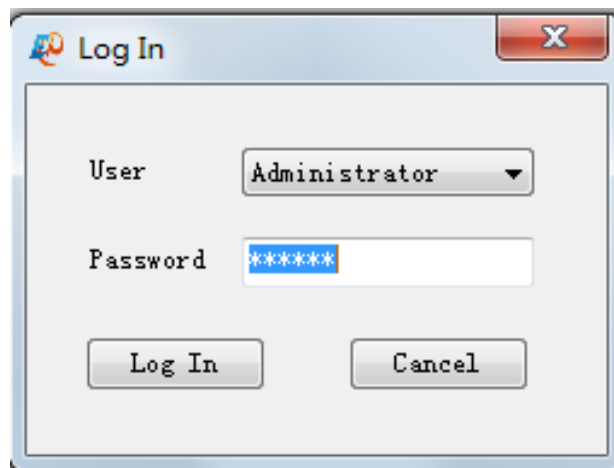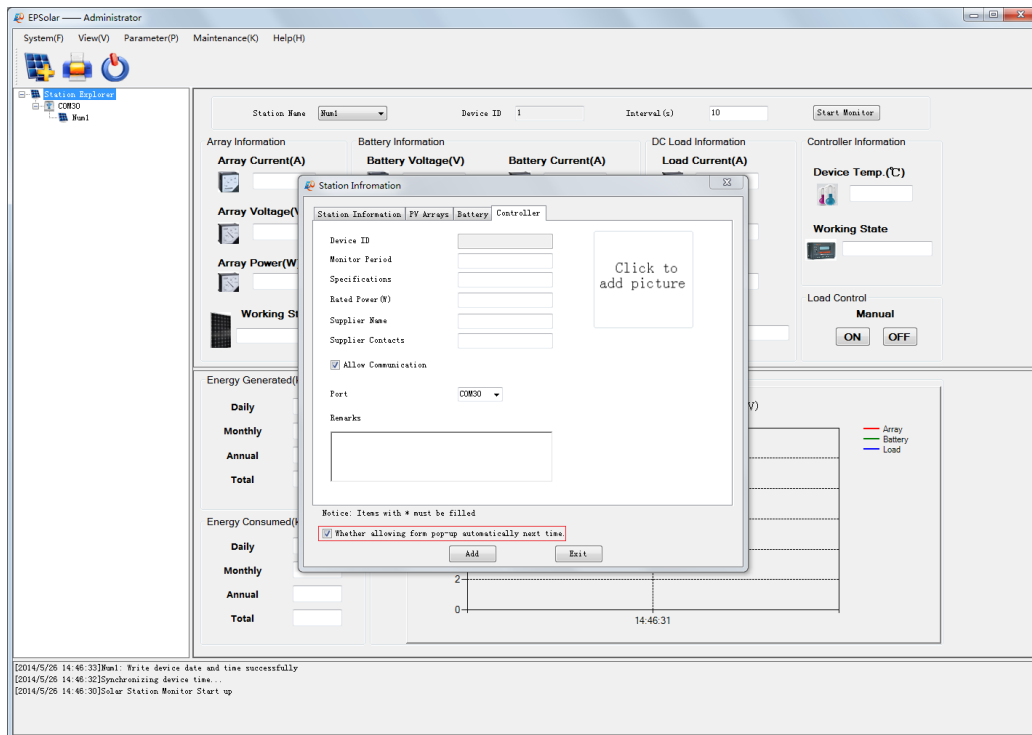
Notes: After logging in , the station information dialog pop up automatically as same as the main interface, and you can set whether the station information dialog pop up below the dialog.

(2)Add station information. The Station information has been filled in on the simplified version of PC monitoring software. Just select the station port and click the button "Add", you will add station successfully.

Notes: Device ID default is 1 in the station information (Controller ID of factory default is 1). When you add the station, you must check station information correctly. In addition, select the correct communication port in the page of "Controller" information (The port corresponds with the port of communication line), otherwise lead the controller and the PC software to communicating incorrectly.
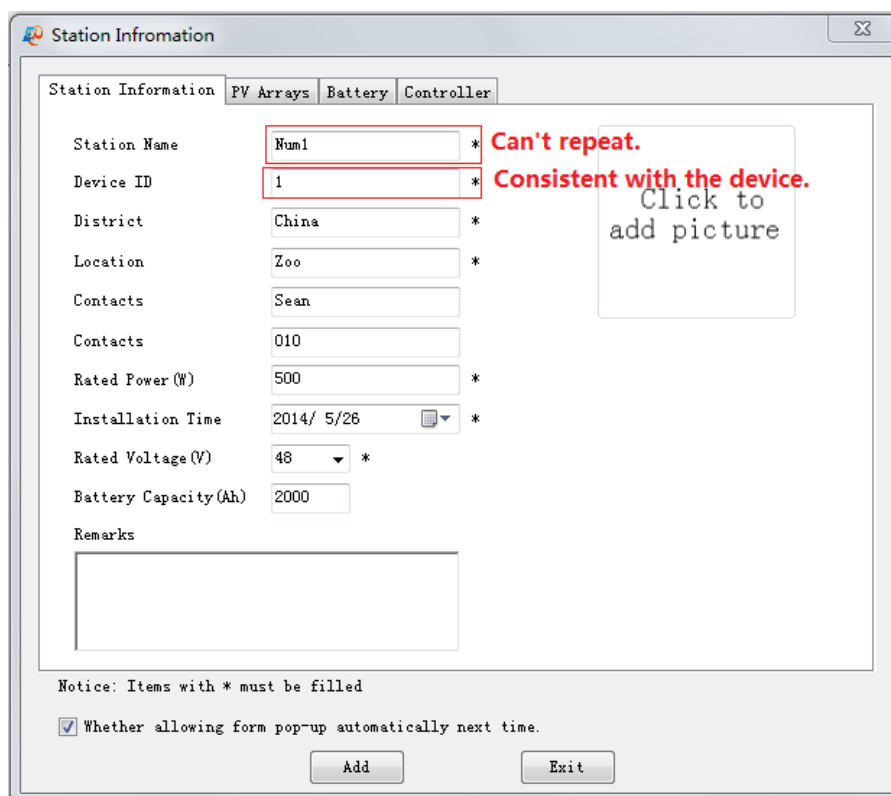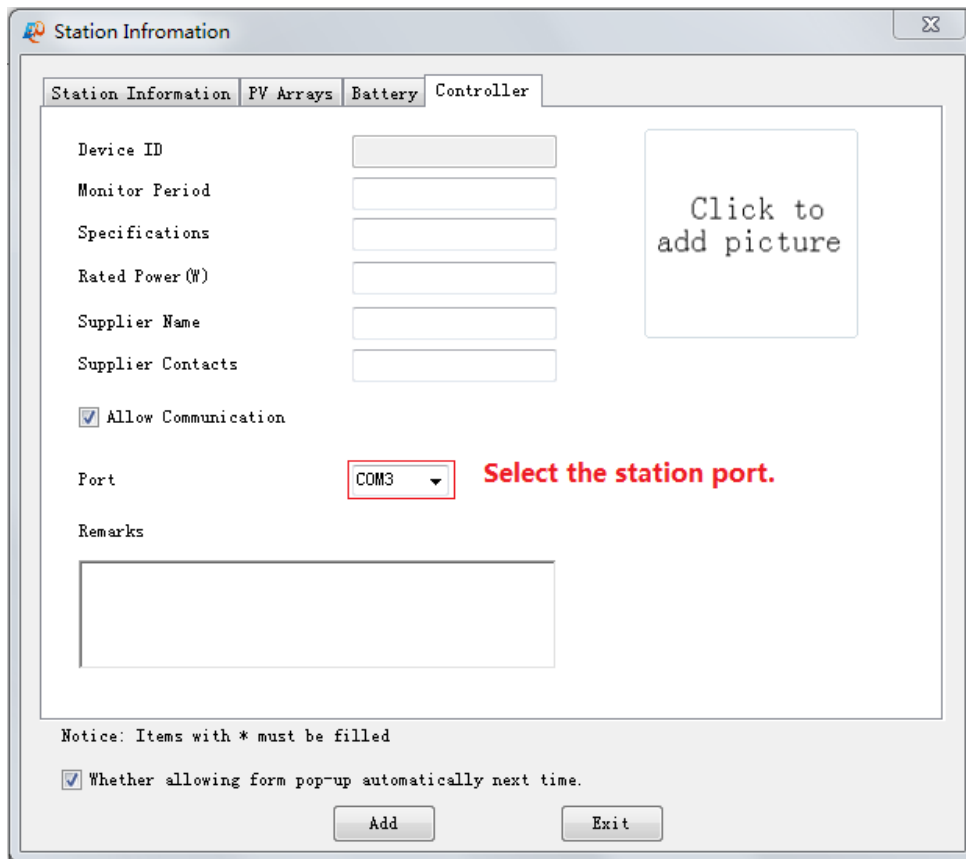
(3) Start up the real-time monitoring. Click the button "Start monitor" to enter into monitoring the controller and looking over the real-time monitoring data, operating interface is as shown below:
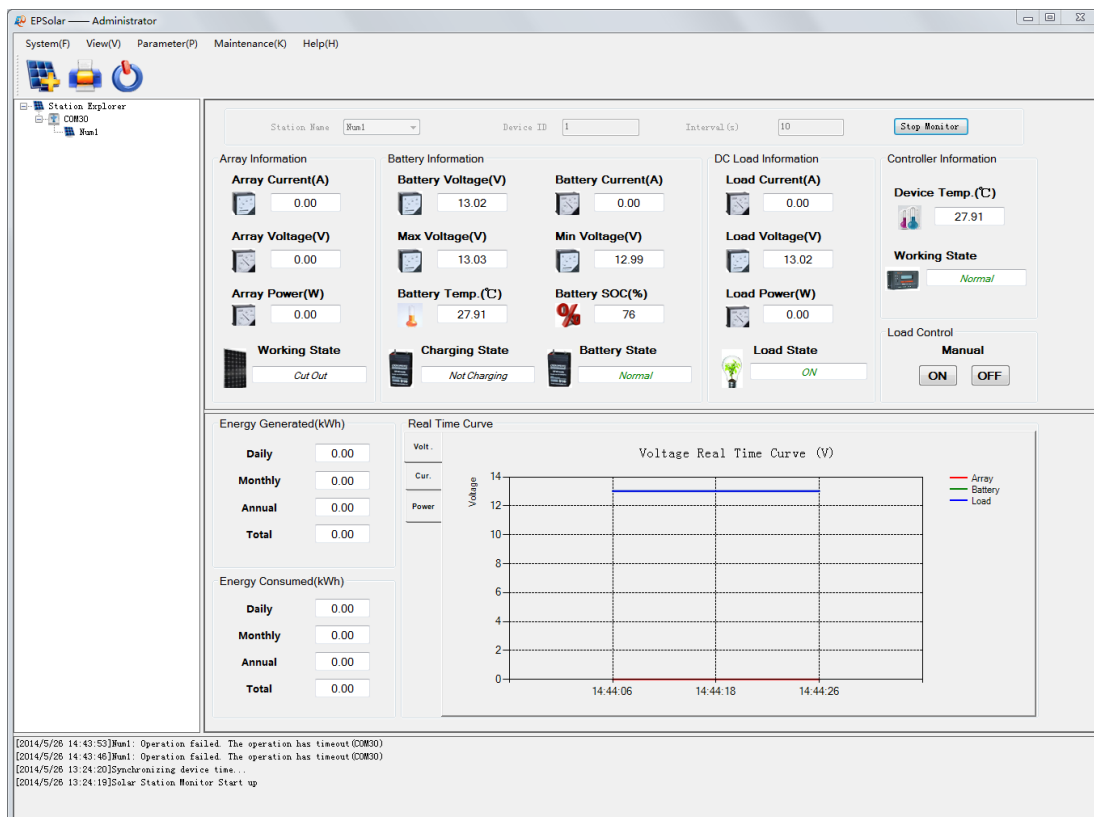
Notes:

(1) The help document in the menu bar "Help(H)->Help" explains the other operation of PC software in detail.

(2) Because different language windows systems have different character format, you can check the region and language setting and set Enlish language and region in the "Menu>ControlPanel>Region&Language>Format". This will help you use our software normally.

1 Introduction

   "Solar Station Monitor" is a PC software product developed by Beijing Epsolar Technology Co., Ltd; a simple setting and operation on the software product may help to realize the real-time monitoring of single or multiple machine of the whole series of solar controllers including LS-B, LS-BPL, VS-B, Tracer-B, Tracer-BPL, eTracer-B and iTracer-B, and to facilitate the check and modification on the charge and discharge control parameters, device parameters and load parameters of the solar controllers of the series above.

1.1 Compilation Aim

➢ Compile the manual with the special aim that users can well know the operating method and steps of the software rapidly. It is introduced with real operating interfaces and matched with word descriptions.
➢ It introduces some precautions as well as basic use method and steps of system, ensuring that users use the system effectively and improve working efficiency.
➢ The expected readers of the manual are maintenance workers and users.

1.2 References

➢ The corresponding product operating manual of the whole series of LS-B, LS-BPL, VS-B, Tracer-B, Tracer-BPL, eTracer-B and iTracer-B.

1.3 Agreement

➢ Solar Station Monitor adopts the latest monitoring software developed with C#.
➢ It presumes that you master the basic operations of computer graphical user interface.

1.4 Technical Support

Thank you for using the products of Beijing EPsolar Technology Co., Ltd. Please leave messages at our website (http://www.epsolarpv.com) if you have any ideas and suggestions, or send e-mails to our project group: Webmaster@epsolarpv.com.

2 Operating Environment

2.1 Hardware Environment

➢ Recommend that internal memory of hardware configuration-above 512M, and CPU-above Intel Pentium 4 +2.0G

2.2 Software Environment

➢ Suggested operating system to be installed for running the software:
Windows XP/Windows 2000 Professional/ Windows 2000 Server/Windows7/Windows8
➢ The above-mentioned systems are all 32-digit and 64-digit operating system.

3 Software Installation and Uninstalling

3.1 Software Installation

➢ Double click Setup.exe in the installation package.

3.2 Software Uninstalling

➤ Choose **Solar Station Monitor** in the control panel and click uninstall.

4 Operation Tips

➤ Accurate setup of series port communication parameter and addition of power station information are required before using each functions of the software.
➤ In the case that the serial port of the power station selected by the user is not set up or opened, there will be "Absent or Unconfigured' in the power station list concerning the corresponding series port.
➤ The system will prompt users when communication is overtime, through popping up alarm dialog box or inputting corresponding prompt message on the information output bar. If the same controller is not able to communicate for many times, please check whether the hardware connection is normal.
➤ The above-mentioned precautions will not be repeated in the introductions of each module function below.

5 Software Description

5.1 System Overview

➤ Software initiation

After the monitoring software of solar controller is installed, double click the icon [image] or click the **Start -> All Programs -> EPSolar->Solar Station Monitor** on Windows Desktop to enter into the operation interface of the monitoring software of solar controller.

➤ Main system interface
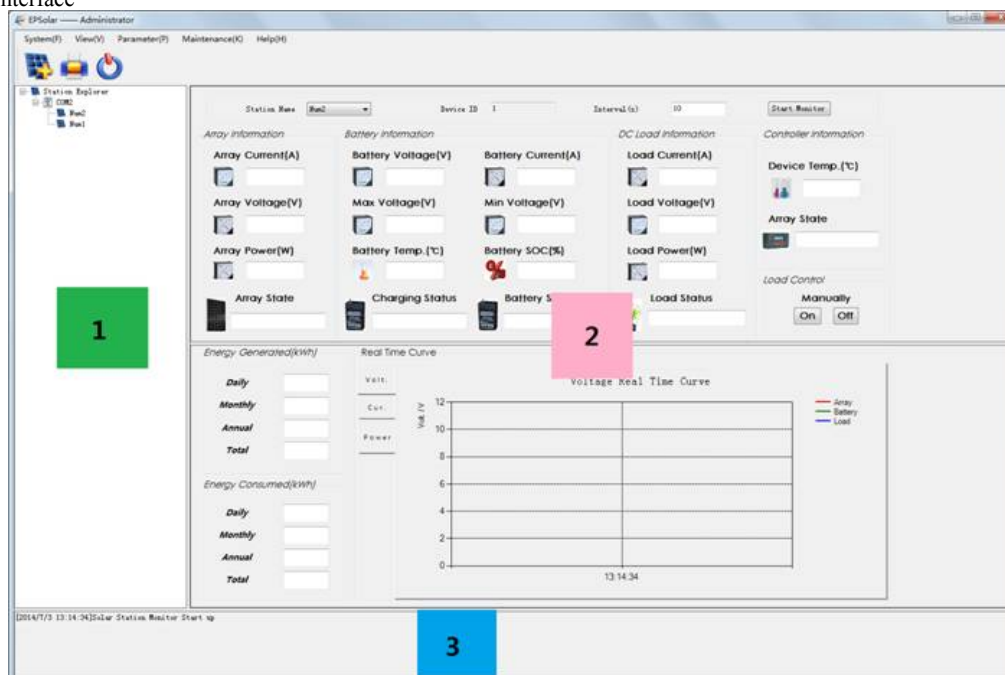
Chart 5-1-1 Main System Interface

➤ System Overview

Solar Station Monitor software is supposed to be installed on the server or workstation and help to realize the information record of solar power generation system, real-time monitoring of the running status of solar controller, the browsing and modification of charge and discharge control parameter, device parameter and load parameter as well as the display and statistical calculating of charge and discharge capacity by means of communication of series port between solar controller and PC.

➤ Interface composition

It is composed of toolbar, menu and each functional window.

Main system interface chart is as shown in Chart 5-1-1, the 1st position on the left is power station tree list, in which the 1st level point lists locations of communication port and the 2nd level point lists names of power stations. The 2nd position on the right is functional window displaying column, in which it shows the corresponding interface based on different functions selected by users so

as that users can make operations. The 3rd position at the bottom is standard information output column, used for recording information users operated so as to prompt users when errors happen.

5.2 Function Index

5.2.1 Menu

All functions menu and description of Solar Station Monitor software is as shown in Tab.5-1.

Tab. 5-1 System Menu Introductions

Menu	1st Level Menu Item	2nd Level Menu Item	Function Descriptions
System (F)	Print Setup		Set up print parameters
	Print Preview (V)		Preview print effect
	Exit (X)		Exit from the software
View (V)	Toolbar (T)		Hide/display toolbar
	Station Explorer		Hide/display Power Plant List
	Messages Window		Hide/display Information Outlet List
Parameter (P)	Device Parameter	Real Time Clock	Setup of real time clock of device
		Device Parameter Set	Setup of related parameters of device
		Device ID Set	Change the ID of specified equipment
	Control Parameter		Configuration of control parameter
	Load Configuration	General Load Configuration	Configuration of load control parameter
		LED Load Configuration	Configuration of LED load control parameter
	System Configuration		Basic system setting
	Device information		Read the ex-factory information of controllers
	Factory Operation		Restore the default parameter of the controller and test the status of the load switch
Monitoring(M)	Real Time Monitoring		Realization of real time monitoring of specified equipment
Maintenance (K)	Data Export		Export figures in data base
	Data Import		Import backup data into current system data base
	Maintenance Record		Check/add/delete maintenance record
Help(H)	About Windows		Simple introduction on the software
	Help		Pop out help file of the software

Note: 1.The shortcut key for the main menu is "Alt + letter".

    2. The shortcut key for the first level menu item is "the corresponding letter of the menu".

5.2.2 Toolbar

The toolbar of the software is shown in chart 5-2-1.

Chart 5-2-1 Toolbar View

Tab. 5-2 Toolbar Introductions

Toolbar	Function Descriptions
Real time Monitoring	Realize real time monitoring of specified equipment
Print Setup	Set up print parameters
Exit	Exit from the software

5.3 Power Station Information Management

5.3.1 Type-in Power Station Information

- When choose the menu **System->Add Station,** or click the button ![icon] in the toolbar, or click power station listing on the left, with the right-hand button, to choose add power station**,** it pops up power station information type-in dialog box, as shown in chart 5-3-1.
- There are totally 4 parts with add power station**,** including **Station Information** (as shown in chart 5-3-1), **PV arrays** (as shown in chart 5-3-2), **Battery** (as shown in chart 5-3-3) and **Controller** (as shown in chart 5-3-4).
- The edit boxes marked with "*" in the dialog box are compulsory field.
- After all 4 parts are finished filling, click the button **Add** when the system judge effectiveness of figures users entered. If there is any mistake, it will prompt users.

Chart 5-3-1 Station Information Type-in Dialog Box

1)Station information:

Station information is as shown in chart 5-3-2.

Parameters of Station information are as shown in Tab. 5-4.

Tab. 5-3 Station Information Dialog Box

Name	Instructions
Station Name *	
Device ID	The ID is communication mark of controller, so ID number of multiple equipments should not be same.
District *	
Location *	
Principal	
Contacts	
Rated Power(W)*	Unit: KW
Installation Time *	
Rated Voltage(V)*	Options:---12?24?36?48 (V)
Battery Capacity(Ah)	
Pictures	
Remarks	Other descriptive information on the station

2)PV arrays:
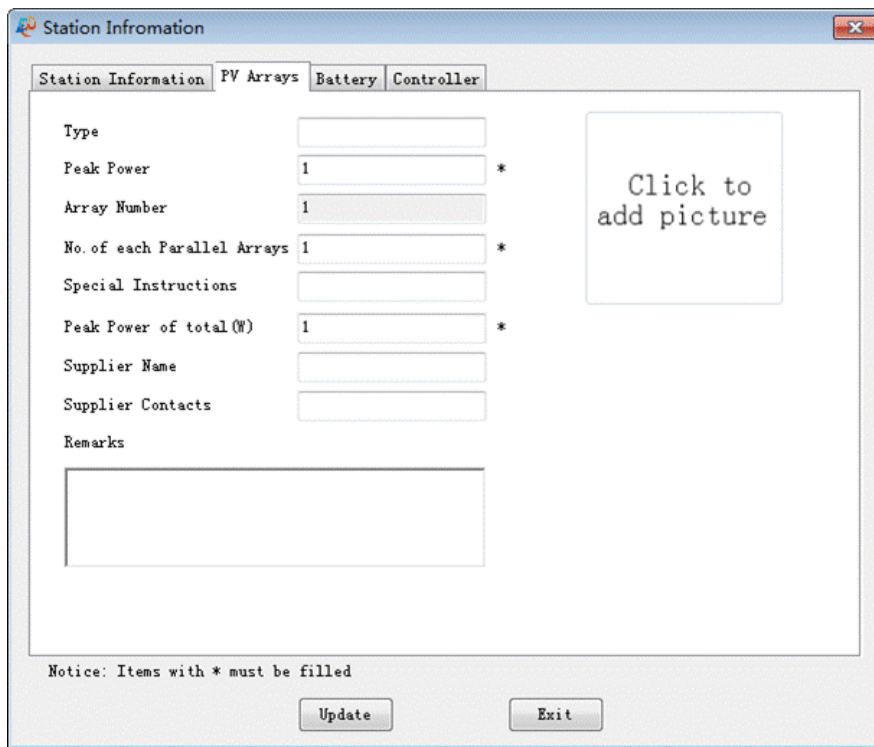
Chart 5-3-2 PV Arrays Dialog Box

➤ Parameter of PV arrays information is as shown in Tab. 5-5:

Tab. 5-4 PV Arrays Parameters

Name	Instructions
Type	Solar panel specification and model
Peak Power *	Peak power of solar panel
Arrays Number	Solar panel array number in the station,
No. of each Parallel Arrays *	Parallel connection number in each solar panel array
Special Instructions	
Peak Power of Total *	
Supplier Name	
Supplier Contacts	
Pictures	
Remarks	User's other descriptive information on solar panel

3)Battery:

Battery dialog box information is shown in chart 5-3-3.
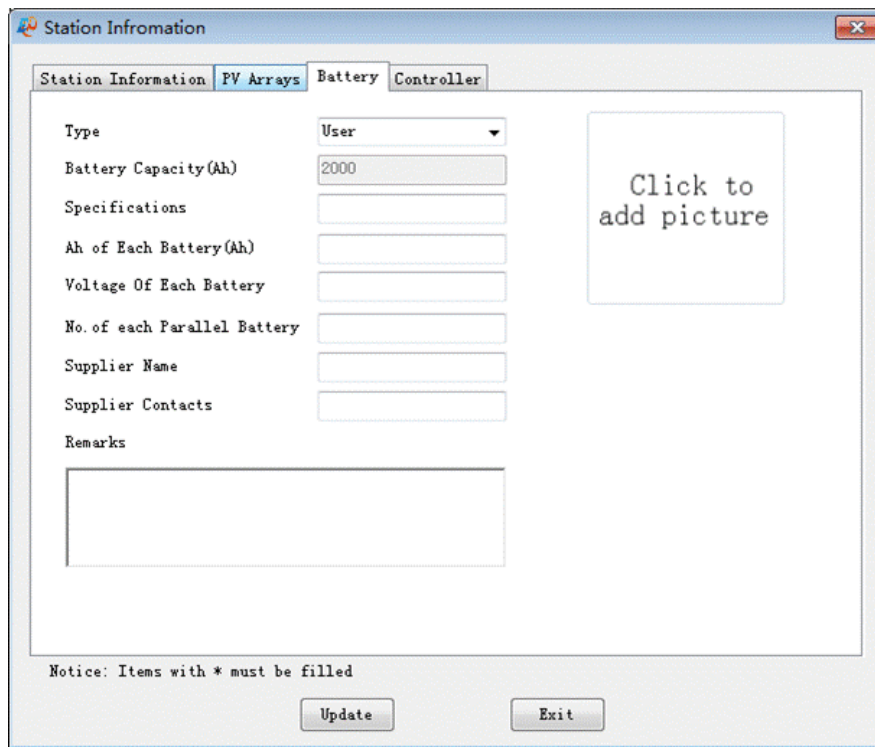
Chart 5-3-3 Battery Dialog Box

➢ The basic parameter of battery is as shown in Tab. 5-6:

Tab. 5-4 Battery Parameters

Name	Instructions
Battery Type	User, Gel, Sealed, Flooded
Battery Capacity(Ah)	Automatically fill it in according to basic station information users filled.
Specifications	
AH of Each Battery	
Voltage of Each Battery	
No. of Parallel Battery	
Supplier Name	
Supplier Contacts	
Picture	
Remarks	User's other descriptive information on batteries

4)Controller**:**

Controller information dialog box is as shown in chart 5-3-4.
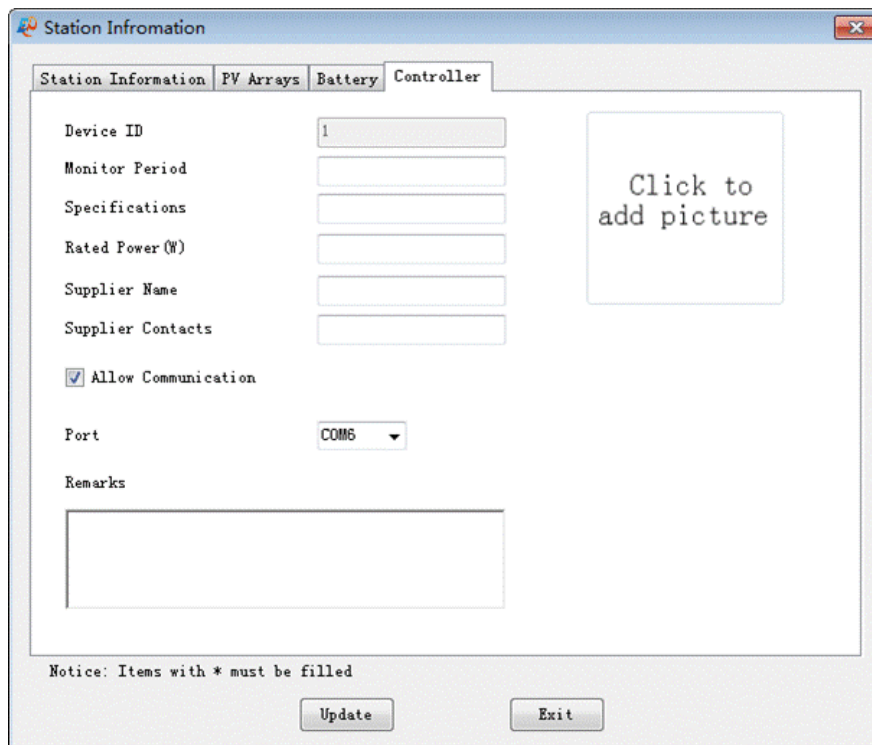
Chart 5-3-4 Controller Information Dialog Box

➤ The basic parameter of controller is as shown in Tab. 5-7:

Tab. 5-6 Basic Controller Parameters

Name	Instructions
Device ID	Fill it out in the station information dialog box, and the interface is used for displaying only.
Monitor Periods	Time interval with controller communication
Specifications	
Rated Power(W)	Rated Power of controller (W)
Supplier Name	
Supplier Contacts	
Allowing Communication	Communicate with controller after selecting.
Ports	PC`s Communication serial ports
Picture	
Remarks	User's other descriptive information on batteries

5.3.2 Delete Station

Select the power station to be deleted in power station listing, click the right mouse button and select **'Delete'** in the menu popped up. The system will pop up dialog box, requiring users to confirm if delete the power station. If users click 'OK', the station is deleted. The dialog box is as shown in chart 5-3-5.

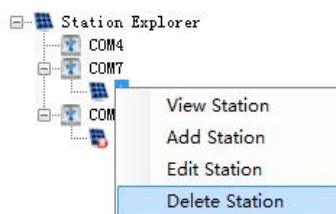**Chart 5-3-5 Delete Power Station**

Notes: As power station involves in serial port communications, stop all communications before make delete operations in order to avoid conflicts. There is related prompt for the case with the system.

5.3.3 View Station

Click the power station listing with the right mouse button and select **'View Station'** in the menu popped up. The system will display

corresponding station information on the interface, according to the selected station.

5.3.4 Edit Station

Login as Administrator, select the station in the station list, whose information needs modifying, and click the right mouse button to select **'Edit Station'**. The system pop up station information modification dialog box. Click the button 'Save' after modification is made.

5.4 Parameter

5.4.1 Device Parameter

5.4.1.1 Real Time Clock

Choose **Parameter -> Device Parameter -> Real Time Clock**, and the real time clock setting dialog box is popped up, as shown in chart 5-4-1.

Chart 5-4-1 Real Time Clock Setting Dialog Box

➢ After the interface is activated, the system automatically obtains the current date and time information of the PC and displays them in the local time box.

➢ Select the power station name of the pull-down list of **Station Name**.

➢ Click the button **'Read'** to check the current time of selected controller.

➢ Click the button **'Update'** to refresh the controller time, making it the same with time information in the dialog box. Such reasons as communication time consuming leads to pimping errors.

➢ Clock parameters-yyyy-mm-dd-hh-mm-ss.

➢ Click the button **'Manually'**, and users can modify the time needing updating manually.

5.4.1.2 Device Parameter Setting

Choose **Parameter -> Device Parameter -> Device Parameter Setting**, the device parameter set dialog box pops up, as shown in chart 5-4-2.
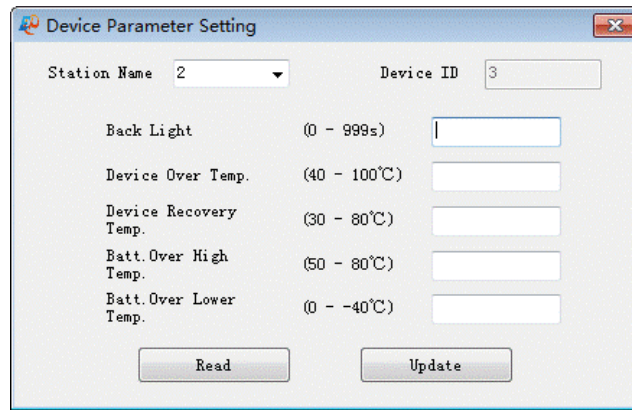
Chart 5-4-2 Device Parameter Set Dialog Box

➢ Select the power station name of the pull-down list of **Station Name**.

➢ Click the button **'Read'**, and each textbox in the interface displays the current value corresponded with controller. Click the button **'Update'** to modify parameters corresponded with controller.

➢ Parameters are as shown in Tab. 5-7:

Tab. 5-7 Device Parameter Range

Item	Parameters range	Default
Back Light	0~999s	60s
Device.Over Temp.	40~100?	85?
Device Recover Temp.	30~80?	75?
Batt. Over High Temp.	50~80?	65?
Batt. Over Lower Temp.	0~-40?	-40?

Note: **Backlight Control** parameter is only effective in allusion to the operation on controllers with LCD function; when the data is modified out of range, the system will pop up a prompt box of "XX parameter is not within the range" for users' reference.

5.4.1.3 Device ID Setting

➢ Choose **Parameter -> Device Parameter -> Device ID Setting**, the device ID modification dialog box pops up, as shown in chart 5-4-3.

➢ Select the No. of series port and click the button **"Read ID"**, thus reading the ID No. Of the currently connected controller;

   Note: this function is only adaptive and effective for the ID modification on the controller of single machine;

➢ Select the No. of series port and click the button **"Set ID"**, thus forcibly modifying the ID No. Of the current controller;

   Note: the modification range of the controller ID No.: 1 to 248; ID modification should be completed under the guidance of the professionals, and otherwise it will cause abnormal communication of the controller.
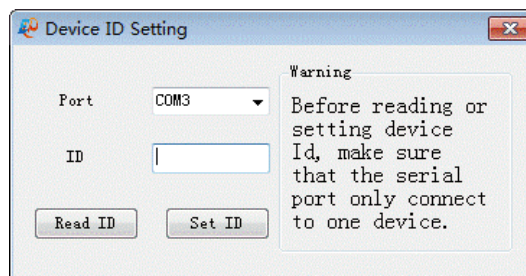

Chart 5-4-3 Device ID Setting Dialog Box

5.4.2 Control Parameter

Choose **Parameter -> Control Parameter**, and the control parameter dialog box pops up, as shown in chart 5-4-4

Chart 5-4-4 Control Parameter Dialog Box

➢ Select the power station name of the pull-down list of "**Station Name**".

➢ Click the button "**Read**", each of the edit box in the interface will correspondingly display the current parameter values of the controller; click the button "**Update**" after the modification of parameter values, which can help to update the control parameters of the controller.

➢ Click the button "**Restore Default**" and all the edit box of "**Current**" in the interface will be automatically written into the default of the corresponding parameters.

➢ Click the button "**Export Settings**", which can help to save all the control parameter values within the interface as a backup file in txt format.

➢ Click the button "**Import Settings**", which can help to lead all control parameters in the original backup file *.txt into this interface as the modified values of the current control parameters.

➢ See the setup of relevant parameters in the interface in Tab.5-8, Tab.5-9, Tab.5-10 and Tab.5-11.

Tab.5-8 Battery Type

Battery type	Notes
Sealed (default)	Fixed controlling voltage, unable to be modified
Gel	Fixed controlling voltage, unable to be modified
Flooded	Fixed controlling voltage, unable to be modified
User	Users can modify voltage controlling points.

Tab.5-9 Charging Mode

Charging mode	Notes
Voltage compensation	voltage control charging (default)
SOC	By setting the charge and discharge SOC target values for battery charge and discharge control

Tab.5-10 Other Control Parameter

Parameters	Default	Range
Battery Ah	200Ah	1~9999Ah
Temperature compensation coefficient	-3mV/?/2V	0~-9mV
Rated Voltage	Auto	Auto/12V/24V/36V/48V
Battery charging	100%	100%(SOC Mode)
Battery discharging	30%	10~80%(SOC Mode)

Tab.5-10 Battery Voltage Parameters (Parameters is in 12V system at 25? , please use X2 in 24V, X3 in 36 V, and X4 in 48 V system)

Battery type	Sealed lead	Gel	Flooded	User

	acid			
Over Voltage Disconnect Voltage	16V	16V	16V	9~17V
Charging Limit Voltage	15V	15V	15V	9~17V
Over Voltage Reconnect Voltage	15V	15V	15V	9~17V
Equalize Charging Voltage	14.6V	--	14.8V	9~17V
Boost Charging Voltage	14.4V	14.2V	14.6V	9~17V
Float Charging Voltage	13.8V	13.8V	13.8V	9~17V
Boost Reconnect Charging Voltage	13.2V	13.2V	13.2V	9~17V
Low Voltage Reconnect Voltage	12.6V	12.6V	12.6V	9~17V
Under Voltage Warning Reconnect Voltage	12.2V	12.2V	12.2V	9~17V
Under Voltage Warning Voltage	12V	12V	12V	9~17V
Low Voltage Disconnect Voltage	11.1V	11.1V	11.1V	9~17V
Discharging Limit Voltage	10.6V	10.6V	10.6V	9~17V
Equalize Duration	120 mins	--	120 mins	0~180 mins
Boost Duration	120 mins	120 mins	120 mins	10~180 mins

Note: The following rules must be observed when modify the parameters value in user battery type (factory default value is the same as sealed type):

➢ Over Voltage Disconnect Voltage > Charging Limit Voltage ?Equalize Charging Voltage ? Boost Charging Voltage ? Float Charging Voltage > Boost Reconnect Charging Voltage;

➢ Over Voltage Disconnect Voltage > Over Voltage Reconnect Voltage ;

➢ Low Voltage Disconnect Voltage > Low Voltage Disconnect Voltage ? Discharging Limit Voltage;

➢ Under Voltage Warning Reconnect Voltage > Under Voltage Warning Voltage ? Discharging Limit Voltage;

➢ Boost Reconnect Charging voltage > Low Voltage Disconnect Voltage.

5.4.3 Load Configuration

5.4.3.1 General Load Configuration

     Choose **Parameter ->Load Configuration->General Load Config**, and the general load configuration dialog box pops up, as shown in chart 5-4-5.
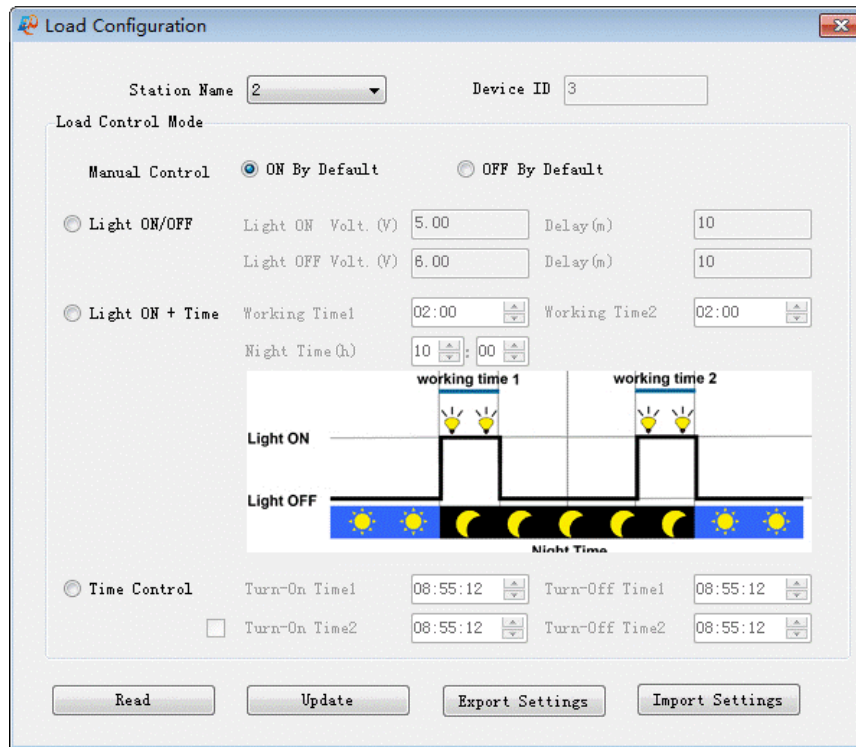
Chart 5-4-5 General Load Configuration Dialog Box

➢ Select the station name in the pull-down list of "**Station Name**";

➢ Click the button "**Read**", which can help to read the load control parameters of the current controller and display them in the interface. Click the button "**Update**" which can help to update the modified load control parameters of the current interface to the controller.

➢ Click the button "**Export Settings**", which can help to save all the Load control parameter values within the interface as a backup file in txt format.

➢ Click the button "**Import Settings**", which can help to lead all Load control parameters in the original backup file *.txt into this interface as the modified values of the current Load control parameters.

➢ See the setup of relevant parameters in the interface in Tab.5-12, Tab.5-13, Tab.5-14 and Tab.5-15

Tab.5-12 Manual Control

	Instructions
Manually On By default	Automatically open the load output when the electricity on the controller stabilizes and keep a 24-hour constant output everyday under the condition that the electricity of the battery is enough and there is no abnormal situation.
Manually Off By default	Automatically close the load output when the electricity on the controller stabilizes, initiate the output after the user operation is opened and keep a 24-hour constant output everyday under the condition that the electricity of the battery is enough and there is no abnormal situation.

Note: By manual mode, users can control the load output of the controller through the load switch button of the controller or through sending a remote command on load switch.

Tab.5-13 Light ON/OFF

	Instructions
Light ON Voltage	When input voltage of solar module is lower than light ON voltage, it automatically turns ON load output if battery capacity is enough and no abnormal conditions happen.
Light OFF Voltage	When input voltage of solar module is higher than light OFF voltage, it automatically turns off load output.
Delay Time	The confirmation time for Light signal. During the period, if light signal voltage continues matching Light ON/OFF voltage, it will carry out corresponding actions(The time adjustment range:0~99mins).

Tab.5-14 Light ON+ Timer

	Instructions
Working Time 1 (T1)	Load working period after light control turns ON load
Working Time 2 (T2)	Load working period before light control turns off load
Night Time	Total night time controller get from calculation(?3h)

Tab.5-15 Time Control

	Instructions
Working Time1(T1)	Control on/off time of load through real-time clock mode.
Working Time2(T2)	Realize the dual timer function of the load control through real-time clock mode.

5.4.3.2 LED Load Configuration

Choose **Parameter ->Load Configuration->LED Load Config**, and the LED load configuration dialog box pops up, as shown in chart 5-4-6.

Chart 5-4-6 Led Load Configuration Dialog Box

➢ Select the station name in the pull-down list of "**Station Name**";

➢ Click the button "**Read**", which can help to read the LED load control parameters of the current controller and display them in the interface. Click the button "**Update**" which can help to update the modified LED load control parameters of the current interface to the controller.

➢ Click the button of "**Export Settings**", which can help to save all the LED Load control parameter values within the interface as a backup file in txt format.

➢ Click the button "**Import Settings**", which can help to lead all the original backup file of *.txt LED Load control parameters in the original backup file *.txt into this interface as the modified values of the current LED Load control parameters.

➢ The specific configuration for the LED load controlling modes in Tab.5-16.

Note: See the configuration of the manual Control, Light ON/OFF, Light On +Timer and Time Control of LED load control in Tab.5-12, Tab.5-13, Tab.5-14, Tab.5-15 ,Tab.5-17 and Tab.5-18.

Tab.5-16 Relevant Parameters of LED Load Configuration

Parameter	Introduction
Output Power	Rated output power value of the controller
Output Current	Rated output current value of the controller
Output Voltage	Rated output voltage value of the controller
LED Rated Current	Rated output current value of the controller (adjustable)
LED Rated Current Percentage	Set up the parameter of the rated current percentage of the corresponding operating period of the controller; the controller will control the LED load output current according to the parameter set values.
Battery Under Voltage Control	When the battery is under the voltage, the controller will automatically control its output as by the half value of the rated output current; when the undervoltage of the battery returns, the controller will automatically restore the set rated current value output.

Tab.5-17Light Control +Time 1 Mode1

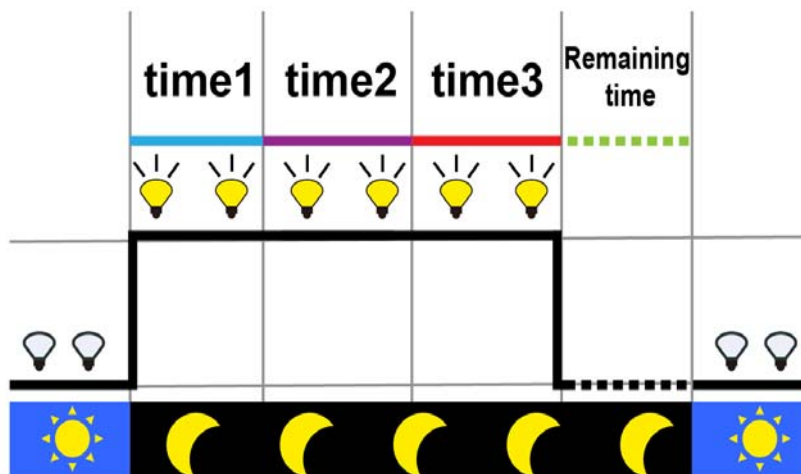| Parameter	Introduction
Work Time1 (T1)	Load working period after light control turns ON load.
Work Time 2 (T2)	The running hour of the load after the end of the work time 1.
Work Time 3 (T3)	The running hour of the load after the end of the work time 2.

Chart 5-4-7 Light Control +Time 1 Mode1

Tab.5-18 Light Control +Time 2 Mode1

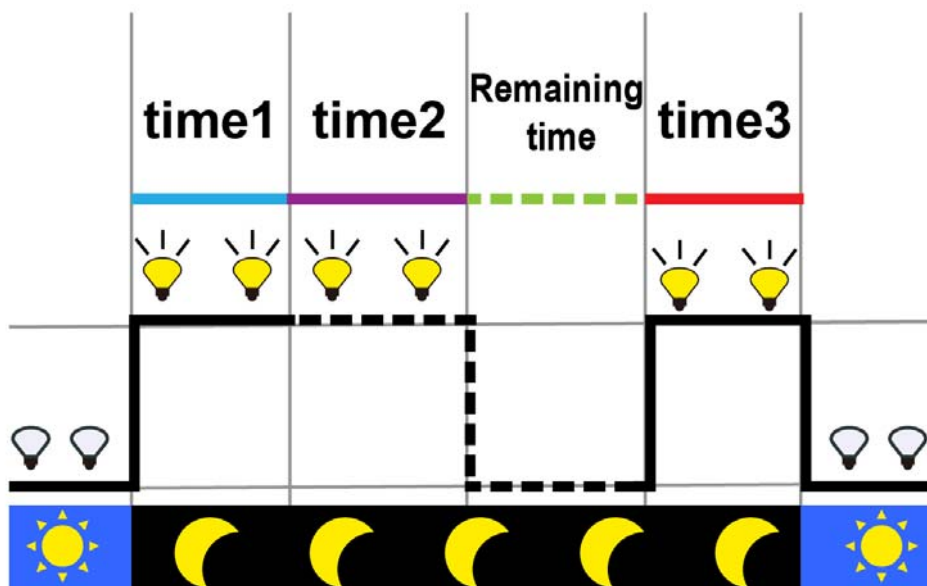| Parameter	Introduction
Work Time1 (T1)	Load working period after light control turns ON load.
Work Time 2 (T2)	The running hour of the load after the end of the work time 1.
Work Time 3(T3)	Load working period before light control turns off load.
Night Time	Total night time controller get from calculation(?3h).

Chart 5-4-8 Light Control +Time 2 Mode1

5.4.4 System Configuration

Choose **Parameter -> System Configuration**, and the system set dialog box pops up, as shown in chart 5-4-9.
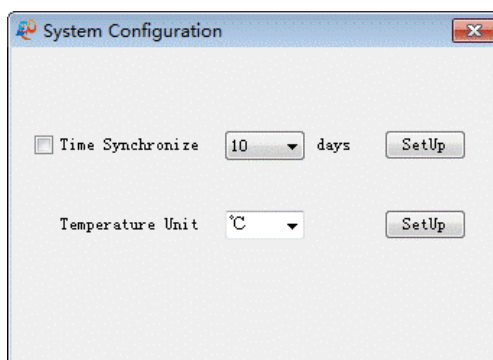

Chart 5-4-9 System Configuration Dialog Box

➢ **'Time Synchronize'** pull-down list can set the controller time that is automatically updated to the PC system time by the software every 5 days or 10 days.

➢ **'Temperature Unit'** pull-down list can set temperature unit displayed by the software.

5.4.5 Device Information

Choose **Parameter -> Device Information**, and the device information dialog box pops up, as shown in chart 5-4-10.

Chart 5-4-10 Device Information Dialog Box

➢ Select the power station name of the pull-down list of "**Station Name**".

➢ Click the button "**Read**", which can help to read the device mode, device version No. and device serial No. of the controller and display them in the interface.

5.4.6 Factory Operation

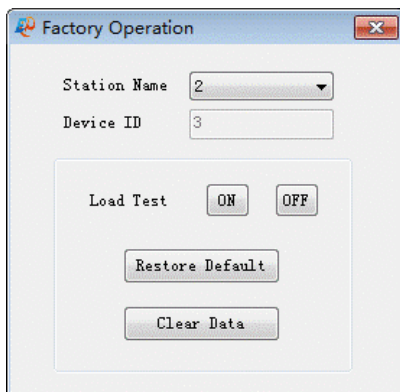Choose **Parameter -> Factory Operation**, and the factory operation dialog box pops up, as shown in chart 5-4-11.

Chart 5-4-11 Factory Operation Dialog Box

➢ Select the power station name of the pull-down list of "**Station Name**".

➢ Click the button "**On**" or "**Off**", which can help to conduct the test operation of the load switch (the controller could use the test load to command the load output of the switch under any load mode);
➢ Click the button "**Restore Default**", which can help to restore all the parameters of the controller to the ex-factory default parameter values.
➢ Click the button "**Clear Data**", which can help to clear all the previously accumulated electricity quality of the controller.
Note: The factory password of the controller is required in the operation of clearing electricity quality; please contact the manufacturer or the agent when the password is obtained.

5.5 Real Time Monitoring

Choose **Monitoring -> Real time Monitoring** in the menu, or the icon in the toolbar. The main interface is as shown in chart 5-5-1
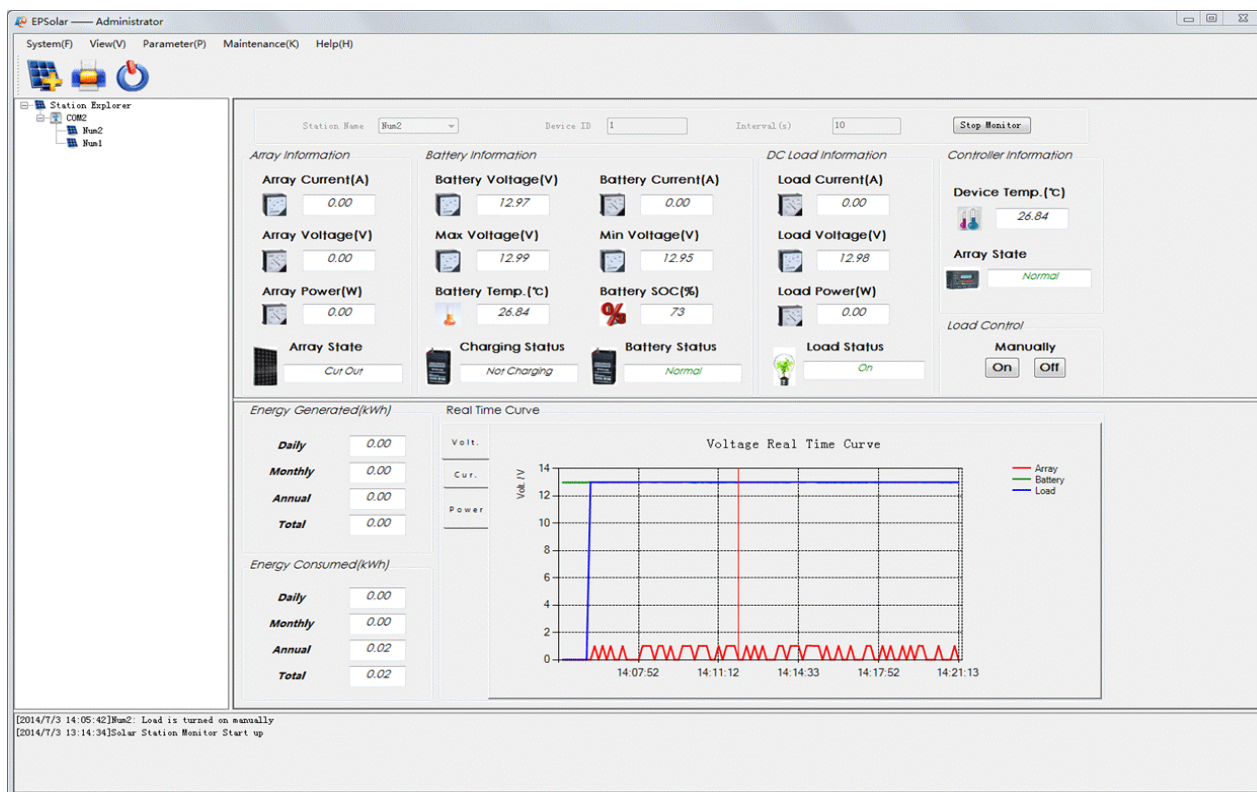
Chart 5-5-1 Real time Monitoring Interface

Real time monitoring means the system send read order to some controller users selected in a fixed period. The read data is displayed in the interface with figure, curves and diagram. In addition, users can remotely and manually control load of controller connected through clicking the corresponding buttons.

➢ Select the power station name, which requires real time monitoring, in the pull-down list of "**Station Name**".

➢ Set the time period of the monitor and the default period is 10 seconds (ranged from 10 to 1800 seconds), which can be modified by the user

➢ After clicking the button "**Start Monitor**", the real-time monitoring is initiated and the system starts to read and select the real-time data of the controller (meanwhile the button display is changed into "**Stop Monitor**").

➢ See the detailed introduction of the status and color of the real-time monitoring controller in Tab.5-19 and Tab.5-20.

Tab.5-19 Real time Monitoring State Listing

Name	State value
Controller Status	Normal, Overheating, RatedVoltageError
Array Status	Cut out, Income
Charging Status	NotCharging, FloatCharge, RaisingCharge, EqualizingCharge
Battery Status	Normal, Overdischarging, Undervoltage, Overvoltage, OverMaxTemp
Load Status	On, Off, ShortCircuit, Overload

Tab.5-20 Instruction of Status Color

Status color	Instruction
Green and black	Normal operative status of the controller
Red	Abnormal and failure status of the controller

5.5.1 Data Displaying

➢ Real-time monitoring data mainly include the array data, battery data, direct-current load data, other data, etc.
➢ See the specific data and the introduction of real-time monitoring in Tab.5-21.

Tab.5-21 Parameter List of Real-time Monitor

| Parameter	Specific parameter	Introduction
Array data	array voltage, array current, array work state	Provided by equipments directly
	array generated power	
Battery data	Battery voltage, Battery current, Max. voltage, Min. voltage?Battery temperature, Battery SOC, Charging state, Battery state	
DC load data	Load current, Load voltage	
	Load power	
Other data	Controller current temperature	
Electricity statistics	Charged electricity quality statistics and discharged electricity quality statistics	Aggregate value of the total electricity quality of the device/day/month/year

5.5.2 Curve Setting and Displaying
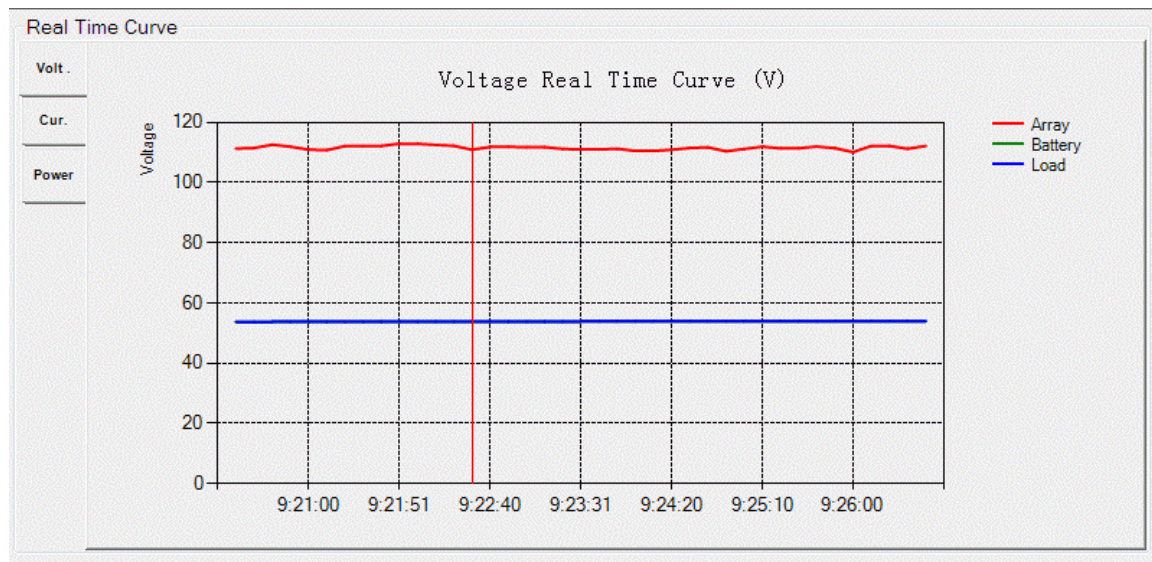
Chart 5-5-2 Display Interface of Curves

The display of the curves is shown in Fig.5-5-2:

➢ Displaying content of curves includes array voltage, array current, array power, battery voltage, battery current, load current, load voltage and load power.

➢ Change curve display: When click the button **"Volt".**, the curve page displays voltage curves, when click the button **"Cur".**, the curve page displays current curves and when click the button **"Power"**, it changes into power curves displaying.

Right click the interface of real-time curve and see the pop-up list in Chart.5-5-3:
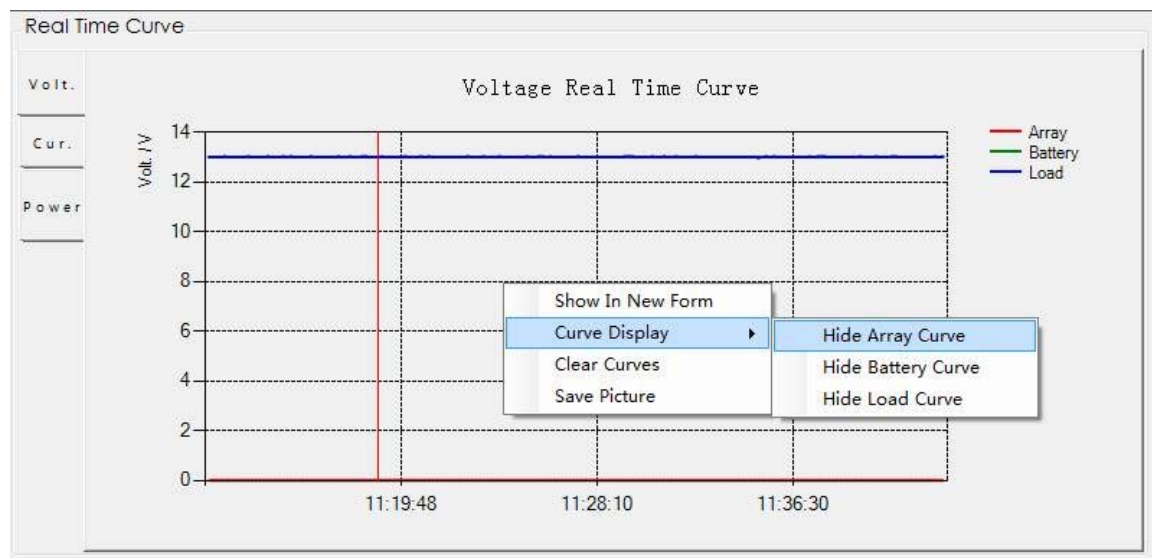

Chart 5-5-3 Curve Display Interface

➢ Displayed in the new window: the curve display window could be maximized singly, as seen in Chart 5-5-4:
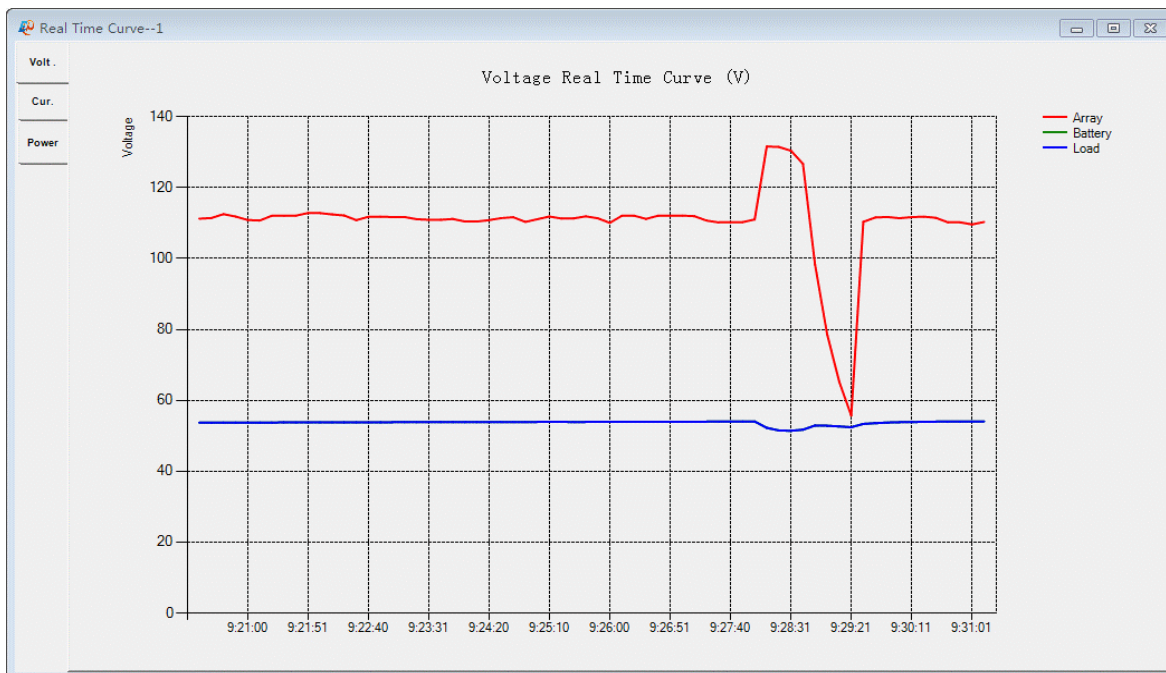
Chart 5-5-4 Interface of Curve Window Display

➢ Show and hide the curve: click "**Curve Display**", and select the shown or hidden curve.

➢ Clear the curve: clear the original curve record, and record a new curve again.

➢ Check the curve record: double click the curve record position, and the curve region will change into a rolling window in which the historic curve record can be checked.

➢ Save picture: the system will store the curve chart displayed on the current interface, and pop up the "Save As" dialog box, as showed in Fig.5-5-5. Then the user input the file name, select the save path and click the button "**Save**", and the file is saved by the path selected by the user in the format of .bmp.
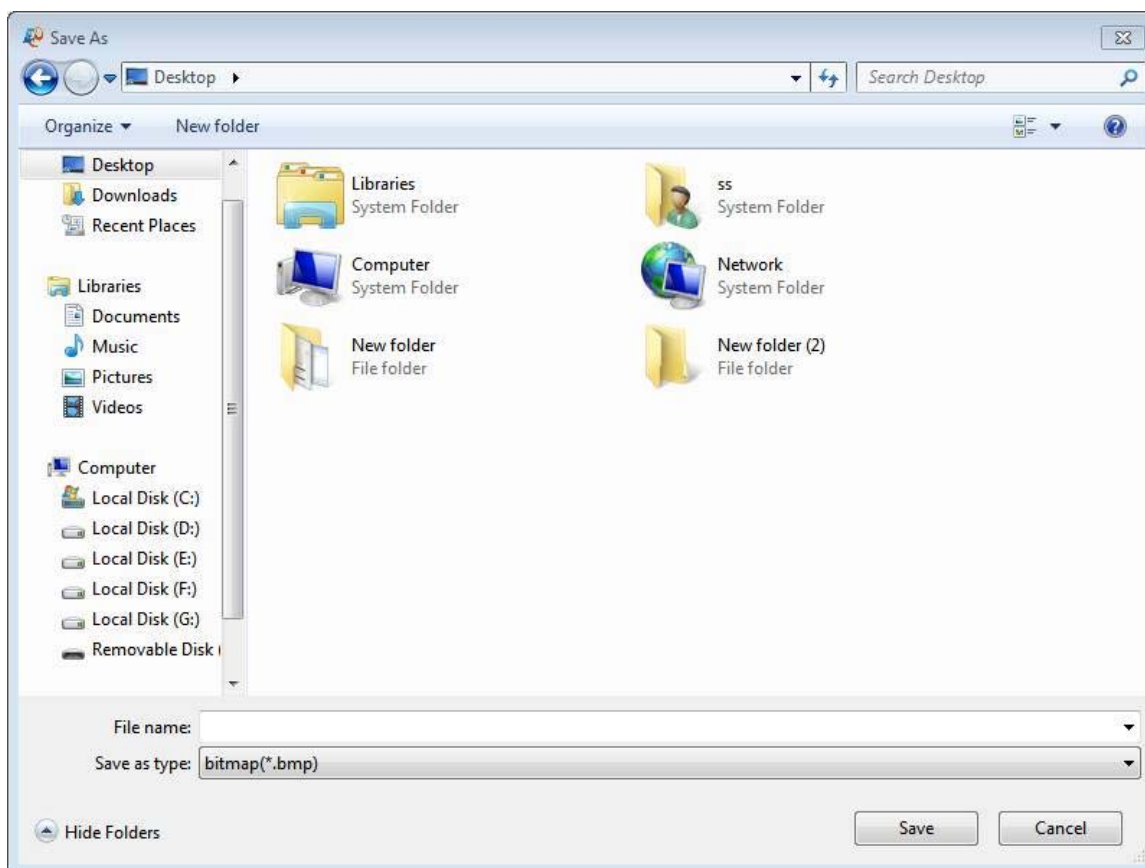

Chart 5-5-5 Data Export Interface

5.6 Print Setup and Print

Click **System ->Print Setup** in the menu, or the icon ☐ in the toolbar, and the dialog box is popped up, as shown in chart 5-6-1
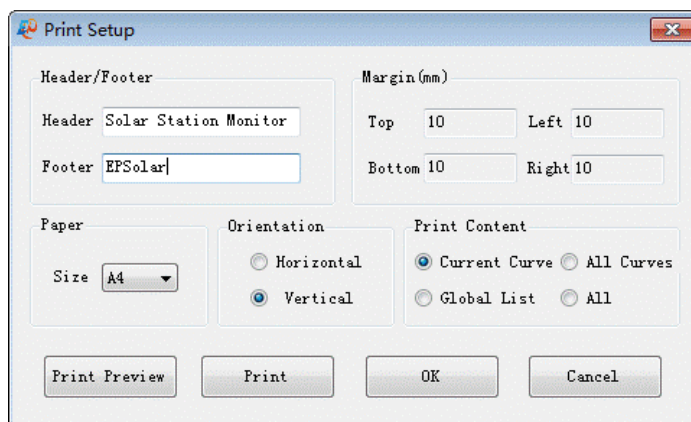

Chart 5-6-1 Print Setup Interface

➢ The default setup of print are Header="", Footer="", (Up, Down, Left, Right) Margin=10mm, Size=A4, Orientation=Vertical, Printing Content=Current Curve; the user may modify these default setup, and the system will provide print and provide print preview based on the setup input by the user. What needs attention is that, even when the software is closed and restarted, there is no need to reset these parameters, and the printing parameters are still the ones set by the user before closing the software.

➢ The printing content options in the interface are Current Curve, All Curves, Global List and All. See the specific print input form in Tab.5-22.

Tab.5-22 Classification of Printing Content

Print content	Printing form
Current Curve	Real-time curve of voltage, current or power
All Curves	Real-time curves of voltage, current and power
Global List	Global monitoring table
All	Real-time curves of voltage, current and power, and global monitoring table

➢ Click the button "**Print Preview**", the system will provide a printing preview of the current displayed interface of the software. See the print preview effect in Fig.5-6-2.
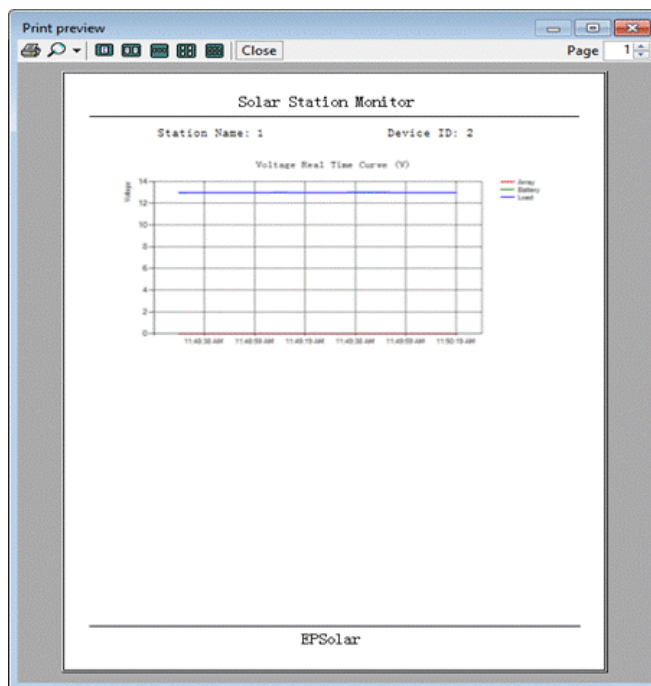

Chart 5-6-2 Print Preview Effect Picture

➢ Click the button "**Print**" of the dialog box, the system will directly print the table or curve displayed on the current interface.

5.7 System Maintenance

5.7.1 Data Import and Export

Data import means that users backup data-base file and data export means that users import the backup data-base to software. The software has 1 data bases and the specific stored contents are shown in Tab.5-23.

Tab. 5-23 Data Base Stored Content List

Name of data-base	Stored content	Backup name
epsolar.mdb	Battery Information, Controller Information,Maintenance Record, Array Information, Serial Port Setting, Station Basic Information, Station Picture	Be named according to the actual condition.

➢ Click the menu **System Maintenance->Data Export** and the system will automatically face 1 data-base. Back up data-base with the current installation contents in the software, the backup form is .bak. If it is successfully backed up, the system will prompt user.

➢ Click **System Maintenance->Data Import** menu, and the user selects the backup file to be imported, and then click the button "**Open**"; when there is the system prompt "Import data successfully, please restart software", click the button "**OK**" to restart the system.

5.7.2 Maintenance Record

Maintenance record means that users mainly enter and check maintenance conditions of controller. Click **System Maintenance-> Maintenance Record** and the dialog box popped up, as shown in chart 5-7-1.
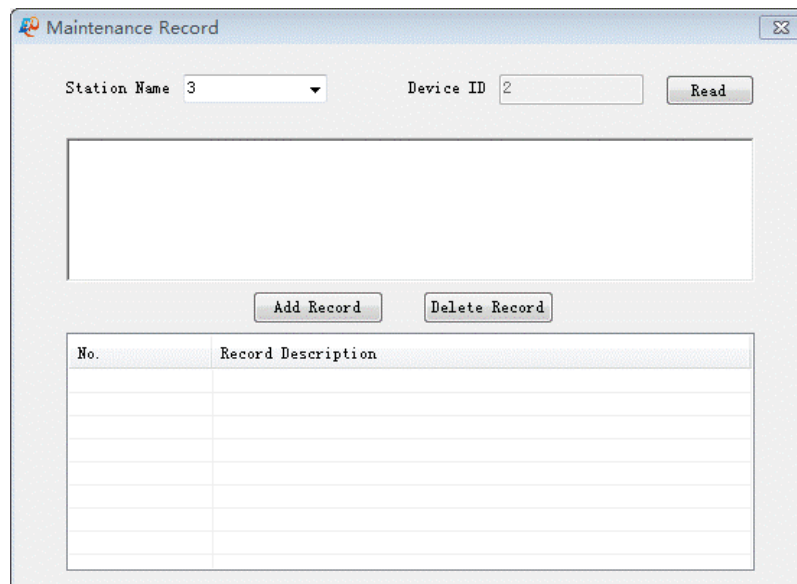

Chart 5-7-1 Maintenance Record Interface

➢ Select the power station name of the pull-down list of "**Station Name**".

➢ Click the button "**Read**", and the system will display in the list the maintenance record of the controller designated by the user.

➢ Users can also enter one maintenance record in the edit box. After click the button "**Add**", the system will automatically add user's entering to the list.

➢ Users can select one maintenance record in the list and click the button "**Delete**", carry out deleting operation.

6 Use Step

1. Add station information

   See the function description in **5.3 Power Station Data Management**

2. Operate real-time monitoring programs, or view and modify the control parameter, device parameter, load parameter and other operating parameters of the controller. See the real-time monitoring function in **5.5 Real-time Monitoring**, and for viewing and modifying the control parameter, device parameter, load parameter and other operating parameters in **5.4 Control Parameter**

3. Database and maintenance record backup

    See the function description in **5.7 System Maintenance**

Note: Because different language windows systems have different character format, you can check the region and language setting and set Enlish language and region in the "Menu>ControlPanel>Region&Language>Format". This will help you use our software normally.