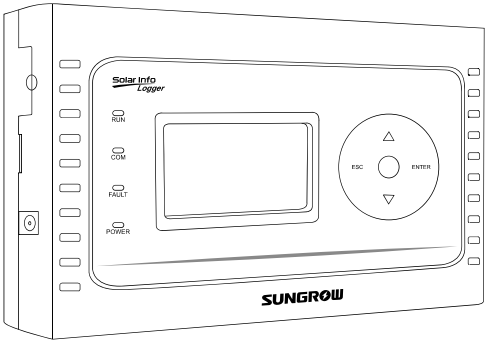
SolarInfo Logger

Remote Monitoring and Control of PV Plants

User Manual



About This Manual

Thank you for purchasing SolarInfo Logger from Sungrow. We hope that the device will meet with your satisfaction when monitoring your PV plant system.

Aim

This manual contains detailed product information, operation instructions and safety instructions that must be understood and followed during the installation and use of SolarInfo Logger.

Target Group

The manual is aimed at people who need to install and use the data logger.

How to Use This Manual

Read this manual and other documents carefully before any work on SolarInfo Logger.

This manual takes the standard vision for example, the actual product may differ.

Document must be stored with other documents and available at all times.

The contents of this manual will be periodically updated or revised, where necessary. Discrepancies therefore cannot be excluded. Please refer to the actual product.

The latest version is available on Sungrow's web site at www.sungrowpower.com or from the usual sales channels. Any suggestion, question or criticism is always welcome.

Symbols Explanation

This manual contains important safety and operational instructions that must be accurately understood and followed during the installation and maintenance of the equipment.

To ensure optimum use of this manual, note the following explanations of symbols used.

⚠ CAUTION

CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE indicates a situation which, if not avoided, could result in equipment or property damage.

NOTE indicates additional information, emphasized contents or tips to help you solve problems or save time.

Content

1 Function Introduction

1.1 Intended Usage

SolarInfo Logger is the latest device for user to monitor the PV power system. It can monitor up to 60 devices via RS485 bus in a large-scale PV power plant. The numbers of devices monitored can be extended according to user's special requirements.

Solar Logger may receive and implement the requirements of the grid management.

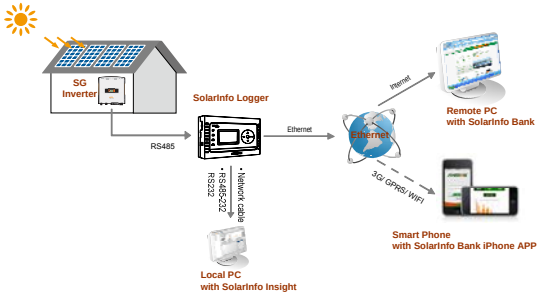


Fig. 1-1 Small-scaled PV Power System Monitoring via SolarInfo Logger

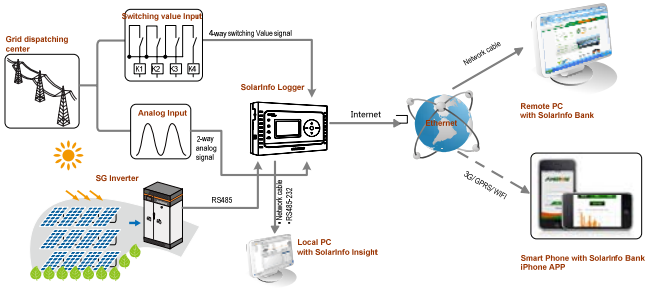


Fig. 1-2 Large-scaled PV Power System Monitoring via SolarInfo Logger (with power control functions)

As a terminal display, SolarInfo logger can monitor PV power system's current running and store historical information in its integrated data memory. The only connection between the inverters and SolarInfo Logger is RS485. If there is more

than one inverter, communication connection between them is a RS485 daisy chain.

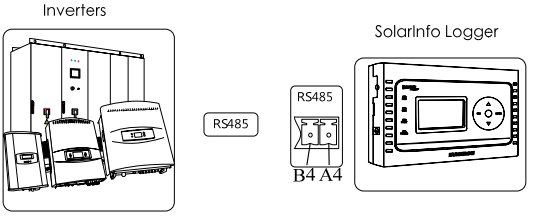


Fig. 1-3 Connection between Inverters and SolarInfo Logger via RS485

As an intermediate device, SolarInfo Logger collects information from PV power system and transfers to PC. SolarInfo logger can be connected to PC through RS232 interface, or Net.

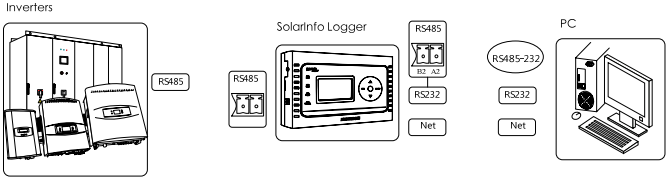


Fig. 1-4 Various Connection methods among Devices

With comprehensive standard interfaces, it is convenient for you to choose optimal monitoring for your existing devices and reduce cost.

1.2 Functions

The functions that SolarInfo Logger can perform are shown as follows:

- Up to 60 devices can be connected to each SolarInfo Logger in a RS485 daisy chain
- SolarInfo Logger transfers data to PC via RS485, RS232 or Ethernet
- SolarInfo Logger equips 12 channels of switching value input signals, 2 channels of switching value output signals and 2 channels of analog signals
- Running information storage of connected devices in its integrated memory or plug-in Micro SD
- Display the following values of the PV system:
- Sum of the real time power of all inverters connected
- Daily yield (E-day)

- Total energy yield (E-tot)
- Total amount of CO2 reduction (CO2-reduce)
- Display the following values of individual device connected:
- Real time power of individual inverter
- Daily yield (E-day)
- Total energy yield (E-tot)
- Total CO2 reduction (CO2-reduce)
- Monitoring information of SolarInfo EM (if any)
- State information of SolarInfo PVS (if any)
- Power curve of each inverter
- Malfunctions of the devices connected on LCD

NOTICE

Data collected by SolarInfo Logger may differ from that of the ammeter and must not be used as a basis for invoicing.

2 Product Description

2.1 Product Appearance

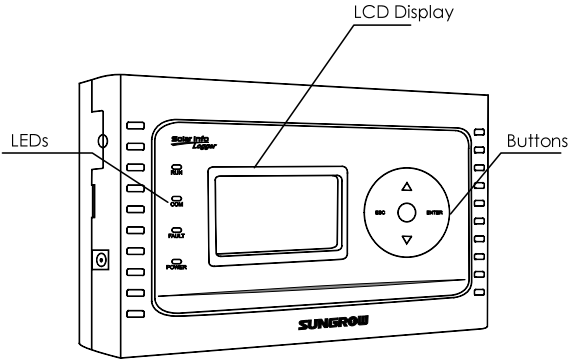


Fig. 2-1 Top View of SolarInfo Logger

2.2 Introduction to LCD Display

There are four LED indicators, four touch buttons and the LCD screen on the surface.

- Display the operation state of the SolarInfo Logger through LED indicators;
- Check the operation information and other related function setting from the LCD display through the touch button.

Tab. 2-1 Definition of LEDs

LED	Explanation
POWER	SolarInfo Logger is powered by adapter
RUN	The Logger works normally when it is on
FAULT	There is a fault when it is on
COM	Communication indicator

2.3 Dimensions and Weight of SolarInfo Logger

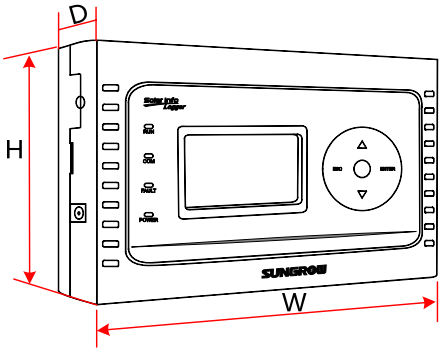


Fig. 2-2 Dimensions of SolarInfo Logger

W(mm)	H(mm) (without terminals)	D(mm)	Weight(kg)
205	132	138	0.55

3 Installation Flow

The following diagram shows the installation flow of SolarInfo Logger. Proceed as follows.

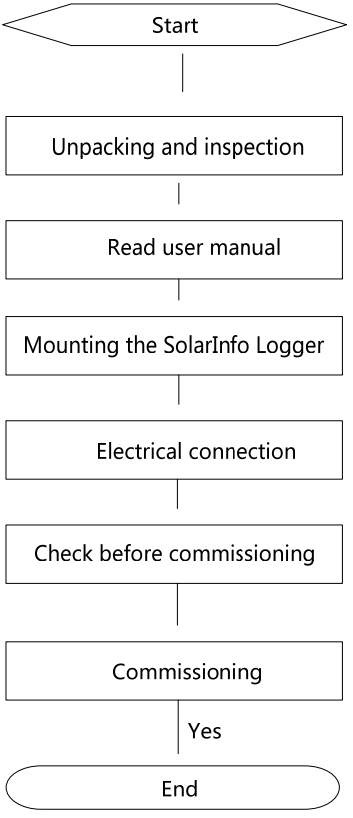


Fig. 3-1 Installation Flow Chart

Tab. 3-1 Description of Installation Flow

Order	Description
1	Unpacking and inspection
2	Choose the best installation site
3	Install the SolarInfo Logger
4	Electrical connection
5	Examine before commissioning
6	Start up SolarInfo Logger for the first time

4 Mounting SolarInfo Logger

4.1 Unpacking and Inspection

The unit is thoroughly tested and strictly inspected before delivery. Although sturdy package is adopted, damage may still occur during shipping.

The first thing you should do upon receiving the unit is to check the packing box. If damage to the packing box is apparent, or if you find that the SolarInfo Logger unit is damaged after unpacking, please notify the shipping company and Sungrow. If a related photo is supplied, you will get faster and better service.

Please check the completeness of the delivery contents according to the packing list.

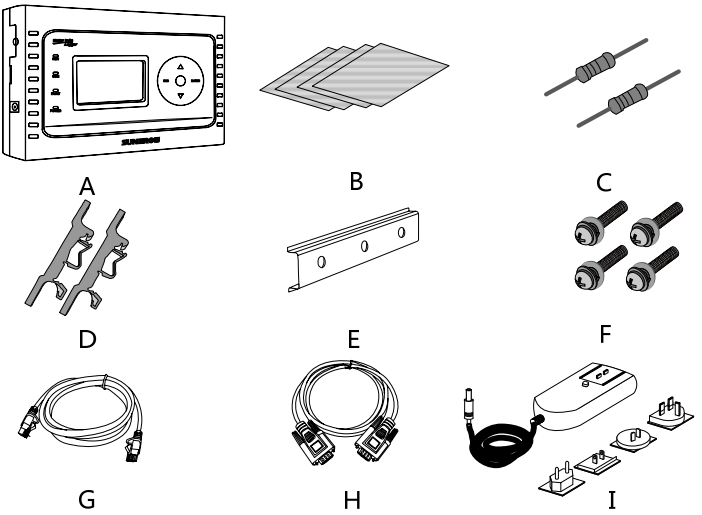


Fig. 4-1 Delivery Contents

Item	Name	Description
A	SolarInfo Logger	-
B	Product documents	Quick user manuals, Test report, Packing list, Product warranty card, Certification

Item	Name	Description
C	Terminating resistors	2*120Ω(when the length of RS485 is longer than 300 meters, the 120Ω resistance is advisable to installed from the start to the end)
D	Guide rail bracket	Standard configuration
E	Guide rail	Standard configuration. Length: 16cm
F	Fasteners	M3*16
G	Net cable	1m Net cable for connection to PC
H	Serial port cable	1.5m serial port cable for connection to PC
I	Power adaptor for multi-countries	-

4.2 Nameplate

The nameplate is affixed to one side of the unit. It provides information on type of SolarInfo Logger, marks of certification institutions, web site and serial number which is available and identified by Sungrow.

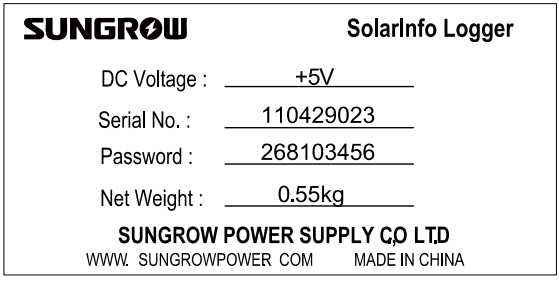


Fig. 4-2 Nameplate of SolarInfo Logger

User can view the device serial number, MAC address and software version information by entering the password 3333 in the parameter setting interface.

4.3 Installation Location Requirements

This section provides guidelines on choosing the best installation site and suggestions to ensure the optimal operation of SolarInfo Logger.

- SolarInfo Logger with IP20 is only suitable for indoor use.
- The ambient temperature must be within -20°C and +60°C.

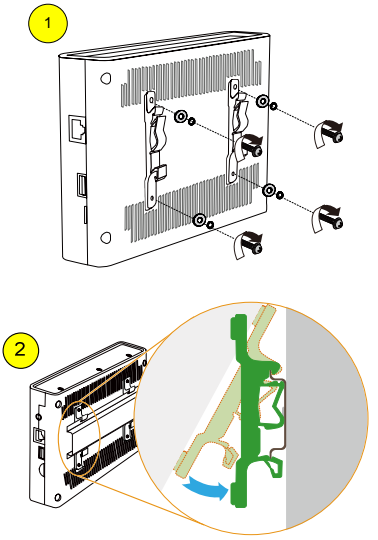
- The humidity of the chosen installation site should never exceed 95%. Moisture may result in corrosion to the lid and damage to the inner electronic components.
- Protect the SolarInfo Logger against dust, wet conditions and caustic substances.
- The maximum length of the Net connection cable is 1m. The maximum length of the serial port cable is 1.5m.

Additional lightning-proof devices are advisable depending on the in-site situation

4.4 Installing SolarInfo Logger

The SolarInfo Logger can be installed at any places where meet the abovementioned location requirements.

SolarInfo Logger can be mounted to the guide rail.



5 Electrical Connection

5.1 General Safety Instructions

⚠ CAUTION

Improper operation during the wiring process can cause fatal injury to the operator or damage to SolarInfo Logger.

Only qualified personnel can perform the wiring work.

NOTICE

All cables must be firmly attached, undamaged, properly insulated and adequately dimensioned.

5.2 Terminal Description

Cable connection terminals of the SolarInfo Logger are located in the four sides of the device. Please refer to the following table for detailed information.

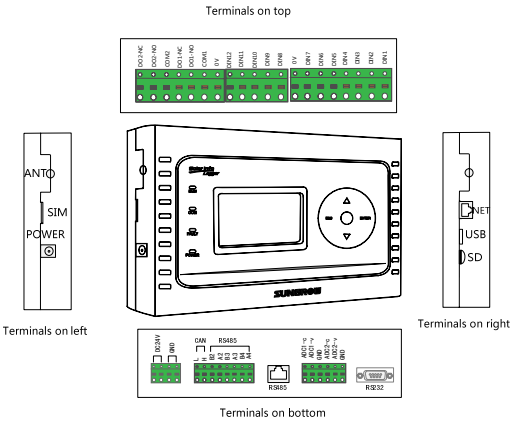


Fig. 5-1 Position of the terminals

Identify the connection ports on the SolarInfo Logger through the following table.

Name	Description
SIM	SIM card slot, function reserved
ANT	Wireless communication antenna, function reserved
POWER	Power input port of the SolarInfo Logger, power supplied by power adaptor with input voltage of 120V-240VAC, frequency of 50/60Hz and output voltage of 5VDC, 0-2.0A.
DC24V	This device adopts AC-DC module and provides +24V power to SolarInfo Logger (power consumption <3W). Notice: POWER port and DC24V port cannot be used at the same time. Otherwise the device may be damaged!
GND	Ground terminal
CAN	Reserved
A2B2~A4B4	• By default: • A4B4 connects to inverter; • A3B3 connects to meter with communication protocol of DL/ T645 (-1997) • A2B2 connects to combiner box and EM device.
RS485	RS485 connects to inverter with RJ45 port
ADC1-C, ADC1-V, GND, ADC2-C, ADC2-V, GND	Analog signal input interface. Equipped with AD sampling function to receive grid analog dispatch. Analog voltage range: 0-10V; analog current range: 4-20mA.
RS232	Communicate with PC
Micro SD	Store device operation data
USB	USB communication port, function reserved
NET	Internet communication interface. This interface can connect to 10/100M network.
DIN1~DIN12	12 switching value input channels
COM1, DO1-NO, DO1-NC COM2, DO2-NO, DO2-NC	2 dry contact output signal channels (COM1 and COM2). Can be feedback of switching value input signal state. Within each switching value output: • COM: public terminal of output dry contact; • NO: commonly open output contactor; • NC: commonly close output contactor.

5.3 Electrical Connection

One or more than one inverter, SolarInfo EM, SolarInfo PVS and +5V power can be connected to SolarInfo Logger as follows:

One inverter connects to SolarInfo Logger via RS485

- more than one inverter, SolarInfo EM and SolarInfo PVS connects to SolarInfo Logger via RS485 daisy chain
- more than one inverter , SolarInfo EM and SolarInfo PVS connects to SolarInfo Logger via Net
- PC can be connected to SolarInfo Logger via:
- Port A2B2 or RS232
- Net

Several electrical connections are introduced in the following:

NOTICE

1 RS485 communication cables must be STP with the shielding layer grounded.

2 The maximum cross-section areas of the twisted pair should be within 0.2mm² and 1.2mm² while the stripped length is recommended to be 8mm.

3 Distant the cables from the strong current for at least 0.5m and avoid long parallel runs of the cables. Steel tube is encouraged where the interference is strong.

4 Outdoor equipment (such as combiner box) access to the data acquisition, the proposed increase in lightning protection equipment, as this may lead to the data collection due to lightning damage.

5.3.2 For Single Inverter

Where SolarInfo Logger only monitors one inverter, perform the electrical connection as follows:

- Inverter connects to SolarInfo Logger via RS485 cable (1).
- Inverter connects to PC via NET (3) socket on the right side of SolarInfo Logger.
- Power of the unit is supplied by +5V adapter via POWER (2) socket on the left side of SolarInfo Logger.

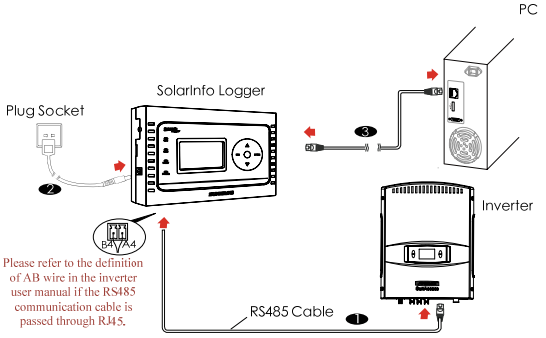


Fig. 5-2 Recommended Communication Connection for One Inverter Monitoring

5.3.3 For PV Plant Application

Where SolarInfo Logger is used in PV plant, perform the electrical connection as follows.

- More than one inverter, SolarInfo EM and SolarInfo PVS are connected in a RS485 daisy chain (1). The device nearest to SolarInfo Logger is connected to A4B4 ports on the bottom of SolarInfo Logger.
- Power of the unit is supplied via POWER (2) socket on the left side of SolarInfo Logger.
- PC connects to SolarInfo Logger via NET (3) socket on the right side of SolarInfo Logger.

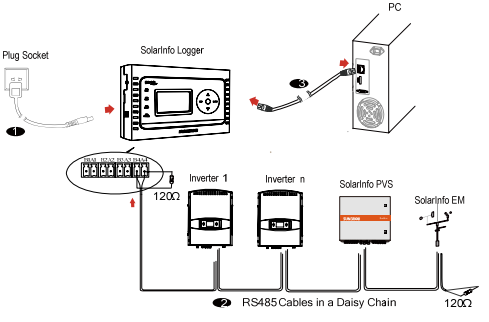


Fig. 5-3 Multiple Devices Monitoring

SolarInfo Logger may also connect to PV devices from other manufacturers.

PV devices from Sungrow and other manufacturers should connect separately or in a daisy chain to different RS485 terminals. (Refer to the above-mentioned connection methods.)

6 Commissioning

6.1 Verify before Commissioning

No.	Check Item	Result
1	Check whether all cables are undamaged, properly insulated and adequately dimensioned.	☐
2	Check whether all cables are firmly and correctly attached.	☐

6.2 Commissioning Procedures

Before commissioning, the monitored devices should be allocated different communication addresses.

No.	Check Item	Result
1	Check whether all cables are undamaged, properly insulated and adequately dimensioned.	☐
2	Check whether all cables are firmly and correctly attached.	☐
3	Verify before commissioning	☐
4	Start up devices and allocate addresses for individual device	☐
5	Set address search range on SolarInfo Logger LCD. See "0.0.0 Port Settings"	☐
6	Go back to the main screen and wait for devices searching	☐
7	Configure communication parameters between SolarInfo Logger and PC according to different connections	☐
8	Install SolarInfo Insight on PC.	☐
9	Configuration of SolarInfo Insight	☐
10	Search devices and monitor the running of PV system	☐
11	Monitor the remote device by SolarInfo Bank	☐

For detailed configuration, please refer to "SolarInfo Logger Quick Use Guide".

7 Operation of LCD Menu

7.1 Description of Button Function

SolarInfo offers four buttons for the user to look up running information and configure parameters. Users should know the button functions and how to operate before any operation on the unit.

Tab. 7-1 Definition of Buttons

Button	Function
ESC	Cancel or return to the previous menu or move to the left cursor
ENTER	Confirm or move to the right cursor
▼	Move down to the next line or decrease the present value
▲	Move up to the above line or increase the present value

7.2 Description of LCD Display

7.2.1 Selecting an icon

When the selection frame is placed over an icon (see the example icon on the right), press "ENTER" to select the icon.

7.2.2 Setting value

When the cursor is placed over a value, the display will be shaded. Press "▼" or "▲" to set the value and press "ENTER" to move to the next value.

Date 22/05/2012

7.3 Overview of LCD Menu

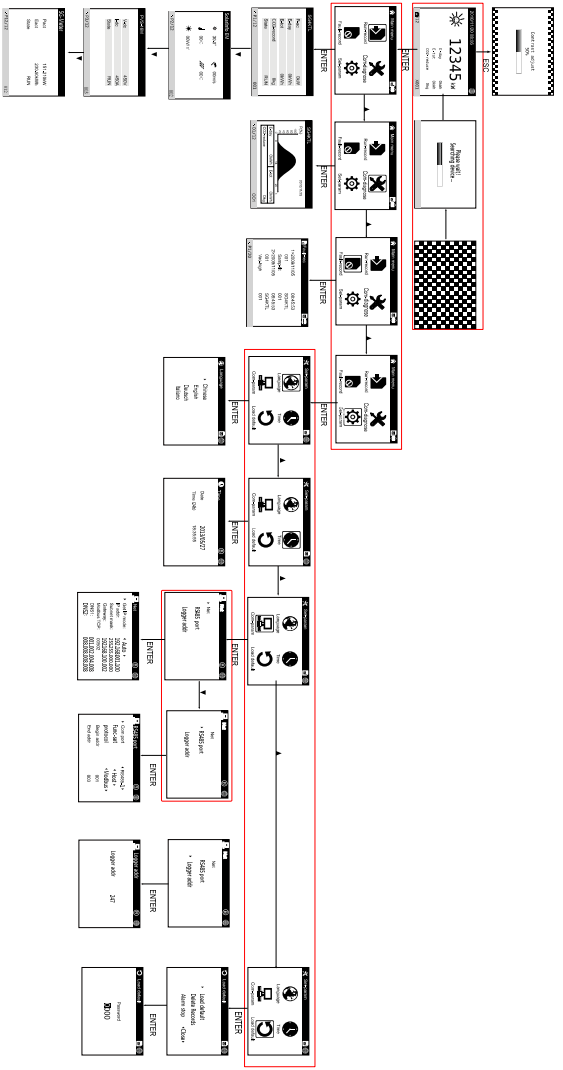


Fig. 7-1 Menu Tree

7.4 Default Menu

If the communication connection is correct, SolarInfo Logger enters the default menu (Figure 7-2) after devices searching.

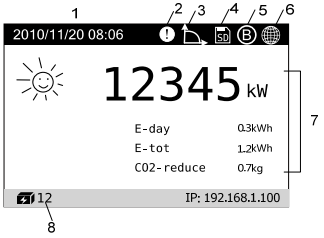
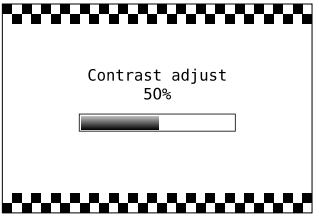


Fig. 7-2 Description of Default Menu

No	Description
1	Current date. For date change please refer to "7.9.2 Date and Time Settings"
2	Smog alarm stop icon
3	Logger receives the control instructions from the grid control center
4	Micro SD symbol
5	SolarInfo Bank symbol
6	Net symbol
7	Power, daily energy yield (E-day), total energy yield (E-tot) and total CO2 reduction (CO2-reduce) of the PV plant
8	The total number of devices in the PV system searched by Logger

7.5 Contrast Adjustment

In the default menu, press "ESC" to access the contrast adjustment sub-menu. Press "▲" to increase the setting value and press "▼" to decrease the value.



The contrast value ranges from 0 to 100%.

The recommended value is 50% or 60%.

7.6 Running Record

SolarInfo records the current running information of each device connected. User can view the real-time information as follows:

Step 1 Enter into the main control menu by pressing "ENTER" in the default menu.

Step 2 Press "▼" to move the selection the frame and press "ENTER" to select "Run-record".

Step 3 Turn pages to view the current running record of different devices.

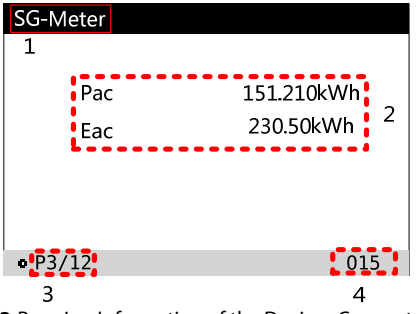


Fig. 7-3 Running Information of the Devices Connected

No.	Description
1	Device name
2	Specific running information of one device
3	Device number. "P1/12" represents there are twelve devices in total and this is the first one.
4	Device address

NOTICE

Each device must be allocated a unique address. Otherwise there may be data missing.

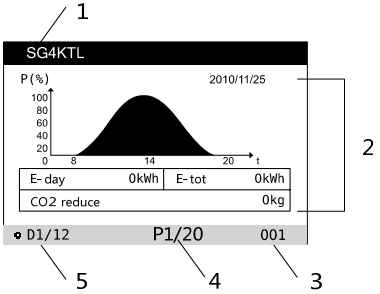
7.7 Device Record

The running information of the latest 30 days can be stored in SolarInfo Logger. Proceed as follows to check the history information.

Step 1 Enter the main control menu by pressing "ENTER" in the default menu.

Step 2 Select the "Device record" icon.

Step 3 Press "▲" to turn pages, and press "ENTER" to check the history information of the next device.



No	Description
1	Device name
2	History running information of the device
3	Device serial number.
4	The history record No. For example, "P1/20": the history running information of this device in 20 days, while the present page is the first page.

No	Description
5	The address of the device. For example, "D1/12" means 12 devices have been searched in total, while this device is first one.

7.8 Fault Record

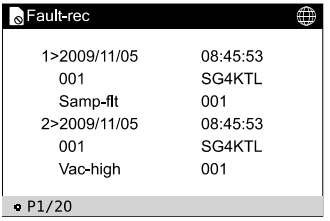
SolarInfo Logger can store up to 20 fault records of the PV system. These fault records can be viewed following the procedures below:

Step 1 Enter into the main control menu by pressing "ENTER" in the default menu.

Step 2 .Press "▼" to move the selection frame and press "ENTER" to select "Fault-record".

Step 3 Press "▲" to turn pages.

"P1/10" represents there are 10 pages' fault records and this is the first page.



7.9 Parameter Settings

Users can set different parameters by entering the different passwords.

Enter password 1111 to set the language, date and time, load default, alarm stop, communication settings and etc.

Enter password 2222 for communication diagnosis.

Enter password 3333 to view the SolarInfo Logger vision, password and etc.

7.9.1 Language Settings

SolarInfo Logger supports four languages: Chinese, English, Italian and German. Set language as follows:

Step 1 Enter into the main control menu by pressing "ENTER" in the default menu.

Step 2 Press "▼" to move the selection frame and press "ENTER" to select "Set-param".

Step 3 Press "▼" to move the selection frame and press "ENTER" to select "Language".

Step 4 Press "▼" or "▲" to select language and then press "ENTER" to confirm the setting.

7.9.2 Date and Time Settings

Date and time can be set as the following instructions.

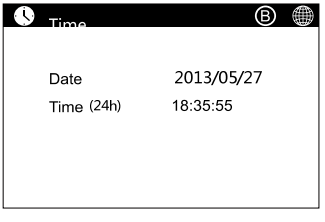
Step 1 Enter into the main control menu by pressing "ENTER" in the default menu.

Step 2 Press "▼" to move the selection frame and press "ENTER" to select "Set-param".

Step 3 Press "▼" to move the selection frame and press "ENTER" to select "Time".

Step 4 Press "▼" or "▲" to scroll through items and press "ENTER" to enter into the edit mode.

Step 5 Press "▼" or "▲" to set value and press "ENTER" to move to the next cursor. Confirm the settings by pressing "ENTER".



7.9.3 Load Default Settings

Load Default

NOTICE

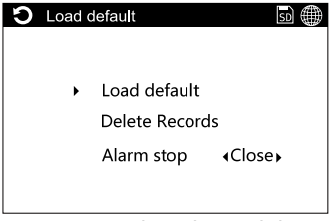
When "Load default" is performed, all parameters except "time" will return to the factory values.

Step 1 Enter into the main control menu by pressing "ENTER" in the default menu.

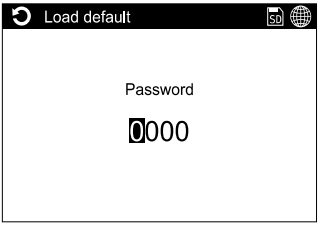
Step 2 Press "▼" to move the selection frame and press "ENTER" to select "Set-param".

Step 3 Press "▼" to move the selection frame and press "ENTER" to select "Load default".

Step 4 Press "▼" to move arrow and select "Load default".



Step 5 Press button "▼" or "▲" to set the value and then press "ENTER" to move to the next value. Input the password "1111" and confirm by pressing ENTER.



Delete Records

NOTICE

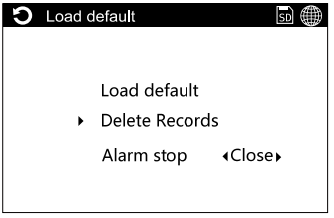
When "Delete records" is performed, all historical records will be cleared. Make sure records have been safely archived device before performing "Delete records".

Step 1 Enter into the main control menu screen by pressing "ENTER" in the default menu.

Step 2 Press "▼" to move the selection frame and press "ENTER" to select "Set-param".

Step 3 Press "▼" to move the selection frame and press "ENTER" to select "Load default".

Step 4 Press "▼" to move arrow to select "Delete records".



Step 5 Press button "▼" and "▲" to set value and then press "ENTER" to move to the next value. Input the password "1111" and confirm by pressing ENTER.

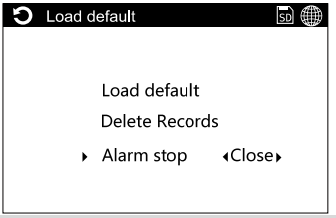
7.9.4 Warning Stop

Step 1 Press ENTER to enter the main screen from the default menu;

Step 2 Select 

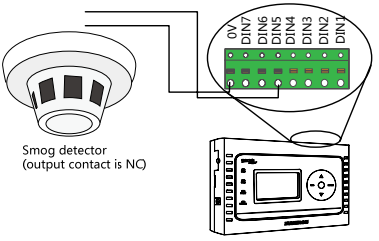
icon to enter sub-menu. There will be password entry interface before parameter interface. Input password 1111. Select 

icon to enter sub-menu. Press ▼ to move the cursor and select Alarm Stop. Press ▼ to enable or disable this function.



NOTICE

This function usually applies to station equipped with smog detector. The connection method is shown as below:



- When this function is enabled and the smog density reaches to the set value, SolarInfo Logger will send stop command to the inverter inside the station to stop the inverter and to ensure the safety of the personnel inside the station. If you want to disable this function, restart the SolarInfo Logger after power down. Follow the operation in this section to disable the alarm stop function.
- Once this function is disabled, SolarInfo Logger will not send stop command to the inverter even if the smog density reaches to the set value.

7.9.5 Communication Parameters Settings

Net Parameters Settings

Where the connection between SolarInfo Logger and PC is via Net, the Net parameters configuration is advisable for good communication. For more detailed information, please refer to the "SolarInfo Logger Quick Use Guide".

Net parameters setting can be performed as follows:

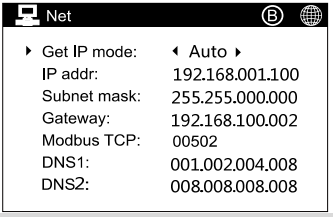
Step 1 Enter into the main control menu screen by pressing "ENTER" in the default menu.

Step 2 Press "▼" to move the selection frame and press "ENTER" to select "Set-param".

Step 3 Press "▼" to move the selection frame and press "ENTER" to select "com-param".

Step 4 Press "▼" to move the selection frame and press "ENTER" to select "Net".

Step 5 Press "▼" or "▲" to set the value and then press "ENTER" to move to the next value. Confirm the setting by pressing ENTER.



If SolarInfo Logger directly connects to upper PC via Net cable, the IPs of the Logger and the PC should be configured in the same segment, e.g. if the IP of the Logger is 192.168.100.057, the IP of the PC should be 192.168.100.058, and the other parameters should be the same as each other.

If solarInfo Logger connects to upper PC via Router and the upper PC was set to "Get an IP address automatically", the "Get IP mode" of the Logger can be either set to "Manual" and allocated an IP, or set to "Auto" without other operation.

Port Settings

Port settings are to allocate communication parameters for the devices connected to the SolarInfo Logger via RS485 terminals.

Port settings can be performed as follows:

Step 1 Enter into the main control menu screen by pressing "ENTER" in the default menu.

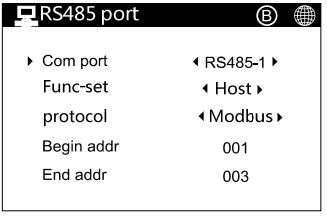
Step 2 Press "▼" to move the selection frame and press "ENTER" to select "Set-param".

Step 3 Press "▼" to move the selection frame and press "ENTER" to select "Com-param".

Step 4 Press "▼" to move the selection frame and press "ENTER" to select "RS485 Port".

Step 5 Press "▼" or "▲" to scroll through items and then press "ENTER" to enter into the edit mode.

Step 6 Press "▼" or "▲" to set value and then press "ENTER" to move to the next value. Confirm the setting by pressing ENTER.



Step 7 A "Config are change, delete the records" will prompt. Press ENTER to confirm setting, otherwise press ESC to cancel the setting.

Item	Specification
Com port	Communication Port: RS485-1 to RS485, RS485-2 to A2B2 terminals; RS 485-3 to A3B3 terminals; RS485-4 to A4B4 terminals.
Function setting	Set the port connected to PC to Slaver and connected to other devices to Master.
Protocol	Communication protocol of the port: Modbus protocol and DL/T645 (-1997) protocol are available. (DL/T645-1997protocol is available only in Mainland China.)
Begin addr	The number of devices connected should be less than 60. 1 ≤ "Begin addr" ≤ "End addr" ≤ 247 Address fields of every port should be independent of each other. When the port is set as "Slave", address may not be set.
End addr	

Data Transmission

To monitor the data of devices from a third manufacturer, SolarInfo Logger will transfer the data to PC via A3B3 port and the PC will then handle the data received.

Currently, Logger only recognizes the A3B3 as the transmission port. By the default port 503, data of all devices connected to the A3B3 can be visited, i.e. Logger is only responsible for data transmission, functioning as serial port/internet port switch. Default configuration of A3B3 is 9600, N, 8, 1.
It will take 0.5s or loner for background to receive the data from the port.

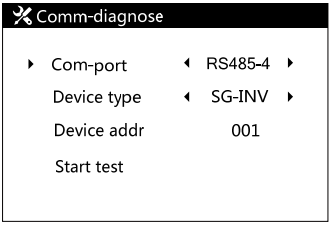
7.10 Communication Diagnose

There is the communication test function in the LCD display of the SolarInfo Logger for on-site device communication test. The test results can be used to analyze the device communication conditions.

Step 1 Press ENTER to enter the main screen from the default menu;

Step 2 Select the 

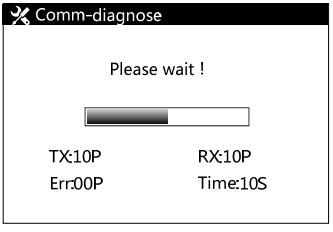
icon to enter the sub-menu.



Step 3 Select Com-port, for example RS485-4 stands for the A4B4 port of the SolarInfo Logger.

Step 4 Select Device Type. SG-INV for Sungrow inveter; SG-PVS for Sungrow combiner box; SG-PMD for Sungrow DC power distribution cabinet; SG-EM for Sungrow environment monitoring device.

Step 5 Press ENTER after entering device address. Select Start Test to enter the test interface as shown below.



NOTICE

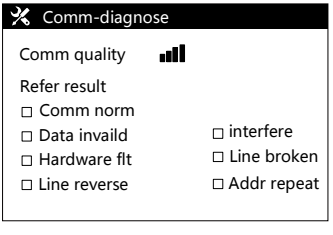
TX: data package sent by SolarInfo Logger;

RX: correct data package received by SolarInfo Logger;

ERR: error data package received by SolarInfo Logger;

Time: communication test remaining time

Step 6 The following interface appears when test is finished.



Communication quality is identified by signal bar. Reference result is the reason affecting the communication quality analyzed by SolarInfo Logger based on the communication test situation. Please refer to the on-site situation for further confirmation. This function provides the possible problems.

8 Connecting to SolarInfo Bank

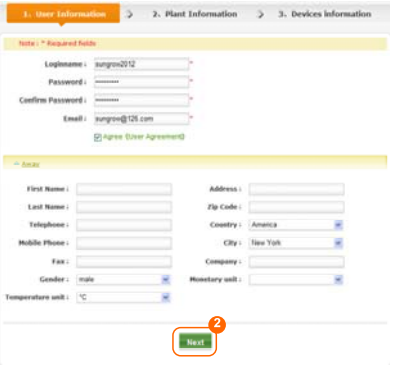
8.1 Registration and Adding PV Plant

SolarInfo Logger acquires the operation data of the PV plant through RS485, and then transmits those data to Internet through Ethernet or GPRS. Users can view the data and the operation status of the PV plant by browsing the webpage www.solarinfobank.com.

Register and add PV plant information as follows:

Step 1 Open a browser and enter the URL www.solarinfobank.com to view the homepage of SolarInfo Bank. Register a new user by clicking "Register".

Step 2 Fill in related information according to the requirements and click "Next" to complete the registration process.

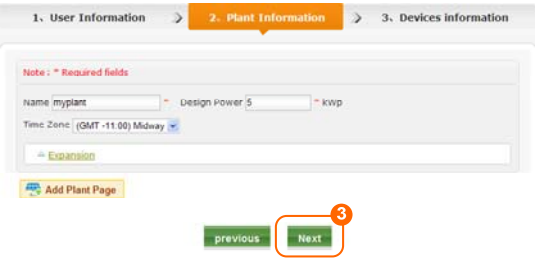


Country, City, Gender, Monetary and Temperature: you can select the information through the pull-down menu or manually enter the country and city by selecting "Other".

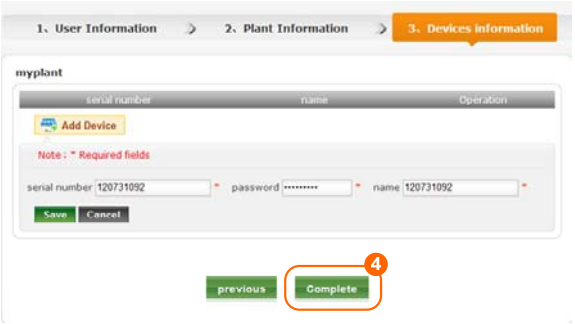
Other information:

you shall manually fill in other information.

Step 3 Fill in related information according to the requirements and click "Next".



Step 4 Fill in related information according to the requirements and click "Complete".



Step 5 Bind the information source to the plant as follows:

(1) Click the added plant in the plant list, e.g. "120731092", to view the "serial number" dialog box in the right of the page.

(2) Enter the serial number on the back of SolarInfo Logger nameplate into "password", e.g. 120706001;

Enter the password on the back of SolarInfo Logger nameplate into "name", e.g. 123456.

The default name displayed in "Name" is the serial No. of SolarInfo Logger. You can rename it, for example SolarInfo Logger-1.

(3) Click "complete" to complete the information binding process.

8.2 Viewing Plant Data

You can view the plant data by logging in to SolarInfo Bank through computer (see Scenario 1) or smart phone/iPad (see Scenario 2).

Scenario 1: Logging in to SolarInfo Bank through computer

Step 1 Enter the URL www.solarinfobank.com into your computer to view the homepage of SolarInfo Bank. Enter the correct username and password, and click "Login" to log in to the SolarInfo Bank system.

Step 2 You can view the details of the plant added in 8.1 in SolarInfo Bank system. The system comprises two areas, as shown in the following figure:

A: Navigation Bar

Navigation bar is located in the left of SolarInfo Bank system, containing four submenus:

- Plant List: list all the plants you have added.
- Plant Data: demonstrate plant-related data and charts.
- Analysis Chart: demonstrate the annual power output comparison charts and the investment return comparison charts.
- Configuration: configure the charts, reports and user information.

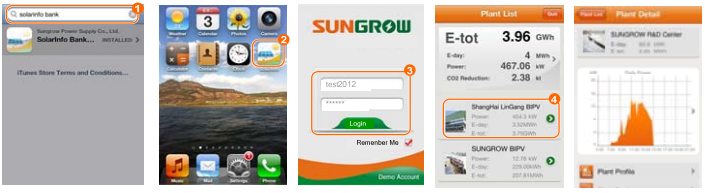
B: Information Display Area

Information display area is in the right of the system. Click the submenu in the navigation bar to view corresponding information.

Scenario 2: Logging in to SolarInfo Bank through smart phone/iPad

Log in to SolarInfo Bank by downloading and installing APP into your smart phone or iPad. Take iPhone 4 for example, the related pages of SolarInfo Bank is shown in

Fig. 8-1.



Search for SolarInfo Bank and install | Open SolarInfo Bank | Enter username and password to login | Select the target plant | View the plant data

Fig. 8-1 Related pages of SolarInfo Bank

NOTICE

If user needs to communicate with Bank, the local telecom provider should provide available DNS address , and if communicate with Insight, users should set the static IP address. Ensure that the logger have been connected to the internet via router or switch.

Otherwise, users cannot monitor the remote device through SolarInfo Bank.

SolarInfo Bank port: 9999; domain name:….

If the network SolarInfo Logger connected to is connected to the Internet via the fire wall, the pertinent settings of the firewall must allow access to the Bank.

9 Power Control

9.1 Functions

SolarInfo Logger is equipped with a power control module. It receives the control instructions from the grid control center, sends the control instructions to the monitored inverters through RS485, controls the inverter active power, reactive power and power factor of the output and performs inverter start/stop operations.

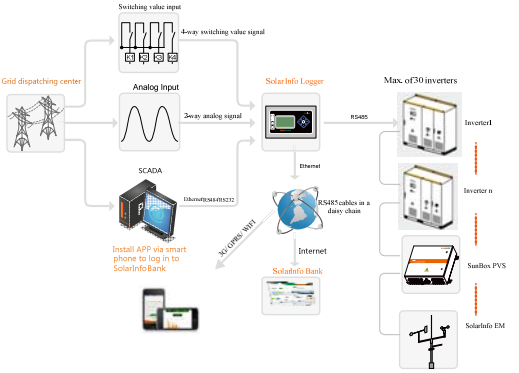


Fig. 9-1 Architecture of SolarInfo Logger Power Control

As shown in Fig. 9-1, the control instructions of the power control center are dispatched through the following types:

- 4-way switching value signal
- 2-way analog value signal
- Communication with SolarInfo Logger through Ethernet/ RS485/ RS232 and send commands directly to inverters monitored by SolarInfo Logger

This chapter describes how SolarInfo Logger controls the inverters through receiving switching value signals or analog signals from the grid control center.

Only if the inverter is equipped with active power control, power factor control and reactive power control can you set the corresponding power dispatch function. Please refer to the user manual or local reseller for details.

9.2 Interfaces

The Logger has a switching value control interface and an analog control interface to receive switching value signals and analog signals dispatched by the grid control center respectively.

9.2.1 Switching Value Control Interface

Switching value control interface is located on top of the SolarInfo Logger as shown below:

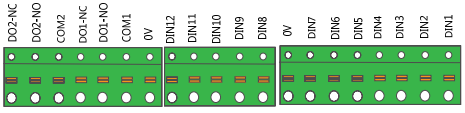


Fig. 9-2 Switching value control interface of SolarInfo Logger

Tab. 9-1 Definitions of switching value control interface signals

Signal	Definitions	Signal	Definitions
DIN1/DIN2…DIN12	12 input dry contact signal channels	COM1/2	2 output dry contact public terminals
0V	Grounding end of the input dry contact signals	DO (1/2) -NO	Normally open output contact

Signal	Definitions	Signal	Definitions
-	-	DO (1/2) -NC	Normally closed output contact

注 意

SolarInfo Logger supports 12 switching value inputs and 2 switching value outputs. DIN1/2/3/4 switching value inputs are used to control the power.

This section will introduce the DIN1, DIN2, DIN3 and DIN4 ports.

9.2.2 Analog Control Interface

Analog control interface is located on bottom of the SolarInfo Logger as shown below:

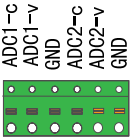


Fig. 9-3 Analog control interface of SolarInfo Logger

Tab. 9-2 Definitions of analog control interface signals

Signal	Definitions	Signal	Definitions
ADC1-C	4-20mA analog current input channel 1	ADC2-C	4-20mA analog current input channel 1
ADC1-V	0~10V analog voltage input channel 1	ADC2-V	0~10V analog voltage input channel 2
GND	Grounding end of analog input	GND	Grounding end of analog input

SolarInfo Logger supports 2-input 0-10V analog voltage inputs or 2-input 4-20mA analog current inputs.

NOTICE

When selecting the analog current control, you need to connect the voltage input port to the current input port. As shown in Fig. 9-4.

For example, to control the active power through ADC1-C, the ADC1-C needs to be connected to ADC1-V. Then the analog current signal is sent through the ADC1-C and GND terminals.

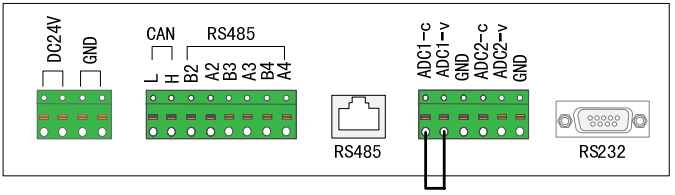


Fig. 9-4 The voltage and current input connection diagram

9.3 Operation of Power Control Configure Tool

The Logger must be configured by configuring Power Control Configure Tool before the grid control module of Logger is enabled and the grid control center sends control commands to Logger through the switching value or analog value:

- Connect PC to Logger and install SolarInfo Logger Power Control Configure Tool on PC. See *9.3.1* .
- Parameter configuration (physical channels, equipment and parameter setting). See 9.3.2 *and* 9.3.3 .

9.3.1 Connect Logger to PC and Install the Software

Connect SolarInfo Logger to PC through RS485/RS232 or Ethernet port.

Through RS485/RS232

Step 1 Connect SolarInfo Logger from its RS232 or RS485 interface to the RS232 interface of PC. Use a serial cable to connect the RS232 interface of SolarInfo Logger to PC directly, as shown in Fig. 9-5(a). Or use a serial cable to connect the RS485 interface of SolarInfo Logger to the RS232 interface of PC through an RS485-232 converter, as shown in Fig. 9-5(b).

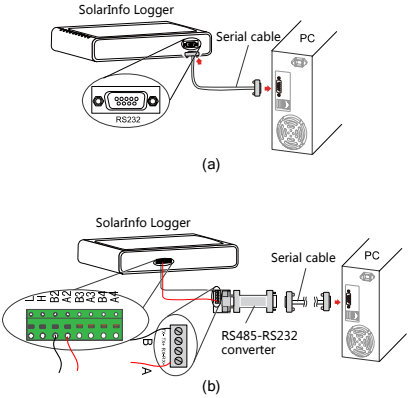


Fig. 9-5 Connection to PC through RS485/RS232

Note： 485-232 converter is configured by the user

Step 2 If the RS485 interface is used, relevant parameters need to be set in the port parameter setting interface of SolarInfo Logger. The unit must be set to Slave in the Host-Slave setting (See Fig. 9-6). For details on the setting, please refer to ***0.0.0 Port Settings***.

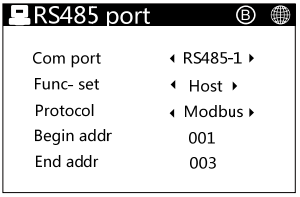


Fig. 9-6 Parameter setting interface of SolarInfo Logger port

Step 3 After connection, you need to check the port number through the device manager of the host. As shown in Fig. 9-7, the port number is COM1.

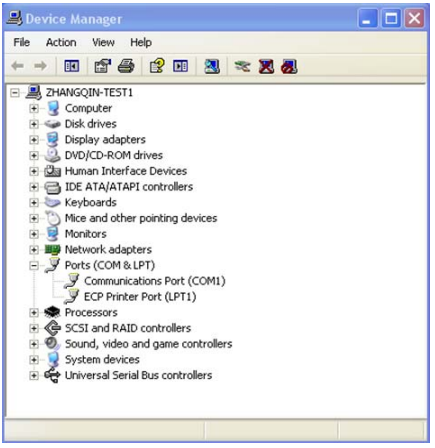


Fig. 9-7 View the port number

Through network cable

You can also connect the SolarInfo Logger to PC to set up Ethernet communication.

Step 1 Use network cable to communicate with PC.

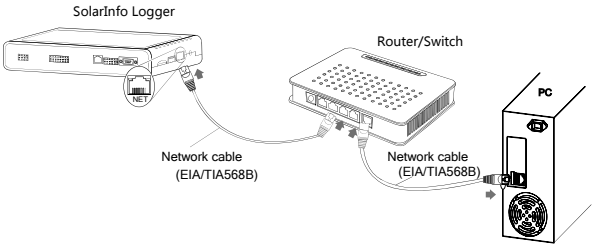


Fig. 9-8 Ethernet communication connection

Step 2 Configure network communication for SolarInfo Logger.

Step 3 Apply an IP address, subnet mask, default gateway and port number for SolarInfo Logger from your network administrator.

Note that if there is more than one SolarInfo Logger, a unique IP address should be assigned to each SolarInfo Logger.

Step 4 Configure the Internet protocol (TCP/IP) properties for the PC according to the applied IP address, subnet mask and default gateway. Click "OK" after setting, as shown in Fig. 9-9.

The IP address of PC must be in the same network segment with the applied IP address but different from the applied IP address. For example, if the applied IP address is IP 192.168.101.19, the IP address of the PC can be set to 192.168.101.125. Other information can be set the same as that has been applied.

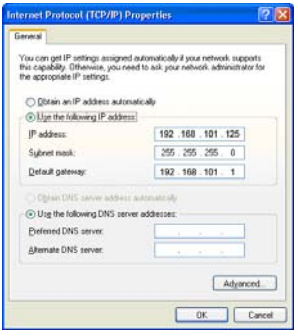


Fig. 9-9 Network communication configuration

Step 5 Set the network parameters for SolarInfo Logger, including the IP address, subnet mask, default gateway and port number, as shown in Fig. 9-10. For details about configuration, please refer to 0.0.0 Net Parameters Settings.

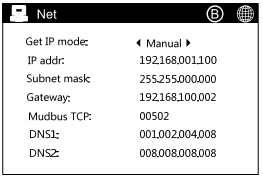


Fig. 9-10 Parameter setting interface of SolarInfo Logger port

Install the configuration software

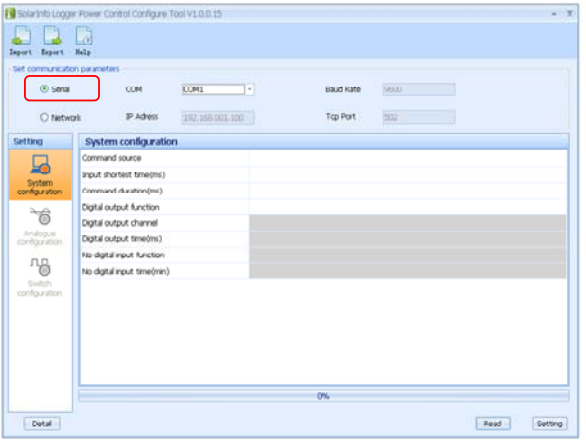
After connecting SolarInfo Logger to your PC, you can install the configuration software SolarInfo Logger Power Control Configure Tool on your PC follow the installation wizard. The software is available on http://www.sungrowpower.com/sungrow-english/product.php?page=2&cate=62&product=35&menu=1

Fig. 9-11 Software installation wizard

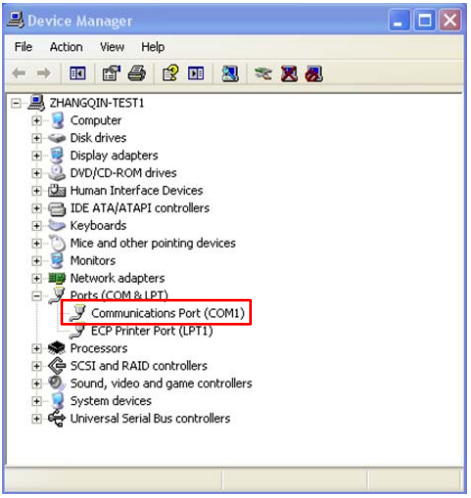
9.3.2 Startup the SolarInfo Logger Power Control Configure Tool

After installing the software on your PC, double-click the desktop shortcut to start the software. The screen as shown in following picture appears.

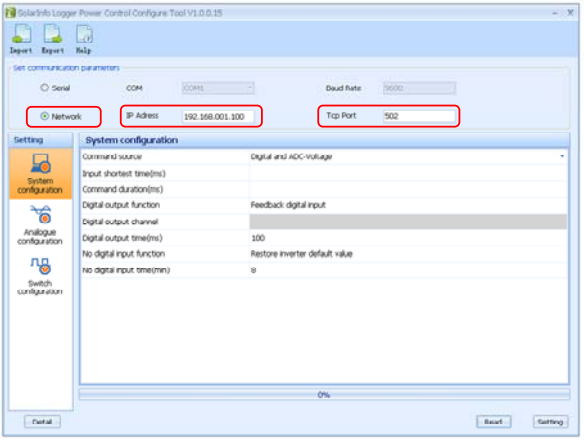
- If SolarInfo Logger connects to PC through RS232, RS485 or A2B2 ports, click [Serial] from the Power Control Configure Tool software. Select communication port connected to SolarInfo Logger as shown below.



-



- If SolarInfo Logger connects to PC through network, click [Network] and input the IP address and TCP port as shown below:



9.3.3 Parameter Settings

No matter which control method is selected, system configuration is a request.

- If switching value control method is selected, perform Switch Configuration;

- IF selecting analog control method, perform the Analogue Configuration;
- IF selecting switching value and analog control methods together, perform the Analog configuration and Switch configuration.

Switching value Control

If the digital switching value control is selected, please complete relevant configuration as per the following steps.

Step 1 Set the system parameters on the System configuration screen.

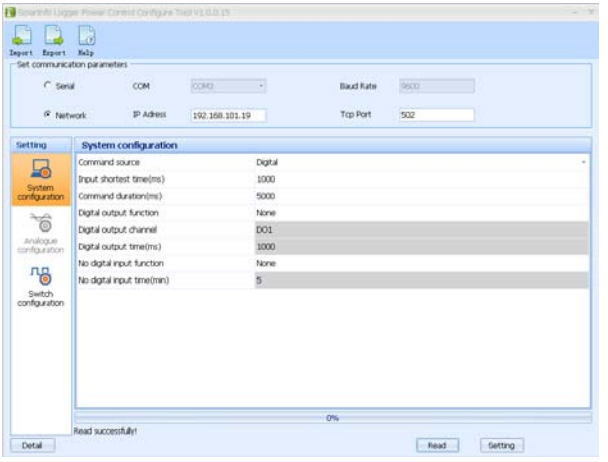


Fig. 9-12 Digital operation screen 1 of Power Control Configure Tool

Tab. 9-3 System parameter configuration

No.	Parameter	Setting description
1	Command source	Control command source. Controlled by switching value. Select Digital, then the command sent by grid dispatch center will be switching value.

No.	Parameter	Setting description
2	Input shortest time(ms)	Min. duration of digital switching value in ms. Permissible range: 50 ~ 60000 (set to be integral multiple of 10). Default value: 1000. You can either input the digital or scroll the mouse to adjust the value. If 1000 is selected, digital switching value state needs to stay for at least 1000ms (1s) before system response. After system response, SolarInfo Logger needs to send the control command to communicated inverters. Communication time delay of each device is approximately 300ms.
3	Command duration(ms)	Used to set the communication timeout when SolarInfo Logger and inverter has communication fault. Time in ms. Permissible range: 50-60000. Default value: 5000. You can either input the digital or scroll the mouse to adjust the value. If 5000 is selected, SolarInfo Logger will try to communicate with the inverter when communication between the SolarInfo Logger and inverter is failed until the following situation occurs: • Communication normal; • Reach to continuous delay time; • New control command is sent.
4	Digital output function	Set the digital output function. • None: the 2-output public terminals are connected to the normally close terminal; • Feedback inverter fault: inverter feedback is shown by digitals. • Feedback digital input: feedback the digital input. This function is reserved and unavailable

No.	Parameter	Setting description
5	Digital output channel	Digital output channel (DO1, DO2). This parameter is settable only when the "Digital output function" in 4 is set to be Digital output function. Default selection is DO1, meaning the feedback is done by DO1 channel.
6	Digital output time(ms)	Longest time duration of Digital output. Unit: ms. Range: 50 ~ 1800000, or Forever; default value: 1000. • When Forever is selected, the feedback signal will be output by digital output. This setting is not recommended since it will damage the lifetime of relay; • When 1000 is selected, the digital output will stay at 1000ms (1s) and then recover initial state.
7	No digital input function	Control function when there is no digital input. When the 4 digital inputs (DIN1, DIN2, DIN3 and DIN4) are all in disconnection state: • When None is selected, inverter is in default state. • When Restore inverter default value is selected, inverter recovers active power 100% and the power factor is 1.0.
8	No digital input time(min)	Duration when there is no digital input. Unit: min; range: 5~30; default value: 5, meaning when the 4 digital input (DIN1, DIN2, DIN3 and DIN4) are all in disconnection state for 5 minutes, inverter will recover default state.

Step 2 After the parameter setting, click **Setting** to send the data to Logger.

Step 3 Set the control operations of different switching inputs on the Switch configuration screen.

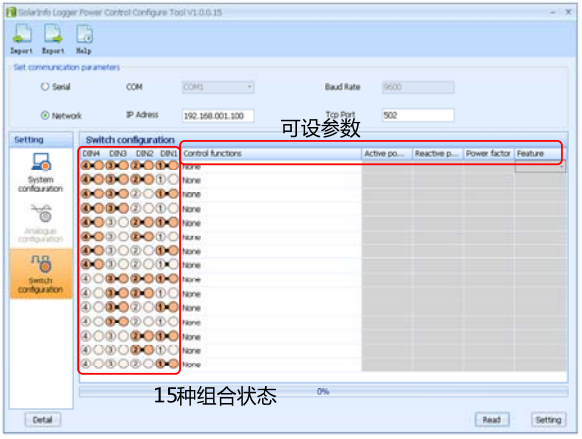


Fig. 9-13 Digital operation screen 2 of Power Control Configure Tool

Switch state includes 15 combinations. Example: node 4 corresponds to DIN4 port of the SolarInfo Logger.

- Node 4 is closed.
- Node 4 is open.

Tab. 9-4 Configuration of switching value parameters

No.	Parameter	Setting description
2	Control functions	Function selection. • 7 functions are available: • Active power control: active power control at this switch input state; • Reactive power control: Reactive power control at this switch input state; • Power factor control: Power factor control at this switch input state; • Open the inverter: Open the inverter control at this switch input state; • Close the inverter: Close the inverter control at this switch input state; • Active power and Reactive power control: Active power and Reactive power control at this switch input state; • Active power and Power factor control: Active power and Power factor control at this switch input state; • None: No control at this switch input state;
3	Active power Percentage	Percentage of input active power control; range: 0~100.0. This parameter cannot be set when Control functions is set to None.
4	Reactive power Percentage	Percentage of input reactive power control; range: 0~100.0. This parameter cannot be set when Control functions is set to None.

No.	Parameter	Setting description
5	Power factor Percentage	Power factor range: 90.0~100.0. This parameter cannot be set when Control functions is set to None.
6	Feature	Can be set to Capacitive or Inductive. This parameter cannot be set when Control functions is set to None.

Step 4 After the parameter setting, click **Setting** to send the data to Logger.

Now all parameters are set and the switching control function can be enabled, i.e. control the inverter power and power factor by changing the state of the 4 switches.

When switch state id changed, SolarInfo Logger can send command to inverter.

"Reactive power" and "Power factor" cannot be controlled at the same time. When "Power Factor Control" is selected and the corresponding switch state is input, inverter power factor can be changed.

However, "Reactive power" can automatically recover to 0. Select "Reactive power control" and input the corresponding switch state, inverter "Reactive power" can be changed to the set value. Yet, "Power factor" will be automatically changed to 1.

NOTICE

When selecting switching control, the switching combination state must change so that the setting is valid.

For example, way to set the DIN4, DIN3, DON2, and DIN1 closed (i.e. set the inverter active power to 90%) is:

Setting will be valid only when the switching combination state is changed to DIN4, DIN3, DON2, and DIN1 are all closed from either state (for example, DIN4, DIN3, DON2, and DIN1 are all open). Now the inverter active power is adjusted to 90%.

Analog control

If the analog control is selected, please complete relevant configuration as per the following steps.

Step 1 Set the system parameters on the System configuration screen.

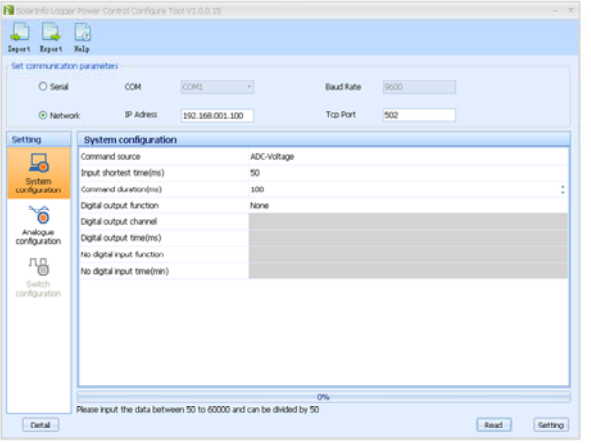


Fig. 9-14 Analog operation screen 1 of Power Control Configure Tool

Tab. 9-5 System parameter configuration

No.	Parameter	Setting description
1	Command source	Control the command source. • Select ADC-Current if controlled by analog current • If controlled by 1-input analog voltage and 1-input analog current, select ADC-Voltage 1 and ADC-Current or ADC-Voltage 2 and ADC-Current 1 according to the analog input port of the SolarInfo Logger.
2	Input shortest time(ms)	Shortest time duration of analog input, unit in ms; Range: 50 ~ 60000 (the valid set value is integral multiple of 50). Default value: 1000. You can either input the digital directly or scroll mouse to adjust. Example: when 1000 is selected, system will respond when it lasts for at least 1000ms (1s). After system response, SolarInfo Logger will send the control command to the inverter communicated. Communication delay is approximately 300ms for each device.
3	Command duration(ms)	Control command delay time duration. This parameter is used to set the communication delay time when a communication fault occurs between SolarInfo Logger and an inverter. Unit in ms; range: 50 ~ 60000 (the valid set value is integral multiple of 50). You can either input the digital directly or scroll mouse to adjust. Example: when 5000 is selected, SolarInfo Logger

No.	Parameter	Setting description
		will attempt to communicate with the inverter in 5000ms (5s) delay time duration when SolarInfo Logger and the inverter has communication fault until the following situations occur: • Communication normal; • 5s time delay is reached; • New control command is sent.
4	Digital output function	Digital output function setting • None: the common port of the 2 output (COM1 and COM2) connects to the normal close port. • Feedback inverter fault: digital output is used as inverter fault feedback. This function needs the cooperation of Digital output channel. • Feedback digital input: reserved function, need no configuration.
5	Digital output channel	Digital output channel selection. Available channels: DO1, DO2, DO3, and DO4. Set this parameter only when the 4th parameter is set to be Feedback inverter fault. Default channel: DO1 channel. Now, only DO1 and DO2 channels are available, DO3 and Do4 are unavailable.
6	Digital output time(ms)	Longest time duration of digital output. Cannot be set.
7	No digital input function	Control function when no digital input. Need not to be set when controlled by analog.
8	No digital input time(min)	Time duration when no digital input. Need not to be set when controlled by analog.

Step 2 After all data setting, click **Setting** to send data to Logger.

Step 3 Configure the analog control on the Analog configuration screen.

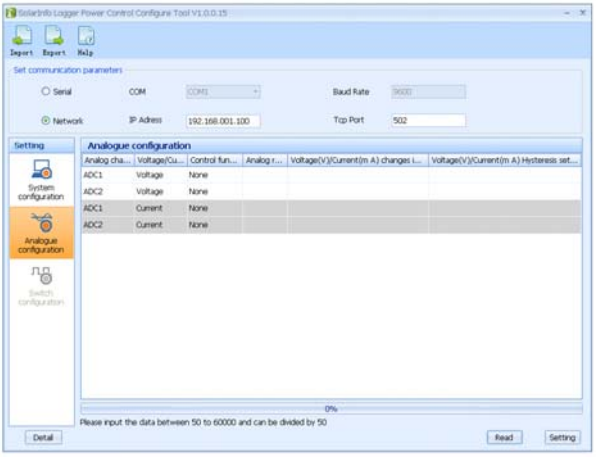


Fig. 9-15 Analog operation screen 2 of Power Control Configure Tool

Tab. 9-6 Configuration of analog parameters

No.	Parameter	Setting description
1	Analog channels	Display two analog input channels, corresponding to ADC1 and ADC2 of SolarInfo Logger.

No.	Parameter	Setting description
2	Voltage/Current	Display the analog type. • If connection ports of SolarInfo Logger is ADC1-V and ADC2-V, and the control command source of the system configuration interface is ADC-Voltage, only voltage-related parameters can be set; • If connection ports of SolarInfo Logger is ADC1-C and ADC2-C, and the control command source of the system configuration interface is ADC-Current, only current-related parameters can be set; • If connection ports of SolarInfo Logger is ADC1-V and ADC2-C, and the control command source of the system configuration interface is ADC-voltage 1 and ADC-Current 2, both current- and voltage-related parameters can be set; • If connection ports of SolarInfo Logger is ADC1-C and ADC2-V, and the control command source of the system configuration interface is ADC-Voltage 2 and ADC-Current 1, both current- and voltage-related parameters can be set;

No.	Parameter	Setting description
3	Control functions	Function selection. 4 functions are available: • None: no control to this analog input; • Active power control: active power control to this analog input; • Reactive power control: reactive power control to this analog input; • Power factor control: power factor control to this analog input. Analog control is defined by the control curve, for details, please refer to Fig. 9-17.
4	Analog range	Display the analog input range. The latest SolarInfo Logger supports 0-10V voltage input range; 4-20mA current input range.
5	Voltage (V) /Current (mA) changes in minimum	Analog minimum fluctuation range. • Voltage fluctuation range: 0.05~1V; default value: 0.05V, i.e. the fluctuation range of analog voltage is 0.05V; only when the difference between input analog voltage and the analog voltage of last time is at least 0.05V, system will respond to this analog voltage input. • Current fluctuation range: 0.2~1mA; default value: 0.2mA, i.e. the fluctuation range of analog current is 0.2mA; only when the difference between input analog current and the analog current of last time is at least 0.2mA, system will respond to this analog current input.

No.	Parameter	Setting description
6	Voltage (V) /Current (mA) Hysteresis setting value	Hysteresis value input range. This parameter is effective only when the analog control function is power factor. Hysteresis value is the hysteresis control when power factor is switched between +1.0 and -1.0. Setting range: voltage 0.2V-1V; current 0.2mA-1mA; Default value: 0.3V voltage, 0.3mA current

Step 4 After the parameter setting, click **Setting** to send the data to Logger.

The analog control ratio is shown in Fig. 9-16

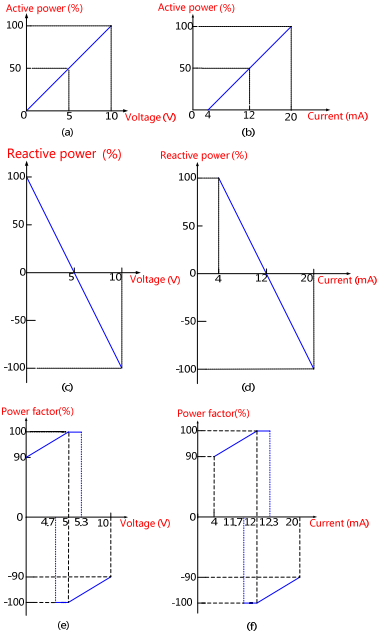


Fig. 9-16 Diagram of analog input control

Fig. 9-16(a): inverter active power ratio can be regulated automatically between 0 to 100% with the precision of ±2% when the analog voltage input is 0-10V.

Fig. 9-16(b): inverter active power ratio can be regulated automatically between 4 to 100% with the precision of ±3% when the analog current input is 4-20mA.

Fig. 9-16(c): inverter reactive power ratio can be regulated automatically between -100% to 100% with the precision of ±3% when the analog voltage input is 0-10V.

Fig. 9-16(d): inverter reactive power ratio can be regulated automatically between -100% to 100% with the precision of ±5% when the analog current input is 4-20mA.

Fig. 9-16(e): inverter power factor can be regulated automatically between 90% to 100% and -90% to -100% with the precision of ±1% when the analog voltage input is 0-10V.

Fig. 9-16(f): inverter power factor can be regulated automatically between 90% to 100% and -90% to -100% with the precision of ±2% when the analog current input is 4-20mA.

As the power factor regulation shown in Fig. 9-16(e) and Fig. 9-16(f), there exist value jumping points at +100% and -100%. The hysteresis algorithm is therefore added to record the analog value of last time. When the current analog value reaches the central point in the lateral axis in the figure, the value of the power factor will not change immediately. It will change when the change of the analog value remains for a certain range.

For example, in Fig. 9-16(e), if the analog voltage of last time is 7.5V, the power factor regulation is done only when the current analog voltage is lower than 4.65V. If the analog voltage is within the range from 5.0V to 4.7V, the power factor will remain at -100%.

So far, all parameter settings are completed. Then you can enable the analog control function to control the generation power and power factor of inverters by changing

the voltage/current of the two inputs. For example, if the parameters as shown in Fig. 9-15are used (input type: voltage), you can change the input voltage of ADC1-V to control the active power of the inverter as per the curve shown in Fig. 9-16(a); you can change the input voltage of ADC2-V to control the reactive power of the inverter as per the curve shown in Fig. 9-16(c). The voltage fluctuation range is 0.05V. If ADC1-V input voltage is 2.50V and ADC2-V input voltage is 7.50V, the inverter active power percentage can be configured as 25% while the reactive power percentage can be configured as -50%.

Combination control of digital and analog

If the combination control of digital and analog is selected, please complete relevant configuration as per the following steps.

Step 1 Set the system parameters on the System configuration screen.

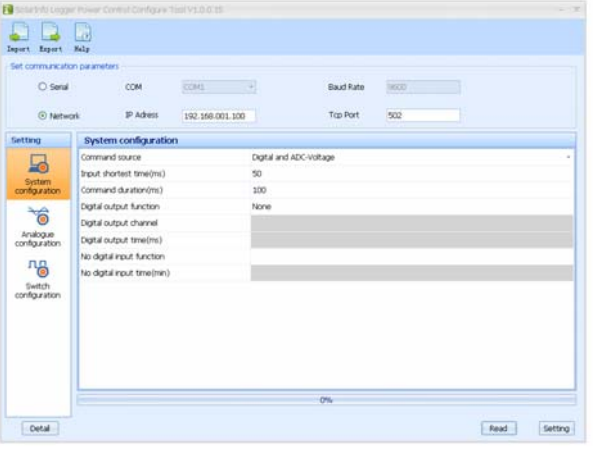


Fig. 9-17 Combination control screen 1 of Power Control Configure Tool

Tab. 9-7 System parameter configuration

No.	Parameter	Setting description
1	Command source	Control command source. • Select Digital and ADC-Voltage if controlled through digital and analog voltage; • Select Digital and ADC-Current if controlled by digital and analog current; • Select Digital and ADC-Voltage 1 and ADC-Current 2 if controlled by analog, ADC-V1, and ADC-C2; • Select Digital and ADC-Voltage 2 and ADC-Current 1 if controlled by analog, ADC-V2 and ADC-C1.
2	Input shortest time(ms)	Shortest time duration of switch input, unit in ms; Range: 50 ~ 60000 (the valid set value is integral multiple of 50). Default value: 1000. You can either input the digital directly or scroll mouse to adjust. Example: when 1000 is selected, system will respond when it lasts for at least 1000ms (1s). After system response, SolarInfo Logger will send the control command to the inverter communicated. Communication delay is approximately 300ms for each device.

No.	Parameter	Setting description
3	Command duration(ms)	Control command delay time duration. This parameter is used to set the communication delay time when a communication fault occurs between SolarInfo Logger and an inverter. Unit in ms; range: 50 ~ 60000; default value: 5000. You can either input the digital directly or scroll mouse to adjust. Example: when 5000 is selected, SolarInfo Logger will attempt to communicate with the inverter in 5000ms (5s) delay time duration when SolarInfo Logger and the inverter has communication fault until the following situations occur: • Communication normal; • 5s time delay is reached; • New control command is sent.
4	Digital output function	Digital output function setting • None: the common port of the 2 output connects to the normal close port. • Feedback inverter fault: digital output is used as inverter fault feedback. • Feedback digital input: reserved function, unavailable.
5	Digital output channel	Digital output channel (DO1 and DO2) selection. Set this parameter only when the 4th parameter is set to be Feedback inverter fault. Default channel: DO1 channel, i.e. DO1 channel is available.

No.	Parameter	Setting description
6	Digital output time(ms)	Longest time duration of Digital output. Unit: ms. Range: 50 ~ 1800000, or Forever; • When Forever is selected, the feedback signal will be output by digital output. This setting is not recommended since it will damage the lifetime of relay; • When 1000 is selected, the digital output will stay at 1000ms (1s) and then recover initial state.
7	No digital input function	Control function when there is no digital input. When the 4 digital inputs (DIN1, DIN2, DIN3 and DIN4) are all in disconnection state: • When None is selected, inverter is in default state (i.e., active power is 100%, power factor is 1.0) • When Restore inverter default value is selected, inverter recovers active power 100% and the power factor is 1.0. This function needs to match with the "No digital input time (min)" configuration.
8	No digital input time(min)	The duration when there is no digital input; unit: min. Range: 5 ~ 30; default value: 5. If 5 is selected, inverter will recover default state when 4 digital inputs (DIN1, DIN2, DIN3 and DIN4) are disconnected for 5 minutes.

Step 2 Click setting to send the data to SolarInfo Logger when the above mentioned parameter configuration is completed.

Step 3 Set the analog control function on the Analog configuration screen.

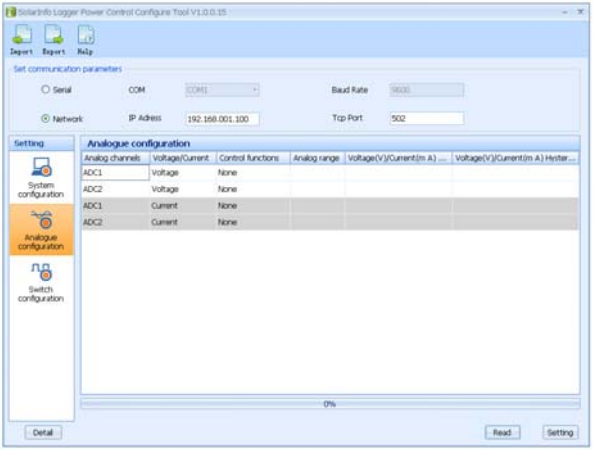


Fig. 9-18 Combination control screen 2 of Power Control Configure Tool

Definitions and values of these parameters are described in Tab. 9-3.

Click Setting to send the data to SolarInfo Logger when the parameters configuration is completed. Refer to Fig. 9-15for the analog control curve.

Step 4 Set the digital control function on the Switch configuration screen.

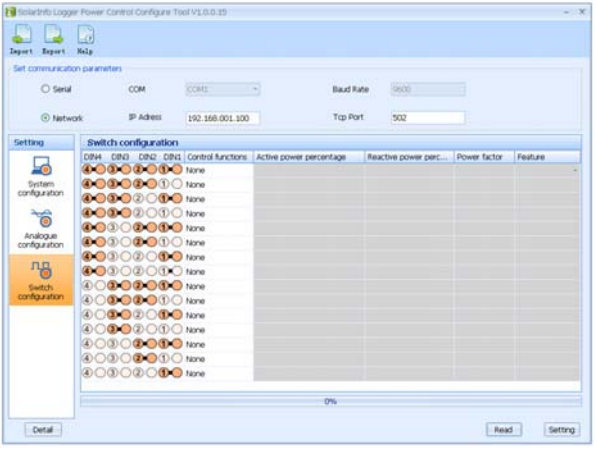
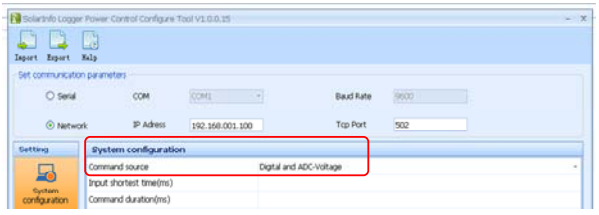


Fig. 9-19 Combination control screen 3 of Power Control Configure Tool

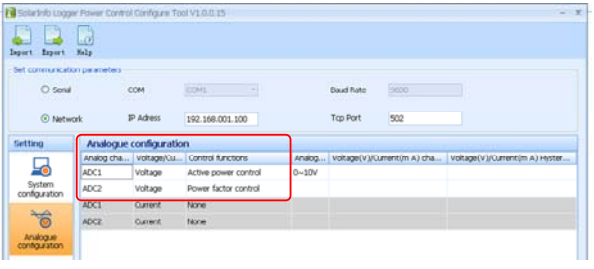
So far, all parameter settings are completed. You can enable the switching value and analog combination control function to control the power and start/stop the inverter via changing the status of the four switches and the analog input value.

For example:

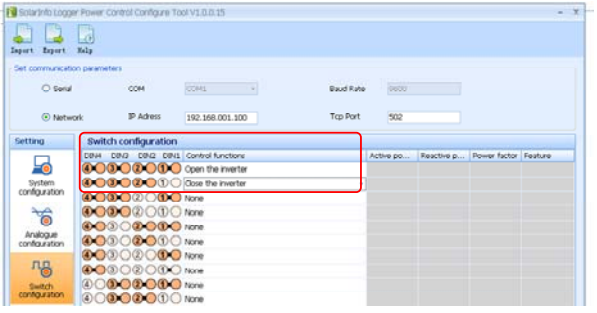
- Command source: Digital and ADC-Voltage;



- Control functions: select Power control for ADC1 and Power factor control for ADC2;



- Digital control functions:
  - Select "Open the inverter" when all the four switches are closed;
  - Select "Close the inverter" when the 1st switch opens and the rest three switches close.



- Voltage of channel ADC1-V, control the active power of the inverter according to the curve in Fig. 9-18(a);
- Voltage of channel ADC2-V, control the power factor of the inverter according to the curve in Fig.9-18(e), power factor fluctuation range: 0.05V.

If input voltage of ADC1-V is 5V, according to Fig.9-18(a), SolarInfo Logger can control 50% of inverter power. If the input voltage of ADC2-V is 7.5V, according to Fig.9-18(e), SolarInfo Logger can control 75% of inverter power

Start the inverter by connecting all the four switches in the digital input mode; stop the inverter by disconnect the first switch and connect the rest three switches in the digital input mode.

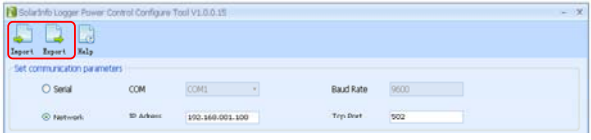
NOTICE

The control function is non-repeatable when SolarInfo Logger adopts the combination control. For example, if the active power percentage is controlled by the analog value, the switching value cannot control the active power percentage and there is no active power percentage option when setting the switching value control function in the SolarInfo Logger Power Control Configure Tool.

Meanwhile, the reactive power percentage and power factor can only be controlled by one of the control methods. If you select the Power factor control and input the corresponding status, the inverter Power factor will change into the set value and the Reactive power will automatically recover to 0; if you select Reactive power control and input the corresponding status, the inverter Reactive power will change into the set value and the Power factor will automatically recover to 1.

9.3.4 Parameter Export/Import

To facilitate the reuse of data, after parameter setting, you can click **Export** on the upper left corner of the parameter setting screen to export the data (in .csv format). You can click **Import** to import the data when the data will be used next time, click **Setting** to send the data to SolarInfo Logger.



10 Data Storage

SolarInfo Logger is designed with SD card port to store the data acquired from the combiner box or the inverter. User can view the data from a PC. This chapter introduces the use of SD card and the data read-out.

10.1 Use of SD Card

SD card slot is located in the lower right side of the SolarInfo Logger as shown in the flowing figure.

Step 1 Push the SD card into the SD card slot slightly.

Step 2 SolarInfo Logger will identify the SD card automatically once it is inserted correctly. SD icon will appear in the LCD main screen.

SolarInfo Logger records the data every 5 minutes after the SD card is inserted.

Delete or cut the logs in the SD card and reinsert the card if use want to change the LCD display language. The language of the SD logs will be the language before change if otherwise. DO NOT plug the SD card when it is under-voltage.

The following icons will appear in the SolarInfo Logger main interface during SD

card use:

SD card not identified	Possible reason: SD card is in poor contact with the slot; reinsert the card	SD card identified	
SD card is recoding data		SD card capacity warning	20% left: 10% left: 5% left: No capacity:

10.2 File Read-out

Proceed as follows to read the SD data by using a card reader:

Step 1 Pop out the SD card and insert it to the card reader.

Step 2 Connect the card reader with the SD card to computer as shown below. Open it in the computer and view information you need.

10.3 File Viewing

The following picture shows the data storage format at the SD card:

"EVENT" records the inverter parameter setting by the SolarInfo Logger, such as control the inverter power, start or stop the inverter via digital

input.

"FAULT" records the device fault information collected by the SolarInfo Logger.

"RUNLOG" records the device running information collected by the SolarInfo Logger.

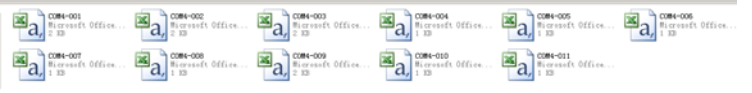
The files are stored in csv format in a four-level-category. Open the files of each category to visit the data of corresponding device in a specific day.

For example: open "FAULT"- "2013"- "201307"-"2030701" to view the fault information of the device on 1st July, 2013.

10.3.1 File Information Introduction

Device Running Information

The device running information is stored in the "RUNLOG" file. It is named as COM4-device address, such as COM-001 (the running information of the device whose address is 1).



SolarInfo Logger can also store the running information of the combiner box, inverter, environment monitoring device, ammeter, etc.. The following example is the running information of the inverter:

	B	C	D	E	F	G	H	I	J
1	Name	Time	E_Day(kWh)	E_Total(kWh)	Run_Total(h)	Temp(℃)	U_DC1(V)	I_DC1(A)	U_DC2(V)
2	SG30KTL	2013-7-5 16:35	123.5	123678	398	41.8	710	12.2	0
3	SG30KTL	2013-7-5 16:40	125.1	123679	398	42.2	711	11.9	0
4	SG30KTL	2013-7-5 16:45	128.6	123682	398	41.9	708	12.6	0

Device Fault Information

The device fault information is stored in the "FAULT" file. It is named as COM4-device

address, such as COM-001 (the fault information of the device whose address is 1).

	A	B	C	D	E	F
1	Addr	Device name	Time	Fault name	Fault type	Fault data
2	1	SG30KTL	2013-7-13 14:53	Vdc-high	0001H	2102H
3	1	SG30KTL	2013-7-13 18:05	Vdc-low	0002H	085FH

The Fault code and Fault data in the table are values defined according to the device communication.

Device Event Record

The "EVENT" file is named as "PWR_CTRL", recording the power control to the inverter. the following table shows the data inside the file.

	A	B	C	D
1	Data	Time	Command source	Event
2	2013-7-1	15:00:02	Din: 0001B	P: 95.8%
3	2013-7-1	18:05:08	Din: 1001B	P: 0.0%
4	2013-7-2	10:25:16	Din: 1101B	Q: 50.0%
5	2013-7-2	13:08:30	ADC1-V: 7.500V	P: 75.0%
6	2013-7-2	16:22:36	ADC2-V 2.500V	PF: 0.925

Tab. 10-1 Explanation of the command source

Command source	Explanation	Command source	Explanation
Din	On-off input, corresponds to the on-off input of the SolarInfo Logger and records the on-off input status. 0: on; 1: off. Example: 0001B means DIN4, DIN3 and DIN2 are on, while DIN1 is off	ADC2-C	Analog value ADC current input corresponds to ADC2-C input of the SolarInfo Logger and records the input analog current
ADC1-V	Analog value ADC voltage input corresponds to ADC2-C input of the SolarInfo Logger and	NET	Network input corresponds to the network port of the

Command source	Explanation	Command source	Explanation
	records the input analog voltage		SolarInfo Logger and records the input IP address.
ADC2-V	Analog value ADC voltage input corresponds to ADC1-V input of the SolarInfo Logger and records the input analog voltage	RS485	RS485 input corresponds to the RS485 of the SolarInfo Logger and records the input port no.: A4B4, A3B3, and A2B2
ADC1-C	Analog value ADC current input corresponds to ADC1-V input of the SolarInfo Logger and records the input analog current	RS232	RS232 input corresponds to the RS232 of the SolarInfo Logger

Event includes the power limitation setting, reactive power setting, power factor setting, start setting, and stop setting.

Whereas, P is the power limitation setting. P: 95.8% means that the active power output is 95.8% of the nominal active power.

Q is the reactive power setting. Q: 50.0 means that the reactive power is 50.0% of the nominal reactive power.

PF: power factor setting. PF: 0.925 means that the power factor is set to be 0.925.

11 Communication Function

This chapter introduces the communication between the background and the SolarInfo Logger. The communication via serial port can also refer to this chapter.

Operators described in this chapter should be familiar with electrical and communication knowledge.

11.1 Checking before Communication

- Check if the cable connections are correct according to Chapter 5.3.
- Check if the net setting of the SolarInfo Logger and background is correct.

11.2 Communication Process

When internet port communication is selected, the port of the SolarInfo Logger is a TCP/IP gateway. The background reads the data of the device connected in turn based on the address and protocol of the device collected by the SolarInfo Logger. Protocol format is the standard Modbus TCP. See the following figure.

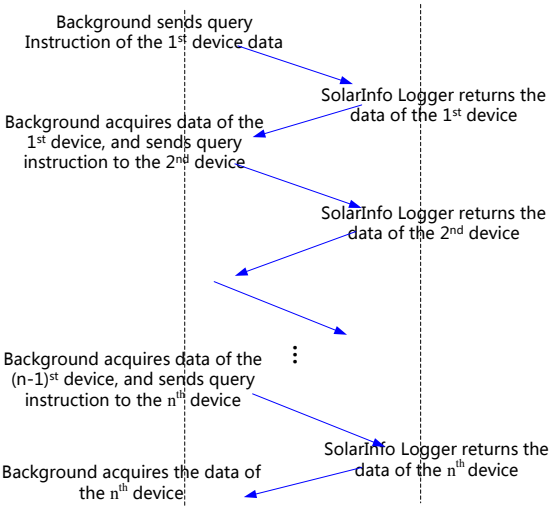


Fig. 11-1 Query logic of the background data

For example, the A4B4 port of the SolarInfo Logger connects to two PV grid-connected inverters, 8 combiner boxes and 1 environmental monitoring device. A3B3 port connects to 1 ammeter.

The default IP address of the SolarInfo Logger is 192.168.1.100 (actual address is configured by users) and the default Modbus TCP port number is 502. Devices' address numbers are:

- Inverter: 1 -2;
- Combiner box 3 -10;
- Environmental monitoring device 11;
- Ammeter 12.

Background can inquire the data of device 1 to 12 in turn according to the device communication protocol.

SolarInfo Logger reads and stores the device data and then the background can

read the data from the SolarInfo Logger. Take PV grid-connected inverter protocol for example, the inquiry of the inverter 1 to 2 data is as follows:

11.3 Read Inverter Running Information

Background reads the running data of inverter number 1 and number 2 via the Logger internet port. The address type is 3X, read register address range: 5000 – 5047. At this time, background is the client (TCP client), Logger is a server (TCP server), then:

For Inverter number 1,

TCP Client sends data:

01 01 00 00 00 **06** 01 **04 13 87 00 30**

TCP Server returns data:

01 01 00 00 00 63 01 04 60 00 27 01 2C 00 01 04 D3 E3 1E 00 01 01 3E 00 00 01 A2 01 B0 01 BA 19 64 00 70 17 84 00 80 19 69 00 70 AE 78 00 01 00 DD 00 E7 00 DA 04 B0 04 6A 04 A6 00 00 00 00 00 00 00 00 00 00 00 00 00 8A 9F 00 01 06 35 00 00 03 DE 01 F6 03 E6 00 00 07 DD 00 05 00 0B 00 0E 00 03 00 06 00 00 00 00 00 00

For inverter number 2,

TCP Client sends data:

01 01 00 00 00 **06** 02 **04 13 87 00 30**

TCP Server returns data:

01 01 00 00 00 63 02 04 60 00 27 01 2C 00 01 04 D3 E3 1E 00 01 01 3E 00 00 01 A2 01 B0 01 BA 19 64 00 70 17 84 00 80 19 69 00 70 AE 78 00 01 00 DD 00 E7 00 DA 04 B0 04 6A 04 A6 00 00 00 00 00 00 00 00 00 00 00 00 00 8A 9F 00 01 06 35 00 00 03 DE 01 F6 03 E6 00 00 07 DD 00 05 00 0B 00 0E 00 03 00 06 00 00 00 00 00 00

About the data sending and receiving in this chapter: underline is the FH of Modbus TCP, the first 5 bytes are 01 01 00 00 00, and the sixth byte is the length of the data frame after that data.

Explanation of 01 04 13 87 00 30 sent by TCP client:

Data	Definition	Length	Note
0x01	Device address	1 byte	Communication address of the actual device
0x04	Function code	1 byte	Modbus function code to read the running information
0x13 0x87	Start register	2 bytes	0x1387 = 4999, visit the data from register 4999. Note that the address here is 1 smaller than that in the protocol which is 5000.
0x00 0x30	Read the registers	2 bytes	Read continually the data stored in the 48 registers.

TCP Server: explanation of the return data

Data	Definition	Length	Note
0x01	Device address	1 byte	Communication address of the actual device
0x04	Function code	1 byte	Modbus function code to read the running information
0x60	Data length	1 byte	96 bytes of the data behind this data frame
0x00 0x27	Device type code	2 bytes	Inverter SG30KTL
0x012C	Nominal output	2 bytes	0x12C = 300, according to the protocol definition, it is 30.0kW

	power		
0x00 0x01	Output type	2 bytes	According to the protocol, it is 3P4L
0x04 0xD3	Daily power yields	2 bytes	According to the protocol, it is 123.5KWh
0xE3 0x1E 0x00 0x01	Total power yields	4 bytes	According to the protocol, it is 123678KWh. Note that for U32 data, the sequence of byte is 2143, data needs to re-splitting to 0x0001E31E = 123678
0x01 0x3E 0x00 0x00	Total runtime	4 bytes	According to the protocol, it is 318h. Note that for U32 data, the sequence of byte is 2143, data needs to re-splitting to 0x0000013E = 318
0x01 0xA2	Internal temperature	2 bytes	According to the protocol, it is 41.8℃
0x01 0xB0	Reserved	2 bytes	According to the protocol, this data is invalid

Please refer to communication protocol definition for the analysis of other data.

11.4 Read Inverter Data Setting Information

Read the data of inverter 1 and 2 via the SolarInfo Logger internet port. The address type is 4X, read register address range: 5000 – 5008

For inverter 1,

TCP Client sends data:

01 01 00 00 00 **06** 01 **03 13 87 00 09**

TCP Server returns data:

01 01 00 00 00 **15** 01 03 12 07 DD 00 05 00 1D 00 0A 00 08 00 15 00 CF 00 AA 03 E8

For inverter 2,

TCP Client sends data:

01 01 00 00 00 **06** 02 **03 13 87 00 09**

TCP Server returns data:

01 01 00 00 00 **15** 02 03 12 07 DD 00 05 00 1D 00 0A 00 08 00 15 00 CF 00 AA 03 C8

For inverter 1, explanation of 01 03 13 87 00 09 sent by TCP client:

Data	Definition	Length	Note
0x01	Device address	1 byte	Communication address of the actual device
0x03	Function code	1 byte	Modbus function code to read the setting information
0x13 0x87	Start register	2 bytes	0x1387 = 4999, visit the data from register 4999. Note that the address here is 1 smaller than that in the protocol which is 5000.
0x00 0x09	Read the registers	2 bytes	Read continually the data stored in the 9 registers.

TCP Server: explanation of the return data

Data	Definition	Length	Note
0x01	Device address	1 byte	Communication address of the actual device

Data	Definition	Length	Note
0x03	Function code	1 byte	Modbus function code to read the setting information
0x12	Data length	1 byte	18 bytes of the data behind this data frame
0x07 0xDD	Year	2 bytes	According to the protocol, it is year 2013
0x00 0x05	Month	2 bytes	According to the protocol, it is May
0x00 0x1D	Day	2 bytes	According to the protocol, it is 29th
0x00 0x0A	Hour	2 bytes	According to the protocol, it is 10 o'clock
0x00 0x08	Minute	2 bytes	According to the protocol, it is 8 minute
0x00 0x15	Second	2 bytes	According to the protocol, it is 21 second
0x00 0xCF	Start/stop	2 bytes	According to the protocol, it is in the start state
0x00 0xAA	Power limitation setting enable	2 bytes	According to the protocol, the power limitation is enabled
0x03 0xE8	Power limitation data	2 bytes	According to the protocol, the present power limitation data is 100.0%

11.5 Setting Inverter Parameter

Set the parameter of inverter number 1 and number 2 via the Logger internet port. The address type is 4X,

For example, set the time for inverter number 1 to 2013-5-29 08:00:00, and power for inverter number 2 to 60.0% (convert to 4-digital decimal digital: 0258), then

For inverter number 1,

TCP Client: 01 01 00 00 00 **13** 01 10 13 87 00 06 0C 07 DD 00 05 00 1D 00 08 00 00 00 00

TCP Server:01 01 00 00 00 **06** 01 **10 13 87 00 06**

For inverter number 2,

TCP Client: 01 01 00 00 00 0B 0210 13 8E 00 02 04 00 AA 02 58

TCP Server:01 01 00 00 00 **06** 02**10 13 8E 00 02**

For inverter number 1, TCP Client: explanation of the data frame length

Data	Definition	Length	Note
0x01	Device address	1 byte	Communication address of the actual device
0x10	Function code	1 byte	Modbus function code, can set several parameters continuously
0x13 0x87	Start register	2 bytes	0x1387 = 4999, visit the data from register 4999. Note that the address here is 1 smaller than that in the protocol which is 5000.
0x00 0x06	Set the registers	2 bytes	Set continually the data stored in the 6 registers.
0x0C	Valid data length	1 byte	There are 12-byte data after this data
0x07 0xDD	Year	2 bytes	According to the protocol, it is year 2013
0x00 0x05	Month	2 bytes	According to the protocol, it is May
0x00 0x1D	Day	2 bytes	According to the protocol, it is 29th
0x00 0x08	Hour	2 bytes	According to the protocol, it is 8

Data	Definition	Length	Note
			o'clock
0x00 0x00	Minute	2 bytes	According to the protocol, it is 0 minute
0x00 0x00	Second	2 bytes	According to the protocol, it is 0 second

If the time setting succeeds, TCP Sever: explanation of the return data:

Data	Definition	Length	Note
0x01	Device address	1 byte	Communication address of the actual device
0x10	Function code	1 byte	Modbus function code, can set several parameters continuously
0x13 0x87	Start register	2 bytes	0x1387 = 4999, visit the data from register 4999. Note that the address here is 1 smaller than that in the protocol which is 5000.
0x00 0x06	Set the registers	2 bytes	Set continually the data stored in the 6 registers.

For inverter number 2, TCP Client: explanation of the data frame length

Data	Definition	Length	Note
0x02	Device address	1 byte	Communication address of the actual device
0x10	Function code	1 byte	Modbus function code, can set several parameters continuously
0x13 0x8E	Start register	2 bytes	0x138E = 5006, visit the data from

			register 5006. Note that the address here is 1 smaller than that in the protocol which is 5007.
0x00 0x02	Set the registers	2 bytes	Set continually the data stored in the 2 registers.
0x04	Valid data length	1 byte	There are 4-byte data after this data
0x00 0xAA	Power limitation setting enable	2 bytes	According to the protocol, the power limitation is enabled
0x02 0x58	Power limitation data	2 bytes	According to the protocol, the present power limitation data is 60.0%

If the power limitation setting succeeds, TCP Sever: explanation of the return data:

Data	Definition	Length	Note
0x02	Device address	1 byte	Communication address of the actual device
0x10	Function code	1 byte	Modbus function code, can set several parameters continuously
0x13 0x8E	Start register	2 bytes	0x138E = 5006, visit the data from register 5006. Note that the address here is 1 smaller than that in the protocol which is 5007.
0x00 0x02	Set the registers	2 bytes	Set continually the data stored in the 2 registers.

11.6 Inverter Power Control

Example:

- Set the active power of inverter number 1 to 98.5% (convert to 4-digital decimal digital: 03D9).
- Set the reactive power of inverter number 2 to 60.0% (convert to 4-digital decimal digital: 0258). Then:

For inverter number 1

TCP Client: 01 01 00 00 00 0B 01 1013 8E 00 02 04 00 AA 03 D9

TCP Server:01 01 00 00 00 **06** 01 **10 13 8E 00 02**

For inverter number 2

TCP Client: 01 01 00 00 00 **0B** 02 **10 13 AB 00 02 04 00 A2 02 58**

TCP Server:01 01 00 00 00 **06** 02**10 13 AB 00 02**

For inverter 1, TCP Client: explanation of the return data

Data	Definition	Length	Note
0x01	Device address	1 byte	Communication address of the actual device
0x10	Function code	1 byte	Modbus function code, can set several parameters continuously
0x13 0x8E	Start register	2 bytes	0x138E = 5006, visit the data from register 5006. Note that the address here is 1 smaller than that in the protocol which is 5007.
0x00 0x02	Set the registers	2 bytes	Set continually the data stored in the 2 registers.
0x04	Valid data	1 byte	There are 4-byte data after this data

Data	Definition	Length	Note
	length		
0x00 0xAA	Power limitation setting enable	2 bytes	According to the protocol, the power limitation is enabled
0x03 0xD9	Power limitation data	2 bytes	According to the protocol, the present power limitation data is 98.5%

If the active power setting succeeds, TCP Sever: explanation of the return data:

Data	Definition	Length	Note
0x01	Device address	1 byte	Communication address of the actual device
0x10	Function code	1 byte	Modbus function code, can set several parameters continuously
0x13 0x8E	Start register	2 bytes	0x138E = 5006, visit the data from register 5006. Note that the address here is 1 smaller than that in the protocol which is 5007.
0x00 0x02	Set the registers	2 bytes	Set continually the data stored in the 2 registers.

For inverter number 2, TCP Client: explanation of the data frame

Data	Definition	Length	Note
0x02	Device address	1 byte	Communication address of the actual device
0x10	Function code	1 byte	Modbus function code, can set several parameters continuously
0x13 0xAB	Start register	2 bytes	0x13AB =5035, visit the data from register 5035. Note that the address here is 1 smaller than that in the protocol which is 5036.
0x00 0x02	Set the registers	2 bytes	Set continually the data stored in the 2 registers.
0x04	Valid data length	1 byte	There are 4-byte data after this data
0x00 0xA2	Reactive Power adjustment setting	2 bytes	According to the protocol, the reactive power adjustment is enabled
0x02 0x58	Reactive Power limitation data	2 bytes	According to the protocol, the reactive power is 60.0%

If the reactive power percentage setting succeeds, TCP Sever: explanation of the return data:

Data	Definition	Length	Note
0x02	Device address	1 byte	Communication address of the actual device
0x10	Function code	1 byte	Modbus function code, can set several parameters continuously
0x13	Start register	2 bytes	0x13AB =5035, visit the data from register 5035.

0xAB			Note that the address here is 1 smaller than that in the protocol which is 5036.
0x00 0x02	Set the registers	2 bytes	Set continually the data stored in the 2 registers.

For example: set the active power of inverter No. 1 and No. 2 to 98.5% at the same time,

TCP Client: 01 01 00 00 00 0B 00 10 13 8E 00 02 04 00 AA 03 D9

Data	Definition	Length	Note
0x00	Device address	1 byte	0x00 is broadcast, set all inverters connected to the SolarInfo Logger
0x10	Function code	1 byte	Modbus function code, can set several parameters continuously
0x13 0x8E	Start register	2 bytes	0x138E = 5006, visit the data from register 5006. Note that the address here is 1 smaller than that in the protocol which is 5007
0x00 0x02	Set the registers	2 bytes	Set continually the data stored in the 2 registers.
0x00 0xAA	Power limitation setting enable	2 bytes	According to the protocol, the power limitation is allowed
0x03 0xD9	Power limitation data	2 bytes	According to the protocol, the present power limitation data is 98.5%

For example: set the active power of inverter No. 1 and No. 2 to -50.0% at the same time,

TCP Client: 01 01 00 00 00 0B 00 10 13 AB 00 02 04 00 A2 FE 0C

Data	Definition	Length	Note
0x00	Device address	1 byte	0x00 is broadcast, set all inverters connected to the SolarInfo Logger
0x10	Function code	1 byte	Modbus function code, can set several parameters continuously
0x13 0xAB	Start register	2 bytes	0x13AB =5035, visit the data from register 5035. Note that the address here is 1 smaller than that in the protocol which is 5036
0x00 0x02	Set the registers	2 bytes	Set continually the data stored in the 2 registers.
0x00 0xA2	Reactive Power adjustment setting	2 bytes	According to the protocol, the reactive power adjustment is enabled
0xFE 0x0C	Power limitation data	2 bytes	According to the protocol, the present reactive power is -50.0% (this data is signed integer, 0xFE0C is converted to be -500)

For example: start and stop the inverter No. 1 and No. 2 at the same time,

Start: TCP Client: 01 01 00 00 00 **06** 00 **06 13 8D 00 CF**

Stop: TCP Client: 01 01 00 00 00 **06** 00 **06 13 8D 00 CE**

Data	Definition	Length	Note
0x00	Device address	1 byte	0x00 is broadcast, set all inverters connected to the SolarInfo Logger
0x06	Function code	1 byte	Modbus function code, can set one register
0x13 0x8D	Start	2 bytes	0x138D = 5005, visit the data from register

	register		5005. Note that the address here is 1 smaller than that in the protocol which is 5006
0x00 0xCF/0xCE	Start/Stop data	2 bytes	Control inverter start/stop: 0xCF is start; 0xCE is stop

11.7 Checking Inverter Running State

For Inverter No. 1

TCP Client: 01 01 00 00 00 **06** 01 **0413 AD 00 01**

TCP Server:01 01 00 00 00 **05** 01 **04 02 00 00**

For Inverter No. 2

TCP Client: 01 01 00 00 00 **06** 02 **0413 AD 00 01**

TCP Server: 01 01 00 00 00 **05** 02 **04 02 82 00**

Data	Definition	Length	Note
0x01/0x02	Device address	1 byte	Communication address of the actual device
0x04	Function code	1 byte	Modbus function code, read inverter running information
0x13 0xAD	Start register	2 bytes	0x13AD = 5037, visit the data from register 5037. Note that the address here is 1 smaller than that in the protocol which is 5038
0x00 0x01	Read the registers	2 bytes	Read continually the data stored in 1 register.

TCP Server: explanation of the data frame

Data	Definition	Length	Note
0x01 / 0x02	Device address	1 byte	Communication address of the actual device
0x04	Function code	1 byte	Modbus function code, read inverter running information
0x02	Data length	1 byte	Length of the data behind this data frame
0x00 0x00 / 0x82 0x00	设备运行状态 Device running state	2 bytes	According to the protocol, state of inverter no. 1 is running State of inverter no. 2 is dispatch running

NOTICE

- **Background reads the data of the read-only register with address type of 3X through the internet port (the supported function code is 0x04). Logger is used to return the pre-collected data to the background. The communication speed is as fast as 200ms. Background is recommended to operate the 3X register data at 500ms or longer.**
- **If background reads or sets the 4X read-and-write register (supported function codes are 0x03, 0x06, and 0x10) via the internet port, Logger needs to send the background data collected by the internet port to the devices. Once the device returns data, Logger can then transfer the data back to the background. The communication speed is comparatively slow (max. 500ms). Background is recommended to operate the 4X register data at 1s or longer.**

Read via Serial Port

At this time, Logger is a concentrator. Background reads the data of the devices

connected to the Logger in turn according to the device address and protocol. Read communication action and logic the same way as the internet port. The communication protocol is Modbus RTU.

Please note that if background operates the 3X register, the communication speed can be as fast as 350ms. Background is recommended to operate the 3X register data at 500ms or longer; if background operates the 4X register, the communication speed is comparatively slow (max. 500ms). Background is recommended to operate the 4X register data at 1s or longer.

12 Appendix

12.1 Technical Data

Communication	
Inverter communication	RS485*1
PC communication	10/100Mbit Ethernet/RS232/RS485
Wireless module (optional)	Zigbee (2.4GHz) (optional)
Max. number of devices	
RS485 port	30 (inverter, PV combiner box and etc.)
Max. communication range	
RS485/Ethernet	1,200m/100m
RF in the open area	100m
Power supply	
Power supply	External plug-in power supply
Input voltage	120V-240V, 50/60Hz
Power consumption	Typ.3W/max.10W
Environment conditions in operation	
Ambient temperature	-20℃ ~ 60 ℃
Relative humidity	5~95% without condensation
Memory	
Internal	4 MB in a ring memory configuration
External	Micro SD card 128M/512M/1GB/2GB (optional)
General data	
Dimensions without terminals (W x H x D)	205*132*38 mm
Dimensions with terminals (W x H x D)	205*142*38 mm
Weight	0.55kg
Mounting location	Indoors
Installation options	DIN rail installation, wall mounting, tabletop device
Status display	LCD & LED
Language	English, German, Italian, Chinese
Accessories	
Micro SD card	Optional
Outdoor RF antenna	Optional
Wireless module(Zigbee)	Optional

12.2 Exclusion of Liability

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- Install or operate the product in unintended environment
- Install or operate the product without observing relevant safety regulations in the deployment location
- Ignore the safety warnings or instructions contained in all documents relevant to the product
- Install or operate the product under incorrect safety or protection conditions
- Alter the product or supplied software without authority
- Product malfunctions due to operation attached or neighboring devices running out of the allowed limit values
- Unforeseen calamity or force majeure

The use of supplied software produced by Sungrow Power Supply Co., Ltd.. is subject to the following conditions:

- Sungrow Power Supply Co., Ltd. assumes no liability for direct or indirect damages arising from the use of SolarInfo software. This also applies to the provision or non-provision of support activities.
- SolarInfo software used for commercial purposes is prohibited.
- Decompiling, decoding or destroying the original program, including SolarInfo software and the embedded software, is prohibited.

12.3 About Us

Sungrow power supply is a China-leading manufacturer of various power electronics products for renewable energy generation systems. Our products include converters, inverters, battery chargers and other power supplies for distributable generation system in both grid-connected and stand-alone applications. The power rating of Sungrow products covers from several hundred watt to large mega-watt systems.

The pursuit of Sungrow is to help our customers acquire stable and clean power with minimum cost, maximum reliability and enhanced safety.

12.4 Contact Information

Should you have any questions or queries about this product, please contact us through the following information. We will be more than happy to assist you!

Company:	Sungrow Power Supply Co., Ltd.
Website:	www.sungrowpower.com
Email:	info@sungrow.cn; service@sungrow.cn.
Address:	No.1699 Xiyou Rd.,New & High Technology Industrial Development Zone, 230088,Hefei, P. R. China
Zip:	230088
Telephone:	+86 551 6532 7834, +86 551 6532 7845
Fax:	+86 551 6532 7856

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Sungrow Power Supply Co., Ltd.

Add: No.1699 Xiyou Rd.,New & High Technology Industrial Development Zone, 230088,Hefei, P. R. China.
Post Zip: 230088
Web: www.sungrowpower.com
E-mail: info@sungrow.cn
Tel: +86 551 6532 7834/6532 7845
Fax: +86 551 6532 7856