SUNGROW
Clean power for all

Operation Manual

1+X Modular Inverter

String Diagnosis

Contents

1 System Introduction

The diagram of the string diagnosis system is shown as follows:

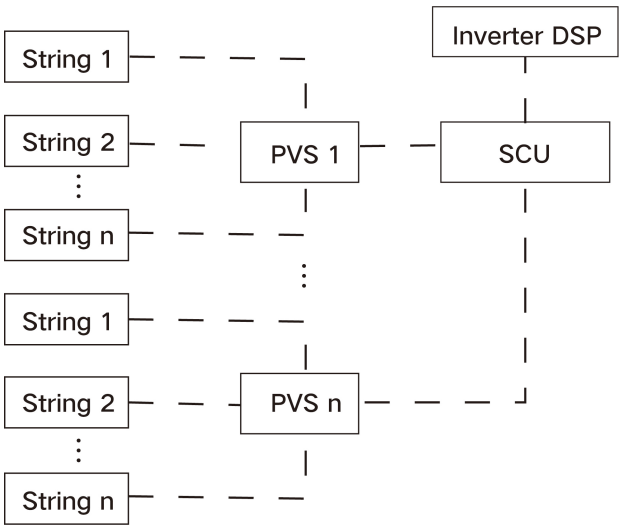


figure 1-1 String Diagnosis System Diagram

Product	Function
PVS	Collect IV data and report it to SCU.
Inverter DSP	Perform IV scanning and voltage regulation accordingly upon receiving command from SCU.
SCU	Synchronize data interaction between inverter DSP and PVS, and read real-time information. Perform smart string diagnosis based on the IV data uploaded by PVS, and present the diagnosis result and report on the web interface.

NOTICE

- **String diagnosis is available only for 1+X series inverters.**
- **The use of Y-type PV connectors in the connection between the module and the inverter is not supported.**

2 Operating Environment Requirements

Prerequisites for use

- Weather conditions: Sunny and cloudless days, with solar irradiance ≥500W/m^2.
- Recommended time for diagnosis: 10:00-14:00.
- The precondition for test-retest consistency is that the retest should be conducted within 30 minutes after the first test. In the case of two tests performed at an interval of over 30 minutes, since the solar irradiance and incident angle will change over this period of time, the actual IV curve may also change, thus affecting the consistency of the diagnosis results.

Software version requirements

Before deploying the string diagnosis system, make sure the PVS, DSP, and SCU software versions meet the corresponding requirements in the tables below.

Software versions required to enable RS485 wired/DC PLC communication between PVS and SCU are listed respectively as follows:

table 2-1 Support RS485 wired communication only

Software	Version
PVS software	PVS_24MH_V03_V03_C or later
DSP software	Host DSP: MDSP_OPAL-C_V1_B.sgu or later
	Client DSP: SDSP_OPAL-C_V1_B.sgu or later
SCU software	SCU-SV100.001.00.P000B001.zip or later

table 2-2 Support RS485 wired communication and DC PLC communication

Software	Version
PVS software	PVS_24MH_V03_V03_E or later
DSP software	Host DSP: MDSP_OPAL-C_V1_J.sgu or later
	Client DSP: SDSP_OPAL-C_V1_J.sgu or later
SCU software	SCU-SV100.001.00.P012B000.zip or later

NOTICE

- **Please use SUNGROW PVS.**
- **RS485 wired communication and DC PLC communication should not be adopted together for PVS communication in the same system.**
- **The DSP software and SCU software should be upgraded together to matching versions so that they can work normally.**

3 Login Steps

3.1 Login (PC)

Step 1 Connect the PC to the debugging network port with a network cable.

Step 2 Configure the IP address of the PC. Set the IP address of the PC to the same network segment as the NET address of the smart unit board.

> Default IP address of the “NET1” port: 12.12.12.12.
>
> Default IP address of the “NET2” port: 14.14.14.14.

Step 3 Enter the IP address of NET1 or NET2 port. You will then enter the homepage as a visitor by default.

Step 4 Click  in the upper right corner of the page to select your preferred language.

Step 5 Click  to enter the login page.

Step 6 Enter the default password: **pw1111**, and click **Login** to enter the page as an O&M User.

> To keep your information safe, please change the password at your first login.

- - End

3.2 Login (Mobile)

Step 1 Enable WLAN on the mobile device (e.g., a mobile phone). Then, search for the hotspot, such as SG-xxx (xxx represents the device SN), and enter the password: **ESPWifi@123**.

Step 2 Open a browser on the phone, and enter the address (11.11.11.1) or domain (sungrow.net) to access the WEB interface. You will then enter the homepage as a visitor by default.

Step 3 Click  in the upper right corner of the page to select your preferred language.

Step 4 Click  to enter the login page.

Step 5 Enter the default password: **pw1111**, and click **Login** to enter the page as an O&M User.

> To keep your information safe, please change the password at your first login.

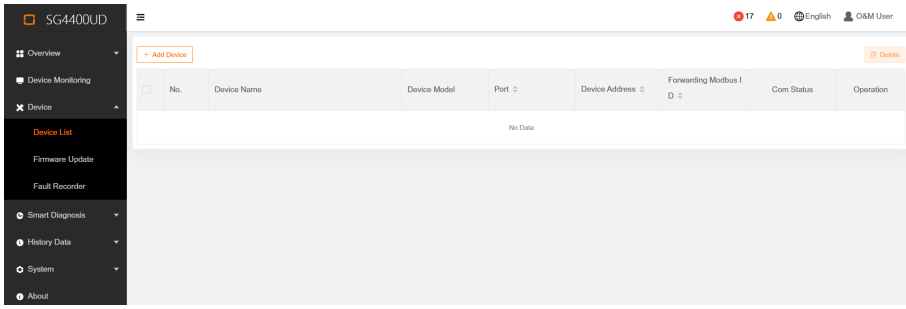
- - End

4 WEB Configuration

4.1 Add PVS

Step 1 Click "**Device→Device List**" on the navigation bar.

Step 2 Click **Add Device** on the **Device List** page.



NOTICE

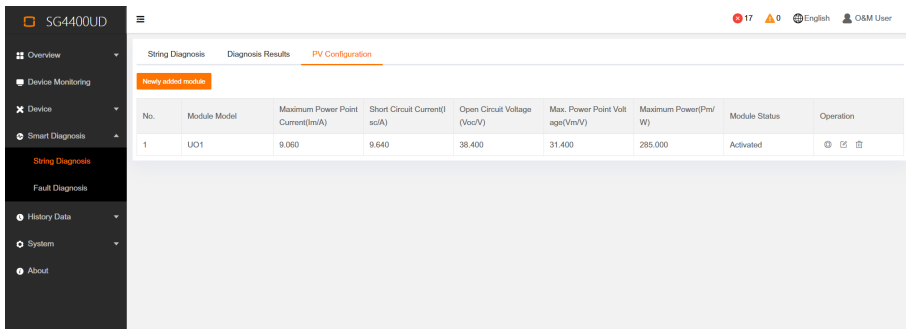
- **The string diagnosis feature can be used only after the PVS supporting RS485 wired communication or DC PLC communication is added.**
- **RS485 wired communication and DC PLC communication should not be adopted together for PVS communication in the same system.**
- **Before construction, please record the location of the inverter unit to which the PVS is connected, and match the actual location with the device address shown on the web interface. In this way, after the diagnosis is completed, you can find the string connected to the PVS easily according to the diagnosis results.**

- - End

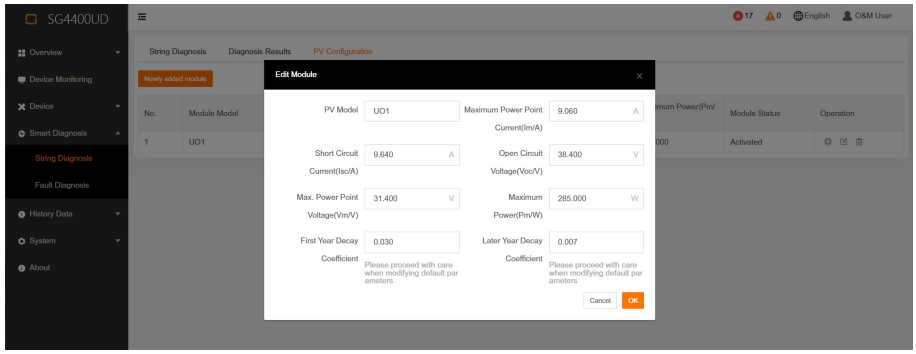
4.2 Add/Edit Module

Step 1 Click "**Smart Diagnosis→String Diagnosis**" on the navigation bar.

Step 2 Choose **PV configuration** on the right side of this page.



Step 3 Click **Newly added module** or edit the parameters of the default modules (2 by default) on the **PV configuration** page.



Step 4 Click  after completing the configuration of module parameters.

Currently, string diagnosis can only be enabled for the system consisting of modules of the same type.

NOTICE

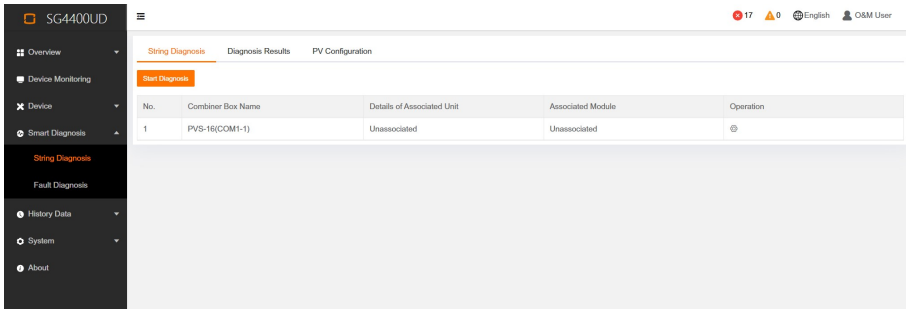
Please complete the configuration in compliance with the actual parameters of PV modules in the plants.

- - End

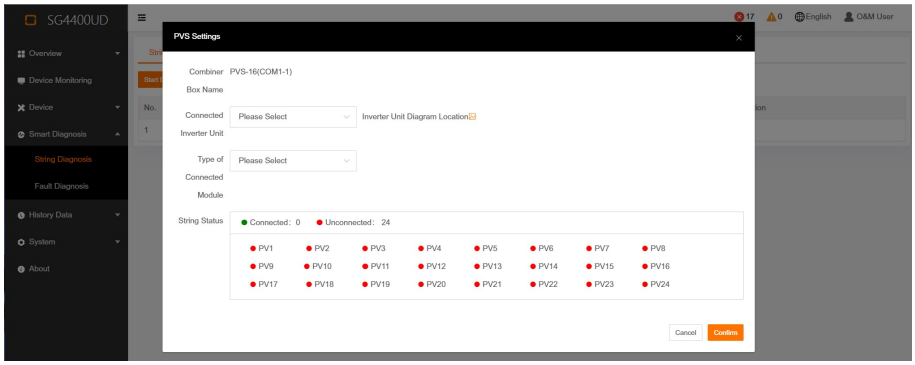
4.3 Set Associated Inverter Unit and Modules

Step 1 Click "**Smart Diagnosis→String Diagnosis**" on the navigation bar.

Step 2 Click **Operation** on the **String Diagnosis** tab page.



Step 3 Set the associated inverter unit and modules of the PVS on the **PVS Settings** window.



Step 4 Click **Start Diagnosis** on the **String Diagnosis** page.

- The PVS is not associated with any inverter unit or module by default.
- The PVS can only be associated with modules that are enabled.
- In the event of low irradiance or irradiance changing greatly, click **Start Diagnosis**, there will be a prompt about whether to continue diagnosis on the page.
- Once the diagnosis is started, the **String Diagnosis** page will be locked, in case module parameters or other parameters are modified by mistake during the diagnosis process. You may still perform actions on other pages.
- If the diagnosis is started when the system operates in limited power mode, there will be a temporary increase in dispatch power.

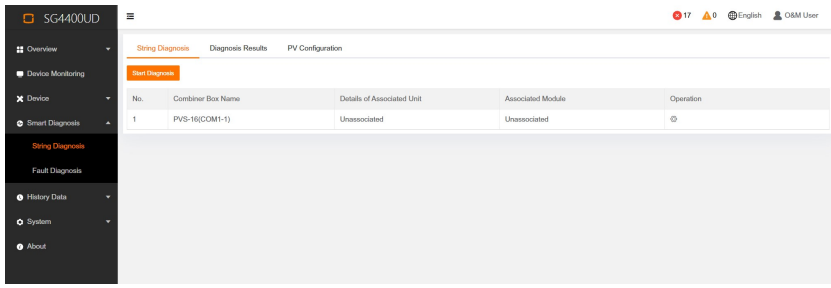
NOTICE

- **The diagnosis cannot be started with power dispatch in process in the background. Please stop the power dispatch first, and then start the diagnosis.**
- **PVS associated with the same inverter unit should be connected to the same COM port.**
- **During plant construction, please check whether relevant settings have been completed correctly according to the string status shown on the PVS Settings window.**
- **During the PVS deployment on site, be sure to mark respectively the strings connected and the strings unconnected, as well as the string current.**

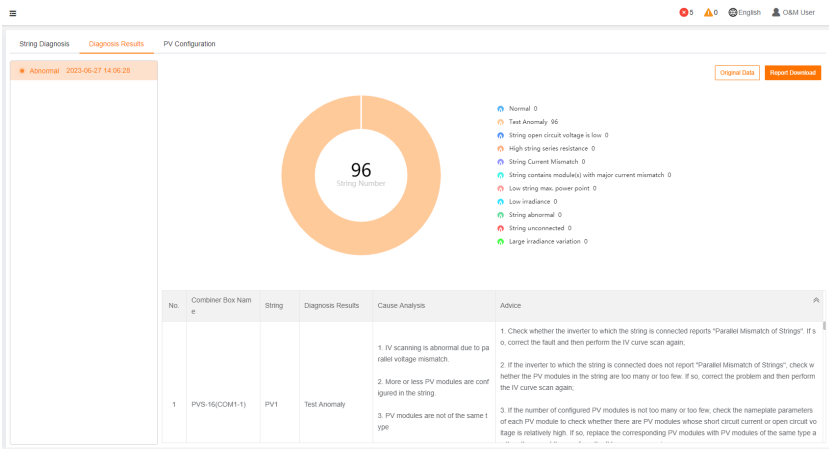
- - End

4.4 Check IV Diagnosis Results and Reports

Step 1 Click "**Smart Diagnosis→String Diagnosis**" on the navigation bar.



Step 2 Click **Diagnosis Results** on the right page to view the detailed diagnosis results.



- You can view up to 10 pieces of history string diagnosis data.
- You can download the diagnosis results in the form of original data or a report.
- During on-site O&M, please inspect the modules according to cause analysis and suggestions provided in the diagnosis results.

- - End