DATA LOGGER

V1000+ / V1000L

Installation & Operation Manual

Warranty Information

Warranty or liability will be void if damage caused by, but not limited to the following:

1. Unauthorized opening of unit
2. Installation faults such as improper environment, wiring and applications
3. Working conditions beyond specified
4. Improper operation of unit
5. Violation of safety instructions in this manual
6. Damage during transportation
7. Any internal modifications
8. Replacing or installation of unauthorized software
9. Unforeseen calamity or force majeure

◯ Safety Precautions

Before beginning your journey, please read the following safety instructions carefully.

> **Qualified Personnel ONLY!**
> Only Qualified technicians shall install or service unit(s) in accordance with local wiring regulations.

> **Recycle**
> Do not throw this electronic device in a trash dumpster when being disposed of. To minimize pollution of environment, please consult your local service provider.

◯ Installation

■ Unpacking

(1) Data Logger（V1000+ or V1000L）X 1
(2) +5V Adapter X 1
(3) RS485 Connector(2Pin) X 2
(4) Screws（Ø4 x 18L）X 2
(5) User Manual

■ Choosing Proper Installation Site

Suitable for indoor (temperature does not exceed 50˚C, humidity should not exceed 95%)

■ Overview of Connection

When the + 5V Adapter is connecting, the power supply is normal if the LAN LED appears for a short time, If RS485 communication works in normal, the front panel LED will appear constant green after 40 seconds. If RS485 communication is abnormal, the front panel LED will appear with flashing green.
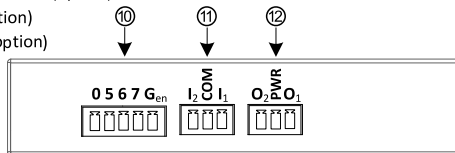
①. LED
②. 12864 LCM(V1000L)
③. Button(V1000L)
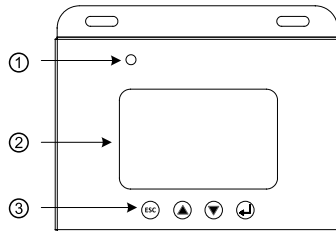
④. +5V Adapter connector
⑤. External sensor signal connector (option)
⑥. USB connector
⑦. RJ45 connector
⑧. RS485-2 connector
⑨. RS485-1 connector
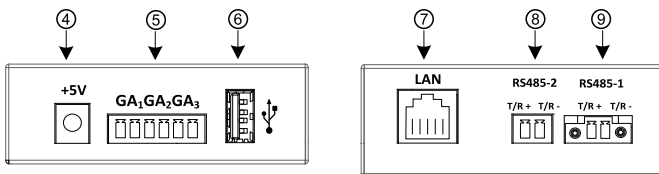
⑩. Remote control signal connector (option)
⑪. Input signal connector (option)
⑫. Output signal connector (option)

◯ External Signal Interface

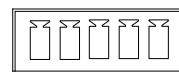### ■ Sensor hardware signal interface

G A₁ G A₂ G A₃

Signal pin from left to right

Pin	Name	Description
1	G	Ground(GND)
2	A₁	Irradiance Signal(0~10V)
3	G	Ground(GND)
4	A₂	Solar Cell Temperature Signal(0~10V)
5	G	Ground(GND)
6	A₃	Ambient Temperature Signal(0~10V)

■ RCR hardware signal interface

0 5 6 7 G$_{en}$

Signal pin from left to right

Pin	Name	Description
1	0	Cutoff PV inverter
2	5	Derating to 0% load output
3	6	Derating to 50% load output
4	7	Derating to 75% load output
5	G$_{en}$	Ground(GND)

■ Input hardware signal interface

I₂ COM I₁

Signal pin from left to right
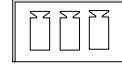
Pin	Name	Description
1	I₂	2th input signal
2	COM	Ground(GND)
3	I₁	1th input signal

■ Output hardware signal interface

O₂ PWR O₁

Signal pin from left to right
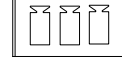
Pin	Name	Description
1	O₂	2th output signal
2	PWR	+5V
3	O₁	1th output signal

◯ RS485 Communication Interface

■ RS485 Hardware Interface
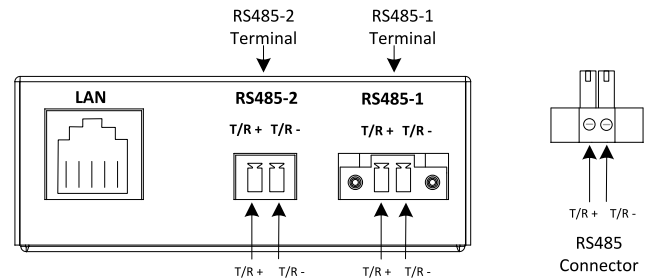
■ RS485-1 Wiring Diagram
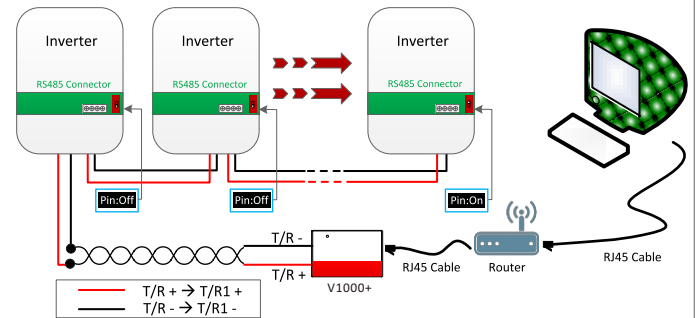
1. Connect T/R+ and T/R- of RS485 converter to the T/R1+ and T/R1- of the data logger respectively.
2. Between two inverters , match T/R2+ and T/R2- of this inverter to T/R1+ and T/R1- of the next inverter.
3. Set terminal resistor switch "ON" of the terminal-end inverter (last data logger of the row) only. The others' should be set as "OFF."
4. Connect data logger and router of RJ45 Cable.

■ RS485-2 Wiring Diagram

RS485-2 port is a multi-function port with the follow 3 working modes
    a. Second PVI group mode
Refer to "RS485-1 Wiring Diagram" for wiring
    b. External device mode
This mode supports connecting with supported digital power meters.

    c. Virtual PVI command mode
This mode only supports for connecting with G2000 while G2000 works as a power limiter. Refer to G2000 user manual for details.

■ Setting the Terminal Resistor

As shown on right, "ON" indicates a resistor is added. ONLY the terminal-end inverter (last inverter of the row) should have this switch set to "ON". Switches of the other inverters should be set as "OFF."
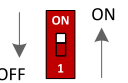
> **Attention!**
> Incorrect settings could cause communication failure.

> **Use Standard RS485 Wire**
> In order to achieve good communication, be sure to use standard copper mesh shielding of RS485 twisted. Do not use general network cable as RS485 wire.

> **RS485 Cable AC and DC Cable Separately**
> To maintain good communication, reduce noise, the RS485 cables and AC and DC wiring used separately or with a metal shield of the cable isolation.

◯ Ready to Monitoring

■ Status LED

The LED on the data logger left side will show the data logger or inverter operation status by different colors. In normal operation, the LED appears in green color; in error circumstance, it appears in red color.

Status	Indication
○	data logger is not connected to AC. Note 1
●	Solid Green: Inverter is standing by/operating (day).
●	Flashing Green: data logger is standing by (evening/night). Note 2
●	Flashing Orange: Ethernet setting or communication failure. Note 3
●	Solid Red: Inverter is having a fault.

Note 1: After a power for about 40 seconds, the recorder will begin operating LED
Note 2: The general situation is not detected to the inverter
Note 3: Ethernet communication failure as below table

Orange led flashing	Description
1s On + 1s Off	Cloud mode is disable
1s On + 3s Off	Cloud account not be setting
1s On + 5s Off	IP address is 0.0.0.0 or ethernet is disconnect
1s On + 10s Off	Post message to ethernet failure(ex: the firewall)

◯ Network and Internet

### ■ Accessing Data Logger via LAN (Local Area Network)

1. Connect the network cable between the network port on the PC and the RJ45 port on the Data Logger, and set the IP address of PC base on the following chart.

tem	Data Logger default value	Example PC setting
IP mode	Fixed IP	Fixed IP
IP address	192.168.0.100	192.168.0.101
Subnet mask	255.255.255.0	255.255.255.0
Gateway	192.168.0.254	192.168.0.254

2. Open web browser and key in 192.168.0.100 at the address bar. This connects to the data logger.

3. On the setting page, click on the IP address and set the IP following the router IP segment, or just set the IP Mode to DHCP.

IP Mode : Fixed IP ▼
IP Address : 192.168.30.14
IP Mask : 255.255.255.0
Gateway : 192.168.30.254
[Save]

IP Mode : DHCP ▼
IP Address : 192.168.30.47
IP Mask : 255.255.255.0
Gateway : 192.168.30.254
[Save]

4. Connect Data Logger to router.

Data Logger

Router/Modem

Computer via LAN

Computer via Internet
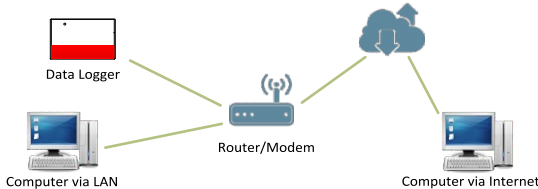
The illustration above demonstrates how to access the data logger via Internet. Similar to LAN, the data logger can be accessed by web browser. However, there is usually a firewall that would block direct access of the LAN from the Internet. In order to overcome this, you will need to set up NAT (Network Address Translation) or Port Forwarding of the router. For detailed information, please refer to the manual provided by your router supplier.

◯ Browsing Data Logger Web Page

■ Basic

Data Logger has a built-in and multi-functional web page that user can access via LAN/WLAN. The recommended web browsers are Internet Explorer, Firefox and Safari. Follow the steps below to explore the inverter web page.

1. Make sure you have successfully connected data logger to a LAN by either Ethernet or Wi-Fi.
2. Open a web browser on your desktop/laptop, key in the IP address you have read previously at the address bar. Note 3
3. Daily graphs will load soon after.

(Note 3 : Download the configuration tool from the login page of your inverter monitoring portal.)

❖ Settings

When in Settings sheet, you will see the table below.

V1000 Plus		SETTINGS	LOGS	List	Main

Now	0 kW
Today	0 kWh
Total	0 kWh
kwh/kwp	0

SENSORS	
Irradiance	292w/㎡
Thermometer	-13.9℃

Logger Info	V1000 Plus	Date & Time	2019-9-19 13:12:05
IP Address	192.168.30.47	Language	English
UPLOAD	(Edit)	Administration	admin
Irradiance Calibration	297w/㎡	RS485-1 Search Starting Address	1
Solar Cell Temperature Calibration	-13.9℃	Irradiance Address	31
Ambient Temperature Calibration	-12.5℃	Temperature Address	32
RS485-2 Search Starting Address	21	RS485-2 application mode	(Edit)
Grid Voltage Range	Voltage Parameter	Grid Frequency Range	Frequency Parameter
Regulation Parameter	Regulation Parameter	Q Parameter	Q Parameter
Customer Parameter	Customer Parameter	Power Limit Parameter	Power Limit Parameter
Digital Meter	Measurement Value		

For any item you wish to change, move the cursor and click on it. You will be prompted to enter user name and password before proceeding.

Name : [_____]
password : [_____]

[Forget Password]   [Login]

1. Logger Info. : Name, serial number and F/W version
2. Date & Time: Clock of logger. You can set the time zone and synchronize with time server automatically

3. IP address: The assigned IP address of logger, click on the IP address can configure the IP of logger
4. Language: Language selection
5. UPLOAD: The website for data uploading, enable the uploading and the account for uploading
6. Administration: User name and password. The default name is "admin"; the default password is "admin"
7. Irradiance Calibration : Calibrate the irradiance value
8. RS485-1 Search Starting Address: RS485-1 modbus search starting address
9. Solar Cell Temperature Calibration : Calibrate the solar cell temperature value.
10. Irradiance Address: Irradiance sensor MUST setting this address
11. Ambient Temperature Calibration : Calibrate the ambient temperature value.
12. Temperature Address: Temperature sensor MUST setting this address
13. RS485-2 Search Starting Address: RS485-2 modbus search starting address while it works on "second PVI group mode"
14. RS485-2 application mode: Setting RS485-2 working mode, default is "second PVI group mode".
15. Grid Voltage Range
16. Grid Frequency Range
17. Regulation Parameter
18. Q Parameter
19. Customer Parameter
20. Power Limit Parameter: Configure power limit parameter while RS485-2 works on "external device mode"
21. Digital Meter: The information of digital meter

◯ Maintenance

Conventionally, the data logger does not require any special care throughout its life. However, to keep the data logger in best performance, it's recommended to do the following on a regular basis :
1. Make sure no object is placed on the top of data logger.
2. Dust off the data logger, especially the heat sink located on the top of data logger.
3. Monitor power production figures of data logger.
4. Inspect all wires and cables.

■ Troubleshooting

In cases where the data logger detects a problem, an error message may be conveyed by the system. Use the table below to resolve accordingly. If the problem persists, contact your local service provider for further assistance.

Trouble	Suggestions
No display or incorrect display	1. Wait for 40 seconds 2. Check AC connection segments such as fuses, breakers and wires. Be sure +5V Adapter is connected to inverter properly 3. Switch +5V Adapter off and on again
RS485	1. Check the wiring and connector 2. Verify that the address inverter is configured correctly, and whether there are other inverters with the same address 3. Verify whether the terminating resistor is only in the last one inverter turn (to rest the machine can not be turned on). If only received a inverter, do not have to open the terminal resistor 4. Verify that the cable is twisted 5. Please put the cable and direct exchange line separate wiring or use a 10 cm above the cable shield isolation
RJ45	1. Make sure the RJ45 connector and RJ45 wire are normal 2. Verify the router is functioning properly 3. Verify the router has locked IP

◯ Specifications

Function	Unit	Specification
Input (DC)		
Nominal Voltage	V	+5V
Maximum Current	A	1A
General		
Temp. Range	°C	-20 ~ 50
IP Protection		IP20
Protection		Class II
Humidity	%	0 ~ 95
Communication Interface & Display		
LCM(V1000L)		128 * 64 Graphic type
Button(V1000L)	4	Esc/Up/Down/Enter
LED		Green/Red/Orange
RS485-1	Standard	Half-Duplex
RS485-2	Standard	Half-Duplex
Network		Cable Network（RJ45）
Data Logging	Month	Yes, 12 Months
Web Server		Yes
Clock Synchronization		Automatically sync with time server
External Signal		
Irradiance	w/m²	0 ~ 1500
Solar Cell Temperature	°C	-40 ~ 90
Ambient Temperature	°C	-40 ~ 90
RCR siganls	Option	4 signals for load derating
Input detection signal	Option	2 signals reserved
Output control signal	Option	2 signals reserved
Mechanical		
Dimension (W x H x D)	mm	128 x 103 x 29
Weight	kg	0.28(V1000+) / 0.34(V1000L)
Certification		
Safety		CE

Note: Specifications are subject to change without prior notice.