



***SunSniffer***<sup>®</sup>

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# Installation Manual

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**For SunSniffer<sup>®</sup> Gateway 5 and 30**

**VERSION 2.2**

**SunSniffer GmbH & Co. KG**

Ludwig-Feuerbach-Straße 69

90489 Nürnberg

Telefon: +49 (0) 911.993.992.0

[www.sunsniffer.de](http://www.sunsniffer.de)

E-Mail Address: [info@sunsniffer.de](mailto:info@sunsniffer.de)

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## Foreword

This manual serves as a support for the installation of the SunSniffer® Monitoring System for photovoltaic plants which allows a module-level monitoring of the plant. **Section 1.1** is an overview of the SunSniffer® Monitoring System and its individual components.

Read this manual carefully before installing SunSniffer® monitoring system.

The manual describes the procedure after the modules have been installed on the roof. Every important step from the installation of the SunSniffer® hardware is described.

Should you have any questions or ambiguities, please don't hesitate to contact SunSniffer® Team.

Note that non-compliance to the instructions, especially the **warning** notes, can lead to irreparable hardware damages. These damages are not covered by the warranty.

## Notes

1. Internet connection is needed to connect SunSniffer® Gateway to the internet and send data to the Webportal.
2. SunSniffer® Gateway needs to have a constant power supply. Make sure that a 230V AC outlet is available in the plant for the power supply unit of the Gateway.
3. For the plant view, the serial numbers of the modules and their spatial location are required. This can be done either manually by inserting the serial numbers in an Excel sheet, or more conveniently, by using a barcode scanner as described in **Section 3.1** of the manual.
4. A laptop is required for the configuration of SunSniffer® Gateway.
5. It is advisable to print out this manual in order to have it on-site and be able to use the documentation forms (see **Section 4**).
6. A waterproof enclosure box is needed to house the Gateway and String Readers.

# 1. Hardware Installation

## 1.1. SunSniffer® System Components

The SunSniffer® Monitoring System consists of sensors, Strings Readers, and Gateways.

### 1.1.1. SunSniffer® Sensor

SunSniffer® sensor is directly integrated by the manufacturer into the junction box of the module. The measured data, voltage and temperature combined with the module's serial number, are sent from the sensor to the String Reader through solar power cables. Measurements are transmitted every 30 seconds with an accuracy of +/- 1 %.



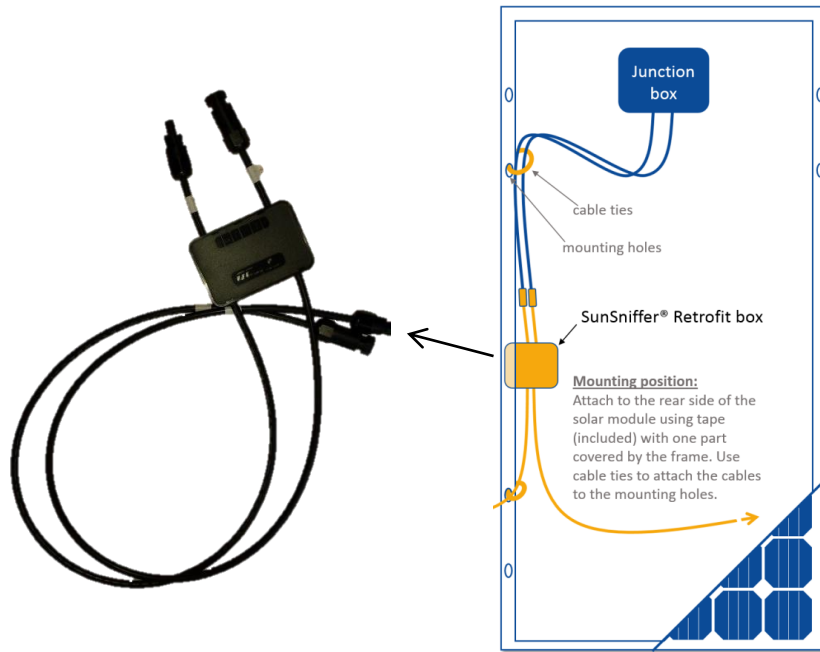
**Figure 1:** SunSniffer® Sensor.

**Retrofit:** SunSniffer® sensors can be retrofitted to existing plants via the Retrofit-Box (see **Figure 2**). The Retrofit-Box is connected in parallel to the module's junction box. The short cables are connected directly to the junction box, and the longer cables connect to neighboring modules through MC4 connectors.

**Note:** It is very important to note down the serial numbers of the Retrofit-Boxes and the retrofitted modules.

The Retrofit-Box has to be mounted onto the back of the module. A suggested fixing of the Retrofit-Box is shown in **Figure 2**.

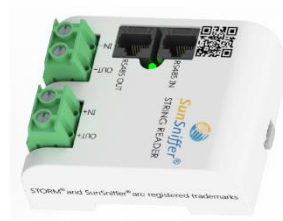
**Note:** Make sure to use only **the tape included** to stick the Retrofit-Box directly on the back of the module as the module's temperature rises and might damage other types of tapes.



**Figure 2:** Connecting a Retrofit-Box to a module

### 1.1.2. SunSniffer® String Reader

The String Reader is a device connected to the end of a solar string. It measures string current and string voltage, gathers measurements transmitted from the sensors in the string, and sends them to the Gateway.



**Figure 3:** SunSniffer® String Reader

### 1.1.3. SunSniffer® Gateway

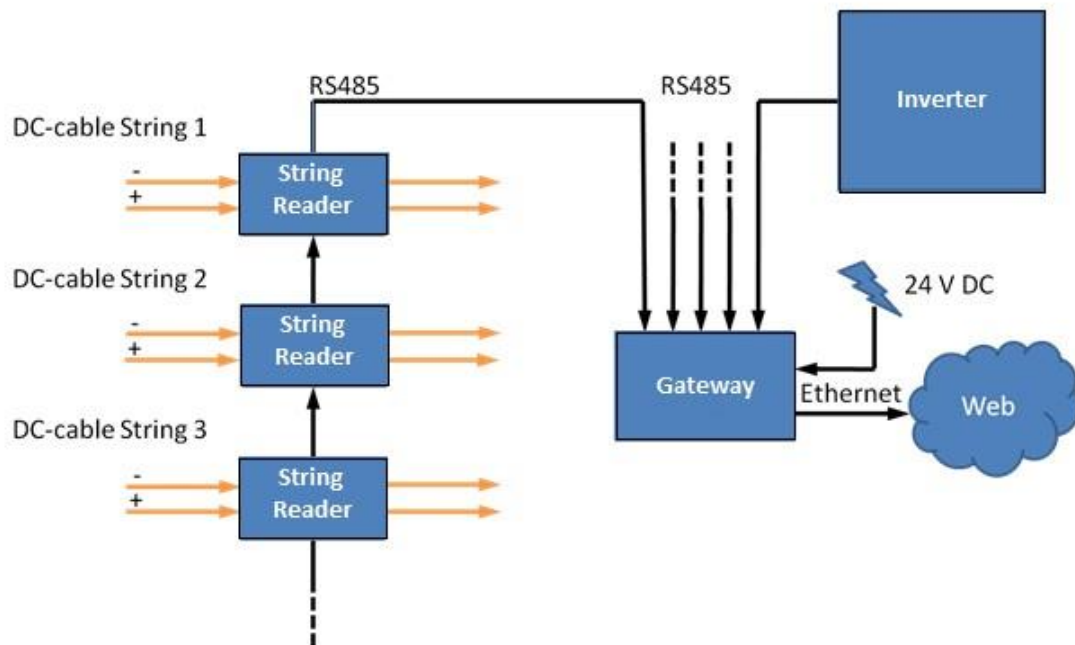
The Gateway gathers all the data from the field and uploads it to SunSniffer® Webportal.



**Figure 4:** SunSniffer® Gateway

## 1.2. Connection Overview

Hardware installation includes String Readers, Gateways, and additional devices to be connected to the Gateway. The corresponding wiring is shown in **Figure 5**. The yellow arrows represent power lines, whereas the black arrows represent data lines.

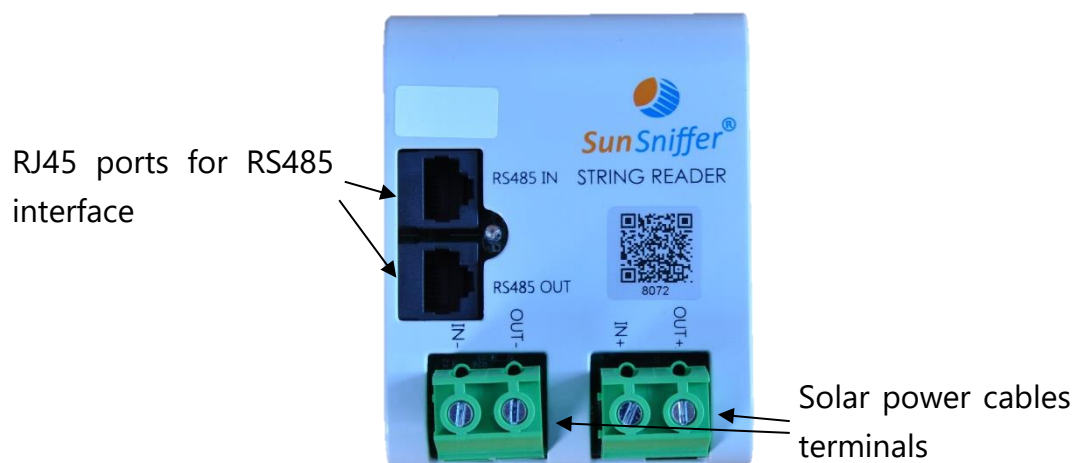


**Figure 5:** Schematic representation of the SunSniffer® Monitoring System

## 1.3. String Reader

### 1.3.1. String Reader Ports and Connections

The String Reader has connections for solar power cables and data communication cables. These are labelled in **Figure 6**.



**Figure 6:** SunSniffer® String Reader



The labels on the screw terminal blocks for solar cables are as follows:

- 'IN-': Negative cable from solar string
- 'IN+': Positive cable from solar string
- 'OUT-': Negative cable to solar inverter
- 'OUT+': Positive cable to solar inverter

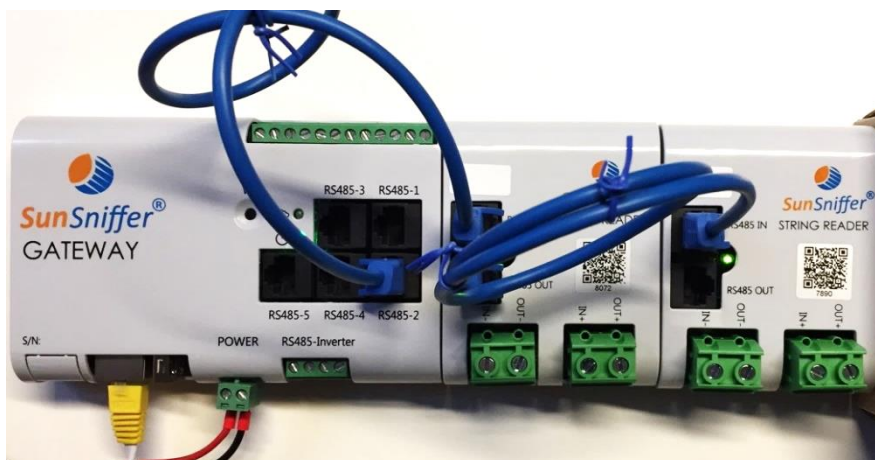
### 1.3.2. String Reader LED Indications

**Table 1:** String Reader LED status and indications

| Status   | Indication  |
|----------|---|
| On       | Device powered on and communication is established with Gateway |
| Blinking | Device powered on but no communication with Gateway             |
| Off      | Device off  |

### 1.3.3. String Reader Installation

1. Make sure to note down every String Reader serial number and the solar string to which it will be connected. This information will be needed later on for the plant creation on the Webportal. A template which can be used to fill out the necessary information can be found in **Section 4.1**.
2. Choose a place to mount the String Reader. An ideal place would be close to the inverters, because all the cabling is going there.
3. Connect the solar power cables to the String Reader according to **Figure 6**. Make sure the connections to the String Readers have the **correct polarity**.
4. For data communication with the Gateway, the String Readers can be connected in RS485 buses in a multidrop connection as shown in **Figure 7**.



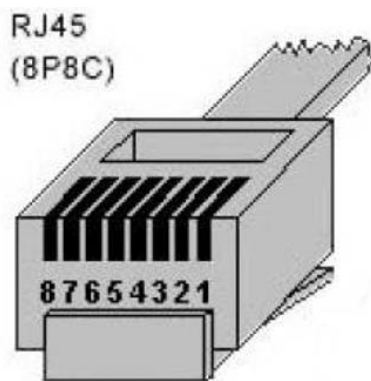
**Figure 7:** Multidrop connection of String Readers using RJ45 connectors

**Note:** Make sure to use **straight-through** (i.e. the colors at each end are wired in the same order) **Cat-5e** cables for the RJ45 ports.

5. The data cabling connection from the RJ45 ports of the Gateway to the first String Reader in the data bus should go to the '**RS 485 IN**' port of the String Reader. Connection to the next String Reader goes from '**RS485 OUT**' of the first device to '**RS485 IN**' of the next device.

#### 1.3.4. RJ45 Connector Wiring Sequence

The following diagram illustrates the functionality of each wire in the RJ45 connector.



**Figure 8:** RJ45 connector

**Table 2:** RJ45 to RS485 wire assignement

| Pin Number | Color        | Function           |
|------------|--------------|--------------------|
| 1          | Orange-White | N/A                |
| 2          | Orange       | N/A                |
| 3          | Green-White  | RS485-A signal (+) |
| 4          | Blue         | Ground             |
| 5          | Blue-White   | Ground             |
| 6          | Green        | RS485-B signal (-) |
| 7          | Brown-White  | Power (+24V)       |
| 8          | Brown        | Power (+24V)       |

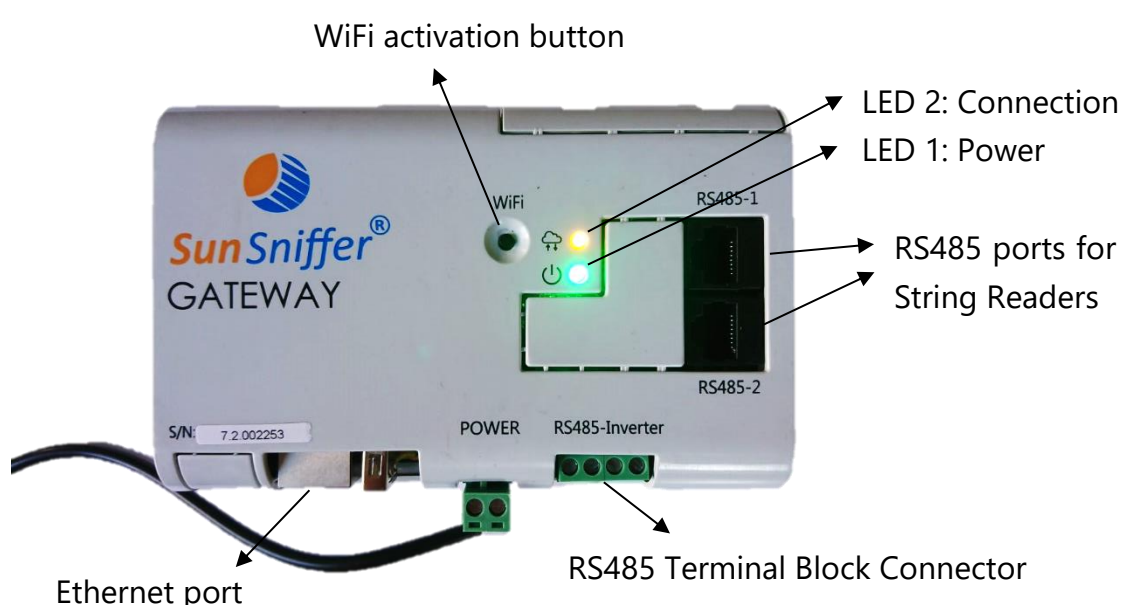
**Note:** Although RS485 standard has a maximum distance limitation of 1000m for data communication, the +24V power supply from the Gateway to the String Readers can be affected at such distances. Therefore, it should be ensured that enough power is reaching the devices in the RS485 bus at long distances.

## 1.4. Gateway

Before installing a Gateway, the following information should be noted down correctly for set-up of the Gateway on the Webportal:

1. **Serial Number:** found on the Gateway housing (Example: 7.2.002253)
2. **ID:** it is the last four digits of the serial number (Example: 2253)
3. **Revision:** it is mentioned on the box in which the Gateway was shipped (Example: CB DIN-A)

### 1.4.1. Gateway Ports



**Figure 9:** SunSniffer® Gateway ports and connections

### 1.4.2. Gateway LED Indicators

**Table 3:** Gateway LED status and indications

| LED | Status                   | Indication                  |
|-----|--------------------------|-----------------------------|
| 1   | Constantly on            | Gateway is powered on       |
|     | Off                      | Gateway is powered off      |
| 2   | 0.5 sec on / 0.5 sec off | No Internet Connection      |
|     | 0.5 sec on / 3.5 sec off | Connection is established   |
|     | 2 sec on / 2 sec off     | WiFi is activated           |
|     | Constantly on            | Gateway is still booting up |

### 1.4.3. Gateway Installation

1. Connect String Reader RS485 buses to any of the RJ45 ports of the Gateway as shown in **Figure 7**.

**Note:** The number of String Readers that can be connected to the Gateway is limited by the Gateway's type. **Gateway 5** can connect to a total of 5 String Readers, whereas **Gateway 30** can connect to a total of 30 String Readers.

2. Inverter bus can be connected to the screw terminal block 'RS485-Inverter'. This port has adjustable baudrate in the range of 1200-115200 which can be set according to connected devices.

**Warning:** the terminal block has a 4-wire input as shown in **Figure 10**. However, only '**A**', '**B**' and '**GND**' are utilized. So the '**+24V**' input should not be used for an inverter data bus. Otherwise, connected devices might get damaged. The '**+24V**' should only be used if String Readers bus is to be connected to this port.

**Note:** Some inverters and other devices that use RS485 interface for communication have the labels '**+**' and '**-**' instead of '**A**' and '**B**' respectively. So care should be taken when connecting such devices.



**Figure 10:** Side view of the Gateway showing the RS485-Inverter connector

3. Plug in the Ethernet cable from the router to the Gateway.
4. Connect the power supply to the Gateway. Pay attention to polarity, otherwise the device will be damaged.

**Note:** The Gateway takes up to 2 and a half minutes to **fully** boot up.

5. The Gateway is now installed and ready to be configured from its webUI as discussed in **Section 2**.

**Note:** After installing the system, each module needs to be scanned before leaving the plant site to be used later in plant creation (see **Section 3.1**).

## 2. Configuration

After the Gateway is installed and all devices are connected to it, it should be configured accordingly in order to correctly detect and gather data from the devices. This can be done through the Gateway's webUI.

### 2.1. Gateway's webUI

The webUI is a user interface through which the Gateway's configuration can be changed. Configuration options include network settings and RS485 ports.



**Figure 11:** Gateway's webUI page

#### 2.1.1. Accessing the Gateway's webUI

1. Press on the WiFi button on the Gateway. LED 2 blinking behavior should change, indicating that WiFi access point is activated.
2. Click on the Network icon on the taskbar of your laptop and click on the network that begins with **SunSniffer** and connect to it. Repeat step 1 if it doesn't show up.



**Figure 12:** Gateway's wireless network

3. Connect to this wireless network. Enter the password "**SunSnifferpass**" and click on "OK".
4. After the connection is established, the Gateway's webUI can be accessed by typing in '192.168.12.1' to the address bar of any web browser. Login by typing "admin" in both the username and password fields.

Access

Change  
Log Off

Network connection

Devices

Push Service

System

## Login to the Gateway

User Name  
Default: admin

Password  
Default: admin

Login

**SunSniffer®**

### System log

[08:59:16] cbx: snapshot is sent to server  
[08:59:16] cbx: creating inverters data snapshot  
[08:59:16] cbx: creating modbus devices snapshot  
[08:54:16] cbx: snapshot is sent to server  
[08:54:16] cbx: creating inverters data snapshot  
[08:54:16] cbx: creating modbus devices snapshot  
[08:49:16] cbx: snapshot is sent to server  
[08:49:15] cbx: creating inverters data snapshot  
[08:49:15] cbx: creating modbus devices snapshot

**Figure 13:** Login page

5. After a successful login, you will be redirected to 'Change Login Data' page, where login credentials can be changed.

### Notes regarding the Gateway's WiFi AP:

- The WiFi AP stays active for one hour after pressing the button. To reactivate it, simply press on the WiFi button again.
- If the Gateway is online while connecting to it through WiFi, it will act as a hotspot and also provide internet access to any laptop or PC connected to it.

## 2.2. Network Connection

The “Network connection” tab allows you to check and configure the network settings of the Gateway.

**Access**

**Network connection**

[Status](#)

[Settings](#)

[Diagnostics](#)

**Devices**

**Push Service**

**System**

### Network Connection Status

DHCP on

IP address 192.168.123.40

Subnet mask 255.255.255.0

Gateway address 192.168.123.2

DNS server 8.8.8.8

Proxy off

IP address 192.168.2.1:8080

**SunSniffer®**

#### System log

[15:55:23] cbx: snapshot successfully sent

[15:52:03] cbx: snapshot successfully sent

[15:48:43] cbx: snapshot successfully sent

[15:45:23] cbx: snapshot successfully sent

[15:42:03] cbx: snapshot successfully sent

[15:38:43] cbx: snapshot successfully sent

[15:35:49] cbx: snapshot successfully sent

**Figure 14:** Network Connection Settings window

Network settings can be changed from ‘Network Connection Settings’ page.

### Network Connection Settings

DHCP ☒

IP Address 192.168.2.100

Subnet mask 255.255.255.0

Gateway address 192.168.2.1

DNS server 192.168.2.1

Proxy\* ☐

IP Address 192.168.2.1 : 8080

Login

Password

\* reboot is needed for proxy settings to take effect

**Apply**

**SunSniffer®**

#### System log

[15:55:23] cbx: snapshot successfully sent

[15:52:03] cbx: snapshot successfully sent

[15:48:43] cbx: snapshot successfully sent

[15:45:23] cbx: snapshot successfully sent

[15:42:03] cbx: snapshot successfully sent

[15:38:43] cbx: snapshot successfully sent

[15:35:49] cbx: snapshot successfully sent

[15:32:03] cbx: snapshot successfully sent

[15:30:35] ftp: upload fail: cur: (28)

Connection timed out after 30001 milliseconds

[15:28:43] cbx: snapshot successfully sent

[15:25:25] cbx: snapshot successfully sent

[15:22:03] cbx: snapshot successfully sent

[15:18:42] cbx: snapshot successfully sent

[15:15:22] cbx: snapshot successfully sent

[15:12:02] cbx: snapshot successfully sent

[15:08:42] cbx: snapshot successfully sent

[15:05:23] cbx: snapshot successfully sent

[15:02:02] cbx: snapshot successfully sent

[14:58:42] cbx: snapshot successfully sent

**Figure 15:** Network Connection Settings

To assign a local IP address to the Gateway manually, uncheck the box next to ‘DHCP’ and type in the required IP settings in the field below it. Proxy settings can also be applied by checking the box next to ‘Proxy’.



## 2.3. Devices

The “Devices” tab is used to configure the devices connected to the Gateway via its RS485 ports. ‘Devices Status’ page shows the number and type of devices connected to the Gateway’s RS485 ports.

| RS485-Port     | Type          | Baudrate | Devices  |
|----------------|---------------|----------|----------|
| RS485-Inverter | none          | 9600     |          |
| RS485_1        | String Reader | 9600     | 1 (View) |
| RS485_2        | none          | 9600     |          |

| Position | ID   | Voltage | Current | Sensors |
|----------|------|---------|---------|---------|
| 1        | 7301 | -       | -       | -       |

Figure 16: Devices Status page.

‘Devices Status’ page will initially show no devices, even if there are devices connected to the Gateway. To detect the connected devices, the RS485 ports should be scanned from ‘Device Settings’ page.

‘Scan’ option should be checked for occupied ports, and the type of device connected should be selected from the drop-down list. Baudrate for ‘RS485-Inverter’ can be changed according to connected inverter type. After clicking on ‘Apply’, the Gateway will start scanning the ports for connected devices. This process can be monitored from the System log on the right side of the page.

| Port           | Baudrate | Type          | Scan                                |
|----------------|----------|---------------|-------------------------------------|
| RS485-Inverter | 9600     | none          | <input type="checkbox"/>            |
| RS485_1        | 9600     | String Reader | <input checked="" type="checkbox"/> |
| RS485_2        | 9600     | none          | <input type="checkbox"/>            |

Apply

Figure 17: Device Settings



## 2.4. Push Service

This service enables sending SunSniffer® data to a FTP server.

## 2.5. System

This tab shows the Gateway status, allows the user to send commands to the Gateway, and test the RJ45 communication ports

**Gateway Status**

Connection Status: online  
Connection speed: 100Mb/s  
Sendings interval (sec): 200  
Serial number: 7.2.002282  
ID: 2282  
Firmware: v. 3

**System log**

[15:59:29] cbx: total devices found: 1  
[15:59:29] cbx: scan complete  
[15:59:28] cbx: slaveID 1: 1-String C  
[15:59:26] cbx: performing scan on bus 127.0.0.1:10002  
[15:59:25] cbx: assigning 7301 to id 1  
[15:59:25] cbx: this bus supports auto id assignment  
[15:59:19] cbx: quering serials at 127.0.0.1:10002

**Figure 18: Gateway Status**

The commands that can be sent to the Gateway are shown in **Figure 19**. 'Download Settings' allows the user to download the current configuration of the Gateway in the form of a JSON file. This can be later uploaded using 'Upload Settings' to apply all the settings in case the Gateway is replaced with another one.

**System configuration**

Set Port Scan:

Restart Gateway:

Download Settings:

Upload Settings:

**System log**

[15:59:29] cbx: total devices found: 1  
[15:59:29] cbx: scan complete  
[15:59:28] cbx: slaveID 1: 1-String C  
[15:59:26] cbx: performing scan on bus 127.0.0.1:10002  
[15:59:25] cbx: assigning 7301 to id 1  
[15:59:25] cbx: this bus supports auto id assignment  
[15:59:19] cbx: quering serials at 127.0.0.1:10002

**Figure 19: System configuration**

"IO board test" page allows the user to test the communication ports 'RS485-1' and 'RS485-2', as well as the Gateway clock.

Access

Network connection

Devices

Push Service

System

Status

Configuration

Device Settings


IO board test

| Read/Write              | RS485_1 | RS485_2 |
|-------------------------|---------|---------|
| Inverter port (RS485_5) | NO DATA | NO DATA |

Real Time Clock (RTC)

NO DATA

Start test



System log

```

[15:59:29] cbx: total devices found: 1
[15:59:29] cbx: scan complete
[15:59:28] cbx: slaveID 1: 1-String C
[15:59:26] cbx: performing scan on bus 127.0.0.1:10002
[15:59:25] cbx: assigning 7301 to id 1
[15:59:25] cbx: this bus supports auto id assignment
[15:59:19] cbx: querying serials at 127.0.0.1:10002
[15:59:16] cbx: Total inverters found: 0
[15:59:16] cbx: Inverters scan complete

```

**Figure 20:** IO board test

In order to initiate the testing, the port to be tested should be connected to 'RS485-Inverter' port in the manner shown in **Figure 21**.



**Figure 21:** Port configuration for testing

The result of a successful test is as shown in **Figure 22**. The RTC option tests the Gateway's clock for time tracking.



**Figure 22:** Successful testing of 'RS485\_1' port and RTC

Each port can be tested once at a time. That's why when one of the ports is being tested, the other port will automatically fail the test.

**Note:** In order to prepare the connection between 'RS485-Inverter' and the other ports, refer to **Table 2**.

### 3. Preparation for Plant Creation

After having successfully finished hardware installation, the plant can be created and integrated to the Webportal. For this purpose, the following information is required.

1. Plant name.
2. Address including country, city, postal code and street.
3. Date of commission under the terms of the Renewable Energies Act.
4. Size of the plant in kWp, which is the product of module count and nominal module power.
5. Renewable energy feed-in tariff in €/kWh.
6. Target yield in kWh/kWp/yr.
7. Operating time/date of end of the assured feed-in compensation. Both finish dates refer to the 01.01 of the subsequent year of commissioning plus 20 years.
8. Module and inverter types (Manufacturer and model).
9. Monitoring level: Inverter, string, hybrid, or module.
10. Geolocation (longitude and latitude, height above the sea level).

Additionally, the following documents need to be prepared. Each document is explained in the following sections. Example and template files can also be found in **Section 4**.

1. PlantView
2. Hardware plan
3. Module mapping
4. Retrofit mapping (in case the plant is retrofitted with SunSniffer)

#### 3.1. PlantView

PlantView is a digital map of the PV plant that enables exact localization of every single module. The serial numbers of every module in the plant are placed in an Excel sheet in the same pattern as they are in the plant. The PlantView can be prepared either manually by copying the serial numbers to the Excel sheet, or automatically by using “**Module Scan**”, which is a process where module serial numbers are scanned in a specific way to generate an Excel sheet with the module serial numbers arranged in the same pattern as they are on-site using Excel macros.

### 3.1.1. Module Scan

To run the module scan, a scanner that is capable of storing scans vertically in a text file is needed. The ARGOX PT-20 is an example of a scanner that can be used. Furthermore, the barcode sheet (see **Section 4.2**) is required, which contains barcodes used to set parameters such as walking direction, module gaps etc.

The following section describes how module scan is performed.

### 3.1.2. Scan order

The first module you have to start scanning from is the module which is situated in the northwestern direction (in viewing direction on the module front it is the module back left).

Start the module scan by scanning the „**Start**“ code in the barcode sheet. To scan a modules row, the walking direction should be set in order to assign the module order correctly. Going in eastern direction means going right on the module plan and going in the western direction means going left.

If the module row is completely scanned, the code „**End Row**“ should be scanned to indicate that the entire row is scanned. Next, either an empty row can be added through „**Row Gap**“ code, or another row is directly scanned by specifying the walking direction with the codes „**Right**“ or „**Left**“.

If the row itself has gaps, „**Module Gap**“ code should be scanned, which initiates the presence of a gap in the row. Then the gap length can be defined via the number codes „**1**“, „**2**“, „**4**“, „**8**“ and „**16**“. Gaps that are bigger can be input by summing up the numbers scanned.

#### Example:

Submitting a gap of 7 modules via scanning the codes:

„**Module Gap**“→„**1**“→„**2**“→„**4**“ represent a gap length 7 (1+2+4)

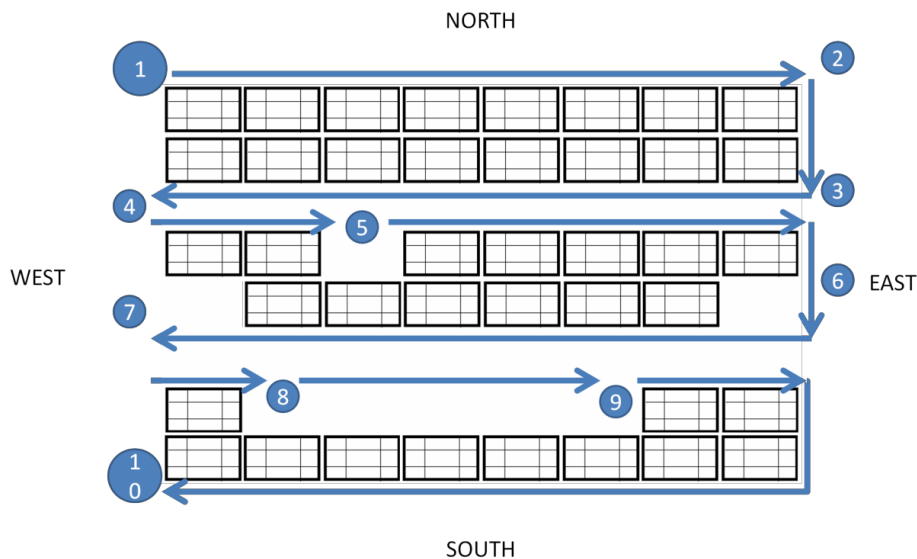
Inputting a gap of 13 modules via scanning the codes:

„**Module Gap**“→„**1**“→„**4**“→„**8**“ represent a gap length of 13 (1+4+8)

After inputting the gap length, the scanning process can be continued. When all rows and modules of the plant have been scanned, „**Stop**“ code must be scanned to finish the module scan. The scanned serial numbers of the modules are stored in the scanner and now need to be transferred to the PC. The following examples help to understand the procedure better.

### Example: Double-rowed module layout

The following procedures describe the module scanning process for the double-rowed module layout shown in **Figure 23**.



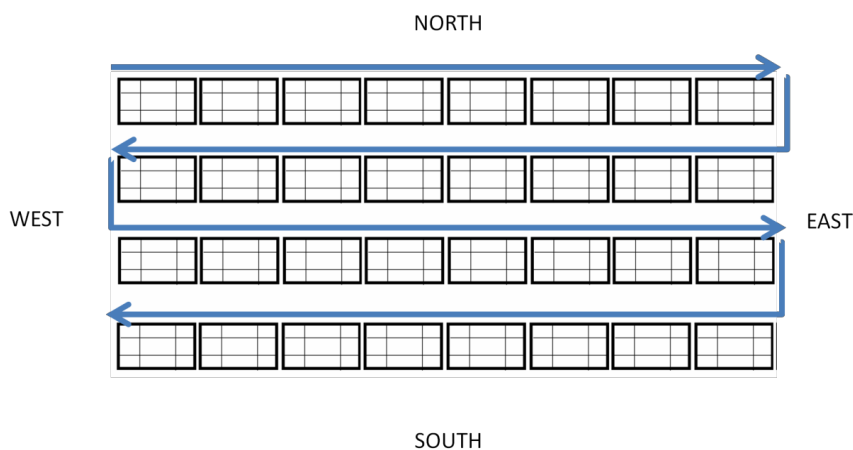
**Figure 23:** Module scanning process for a double-row layout.

1. The start is at the northwestern module (module at the top left). Scan the **“Start”** code to begin with the module scan, then the **“Right”** code to set walking direction. Scan the serial number barcodes of the modules (sticker under the glass of the modules) in the first upper row.
2. To finish the row, scan the **„End Row”** code.
3. Add the next row directly by setting the walking direction with the code **„Left”**. Scan the serial numbers of the modules (the lower of the double-row) one after another.
4. Finish the series with **„End Row”** again. Now there is an empty space till the next double row. This is inserted with the code **„Row Gap”**. Then start the next series with the walking direction **“Right”** again.
5. Scan the modules’ serial numbers till you reach the gap. Since one module is missing here, the gap has a length of 1. Scan the code **“Module Gap”** to make a gap. Then scan the code **„Gap 1”** to insert a gap of length 1. After that, the scan of the modules’ serial numbers can be continued just like before.
6. End the row and start the new one by initiating the walking direction. The missing module can be submitted via scanning **“Module Gap”** and **“Gap 1”** codes.
7. A gap at the end of a row is also detected via the **„Module Gap”** and **„Gap 1”** codes.

**Note:** Gaps at the beginning and end of a row must also be inserted.

8. After inserting the gap, end the row and then add an empty row with the code „**Row Gap**“, and start the next row by setting the walking direction.
9. Initiate the gap by scanning „**Module Gap**“ code. Then scan the codes „**Gap 1**“ and „**Gap 4**“ to insert a gap of 5 modules. After the gap is input, the scan can be continued as usual.
10. After scanning the last row and finishing with „**End Row**“, the module scan is terminated by scanning the code „**Stop**“.

In principle the procedure is the same with single-rowed module constructions. You just have to be careful that a row gap should be inserted between the module rows using the code „**Row Gap**“. The recommended walking direction is shown in **Figure 24**.



**Figure 24:** Walking direction for a single-row module layout.

### 3.1.3. PlantView Preparation from Module Scans

Now the module plan can be created from the obtained scans by following these instructions:

1. Transfer the scans from the scanner to a computer, and export them to the file 'Plantview.xlsm', which can be obtained from the Webportal by navigating to "Monitoring & Analysis" -> "Plant View & Layout" and clicking on "Upload XLS". The scans should be placed in **Table 1** of the file vertically starting from cell **A1**.
2. Use 'Conditional Formatting' -> 'Highlight Cells Rules' -> 'Duplicate Values...' to check for modules which got scanned twice. Delete any duplicates.





### 3.2. Hardware Plan

This Excel document should contain the String/String Reader/Inverter assignment list to the Gateway. A sample of the file can be downloaded from the Webportal in "Hardware Manager" -> "Hardware Settings" by clicking on "Download example file" next to "Hardware plan" on the bottom of the page. A sample file can be seen in **Section 4.4.**

### 3.3. Module Mapping

This document should contain the list of modules' serial numbers connected in each string. A sample file can be downloaded from the Webportal by navigating to "Hardware Manager" -> "Hardware Settings", right-clicking on the Gateway's name and clicking on "Upload Module Mapping". The sample file can be seen in **Section 4.5.**

### 3.4. Retrofit Mapping

This file is needed in case the plant is retrofitted with Retrofit-Boxes. It should contain a list of Retrofit-Box serial numbers and modules serial numbers, to which the Retrofit-Boxes are connected. This document is **extremely** important in order to assign the retrofitted sensors to their correct modules. A sample file can be downloaded from the Webportal from "Hardware Manager" -> "Hardware Settings", and clicking on "Download example file" next to "Retrofit mapping". The sample file can be seen in **Section 4.6.**

The plant is now fully configured and ready to be created on the Webportal. For further assistance or enquiries, please contact SunSniffer Support.

#### **SunSniffer GmbH & Co. KG**

Ludwig-Feuerbach-Straße 69

90489 Nürnberg


Telefon: +49 (0) 911.993.992.0

[www.sunsniffer.de](http://www.sunsniffer.de)

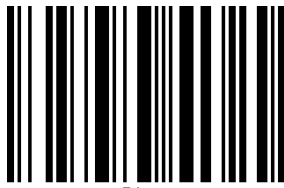
E-Mail: [info@sunsniffer.de](mailto:info@sunsniffer.de)

## 4. Appendices

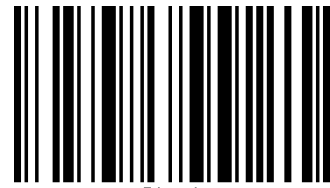
### 4.1. String/String Reader/Inverter assignment sheet

|  |              |                     |                   |                  | <b>Assignment of Strings, String Readers and Inverters</b> |                         |                      |                        |       | PV-plant:<br>Date:<br>Editor: |  |
|---|--------------|---------------------|-------------------|------------------|--|-------------------------|----------------------|------------------------|-------|-------------------------------|--|
|   |              |                     |                   |                  | Webbox   | Serial-No.              | Installation ID      | Revision               | Notes |                               |  |
|   |              |                     |                   |                  | 1  |                         |                      |                        |       |                               |  |
|   |              |                     |                   |                  | 2  |                         |                      |                        |       |                               |  |
| String-No.  | Inverter-No. | Inverter-serial No. | Inverter-Port No. | Type of Inverter | Serial no. of String reader                                | Port No. of the Gateway | String No. Webportal | String Reader Revision | Notes |                               |  |
| 1   |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 2   |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 3   |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 4   |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 5   |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 6   |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 7   |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 8   |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 9   |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 10  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 11  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 12  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 13  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 14  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 15  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 16  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 17  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 18  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 19  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 20  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 21  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 22  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 23  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 24  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 25  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 26  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 27  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 28  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |
| 29  |              |                     |                   |                  |  |                         |                      |                        |       |                               |  |

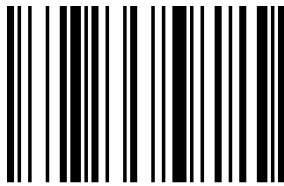
## 4.2. Barcodes for module scanning



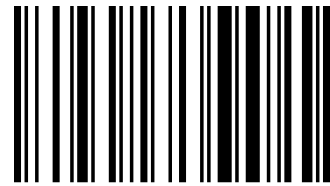
Stop



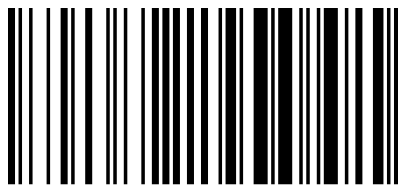
Start



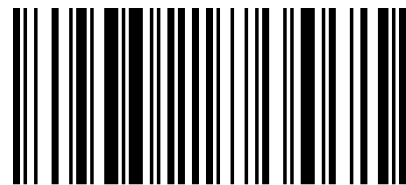
Left



Right



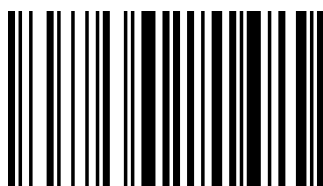
End Row



Row Gap



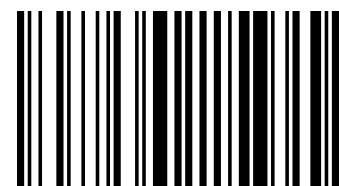
Module Gap



Gap 1



Gap 2



Gap 4



Gap 8



Gap 16

### 4.3. Plant Information for plant creation

|  |         |
|--|---------|
| <b>Name of the plant</b>               |         |
|  |         |
| <b>Adress</b>                          |         |
| Land:<br>City:<br>Postcode:<br>Street: |         |
| <b>Additional Information</b>          |         |
| Feed-in tariff:                        | €/kWh   |
| Size of the plant:                     | kWp     |
| Earnings forecast:                     | kWh/kWp |
| Start date of infeed                   |         |
| Type of module:                        |         |
| Siemens-monitoring                     | yes/no  |
| <b>Hardware</b>                        |         |
| Documentry like pattern:               | yes/no  |
| Number of modules per string:          |         |

## 4.4. Hardware Plan

|    | A                          | B                      | C                    | D          | E                   | F               |
|----|----------------------------|------------------------|----------------------|------------|---------------------|-----------------|
| 1  | String Reader ID (4-digit) | Inverter Serial Number | Inverter Port Number | Gateway ID | Gateway Port Number | Device type     |
| 2  | 7425                       | 43861765               | 1                    | 2099       |                     | 3 String Reader |
| 3  | 4589                       | 43861765               | 2                    | 2099       |                     | 3 String Reader |
| 4  |                            | 43861765               |                      | 2099       |                     | 1 Inverter      |
| 5  |                            |                        |                      |            |                     |                 |
| 6  |                            |                        |                      |            |                     |                 |
| 7  |                            |                        |                      |            |                     |                 |
| 8  |                            |                        |                      |            |                     |                 |
| 9  |                            |                        |                      |            |                     |                 |
| 10 |                            |                        |                      |            |                     |                 |

## 4.5. Module Mapping

|    | A           | B           |
|----|-------------|-------------|
| 1  | Reader_1_ID | Reader_2_ID |
| 2  | Module_SN   | Module_SN   |
| 3  | Module_SN   | Module_SN   |
| 4  | Module_SN   | Module_SN   |
| 5  |             |             |
| 6  |             |             |
| 7  |             |             |
| 8  |             |             |
| 9  |             |             |
| 10 |             |             |

## 4.6. Retrofit Mapping

|    | A               | B            |
|----|-----------------|--------------|
| 1  | Retrofit Serial | Panel Serial |
| 2  | 20001001        | SN1008K0015  |
| 3  |                 |              |
| 4  |                 |              |
| 5  |                 |              |
| 6  |                 |              |
| 7  |                 |              |
| 8  |                 |              |
| 9  |                 |              |
| 10 |                 |              |
| 11 |                 |              |
| 12 |                 |              |
| 13 |                 |              |
| 14 |                 |              |
| 15 |                 |              |
| 16 |                 |              |