



User Manual

Sunny WebBox, Sunny WebBox with *Bluetooth*[®] and SMA Cluster Controller in SUNNY PORTAL



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Important Safety Instructions

SAVE THESE INSTRUCTIONS

This manual contains important instructions for the following products:

- SUNNY PORTAL

This manual must be followed during installation and maintenance.

The product is designed and tested in accordance with international safety requirements, but as with all electrical and electronic equipment, certain precautions must be observed when installing and/or operating the product. To reduce the risk of personal injury and to ensure the safe installation and operation of the product, you must carefully read and follow all instructions, cautions and warnings in this manual.

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1 Information on this Document

Validity

This document is valid for plants in the Internet portal Sunny Portal, in which one of the following communication products is installed:

- Sunny WebBox
- Sunny WebBox with *Bluetooth*® Wireless Technology
- SMA Cluster Controller
- Sunny Boy Control / Plus
- Sunny Data Control

Target Group


This document is intended for end users.

Additional Information

Links to additional information can be found at www.SMA-Solar.com:

Document title	Document type
Performance Ratio	Technical information

Symbol

Symbol	Explanation
	Information that is important for a specific topic or goal, but is not safety-relevant
<input checked="" type="checkbox"/>	Desired result

Typography

Typography	Usage	Example
"light"	<ul style="list-style-type: none"> • Display messages on the inverter • Elements on a software interface • Terminals 	<ul style="list-style-type: none"> • The value can be read in the "Energy" field.
>	<ul style="list-style-type: none"> • Several elements that are to be selected 	<ul style="list-style-type: none"> • Select Settings > Date.
[Button/Key]	<ul style="list-style-type: none"> • The button or key to be selected or pressed 	<ul style="list-style-type: none"> • Select [Next].

Nomenclature

Complete designation	Designation in this document
Small wind turbine system	Plant
PV plant	Plant
SMA America Production, LLC	SMA
SMA Solar Technology Canada Inc.	SMA
SMA Cluster Controller	Cluster Controller
Sunny WebBox with <i>Bluetooth</i> [®] Wireless Technology	Sunny WebBox with <i>Bluetooth</i>

Abbreviations

Abbreviations	Designation	Explanation
CSV	Comma Separated Values	File format
IP	Internet Protocol	-
PV	Photovoltaics	-
SSL	Secure Sockets Layer	Protocol for transmitting coded data via the internet
URL	Uniform Resource Locator	-

2 Sunny Portal

2.1 Intended Use

Sunny Portal is an Internet portal for the monitoring of plants as well as the visualization and presentation of plant data.

In order to use Sunny Portal you need an SMA product that can record your plant data and send it to Sunny Portal (see Section 2.2 "System Requirements", page 10). Depending on the product that sends the data, various functions are available in Sunny Portal.

2.2 System Requirements

- A computer with Internet access must be available.
- An Internet browser must be installed on the computer.
- JavaScript must be activated in the Internet browser.

Required SMA products:

In order to use Sunny Portal you will need an SMA product that can record your plant data and send it to Sunny Portal.

The following SMA products are capable of sending data to the Sunny Portal:

- Sunny WebBox / Sunny WebBox with *Bluetooth*[®] Wireless Technology
- SMA Cluster Controller
- Sunny Boy Control / Plus
- Sunny Data Control
- Additional devices (not addressed in this manual):
 - Sunny Home Manager*
 - Inverters with Webconnect function*
 - Sunny Multigate for plants with module inverters*

* For information on these devices in Sunny Portal, see the user manual of the respective device in Sunny Portal.



Availability of products in your country

Go to the website of your country's subsidiary at www.SMA-Solar.com for information regarding which products are available in your country or contact your distributor.

Supported Internet browsers:

- Google Chrome from version 14.0
- Microsoft Internet Explorer from version 8
- Mozilla Firefox from version 5
- Opera from version 11.0
- Safari from version 5.0

Recommended screen resolution:

- At least 1,024 x 768 pixels

3 Getting Started

3.1 Registering a Plant in Sunny Portal

You can register your plant via the following SMA products in Sunny Portal:

Sunny WebBox / Sunny WebBox with Bluetooth® Wireless Technology:

- Register the Sunny WebBox in Sunny Portal as described in the Sunny WebBox / Sunny WebBox with *Bluetooth* manuals.

SMA Cluster Controller:

- Register the Cluster Controller in Sunny Portal according to the instructions in the user manual of the Cluster Controller.

Sunny Boy Control / Plus:

- If your Sunny Boy Control or Sunny Boy Control Plus is equipped with the optional NET Piggy-Back, you can send the plant data to Sunny Portal directly via Ethernet or by means of one of the available modems. Set the type of data transfer to Sunny Portal in the Sunny Boy Control or Sunny Boy Control Plus according to the instructions in the NET Piggy-Back manual.
- If your Sunny Boy Control or Sunny Boy Control Plus is not equipped with the optional NET Piggy-Back, you can register your plant via Sunny Data Control.

Sunny Data Control:

- In Sunny Data Control, configure Sunny Portal e-mail as described in the Sunny Data Control help. You can obtain the Sunny Data Control software from the download area at www.SMA-Solar.com.

3.2 Logging In and Out of Sunny Portal

Logging In to Sunny Portal

Requirement:

- You have already registered your plant in Sunny Portal (see Section 3.1 "Registering a Plant in Sunny Portal", page 12).

1. Go to www.SunnyPortal.com.
2. Activate "SSL" for secure transmission of your login details.
3. Enter the e-mail address you provided when registering in the "E-mail" field.
4. Enter the password you received by e-mail in the "Password" field.
5. Check the "Remain logged in" box to stay logged in. This way, you will not have to sign in again for your next Sunny Portal session. You will stay logged in, even after closing your browser or switching off your computer. The function will stay activated until you log out of Sunny Portal through the lock symbol in the upper right corner.



Public or shared computers

If you are using a public computer or are sharing yours with other people, deactivate the "Remain logged in" function. Other people could call up your data in Sunny Portal.

6. Select [Login].
 - The "User information" page opens when first logging in.
7. Fill in your address details.
8. Select [Save].



Delays in visualization

Under certain circumstances, it can take up to three hours until the data of your PV plant is displayed in Sunny Portal.

Display according to plant data transferred

The displayed available data on the pages will vary according to the amount of transferred plant data.

Logging Out of Sunny Portal

- To end your session in Sunny Portal, select "User Info/Logout > Logout" or log out via the lock symbol in the top right-hand corner.

3.3 Next Steps

- Change your password in order to protect your Sunny Portal account against unauthorized access (see Section 1.6 "Changing the Password", page 75).
- Get acquainted with Sunny Portal (see Section 4 "Menu Overview", page 14).
- Design your own pages according to your wishes (see Section 6 "Page Design", page 20).
- Use the report function of Sunny Portal and receive current updates about your PV plant by e-mail or text message (see Section 7.4 "Report Configuration", page 51).
- Enter the properties of your plant (see Section 8 "Plant Properties", page 55).
- Give friends access to your Sunny Portal as guests, standard users, installers, or administrators (see Section 11 "User Management", page 73).

4 Menu Overview

Menu	Meaning
Plant Selection	The menu is only shown if your e-mail address is assigned to more than one plant. You can select the desired plant in this menu. The name of the currently chosen plant will be used for the main menu item under the "Plant selection" main menu. All other pages always refer to the currently selected plant.
Plant Selection > Plant List	<p>The page includes an overview of plants that are assigned to your e-mail address. The following data is listed for each plant:</p> <ul style="list-style-type: none"> • Plant power in kWp • Total yield so far • Total yield for the following periods: <ul style="list-style-type: none"> - Current day - Previous day - Current month • Specific plant yield (kWh/kWp) for the following periods: <ul style="list-style-type: none"> - Current month - Current year <p>When accessing the page, the plant list is always sorted in ascending order according to the specific plant yield. Click on a blue value in the header to sort the list of plants in ascending order according to this value, click again to sort the list of plants in descending order.</p>
"Name of your plant"	The menu includes pages with the most important information about your plant: key data, yield, monitoring, and messages. Sunny Portal automatically creates the pages in this menu.
"Name of your plant" > Plant Profile	This page includes an overview with information for the current plant. Sunny Portal compiles the plant profile from information that you have entered on your Sunny Portal pages. Information that you have not entered (e.g. "Operator") is not shown in the plant profile. Information in the plant profile (see Section "Information in the plant profile:", page 17).
"Name of your plant" > Energy and Power	<p>The page shows the following data for the current plant in four diagrams:</p> <ul style="list-style-type: none"> • Day: Power produced over a period of one day • Month: Total yield per month in days • Year: Total yield per year in months • Total: Total yields per year

Menu	Meaning
<p>"Name of your plant"</p> <p>> Grid Management</p>	<p>This page will only be shown if there is a device registered in the plant which provides data on grid management (Cluster Controller or Power Reducer Box). In the respective device, the use of Sunny Portal must be activated and the settings for grid management carried out.</p> <p>The page displays the following data:</p> <ul style="list-style-type: none"> • Diagram with plant power and the specifications for active power limitation stipulated by the grid operator • Table with reports from the plant logbook which are relevant for grid management. Tip: Change to the plant logbook by selecting "System Logbook". • Diagrams with "Active power limitation", "Cos Phi setpoint" and/or "Reactive power limitation" stipulated by the grid operator. Which diagrams are shown depends on the operating mode of the Cluster Controller/Power Reducer Box. If a Power Reducer Box is used, different specifications for the individual line conductors can be represented by separate lines (L1, L2, L3).
<p>"Name of your plant"</p> <p>> Energy Balance</p>	<p>This page is only displayed in plants with Meter Connection Box.</p> <p>The page displays the following data in a diagram depending on the type of meter connected:</p> <ul style="list-style-type: none"> • Plant power • Purchased electricity • Self-consumption
<p>"Name of your plant"</p> <p>> Sensors</p>	<p>This page is only shown if a Cluster Controller with connected sensors is registered in the plant.</p> <p>Depending on which sensors are connected, the page will show the following data in diagrams:</p> <ul style="list-style-type: none"> • Irradiation • Outside temperature and/or cell temperature <p>Tip: If you disconnect the sensors from the Cluster Controller, the data collected so far will remain visible.</p>
<p>"Name of your plant"</p> <p>> Performance Ratio</p>	<p>This page is only shown if a Cluster Controller with connected irradiation sensor is registered in the plant.</p> <p>The page shows the following data in diagrams:</p> <ul style="list-style-type: none"> • Daily performance ratio and irradiation values for the current month • Monthly performance ratio values for the current year

Menu	Meaning
"Name of your plant" > Annual Comparison	The page shows the total yield and the specific yield of the current plant per month in a yearly overview.
"Name of your plant" > Plant Monitoring	On this page, the following functions for monitoring the current plant are available: <ul style="list-style-type: none"> • Monitoring of communication between Sunny Portal and your plant • Monitoring of the plant by comparing inverters • Monitoring of the grid operator setpoints specified for your plant (only for plants with Cluster Controller or Power Reducer Box) Plant monitoring (see Section 7.3 "Plant Monitoring", page 44).
"Name of your plant" > System Logbook	The page shows messages from Sunny Portal and the current plant. These messages help you to detect e.g. disturbances in your plant. The number of unread warning, disturbance and fault messages is indicated after the colon.
Visualization	The menu includes standard pages with visualizations of your plant data that is created automatically by Sunny Portal (standard pages, (see Section 6.8 "Changing Page Arrangement in the Visualization Menu", page 40)). All pages that you create yourself are also stored here by Sunny Portal (creating pages, (see Section 6.2 "Creating a New Customized Page", page 23)).
Configuration	The menu includes pages via which you can set different configurations for your Sunny Portal, e.g. create own pages, edit plant properties, and create new pages. <ul style="list-style-type: none"> • Visualization (see Section 6 "Page Design", page 20) • Plant properties (see Section 8 "Plant Properties", page 55) • System presentation (see Section 9 "Publishing Sunny Portal Pages", page 63) • Device overview (see Section 10.1 "Calling Up and Filtering the Device Overview", page 64) • Report configuration (see Section 7.4 "Report Configuration", page 51) • User management (see Section 11 "User Management", page 73)

Menu	Meaning
User Info/Logout	<p>This menu enables you to call up user information and end your Sunny Portal session. The "User Information" page also lets you change your password.</p> <ul style="list-style-type: none"> • User information (see Section 1.1.4 "Changing User Information", page 74) • Logout

Information in the plant profile:

The following table includes the possible information in the plant profile and the sources for changing or entering the information.

Information in the plant profile	Source
Location	Section (see Section 8.1.1 "Changing General Plant Data", page 55): from the country and city data
Operator	Section (see Section 8.2 "Changing Operator Data", page 58)
Commissioning	Section (see Section 8.1.1 "Changing General Plant Data", page 55)
Plant power	Section (see Section 8.1.4 "Setting the Plant Power", page 56)
Annual Production	Section (see Section 8.3.3 "Entering the Predicted Annual Yield", page 60)
CO₂ savings	
Modules	Section (see Section 8.1.4 "Setting the Plant Power", page 56)
Tilt angle	Section (see Section 10.2.5 "Setting the PV Array Power", page 70), paragraph (see Section "Configuring the Power of an Inverter via Multiple Strings", page 70)
Tracking	
Inverters	Sunny Portal receives the information from the devices
Communication	
Description	Section (see Section 8.1.5 "Changing the Plant Description", page 57)
Plant Image next to The data	Section (see Section 8.1.6 "Changing/Deleting the Plant Image", page 57)

5 Page, Table and Diagram Functions

Page functions:

At the end of each page containing at least two tables or diagrams, you can change the end date for all diagrams and tables on the page. If the depiction period of the table or diagram is one year or one month, the year or month of the end date entered will be adopted.

Table functions:

The functions are described by means of the following example table.

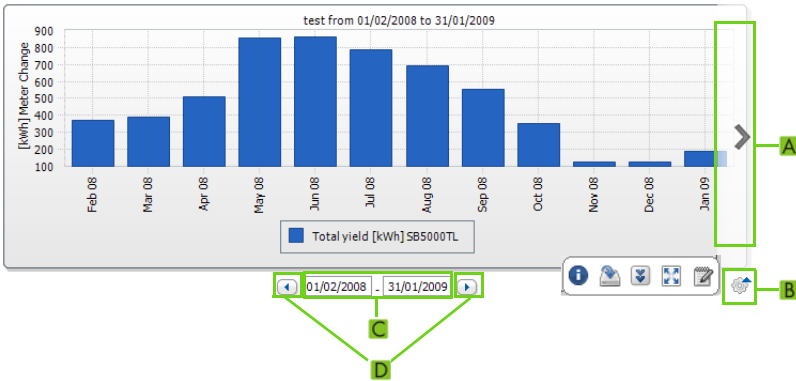
Devices/Plants	Gesamtertrag Meter Change [kWh] 31/03/2010	Gesamtertrag Meter Change [kWh] March 2010	Gesamtertrag Meter Change [kWh] 2010
SB4200TL	10.43	395.34	517.11
SB5000TL	13.95	553.42	721.37
	24.38	948.76	1238.48
	[Total]	[Total]	[Total]

< Year < Month < Day
31/03/2010
Day > Month > Year >

Item	Meaning
A	The table header lets you sort the displayed data in ascending or descending order. Click on a blue value in the header to sort the data in the table in ascending order, click again to sort the data in descending order.
B	Opens a window for saving the data in the set format
C	Opens calendar In the calendar use the arrows to scroll through the months and select the desired display period.
D	Here you can scroll to the next or previous display period at the displayed intervals.

Diagram functions:

The functions are described by means of the following example diagram.



Item	Meaning
A	Via the right and left side of the diagram you can scroll to the next or previous display period if the data is available.
B	Opens more buttons for editing the diagram.
C	Opens calendar In the calendar use the arrows to scroll through the months and select the desired display period.
D	Here you can scroll to the next or previous display period at the displayed intervals.

Buttons for editing the diagrams:

Symbol	Meaning
	Opens a sub-menu with the diagram options described below.
	Opens a window with table view of diagram values. If the window does not open, see Section 12.
	Opens a window for saving the data in the set format.
	Shows legend
	Hides legend
	Shows full-screen diagram
	Opens page configuration for editing the diagram.

6 Page Design

6.1 Standard Pages

6.1.1 Overview of Standard Pages

Standard pages are pages with the most important data, which Sunny Portal creates automatically for the initial transmission of your plant data. The standard pages are saved in the "Visualization" menu. The available standard pages depend on the device types registered. Standard pages can be edited (see Section 6.4 "Changing/Deleting Page Contents", page 38). They can be recreated if they have been deleted or changed (see Section 6.1.2 "Creating Standard Pages", page 22).


Standard Page	Description
Plant Overview	Displayed data of entire plant: <ul style="list-style-type: none"> • CO₂ savings and energy of current day • Meter change of total yield per year in months • Meter reading of total yield and mean power values over a period of two days in hours
Energy and Power	Displayed data of entire plant: <ul style="list-style-type: none"> • Mean power value over a period of one day in hours • Meter change of total yield over a period of seven days in days
Specific plant yield	Displayed data of entire plant: <ul style="list-style-type: none"> • Mean values of specific plant yield over a period of one month in days • Mean values of specific plant yield over a period of one year in months
Performance Ratio	Is created and configured automatically in the following cases: <ul style="list-style-type: none"> • Sunny SensorBox is added to your Sunny Portal plant. • A communication device (with the exception of Cluster Controller) sends data from an irradiation and temperature sensor to Sunny Portal[*]. Tip: In the case of plants with Cluster Controller, the page "Performance Ratio" is displayed in the "Name of your plant" menu. Displayed data of entire plant: <ul style="list-style-type: none"> • Mean values of performance ratio over a period of one month in days • Mean values of performance ratio over a period of one year in months











Standard Page	Description
<p>Devices</p> <p>> Overview "Name Of Inverter"</p>	<p>Displayed data of inverter:</p> <ul style="list-style-type: none"> • Meter change of total yield over a period of one year in months • Mean power value over a period of one day in hours
<p>Report</p> <p>> Daily Plant Report</p>	<p>Data displayed:</p> <ul style="list-style-type: none"> • Meter change of total yield for the current day, current month and current year • Meter change of total yield over a period of one day in hours
<p>Report</p> <p>> Monthly Plant Report</p>	<p>Data displayed:</p> <ul style="list-style-type: none"> • Meter change of total yield for current month and current year • Meter change of total yield over a period of one month in days
<p>Sensors</p> <p>> "Name of the Sensor"</p>	<p>Is created and configured automatically in the following cases:</p> <ul style="list-style-type: none"> • Sunny SensorBox is added to your Sunny Portal plant. • A communication device (with the exception of Cluster Controller) sends data from an irradiation and temperature sensor to Sunny Portal *. Tip: In the case of plants with Cluster Controller, the page "Sensors" is displayed in the "Name of your plant" menu.

*The sensor must be manually adjusted in this case (see Section 8.3.4 "Changing the Performance Ratio", page 61).

6.1.2 Creating Standard Pages

Sunny Portal creates the standard pages automatically. Should you have accidentally deleted or changed a standard page, you can create the standard pages as described below:

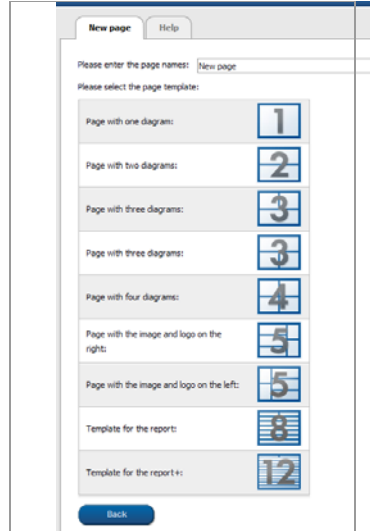
1. Select "Configuration > Visualization".
 - The "Group Configuration" page opens.
2. Select [] in the "Create standard page" area in the row of the selected page.

Create Standard Page		
Page Name	Plant / Device Class	
Plant overview	Photovoltaic plant with Sunny WebBox	
Energy and power	Photovoltaic plant with Sunny WebBox	
Specific yield	Photovoltaic plant with Sunny WebBox	
Performance Ratio	Photovoltaic plant with Sunny WebBox	
Overview	Photovoltaic inverter	
Monthly report	Photovoltaic plant with Sunny WebBox	
Daily report	Photovoltaic plant with Sunny WebBox	
Daily report	Photovoltaic plant with Sunny WebBox	
Monthly report	Photovoltaic plant with Sunny WebBox	
Sensor	Sensor	

- The selected standard page has now been created in the "Visualization" menu.

6.2 Creating a New Customized Page

1. Select "Configuration > Visualization".
 - The "Group Configuration" page opens.
2. Select [New page].
 - Page templates open.



3. Enter page name in "Please enter the page name" field.
4. Select desired page template. Here you can select how the page should be divided. The divided sections can be filled with different contents. TIP: In page templates 8 and 12, the height of the two upper sections is limited. These sections are only suitable for small images, like logos.
 - The "Page Configuration" page opens.
5. Select the desired page content in a section of the page in the "Module type" field.
6. Select [Create] and create desired page content (see Section 6.3 "Generating Page Contents", page 24).

6.3 Generating Page Contents


6.3.1 Overview of Page Contents

You can choose between the following page contents:

Page Contents	Content
Table	<p>You can display the following data in tables:</p> <ul style="list-style-type: none"> Channel values of the devices Selectable channel values depend on the device. Channel values of the entire plant: <ul style="list-style-type: none"> CO₂ savings Total yield Performance ratio Power Feed-in tariff Specific plant yield

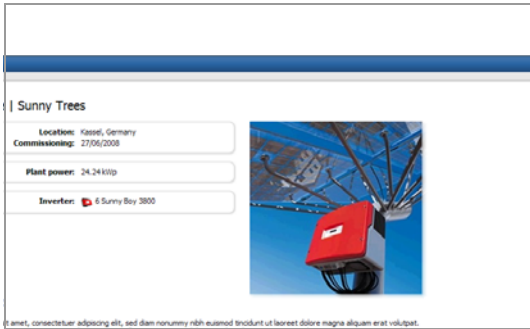
Example of table:

Devices/Plants	Gesamtertrag Meter Change [kWh] 31/03/2010	Gesamtertrag Meter Change [kWh] March 2010	Gesamtertrag Meter Change [kWh] 2010
SB4200TL	10.43	395.34	517.11
SB5000TL	13.95	553.42	721.37
	24.38 [Total]	948.76 [Total]	1238.48 [Total]

< Year < Month < Day Day > Month > Year > 

Page Contents	Content
---------------	---------

Plant Profile	<p>You can also use this information on your customized pages. Information in the plant profile:</p> <ul style="list-style-type: none"> • Plant name • Location • Operator • Date of commissioning • Plant power • Annual production • CO₂ savings • PV modules • Azimuth • Tilt angle • Tracking • Inverters • Communication • Description <p>Example of plant profile:</p> 
----------------------	---



The screenshot shows a web interface for a plant profile. At the top right is the SMA logo and a 'Logout' button. The main content area is titled 'Sunny Trees' and contains the following information:

- Location:** Kassel, Germany
- Commissioning:** 27/06/2009
- Plant power:** 24,245kW
- Inverters:** 6 Sunny Boy 3800

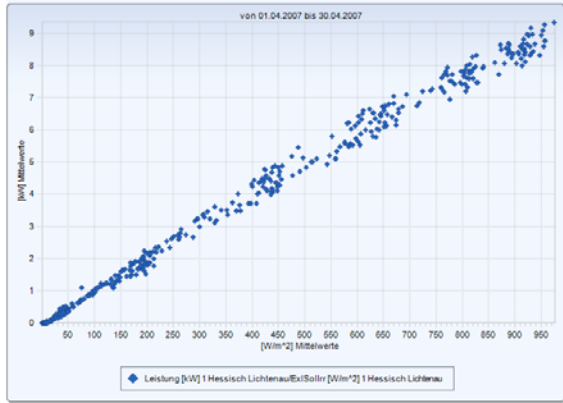
To the right of this information is a photograph of a red SMA inverter mounted on a solar panel structure. Below the main content area, there is a block of placeholder text in Latin.

Page Contents	Content
---------------	---------

XY Diagram

You can display two channel values as coordinates to one another. The x and y axes are assigned one channel value each. The time axis is not depicted. Examples of meaningful value pairs are: plant power and irradiation (only for plants with Sunny SensorBox), performance ratio and irradiation.

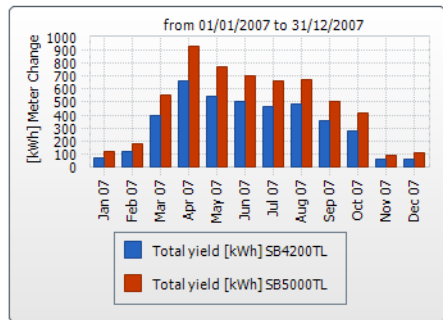
Example of XY diagram:



Diagram

You can represent a timeline of the channel values of the devices and the entire plant as a bar chart or a line chart.

Example of diagram:




Slide Show

You can display a slide show which you have already created in a photo platform.

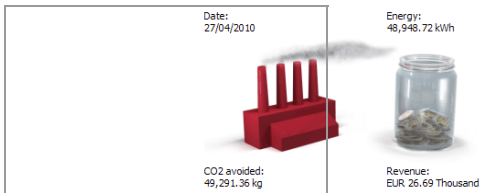
Page Contents	Content
---------------	---------

Image	<p>You can insert an image of your choice.</p> <p>Requirements:</p> <ul style="list-style-type: none"> • Maximum image size: 500 kB • Possible image formats: JPG, PNG, GIF • Height and width: Sunny Portal adjusts the proportions of the image according to the size of the page layout.
--------------	---

Plant Monitoring	<p>You can display the following data:</p> <ul style="list-style-type: none"> • Communication status between the plant and Sunny Portal • Status of the inverter comparison <p>Plant Monitoring:</p> <div style="border: 1px solid black; padding: 10px; text-align: center;">  <p>The image shows a plant monitoring dashboard. On the left, there is a speech bubble icon with a green checkmark, indicating communication status. Below it, the text reads "Last contact 2 minutes ago". On the right, there is a red inverter icon with a green checkmark, indicating the status of the inverter comparison. Below it, the text reads "Yield yesterday: 54.14 kWh".</p> </div>
-------------------------	---

Overview	<p>You can display the following data:</p> <ul style="list-style-type: none"> • Energy of the PV plant • CO₂ saved by PV plant • Feed-in tariff for PV plant • Standard image or a random image
-----------------	--

Overview with standard image:



Text	<p>You can enter and format text in the editor in the same way you would do in other text editing programs. If you are familiar with HTML, you can switch to the source code view and enter or edit the HTML code directly. Java Script is not permitted.</p>
-------------	---

6.3.2 Creating Tables


You can select a table from the templates or create your own table. The following table configurations are available:

Table configurations	Meaning
Standard Configuration for Displaying Plant Energy	The table includes the total yields of all plants to which you have access. The total yields are displayed for the current day, month and year.
Standard Configuration for Displaying the Energy of Inverters	The table includes the total yields of all inverters of the current plant. The total yields are displayed for the current day, month and year.
Standard Configuration for Displaying Specific Inverter Yield	The table includes the specific yields and the total yields of all inverters of the current plant. The specific yields are displayed for the current day, month and year. The total yields are displayed for the current day.
User-defined	Create your own table with values and time periods tailored to your needs.

Creating a Table with Default Configuration

1. Select desired standard configuration.
 2. Select [Next].
 3. Select [Save].
 4. Select [Save].
- Table has been created and is displayed.

Creating a Customized Table

1. Select "User-defined".
2. Select [Next].
3. Select "Add device/plant".
4. In the "Plant/devices" field, select a plant or a device. TIP: In order to narrow your selection, choose a device type or "Plants" in the "Narrow selection" field.
5. Select [Submit].
6. In order to add further plants or devices, select "Add device/plant" and repeat previous steps.
7. Select .
 - The "Channel configuration" page opens.
8. In order to add a heading for this table column or row, enter the heading in the "Name" field.
9. In the "Time unit" field, choose the period for which you would like to see the values.

- In the "End date of display" area, activate the desired end date of the display. The following settings are possible:

Current	The values from the current date (e.g. current day, current month) will always be displayed.
Selectable	You can select the date for which the values are to be displayed, e.g. a certain day, a certain month.

- Select desired channels in the "Channel" area.



Selectable channels

For devices, all channels which are transferred to Sunny Portal are available. For a plant, the calculated channels are available (CO₂ savings, energy, power, feed-in tariff, performance ratio, specific plant yield).

The unit of the first channel selected determines the additional channels available for selection.

- If more than one device or more than one plant has been added, the desired calculation method can be chosen in the "Result" field. The following settings are possible:

Total	Total of all channel contents within the period indicated
Min	Minimum value of channel contents within the period indicated
Mean values	Mean value of channel contents within the period indicated
Max	Maximum value of channel contents within the period indicated

- Select [Submit].

The "Page Configuration" page opens.

- In order to add an additional column or rows for channels, select "Add channel" and repeat previous steps.
- In the "Orientation" area, activate the desired orientation of the table.
- In the "Download file type" field, select the format for saving table data. This will let you save the data in the page view of the table to your computer via "Download". The following settings are possible:

CSV	File format that describes the layout of a text file used for the storage or exchange of simply structured data.
ODS	File format for tables with an Open Document Format that enables the exchange of Office files between various applications and operating systems.
XLSX	File format of the Excel Workbook format supported by Microsoft since the Excel 2007 version.

17. Select [Save].
18. Select [Save].
- Table has been created and is displayed.

6.3.3 Adding a Plant Profile

1. In order to add a heading, enter the heading in the "Title" field.
2. If several plants can be selected in the "Plant" field, select the desired plant.
3. Activate the fields for which the data should be displayed.
4. Select [Save].
5. Select [Save].
- The plant profile has been added and is now displayed.

6.3.4 Creating an XY Diagram

Procedure:

- Configure Y axis, X axis
- Configure time settings
- Make advanced configurations

Configuring Y Axis, X Axis

1. Select a plant or a device in the "Y axis", "X axis" area in the "Plant/devices" field. Only devices of the current plant can be selected. TIP: In order to narrow your selection, choose a device type or "Plants" in the "Narrow selection" field.
2. Select a channel in the "Channel" field.



Selectable channels

For devices, all channels which are transferred to Sunny Portal are available. For a plant, the calculated channels are available (CO₂ savings, energy, power, feed-in tariff, performance ratio, specific plant yield). The unit of the first channel selected determines the additional channels available for selection.

3. Select [+].
- Table with the selected device or plant is displayed.
4. In order to add further plants or devices, repeat the previous steps.



The selection of further channels is based on the unit of the first channel

If the base unit of the first selected channel is "Watts", the only channels subsequently selectable are those compatible with "Watts". The selection options are automatically restricted by Sunny Portal accordingly.

5. Select the desired unit in the "Unit" field.
6. Select the channel type of the value in the "values_type" field. The following channel types are available, depending on the channel:

Analog values	
Mean values	Average value of the channel over the set period.
Maximum values	The highest value of the channel over the set period.
Minimum values	The lowest value of the channel over the set period.

Meter channels	
Meter change	Increase within the period to be selected.
Meter reading	Current total meter reading of the value.
Cum. change	Cumulated (= total) increase within the period to be selected.

7. Set automatic scaling or enter your own scaling values:
 - Automatic scaling: activate "Automatic scaling min" and "Automatic scaling max".
 - Custom scaling: enter scaling values into "Min" and "Max" fields.

Configuring Time Settings

1. In the "Time settings" area, select the period to be displayed in the diagram in the "Display period" field .
2. In the "Number of intervals" field select how many display periods are to be shown.
3. In the "Time unit" field, select the time units into which the display periods are to be subdivided.
4. In the "End date of display" area, activate the desired end date of the display. The following settings are possible:

Current	The values from the current date (e.g. current day, current month) will always be displayed.
Selectable	You can select the date for which values are to be displayed (e.g. a certain day, a certain month).

Making Advanced Configurations

1. In order to add a heading, enter heading in the "Extended configuration" area in the "Module name" field.
2. In the "Download file type" field, select the format for saving diagram data. The following settings are possible:

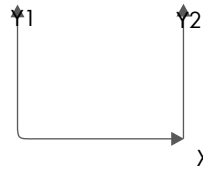
CSV	File format that describes the layout of a text file used for the storage or exchange of simply structured data.
ODS	File format for tables with an Open Document Format that enables the exchange of Office files between various applications and operating systems.

XLSX	File format of the Excel Workbook format supported by Microsoft since the Excel 2007 version.
-------------	---

3. In order to show the legend by default for this diagram, activate "Show legend".
 4. In order to see the preview, open the "Preview" area. Select [Update] to reload diagram after changes have been made.
 5. Select [Save].
 6. Select [Save].
- The XY diagram has been created and is displayed.

6.3.5 Creating a Diagram

A diagram consists of at least one x axis (time settings) and one y1 axis; the y2 axis is optional. Several channel values with the same unit can be displayed on each y axis. Use the y2 axis if you want to display values with another unit than on the y1 axis.



Procedure:

- Configure the Y1 axis (Y2 axis is optional)
- Configure time settings
- Make advanced configurations

Configuring the Y1 Axis (Y2 Axis Is Optional)

1. Select a plant or a device in the "Y1 axis", "Y2 axis" area in the "Plant/devices" field. Only devices of the current plant can be selected. HINT: In order to narrow your selection, choose a device type or "Plants" in the "Narrow selection" field.
2. Select desired channel in the "Channel" field.



Selectable channels

For devices, all channels which are transferred to Sunny Portal are available. For a plant, the calculated channels are available (CO₂ savings, energy, power, feed-in tariff, performance ratio, specific plant yield). The unit of the first channel selected determines the additional channels available for selection.

3. Select [+].
- Table with the selected device or plant is displayed.
4. In order to add further plants or devices, repeat the previous steps.



Selecting additional channels

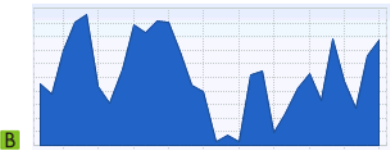
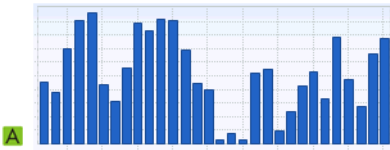
The selection of further channels is based on the unit of the first channel. If the base unit of the first selected channel is "Watts", the only channels subsequently selectable are those compatible with "Watts". The selection options are automatically restricted by Sunny Portal accordingly.

5. Select the desired unit in the "Unit" field.
6. Select the channel type of the value in the "values_type" field. The following channel types are available, depending on the channel:

Analog values	
Mean values	Average value of the channel over the set period.
Maximum values	The highest value of the channel over the set period.
Minimum values	The lowest value of the channel over the set period.

Meter channels	
Meter change	Increase within the period to be selected.
Meter reading	Current total meter reading of the value.
Cum. change	Cumulated (= total) increase within the period to be selected.

7. Select display type in the "Chart type" field. The following display types are possible:



Item	Meaning
A	Bar
B	Area
C	Line with markers
D	Line
E	Markers without line

8. Set automatic scaling or enter own scaling values:

- Automatic scaling: activate "Automatic scaling min" and "Automatic scaling max".
- Custom scaling: enter scaling values into "Min" and "Max" fields.

Configuring Time Settings

1. In the "Time settings" area, select the desired display period of the diagram in the "Depicted time period" field.
2. In the "Number of intervals" field select how many display periods are to be shown.
3. In the "Time unit" field, select the time units for period subdivision.
4. In the "End date of display" area, activate the desired end date of the display. The following settings are possible:

Current	The values from the current date (e.g. current day, current month) will always be displayed.
Selectable	You can select the date for which values are to be displayed (e.g. a certain day, a certain month).

Making Advanced Configurations

1. In order to add a heading, enter heading in the "Extended configuration" area in the "Module name" field.
 2. In the "Download_type" field, select the download format.
 3. In order to show the legend by default for this diagram, activate "Show legend".
 4. In order to view the preview, open the "Preview" area. Select [Update] to reload diagram after changes have been made.
 5. Select [Save].
 6. Select [Save].
- Diagram has been created and is displayed.

6.3.6 Creating a Slide Show

TIP: To enable a/the high-quality slide show display, select a page template for the slide show with only one display module per page.

Procedure:

- Select Picasa or Flickr photo album
- Integrate slide show into Sunny Portal

Selecting a Picasa Photo Album

1. Register on picasa.google.com.
2. If you have no Picasa photo album, create a photo album as described at Picasa.
3. Select photo album.
4. Select [Link to this album].
5. Select [Integrate slideshow].
 - A window opens.
6. "Integrate slideshow" text field.
7. Select the HTML code and copy this to the clipboard.
8. Leave Picasa and switch to Sunny Portal.

Selecting a Flickr Photo Album

1. Register on www.flickr.com.
2. If you have no Flickr photo album, create a photo album as described at Flickr.
3. Select photo album.
4. Select [Slideshow].
 - Slide show begins.
5. Select [Publish].
 - A window opens.
6. Select [Embed HTML].
7. Select [Copy to clipboard].
8. Leave Flickr and switch to Sunny Portal.

Integrating Slide Show into Sunny Portal

1. Call up page configuration of slide show.
2. In order to add a heading, enter the heading in the "Title" field.
3. In the "Data source" field, select the name of the photo platform.
4. Copy HTML code into the "HTML code" field.
5. In order to see the preview, select [Preview].
6. Select [Save].
7. Select [Save].
- Slide show has been created and is displayed.

6.3.7 Creating an Image


Image requirements:

- Maximum image size: 500 kB
- Possible image formats: JPG, PNG, GIF
- Height and width: Sunny Portal adjusts the proportions of the image according to the size of the page layout.

Procedure:

- Upload an image from your own computer to gallery
- Add an image from the gallery to the page

Uploading an Image from Your Own Computer to Gallery

1. Select .
 - A new section opens.
 2. Select [Browse].
 - The "Select file" window opens.
 3. Open desired image.
 - The path of the image is displayed in the line.
 4. Select [Upload selected file].
 5. To upload other images, repeat the procedure.
- Image has been uploaded and is displayed in the gallery.

Adding an Image from the Gallery to the Page

1. In order to add a caption, enter caption in the "Title" field.
 2. Select image by double clicking it.
 - Image is displayed.
 3. In order to use a different image, select [Edit] and repeat previous steps.
 4. Select [Save].
 5. Select [Save].
- Image is inserted on page and displayed.

6.3.8 Creating Plant Monitoring

Requirement:

- Plant monitoring is set (see Section 7.3, page 44).

- 1. In order to add a heading, enter the heading in the "Title" field.
- 2. Activate "Communication monitoring" and/or "Inverter comparison".
- 3. Select [Save].
- 4. Select [Save].
- Plant monitoring has been set and is displayed.

6.3.9 Creating an Overview

Image requirements:

- Maximum image size: 500 kB
- Possible image formats: JPG, PNG, GIF
- Height and width: Sunny Portal adjusts the proportions of the image according to the size of the page layout.

1. Activate field of desired value.
2. Select size of unit.
3. Adding an image:
 - In order to use the displayed image, activate "Automatically".
 - In order to use own image, activate "User-defined" and select [Browse].
4. Select [Save].
5. Select [Save].
- Overview has been created and is displayed.

6.3.10 Creating Text

Impermissible HTML Tags:


<SCRIPT> (and thus JavaScript), <META>, <APPLET>, <FORM>, <HTML>, <HEAD>, <FRAME>, <IFRAME>.

1. In order to add a heading, enter the heading in the "Title" field.
2. Enter desired text in editor.
3. Select [Save].
4. Select [Save].
- Text has been created and is displayed.

Example: Adding a Current Webcam Image

This example shows how you insert the current image of a webcam using the editor. Each time the page is called up, the current image of the webcam is displayed.

Requirement:

- The program of the webcam saves the current image under the same name.
 1. In order to add a heading, enter the heading in the "Title" field.
 2. Select .
 - The "Image properties" window opens.
 3. Enter the URL of the webcam image in the "Select image" field.
 4. Select [OK].

6.4 Changing/Deleting Page Contents

1. Select name of the page in the "Visualization" menu.
 - The selected page opens.
2. Select the "Page Configuration" tab.
3. To change page contents:
 - Select [Edit] in the area of the page content to be changed.
 - Edit page contents.
4. In order to delete page content, select [Delete] in the area of the page content to be deleted.

6.5 Changing the Page Name

1. Select the name of the page in the "Visualization" menu.
 - The selected page opens.
2. Select the "Page Configuration" tab.
3. Change the page name in the "Name of this page" field.
4. Select [Save].

6.6 Publishing Pages

You can publish the following pages:

- All pages of the "Visualization" menu
- The following pages of the "Name of your plant" menu:
 - Plant Profile
 - Energy and Power
 - Annual comparison

Options for publishing:

- Presenting pages at www.SunnyPortal.com in the "Publicly Available Plants" area
- Presenting pages on the Internet

Presenting Pages at Sunny Portal in the "Publicly Available Plants" Area

1. Select the name of the desired page.
 - The selected page opens.
2. If you have chosen a page in the "Visualization" menu, select the "Page Configuration" tab.
3. If you have chosen a page in the "Name of your plant" menu, select "Configuration > Name of page".
4. Activate the field "Also release page on www.sunnyportal.com".
 - The link "Send page by e-mail" is shown next to it.
5. In order to send the page by e-mail, select "Send page by e-mail". A Window to send the e-mail opens. Make the following settings:
 - Enter the recipient's e-mail address in the "Recipient e-mail address" field.
 - In order to change the name of the sender, change entry in "Name of sender" field.
 - In order to add a message to the recipient, enter desired text in the "Your message to the recipient (optional)" field.
 - Select [Send e-mail].
6. Select [Save].
7. In order to see a preview, select "Open page in new window".
 - Page is published.

Presenting Pages on the Internet

Each of your Sunny Portal pages has its own URL. You can use this URL to set a link from another website to your page. You can call up the URL of the page as follows:

1. Select the name of the desired page.
 - The selected page opens.
2. Call up configuration:
 - If you have chosen a page in the "Visualization" menu, select the "Page Configuration" tab.
 - If you have chosen a page in the "Name of your plant" menu, select "Configuration > Name of page".
3. In order to see a preview, select "Open page in new window".
4. Copy URL from "Page URL" field and copy it as a link into a program for creating web pages (e.g. Microsoft Office Frontpage) or integrate it into your own web page through a so-called iframe.

6.7 Deleting Pages

You can delete all pages of the "Visualization" menu.

1. Select the name of the page in the "Visualization" menu.
 - The selected page opens.
2. Select the "Page Configuration" tab.
3. In order to delete the page, select [Delete page].
4. Click [Yes] to accept.

6.8 Changing Page Arrangement in the Visualization Menu

6.8.1 Creating a New Group

Once you have created a new group, you can assign pages to the group by changing the page positions.

1. Select "Configuration > Visualization".
 - The "Group Configuration" page opens.
 2. Select [New group].
 - The "Configure group" page opens.
 3. Enter a name for the group in the "Group title" field.
 4. Select [Save].
- New group can be seen in the directory tree and in the "Visualization" menu.

6.8.2 Changing the Positions of Pages and Groups

Groups are moved as groups, together with the pages assigned to them. The position of the "(without group)" cannot be changed; it always remains in first place.

1. Select "Configuration > Visualization".
 - The "Group Configuration" page opens.
2. Select "Activate positioning".
3. Select the name of the group or page.
 - Arrow keys are now active. The name of the page or group is highlighted in gray.
4. Use the up or down arrow to move the page or group.
 - Page or group moves one step
5. Keep selecting the corresponding arrow until the desired position is reached.
6. Select [Save].

6.8.3 Deleting a Group



Group and all subpages will be deleted permanently.

If you delete a group, all the subpages assigned to the group will also be deleted permanently.

1. Select "Configuration > Visualization".
 - The "Group Configuration" page opens.
2. Select the name of the group.
3. Select [New group].
 - The "Configure group" page opens.
4. Select [Delete] to delete the group permanently.

7 Plant Monitoring

7.1 Overview of Monitoring Functions

Sunny Portal offers the following monitoring functions for your plant:

| Monitoring | Sunny Portal Function | Section |
|--|---|---------|
| Plant events | System Logbook
In the system logbook, you can see messages on events in your plant. | 7.2 |
| | Report Configuration
If you are using the report configuration, you will receive an e-mail with the events of your plant. | 7.4 |
| Yield, tariff, power, CO ₂ savings | Report Configuration
You can configure the report so that you will receive an e-mail with data of your plant. | |
| Inverter yields outside of the tolerance | Plant Monitoring – Inverter Comparison
If you set the inverter comparison option, you will receive an e-mail as soon as the specific yield of an inverter has exceeded the tolerance. | 7.3.3 |
| Communication between Sunny Portal and SMA communication products* | Plant Monitoring - Communication Monitoring
If you set the communication monitoring option, you will receive an e-mail whenever the connection between Sunny Portal and SMA communication products* is interrupted. | 7.3.2 |
| Incoming setpoints of the grid operator for your plant | Setpoint Monitoring
If you activate the setpoint monitoring, you will receive an e-mail as soon as the grid operator transmits setpoints to your Cluster Controller/Power Reducer Box (e.g. to limit the active power). | 7.3.4 |

*Sunny WebBox with Bluetooth, Sunny WebBox, Cluster Controller, Power Reducer Box

7.2 System Logbook

On the page "Name of your plant > System Logbook" you will receive messages from Sunny Portal and your plant. These messages help you to detect e.g. disturbances in your plant. The figure after the colon in the menu name shows the number of unread warning, disturbance and error messages (System Logbook: x, x = number of messages).

7.2.1 Calling Up and Filtering Messages

You can filter messages in the system logbook to restrict the messages received.

1. Select "Name of your plant".
2. Select "System Logbook".
3. Set the desired filter. The following settings are possible:

| | |
|------------------------|--|
| Go to | Here you can select the date whose messages should be displayed. |
| Status | <ul style="list-style-type: none"> • Non-confirmed: non-confirmed messages are displayed (default setting). • Confirmed: confirmed messages are displayed. • All: confirmed and non-confirmed messages are displayed. |
| Plant/Devices | <ul style="list-style-type: none"> • All: messages from Sunny Portal, from the plant, from service, and from the devices are displayed. • Portal: messages from Sunny Portal and the communication devices are displayed. • Plant: messages from all inverters in the active plant are displayed. • Devices (e.g. SB4200TL): messages for the selected device are displayed. |
| Number per page | Here you can select how many messages are to be displayed per page. |
| Type | Here you can select which messages are to be displayed: info, warning, disturbance, errors. |

7.2.2 Confirming Messages

Confirm messages to mark them as read. This will help you to differentiate between read messages and new messages.

1. To confirm messages, activate the boxes before the messages.
2. In order to select all messages, activate "Select all".
3. Select the red checkmark to confirm a message immediately.
4. Select [Submit].

7.3 Plant Monitoring

7.3.1 Overview of Plant Monitoring

The "Name of your plant > Plant Monitoring" page provides information on the monitoring status of your plant. Various monitoring options are available, which you can set and activate. If desired, the plant monitoring will send you an alert via e-mail. The "Plant Monitoring" page is subdivided into a maximum of four areas:

| Area | Meaning |
|---------------------------------|---|
| Plant Configuration | Is only displayed if Sunny Portal has detected a new device in your plant (see Section 10.2.7 "Adding/Replacing Devices (Configuration Wizard)", page 72). |
| Communication Monitoring | Indicates whether there is connectivity between Sunny Portal and SMA communication products* . Alerts per e-mail possible. |
| Inverter Comparison | Displays whether the inverter yields of the selected inverters are in the configured range. Alerts per e-mail possible. |
| Setpoint Monitoring | <p>This function is only available if a device is registered in the plant which provides grid management data (Cluster Controller or Power Reducer Box). In the respective device, the use of Sunny Portal must be activated and the settings for grid management carried out.</p> <p>Displays whether the plant is feeding into the utility grid without restrictions by the grid operator. This area only indicates setpoints for active power limitation.</p> <p>Alerts per e-mail possible when the following setpoints are received:</p> <ul style="list-style-type: none"> • Active power limitation • Reactive power setpoint (fixed reactive power or phase shift factor cos-phi) |





*Sunny WebBox with Bluetooth, Sunny WebBox, Cluster Controller, Power Reducer Box

Communication monitoring:


Communication monitoring monitors the link between Sunny Portal and the following devices:

- Sunny WebBox / Sunny WebBox with *Bluetooth*:
At certain time intervals, Sunny Portal checks whether the Sunny WebBox is sending the data to Sunny Portal at the specified interval. You can set the interval at which the Sunny WebBox should send data to Sunny Portal in the user interface of the Sunny WebBox.
- Cluster Controller:
Sunny Portal checks whether the Cluster Controller is reporting to Sunny Portal at the specified interval. You can set the interval at which the Cluster Controller should report to Sunny Portal in the user interface of the Cluster Controller.
- Power Reducer Box:
Sunny Portal checks whether the Power Reducer Box is reporting regularly to Sunny Portal. The frequency with which the Power Reducer Box should report in Sunny Portal can be set in the user interface of the Power Reducer Box.

If one of these devices does not report to Sunny Portal over a prolonged period of time, an alert mail will be sent to the given e-mail address. After the alert mail, a reminder e-mail is sent on up to three subsequent days if the error still exists. The error will be displayed in Sunny Portal until the device reports to Sunny Portal again. How to configure communication monitoring is described in Section 7.3.2. The following table explains the meaning of the communication monitoring symbols:

| Communication monitoring | | |
|---|-------------|--|
| Symbol | Status | Meaning |
|  | Deactivated | Communication monitoring is not set. |
|  | OK | Communication with Sunny Portal is OK. The time of last contact is displayed. |
|  | Error | Communication with Sunny Portal is interrupted. The "Details" link provides you with detailed information on the time of last contact. The following navigation options are available: <ul style="list-style-type: none"> • Link to the device properties • Link to the parameters • Link to the device reports in the system logbook |
|  | | Click this bell icon to stop the sending of reminder e-mails for the current error. For new errors, the reminder e-mail will start again. |

Status of the device*




| Symbol | Status | Meaning |
|---|--------|---|
|  | Error | Communication with Sunny Portal is interrupted. |

*Sunny WebBox with Bluetooth, Sunny WebBox, Cluster Controller, Power Reducer Box

Inverter comparison:

Sunny Portal provides inverter comparison for plants with at least two PV inverters. Sunny Central inverters are not supported.

By means of the daily yield, Sunny Portal calculates the specific yield for each active inverter and compares this once a day with the mean value of the specific yields of all inverters. Should the specific yield of an inverter by comparison with the average specific yield be below a configurable tolerance, Sunny Portal will inform you by e-mail. How to configure the inverter comparison option is described in Section 7.3.3. The following table explains the meaning of the inverter comparison symbols:




| Inverter comparison | | |
|---|-------------|---|
| Symbol | Status | Meaning |
|  | Deactivated | Inverter comparison is not activated. |
|  | OK | The yields of the monitored inverters are within the configured range. The yield of the last day is displayed. |
|  | Error | Specific inverter yield is outside of tolerance for at least one monitored inverter. The additional "Details" link gives information on the actual specific yield of the respective inverter or inverters and on the comparison value calculated from the mean values of all monitored inverters. The following navigation options are available: <ul style="list-style-type: none"> • Link to the device properties • Link to messages in the system logbook |




Setpoint monitoring:

Sunny Portal provides a setpoint monitoring option for all plants with Cluster Controller or Power Reducer Box. In the "Setpoint monitoring" area you can see whether the grid operator has specified any setpoints for the active power limitation of your plant. If you wish, Sunny Portal can inform you by e-mail about incoming setpoints for active power limitation and reactive power setpoint (fixed reactive power or phase shift factor cos-phi). How to configure the e-mail notification for setpoint monitoring is described in Section 7.3.4.




In addition to setpoint monitoring, you should use the communication monitoring for the Cluster Controller/Power Reducer Box (see Section 7.3.2, page 48). This monitoring option enables Sunny Portal to detect whether or not the setpoint monitoring information is outdated.

The following table explains the meaning of the setpoint monitoring symbols:

| Status of setpoint monitoring for active power limitation | | |
|---|---|---|
| Symbol | Status | Meaning |
|  | No setpoint | There is no active setpoint for active power limitation. |
|  | Setpoint | There is an active setpoint for active power limitation. |
|  | Problem with a Cluster Controller/
Power Reducer Box | There is a problem with a Cluster Controller/
Power Reducer Box. |

| Status of the Power Reducer Box | | |
|---|---------------|--|
| Symbol | Status | Meaning |
|  | OK | The Power Reducer Box is working correctly. |
|  | Disturbance | The Power Reducer Box has received a signal from the radio ripple control receiver that is not configured in the Power Reducer Box. |
|  | Error | The Power Reducer Box connection to at least one Sunny WebBox has failed.

or
There is no Sunny WebBox registered in the Power Reducer Box. |

| Status of the Cluster Controller | | |
|---|---------|---|
| Symbol | Status | Meaning |
|  | OK | The Cluster Controller is working properly. |
|  | Warning | The Cluster Controller has received a signal from the signal source that is not configured in the Cluster Controller. |
|  | Error | There is an error in the Cluster Controller. |

7.3.2 Setting Communication Monitoring

Requirements:

- If you want to monitor the communication between Sunny WebBox and Sunny Portal:
 - The Sunny WebBox is registered in Sunny Portal (see Sunny WebBox manual).
 - On the user interface of the Sunny WebBox, the use of Sunny Portal is activated (see Sunny WebBox manual).
- If you wish to monitor the communication between Cluster Controller and Sunny Portal:
 - The Cluster Controller is registered in Sunny Portal (see Cluster Controller user manual).
 - The use of Sunny Portal is activated on the Cluster Controller user interface and communication monitoring is switched on (see Cluster Controller user manual).
- If you want to monitor the communication between the Power Reducer Box and Sunny Portal:
 - The Power Reducer Box is registered in Sunny Portal (see Power Reducer Box manual).
To this end, all Sunny WebBoxes must be registered in the Power Reducer Box and at least one of these Sunny WebBoxes must be registered in Sunny Portal.
 - The use of Sunny portal is activated in the Power Reducer Box and communication monitoring is switched on (see Power Reducer Box manual).

1. Select "Name of plant > Plant Monitoring".
2. In the "Communication Monitoring" area select [Settings].

- Set alerts. The following settings are possible:

| | |
|-----------------------------------|--|
| off | Communication monitoring is deactivated in Sunny Portal. |
| Bounteous, Tolerant, Sharp | <p>Here, you can select how fast you wish to be notified that communication is interrupted.</p> <p>The time span indicates how long Sunny Portal should wait before sending an e-mail after the expected contact has failed.</p> <ul style="list-style-type: none"> - "Sharp": alert 15 minutes after contact overdue - "Tolerant": alert 1 hour after contact overdue - "Bounteous": alert 3 hours after contact overdue |

- Enter the recipient's e-mail address for notifications in the "Recipient" field. If you enter several e-mail addresses, separate these by commas.
- For the required devices activate the "Monitoring" field.
- Select [Save].

7.3.3 Setting Inverter Comparison

Displaying the inverters in groups or individually:

Inverters are displayed in groups if they are of the same type, have the same set tolerance and have been selected for inverter comparison. If at least one feature is different, the inverters are listed individually.

- Select "Name of plant > Plant Monitoring".
- In the "Inverter comparison" area, select [Settings].
- Enter the recipient's e-mail address for notifications in the "Recipient" field. If you enter several e-mail addresses, separate these by commas.
- Change the preset PV array power in the "Generator power [kWp]" field, if required. Sunny Portal calculates the PV array power based on the nominal power of the inverter. You can configure the PV array power for each inverter (see Section 10.2.5 "Setting the PV Array Power", page 70).
- In the "Tolerance [%]" field, change the preset tolerance for the specific yield of the inverter, if required. If the specific yield is outside the tolerance range, Sunny Portal will inform you by e-mail.
- Activate the "Monitoring" field for required inverters. Activate the "Monitoring" field to select inverters for inverter comparison.
- Select [Save].

7.3.4 Setpoint Monitoring: Setting the E-Mail Alert

Requirements:

- The Cluster Controller/Power Reducer Box is registered in Sunny Portal (see user manual of the Cluster Controller/Power Reducer Box).
- The use of Sunny Portal is activated in the Cluster Controller/Power Reducer Box (see user manual of the Cluster Controller/Power Reducer Box).

1. Select "Name of plant > Plant Monitoring".
2. In the "Setpoint monitoring" area, select [Settings].
3. To receive an alert via e-mail:
 - Activate field "Send alert whenever control commands are received from grid operator".
 - Enter the recipient's e-mail address for notifications in the "Recipient" field. If you enter several e-mail addresses, separate these by commas.
4. If you do not wish to receive an alert, deactivate the field "Send alert whenever control commands are received from grid operator".
5. Select [Save].

7.4 Report Configuration

Reports contain plant data or events for your plant. Sunny Portal sends the reports via e-mail.



Receiving e-mails as text messages on your cell phone

You can also receive the report e-mails as a text message through your mobile network provider or have them forwarded as a text message from your mailbox.

Direct text messages from the Sunny WebBox with optional GSM modem

If you have an installed GSM modem, the Sunny WebBox can notify you directly via e-mail and text message about error events.



Sunny Portal takes delayed data into account in the following reports

If relevant data is received after the report has been sent, Sunny Portal will incorporate the data into the subsequent report.

The following three reports are available, and you can set three in each case:

| Report | Selectable channels |
|-----------------------------------|--|
| Daily info report 1 to 3 | <ul style="list-style-type: none"> • Daily yield (kWh) • Feed-in tariff today • Max. power today (kW) • CO₂ savings today (kg) |
| Monthly info report 1 to 3 | <ul style="list-style-type: none"> • Monthly yield (kWh) • Monthly feed-in tariff • Max. power for the month (kW) • Monthly CO₂ savings (kg) |
| Event report 1 to 3 | <p>For each of the three event reports, you can choose four message types from Sunny Portal, from the plant, and from service:</p> <ul style="list-style-type: none"> • Information • Warnings • Disturbances • Errors |

7.4.1 Setting the Daily Info Report/Monthly Info Report

In the daily info report, the channel data for the respective day is sent; for the monthly info report, the channel data for the respective month. You can set three monthly info reports and three daily info reports each containing different data. Each daily info report can be sent at a set time; the monthly info reports are sent at the end of the month.

1. Select "Configuration/Report Configuration".
2. In the "Report configuration" field, select a daily info report or a monthly info report.
3. Select [Edit].
4. Set report. The following settings are possible:

| | |
|--------------------------|---|
| Activate report | If the report is activated, it will be sent to the set e-mail address at the set interval. You can also save the report settings and activate the report later. |
| Recipient | In the "E-mail address(es):" field enter the recipient's e-mail address. If you enter several e-mail addresses, separate them by commas. |
| Interval | In the "Send report at:" field select the time at which you would like to receive the e-mail. |
| Content | |
| Channel selection | Activate the channel fields to be displayed in the report. |
| Send report as: | Text: You will receive the e-mail with the data in text format.
In the "Send data in:" area activate the fields in which the data should be displayed in the e-mail. <ul style="list-style-type: none"> • Subject of the mail: The data is displayed in the subject line of the e-mail. • Contents of the mail: The data is displayed in the e-mail. |
| | HTML: You receive the e-mail with the data in HTML-Format.
PDF: You receive the e-mail in text format, with the data in PDF format as an attachment.
In the "Portal Page to Be Sent:" field select which Sunny Portal page should be sent with the e-mail. If you want to generate a default report page, save your report settings and create the report manually at a later time. |

5. In order to send the test report to a set e-mail address, select [Send Test Report].
6. Select [Save].

7.4.2 Setting an Event Report

You can set up to three event reports each containing different events and have them sent at different times. In each case, you can select four events from Sunny Portal and the plant: information, warnings, disturbances, errors.

1. Select "Configuration/Report Configuration".
2. Select an event report in the "Report configuration" field.
3. Select [Edit].
4. Set report. The following settings are possible:

| | |
|---|---|
| Activate report | If the report is activated, it will be sent to the set recipients at the set interval. You can also save the report settings and activate the report later. |
| Recipient | In the "E-mail address(es):" field enter the recipient's e-mail address. If you enter several e-mail addresses, please separate these by commas. |
| Interval | In order to receive the report hourly, activate the "Hourly" field. In order to receive the report daily, activate the "Daily" field and select the time. |
| Content | |
| | Activate the respective fields of the events to be included in the report in the "Portal" and "Plant" rows. |
| Send report as: | Text: You will receive the e-mail with the data in text format. |
| | HTML: You will receive the e-mail with the data in HTML-Format. |
| | PDF: You will receive the e-mail in text format, with the data in PDF format as an attachment. |
| Maximum number of messages in one report | Select the maximum number of messages permitted in one report. |
| | If you also wish to receive empty reports, activate "Send empty reports if no new events are available". |

5. In order to send the test report to set e-mail addresses, select [Send Test Report].
6. Select [Save].

7.4.3 Generating Reports Manually

You can generate reports from certain dates at a later point in time. These reports can then be sent to the e-mail addresses set in the report.

1. Select "Configuration/Report Configuration".
 2. Select desired report in the "Report configuration" field.
 3. In the "Report date" field in the "Generate report manually" area, select the date for which the report is to be created.
 4. Select [Generate].
- Next to the button you will see a message that the report has been sent.

8 Plant Properties

8.1 Plant Data

On the "Configuration > Plant Properties" page you can view or edit general information on your PV plant. Some of the information is displayed on the "Plant profile" page.

You can make the following settings, which are explained in the following sections:

- Change general plant data
- Change plant name
- Delete plant
- Set plant power
- Change plant description
- Create image of the plant

8.1.1 Changing General Plant Data

1. Select "Configuration > Plant Properties".
2. Select "Plant Data" tab.
3. Select [Edit].
4. Change plant data. The following settings are possible:

| | |
|-------------------------|--|
| Name | Name of the active plant. The plant identifier is used as the default plant name (to change plant name, (see Section 8.1.2 "Changing the Plant Name", page 56)). |
| Plant identifier | Plant identifier for the plant currently selected. The plant identifier is defined when you register the plant. |
| Commissioning | Date on which the plant was created in Sunny Portal. |
| Street/no. | Street address where the plant is located. |
| Zip code/City | Zip code and city where the plant is located. |
| Country | Country in which the plant is located. |
| Federal state | Federal state in which the plant is located. |
| Time zone | You can select the time zone here. |
| Longitude | Longitude and latitude of the plant location. In order to have geodata for location automatically entered from the database, select "Find geo data". |
| Latitude | |
| Altitude | Altitude of plant location. |

5. Select [Save].

8.1.2 Changing the Plant Name

The plant identifier is used as the default plant name. You can change the plant name and assign a name to your plant. If you have several plants registered in Sunny Portal, it will be easier to distinguish between plants with meaningful names.

1. Select "Configuration > Plant Properties".
2. Select "Plant Data" tab.
3. Select [Edit].
4. In the "Name" field, enter your name for the plant (e.g. "Smith House" or "WebBox plant South").
5. Select [Save].

8.1.3 Deleting a Plant



You cannot undo the delete process.

If you delete a plant, all devices and data related to this plant are permanently deleted.

1. Select "Configuration > Plant Properties".
1. Select "Plant Data" tab.
2. Select [Edit].
3. Select [Irretrievably delete plant].
4. Select [Yes] in order to delete plant permanently.

8.1.4 Setting the Plant Power

The plant power is the sum of the power of all PV modules.

Options for configuring plant power:

- Enter plant power manually
- Calculate plant power from the total power of all inverters

Entering the Plant Power Manually

1. Select "Configuration > Plant Properties".
2. Select "Plant Data" tab.
3. Select [Edit].
4. In the "Power" area, set the plant power in the "Plant power" field.
5. To set the manufacturer of the PV modules, select a setting in the "Manufacturer" field.
6. To set the module type, select a setting in the "Module type" field. Selection options depend on the selected manufacturer.
7. Select [Save].

Calculating the Plant Power from the Total Power of All Inverters

1. Set power of the individual inverters (see Section 10.2.5 "Setting the PV Array Power", page 70).
2. Select "Configuration > Plant Properties".
3. Select "Plant Data" tab.
4. Select [Edit].
5. In the "Power" area, activate "Calculate plant performance from device properties" field.
 Plant power is calculated and displayed.
6. Select [Save].

8.1.5 Changing the Plant Description

You can enter important features of the plant in the description. The editor can format text but does not support HTML. The text is also displayed on the "Plant profile" page.

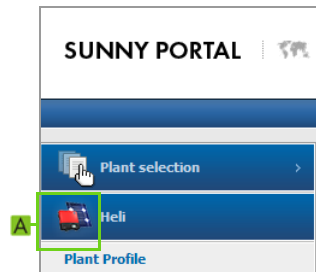
1. Select "Configuration > Plant Properties".
2. Select "Plant Data" tab.
3. Select [Edit].
4. Enter desired description in the "Description" area.
5. Select [Save].

8.1.6 Changing/Deleting the Plant Image

The plant image is the image (A) in the menu "Name of your plant". You can change this image. You can upload an image from your computer or select an image from your own Sunny Portal image gallery. You can store own images in the gallery for later use on your pages.

Image requirements:

- Maximum image size: 500 kB
- Possible image formats: JPG, PNG, GIF
- Height and width: Sunny Portal adjusts the proportions of the image according to the size of the page layout.



Changing the Plant Image

1. Select "Configuration > Plant Properties".
2. Select "Plant Data" tab.
3. Select [Edit].
4. To upload an image from your own computer:
 - In the "Plant image" area, select [Load image].
 - The "Select file" window opens.
 - Select desired image.
 - Select [Open].
 - To change the image section, use the mouse to move the gray squares.
5. To select an image from the gallery:
 - In the "Plant image" area, select [Select from the gallery].
 - The image gallery opens.
 - Select the desired image by double clicking it.
 - To change the image section, use the mouse to move the gray squares.
6. Select [Save].

Deleting the Plant Image

You can delete your own plant images. If you have not created your own plant image, Sunny Portal will revert to the default plant image.

1. Select "Configuration > Plant Properties".
2. Select "Plant Data" tab.
3. Select [Edit].
4. Select [No plant image] in the "Plant image" area.
5. Select [Save].

8.2 Changing Operator Data

You can enter the data of the plant operator in the plant properties in Sunny Portal, as described in this section. The name of the operator is displayed on the "Plant profile" page. The operator is a private or legal person who, for example, owns large-scale PV power plants as a business enterprise and who induces their utilization without necessarily being a user himself.

1. Select "Configuration > Plant Properties".
2. Select "Operator" tab.
3. Select [Edit].
4. Change operator data.
5. Select [Save].

8.3 Parameters

The section describes how to change parameters for displaying your plant in Sunny Portal. The settings only affect the display of your plant in Sunny Portal and have no effect on your devices. The following sections contain a description of the parameters and the calculations for which Sunny Portal needs these parameters.

8.3.1 Changing the Feed-In Tariff

You can either sell the electric current from the plant or use it for self-consumption. Here, you should enter the amount of the feed-in tariff or the savings, as the case may be. Sunny Portal will calculate the amount of money you earn or save. The feed-in tariff in Germany is regulated by the Renewable Energy Sources Act (EEG).

1. Select "Configuration > Plant Properties".
2. Select the "Parameters" tab.
3. Select [Edit].
4. Enter amount of feed-in tariff.
5. Select currency.
6. Select [Save].

Automatically Calculating Feed-In Tariff - for Germany Only

1. Select [Calculate compensation according to EEG].
 - The "Calculate compensation" window opens.
2. Select plant type.
3. Select year of plant's initial commissioning.
4. Select [Submit].
 - The window closes. Feed-in tariff is displayed.
5. Select [Save].

8.3.2 Changing CO₂ Savings Factor

The CO₂ factor indicates how much CO₂ is produced for every single kilowatt hour of electric current generated in the country. Depending on the technology used and the efficiency, the CO₂ factor can vary between the different electric utility companies in the region. You can find out the value of the CO₂ factor of the electric current supplied in your region from your electric utility company. The CO₂ factor is used by Sunny Portal to calculate how much CO₂ has been saved by the eco-friendly power generation of your plant.

1. Select "Configuration > Plant Properties".
2. Select the "Parameters" tab.
3. Select [Edit].
4. Enter CO₂ factor in the "Factor" field or adjust with slider.
5. Select [Save].

8.3.3 Entering the Predicted Annual Yield

The predicted annual yield is the yield to be expected from a PV plant within one year. Sunny Portal uses a table to show how the predicted annual yield of your PV plant is distributed throughout the months of the year.

The predicted annual yield of the PV plant is calculated from the specific annual yield (kWh/kWp) at the location of the PV plant multiplied by the plant power in kWp. The plant power is also called nominal power.

You can obtain the specific annual yield for the location of your PV plant from irradiation maps. Local conditions such as shadings or the plant orientation are not taken into account. You can obtain the plant power in kWp from your installer.

1. Select "Configuration > Plant Properties".
2. Select the "Parameters" tab.
3. Select [Edit].
4. Enter specific annual yield in kWh/kWp in the "Specific annual yield" field.
5. If the "Plant power (nominal power)" field is empty, set the plant power (see Section 8.1.4 "Setting the Plant Power", page 56).
6. Select [Save].

Changing the Monthly Distribution of the Predicted Annual Yield

The monthly distribution shows how the predicted annual yield is distributed throughout the months of the year. Given complete information about the plant location, Sunny Portal can suggest a distribution. You can also enter the distribution manually.

1. Select "Configuration > Plant Properties".
2. Select the "Parameters" tab.
3. Select [Edit].
4. If "Plant location" field is empty, enter information on the plant location in the "Plant Data" tab (see Section 8.1.1 "Changing General Plant Data", page 55).
5. Select [Suggest monthly distribution].
6. To enter the monthly distribution manually, enter values in the "in %" fields.
7. Select [Save].

8.3.4 Changing the Performance Ratio

The performance ratio is a measure of the quality of a PV plant that is independent of the location and is therefore often described as a quality factor. The performance ratio (PR) is given in percent and describes the relationship between the actual and target yields of the plant. Hence, it indicates the proportion of generated energy that is actually available for feed-in after deduction of energy losses (e.g. due to thermal and conduction losses) and of the requisite operating current.

The closer the PR value determined for a plant is to 100%, the more efficiently the respective plant is operating. In real life, a value of 100% cannot be achieved, as unavoidable losses always arise during operation of the plant (e.g. thermal losses due to the PV modules heating up). However, high-performance plants can reach a performance ratio of up to 80%.

The parameters for the performance ratio are configured automatically when one of the following devices is added to your Sunny Portal plant.

- Sunny SensorBox
- Cluster Controller with connected irradiation sensor



Cluster Controller temperature sensors

If a module temperature sensor is connected to the Cluster Controller, the module temperature sensor readings are taken into account in the calculation of the performance ratio. This renders the value of the performance ratio more exact. However, a satisfactory PR calculation is also possible without a temperature sensor.

Adjusting the Irradiation and Temperature Sensor Manually

In the following cases, you will need to adjust the parameters of the irradiation and/or temperature sensor manually.

- If there are several Sunny SensorBox devices in the plant
- If there is a Sunny SensorBox and a Cluster Controller with connected irradiation sensor in the plant
- If the list of parameters has been changed
- If you have replaced a Sunny SensorBox or a Cluster Controller

The reason is that the standard "Performance ratio" page in the "Visualization" menu is not updated automatically.

1. Select "Configuration > Plant Properties".
2. Select the "Parameters" tab.
3. Select [Edit].
4. In the "Irradiation sensor" field, select the sensor according to the serial number of the Cluster Controller / Sunny SensorBox.

5. Select the type of irradiation sensor. The following settings are possible:

| | |
|------------------|---|
| ExtSolIrr | External irradiation sensor |
| IntSolIrr | Internal irradiation sensor (only with Sunny SensorBox) |

6. In the "Temperature sensor" field, select the sensor according to the serial number of the Cluster Controller / Sunny SensorBox.
7. Select type of temperature sensor. The following settings are possible:

| | |
|----------------|----------------------------|
| TmpAmb | Ambient temperature sensor |
| TmpMdul | Module temperature sensor |

8. In the "Tolerance range between" field, enter the upper and lower limits of the tolerance range for the performance ratio (default settings: 0.0 und 1.0). If the performance ratio is outside the tolerance range, a warning will be logged in the plant logbook.
9. Select [Save].

9 Publishing Sunny Portal Pages

There are two options for publishing the Sunny Portal pages of your PV plant:

- Release pages on www.SunnyPortal.com
- Integrate the plant profile in your own website



Releasing pages on www.SunnyPortal.com

If you release Sunny Portal pages of your plant on www.SunnyPortal.com, interested people will be able to find your plant on www.SunnyPortal.com under "Publicly Available Plants" and view the released pages.

1. Log into Sunny Portal with the user role "Installer" or "Plant administrator".
2. Select the desired page in the page and drop-down menu.
3. Select the "Page Configuration" tab.

or

In the Contents area, select [Configuration - "Name of the Page"].

4. In the "Approval" area, activate the "Also release page on www.sunnyportal.com" checkbox.
 5. To send the page by e-mail, select "Send the website by e-mail", enter the e-mail address of the recipient, click [Send E-mail], and select .
 6. Select [Save].
- The icon  is displayed in the page and drop-down menu next to the name of the released page. To view the released pages of the plant, select the hyperlink "Open publicly available area of this plant." under "Configuration > System Presentation".

Integrating the Plant Profile in Your Own Website

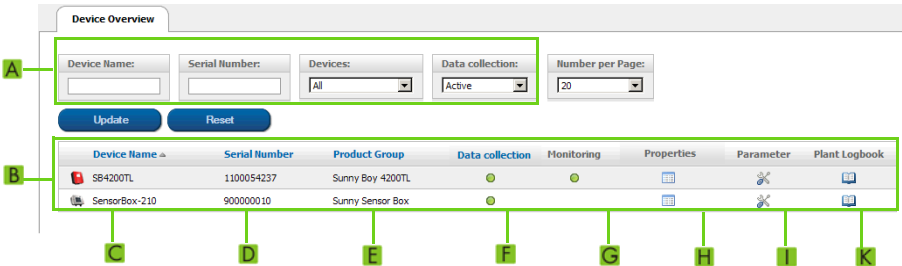
1. Log into Sunny Portal with the user role "Installer" or "Plant administrator".
2. Select "Configuration > System Presentation".
3. In the "Plant profile" area, copy the source code of the page to the clipboard and link it into your own website via a so-called inline frame.




10 Device Settings

10.1 Calling Up and Filtering the Device Overview

On the "Device overview" page you will receive information about all devices of your plant and can make device-specific settings. The "Overview new devices" tab is only visible if Sunny Portal has detected new devices in your plant.

1. Select "Configuration > Device overview".
 - The device overview of all devices of the active plant opens.



| Item | Meaning |
|------|---|
| A | Settings for filtering the device overview |
| B | Device overview |
| C | Device name: Name of the device |
| D | Serial number: Serial number of the device |
| E | Product group: Device group, e.g. Sunny Boy 4200TL |
| F | * Data collection: displays whether the data of this device is to be used on your Sunny Portal pages (see Section 10.2.1 "Activating/Deactivating the Device", page 69). |
| G | * Monitoring: shows whether the device (inverter, Sunny WebBox) is participating in plant monitoring (see Section 7.3 "Plant Monitoring", page 44). |
| H |  Properties: opens tab with properties of the device (see Section 10.2 "Calling Up Device Properties", page 65). |
| I |  Parameters: opens the "Parameters" tab of the device (see Section 10.3 "Calling up Device Parameters", page 72). |
| K |  Plant logbook: opens "System Logbook" tab with filtered messages for this device (see Section 7.2 "System Logbook", page 43). |

*  = active,  = deactivated

2. Set the desired filters in order to filter the device overview. The following settings are possible:

| | |
|------------------------|--|
| Device name | Enter the complete name of a device or parts of a device name. |
| Serial number | Enter the complete serial number of the device or parts of the serial number. |
| Devices | Select the required device class, e.g. photovoltaic inverter or sensor. |
| Data collection | Select the status of the required devices. <ul style="list-style-type: none"> • All: both activated and deactivated devices are shown. • Active: only activated devices are shown. • Deactivated: only deactivated devices are shown. |









3. Select [Refresh].
4. Select [Reset] in order to delete filter settings. TIP: You can sort the devices in the table of the device overview in ascending or descending order by clicking on a blue entry in the table header (device, serial number, device active).

10.2 Calling Up Device Properties

1. Select "Configuration > Device overview".
 2. In the device line, select the icon for the device properties.
- The device properties page opens.

Explanation of device properties:

| Designation | Meaning |
|--|---|
| Data collection | Displays whether the device is activated in Sunny Portal (see Section 10.2.1 "Activating/Deactivating the Device", page 69). Activated devices are used in Sunny Portal, deactivated devices are not used. <ul style="list-style-type: none"> ● = Device is activated in Sunny Portal. ● = Device is deactivated in Sunny Portal. |
| Product group | Device group, e.g. Sunny Boy 4200TL |
| Serial number | Device serial number |
| IP address
(only with Sunny WebBox and Cluster Controller) | By selecting the IP address, you can access the user interface of the Sunny WebBox or Cluster Controller directly. To do this, you may need to set up port forwarding in your router (see router manual). |
| MAC address
(only with Sunny WebBox) | MAC address of Sunny WebBox |
| Manufacturer | Device manufacturer |

| Designation | Meaning |
|---|---|
| Device name
Device name | Device name
The serial number of the device is displayed as the default device name (to change the name (see Section 10.2.2 "Changing the Device Name", page 69)). |
| Description | Space for comments on the device (see Section 10.2.3 "Changing the Description of the Device", page 69) |
| Irradiation sensor connected
(only with Cluster Controller) | Indicates whether an irradiation sensor is connected to the Cluster Controller.
<ul style="list-style-type: none">  = Irradiation sensor connected  = No irradiation sensor connected |
| Module temperature sensor connected
(only with Cluster Controller) | Indicates whether a module temperature sensor is connected to the Cluster Controller.
<ul style="list-style-type: none">  = Module temperature sensor connected  = No module temperature sensor connected |
| Outside temperature sensor connected
(only with Cluster Controller) | Indicates whether an outside temperature sensor is connected to the Cluster Controller.
<ul style="list-style-type: none">  = Outside temperature sensor connected  = No outside temperature sensor connected |
| Line conductor (L1, L2, L3)
(only with inverters) | Line conductors to which the device is connected (see Section 10.2.4 "Setting the Line Conductor", page 69).
<ul style="list-style-type: none">  = The device is connected to this line conductor.  = The device is not connected to the line conductor or the line conductor is not configured. |
| PV array power
(only with inverters) | Total power of all PV modules connected to a PV inverter. |
| Meter reading total yield
(only with inverters) | Meter reading of inverter total yield on the current day |
| Communication monitoring
(only with Sunny WebBox, Cluster Controller and Power Reducer Box) | Shows the settings of the Sunny WebBox/ Cluster Controller/Power Reducer Box for communication monitoring (see Section "Explanation of device properties - Communication monitoring (only for Sunny WebBox, Cluster Controller and Power Reducer Box):", page 67). |

| Designation | Meaning |
|---|--|
| Inverter Comparison
(only with inverters) | Shows the settings of the inverter for this inverter comparison (see Section "Explanation of device properties - Inverter comparison (only for inverters):", page 67). |

Explanation of device properties – Communication monitoring (only for Sunny WebBox, Cluster Controller and Power Reducer Box):

| Designation | Meaning |
|--------------------|--|
| Monitoring | Here you can activate or deactivate communication monitoring for this communication device* . |
| Alert after | Indicates how long there is no contact allowed between Sunny Portal and this communication device* until you receive an e-mail. |
| Interval | Shows the frequency with which the communication device* sends data to the Sunny Portal (configuration via user interface of the communication device*). |
| Time period | Indicates in which period the communication device* sends data to the Sunny Portal (configuration via user interface of the communication device*). |

* Sunny WebBox, Cluster Controller or Power Reducer Box.

Explanation of device properties - Inverter comparison (only for inverters):

| Designation | Meaning |
|----------------------|--|
| Monitoring | Here you can activate or deactivate the inverter comparison for this inverter. |
| Tolerance [%] | The permissible tolerance for the specific yield of this inverter can be entered here for this inverter. If the specific yield is outside the tolerance range, Sunny Portal will inform you by e-mail. |

Explanation of device properties – Device status of the Cluster Controller

- To display the device status of the Cluster Controller, select the "Device Characteristics" page of the Cluster Controller and go to the "Device status" tab.

| Designation | Meaning |
|----------------------|--|
| Device status | Indicates the device status of the Cluster Controller (see page 48). |

| Designation | Meaning |
|---------------------------------|--|
| Grid Management | Indicates whether grid management is activated in the Cluster Controller (see the Cluster Controller user manual). |
| Active power limitation* | Parameter for active power limitation |
| Cos Phi setpoint* | Parameter for the Cos Phi setpoint |
| Target value | Indicates the current target value for active power limitation or the Cos Phi setpoint. The target value is specified by the grid operator. |
| Actual set value | Indicates the current actual set value for active power limitation or the Cos phi setpoint. The actual set value is sent to the inverters by the Cluster Controller. |
| Source of target value | Indicates the type of signal source. |
| Last contact | Shows the date and time of the last contact between the Cluster Controller and the Sunny Portal. |

* The data for active power limitation and Cos Phi setpoint are displayed when the respective function is activated.

Explanation of device properties – Device status of Power Reducer Box

- To display the device status of the Power Reducer Box, select the "Device Characteristics" page of the Cluster Controller and go to the "Device status" tab.

| Designation | Meaning |
|---------------------------|--|
| Device status | Indicates the device status of the Power Reducer Box (see page 47). |
| Operating mode | Displays the operating mode for grid management which is configured in the Power Reducer Box, e.g. "Active power limitation" (see user manual of the Power Reducer Box). |
| Setpoint (target) | Indicates the setpoint value for grid management. The target value is specified by the grid operator. |
| Setpoint (current) | Indicates the current actual value for grid management. The actual value is transmitted to the plant by the Power Reducer Box. |
| Status of inputs | Indicates the status of the digital inputs of the ripple control receiver. <ul style="list-style-type: none"> "Open": no signal "K1 + K2" (example): relay 1 and relay 2 are closed. |

| Designation | Meaning |
|---|---|
| Communication monitoring deactivated/activated | Indicates whether the communication monitoring for the Power Reducer Box is switched on or off. |

10.2.1 Activating/Deactivating the Device

1. If you want to remove a device from your plant or if you do not want to have a device displayed on Sunny Portal, you can deactivate the device on Sunny Portal. The data of the deactivated device is then no longer available for calculating diagrams and tables. In contrast to the deletion of a device (see Section 10.2.6 "Deleting a Device", page 71), the data of a deactivated device is retained on Sunny Portal. Select "Configuration > Device overview".
2. In the device line, select the icon for the device properties.
 - The device properties page opens.
3. Select [Edit].
4. In order to activate a device, activate "Data collection" field.
5. In order to deactivate a device, deactivate "Data collection" field.
6. Select [Save].

10.2.2 Changing the Device Name

The serial number of the device is displayed as the default device name.

1. Select "Configuration > Device overview".
2. In the device line, select the icon for the device properties.
 - The device properties page opens.
3. Select [Edit].
4. Enter new name in the "Name" field.
5. Select [Save].

10.2.3 Changing the Description of the Device

1. Select "Configuration > Device overview".
2. In the device line, select the icon for the device properties.
 - The device properties page opens.
3. Select [Edit].
4. Enter your remarks on the device in the "Description" field.
5. Select [Save].

10.2.4 Setting the Line Conductor

You can set the line conductor to which the inverter feeds in.

1. Select "Configuration > Device overview".

2. In the device line, select the icon for the device properties.
 - The device properties page opens.
3. Select [Edit].
4. Activate respective fields L1, L2, or L3 in the "Phase" area.
5. Select [Save].

10.2.5 Setting the PV Array Power

You will need to make the settings in this section if Sunny Portal is to calculate the entire power of your plant or if you are using the "Inverter comparison" function. Sunny Portal calculates the plant power from the inverter power (PV array power).

Options for setting the PV array power:

- Enter the power of an inverter manually
- Configure the power of an inverter via multiple strings

Entering the Power of an Inverter Manually

1. Select "Configuration > Device overview".
2. In the inverter line, select the icon for the device properties.
 - The device properties of the inverter opens.
3. Select [Edit].
4. Enter inverter power in the "kWp" field under "Generator power".
5. Select [Save].
6. Activate calculation (see Section 8.1.4 "Setting the Plant Power", page 56), paragraph (see Section "Calculating the Plant Power from the Total Power of All Inverters", page 57).

Configuring the Power of an Inverter via Multiple Strings

1. Select "Configuration > Device overview".
2. In the inverter line, select the icon for the device properties.
 - The device properties page opens.
3. Select [Edit].
4. Call up page for configuring the string:
 - Select [Add string] in order to add a new string.
 - To copy an existing string, select [Copy] in the string row and then edit the string.
 - To edit an existing string, select [Edit] in the string row.
- String configuration menu opens.
5. Set the string. The following settings are possible:

| | |
|---------------------|--|
| Designation | Enter name for the string |
| Manufacturer | Select the display module manufacturer |

| | |
|--------------------------|---|
| Module Type | Select the type of module
You must set the manufacturer first. The menu contents vary depending on the manufacturer you select. |
| Module power | These data are entered automatically when you select the module type. You can enter adjustments in the fields using the arrows or the arrow keys on the keyboard. |
| Module surface | |
| Efficiency | |
| Number of modules | Enter the number of modules on the string |
| Azimuth | You can enter the azimuth angle of the string module surfaces here. The azimuth angle indicates, in degrees, the amount by which the module surfaces deviate from an exact southern orientation. <ul style="list-style-type: none"> Tracking
If your module surfaces track the sun automatically, activate this field. |
| Tilt angle | Set the tilt angle of the string module surfaces. The tilt angle indicates, in degrees, the amount by which the module surfaces deviate from the horizontal. <ul style="list-style-type: none"> Optimized
If your plant is optimized based on the latitude, activate this field. In Germany, the ideal orientation is 30° from the horizontal. |
| Description | Enter comments |

6. Select [Submit].
 - The device properties page opens. The string is configured.
7. Select [Save].
8. Activate calculation (see Section 8.1.4 "Setting the Plant Power", page 56), paragraph (see Section "Calculating the Plant Power from the Total Power of All Inverters", page 57).

10.2.6 Deleting a Device



If you delete a device, all the data of that device is deleted permanently. Check in advance whether it is sufficient to deactivate the device (see Section 10.2.1 "Activating/Deactivating the Device", page 69).



Replacing a device using the configuration wizard



After you have replaced a device using the configuration wizard (see Section 10.2.7 "Adding/Replacing Devices (Configuration Wizard)", page 72), the replaced device is automatically deleted.

1. Select "Configuration > Device overview".

2. In the device line, select the icon for the device properties.
 - The device properties page opens.
3. Select [Edit].
4. Select [Delete].
 - A confirmation prompt opens.
5. Select [Delete] to delete the device permanently.

10.2.7 Adding/Replacing Devices (Configuration Wizard)

You can add new devices to the Sunny Portal or replace devices as soon as the communication device is sending data from the new devices to Sunny Portal. Sunny Portal recognizes the new devices and opens the configuration wizard automatically when you log into Sunny Portal with your access data. From a total of ten or more devices, you can add several devices simultaneously by selecting the button below the list. After you have replaced a device using the configuration wizard, the replaced device is automatically deleted in Sunny Portal.

1. To open the configuration wizard manually, select "Name of your plant > Plant Monitoring" or "Configuration > Device overview > Overview of New Devices".
 - The configuration wizard opens.
2. Select "Set up device now".
3. To add a device, select  in the device line and follow the instructions of the configuration wizard.
4. To replace a device, select  in the device line and follow the instructions of the configuration wizard.
5. To add or replace another device, repeat steps.

10.3 Calling up Device Parameters

The parameters are described in the respective manual of the device. You can only read the parameters of the device, you cannot change them. If you want to change the parameters, use the Sunny WebBox or the Sunny Explorer software from SMA Solar Technology AG.

1. Select "Configuration > Device overview".
 - The device overview of all devices of the active plant opens.
2. Select symbol for parameters in the device row.
 - The device parameters open.
3. In order to view a parameter's history, select history symbol.

11 User Management

11.1 User Concept with Roles and Privileges

You can create additional users in your Sunny Portal, so they will be able to access your Sunny Portal. You can assign roles to users. Roles differ in the privileges the user enjoys in your Sunny Portal, for example, whether the user is authorized to create a new page. The following roles are possible:

- Guest
- Standard user
- Installer
- Plant administrator

Overview of Roles and Privileges

| Rights | Role | | | |
|---|-------|----------|-----------|---------------|
| | Guest | Standard | Installer | Administrator |
| Login | ✓ | ✓ | ✓ | ✓ |
| View pages | ✓ | ✓ | ✓ | ✓ |
| View and change user information | ✓ | ✓ | ✓ | ✓ |
| Change password | - | ✓ | ✓ | ✓ |
| View plant properties | - | ✓ | ✓ | ✓ |
| View and read out device properties | - | ✓ | ✓ | ✓ |
| View report configuration | - | ✓ | ✓ | ✓ |
| View, change and delete pages | - | - | ✓ | ✓ |
| View and change plant properties | - | - | ✓ | ✓ |
| View and change device properties | - | - | ✓ | ✓ |
| View and change report configuration | - | - | ✓ | ✓ |
| View and change calculated channels | - | - | ✓ | ✓ |
| View plant log book and approve entries | - | - | ✓ | ✓ |
| Import data | - | - | ✓ | ✓ |
| View user management | - | - | - | ✓ |

| Rights | Role | | | |
|--|-------|----------|-----------|---------------|
| | Guest | Standard | Installer | Administrator |
| Create and delete users and assign roles | - | - | - | ✓ |

11.2 Creating a New User



User is notified by e-mail

If you create a new user, they will receive an e-mail informing them that they have access to your Sunny Portal under this e-mail address. If the new user is not yet registered in Sunny Portal, they will also receive an automatically generated password.

1. Select "Configuration > User Management".
 2. Select [New User].
 3. In the "E-mail address:" field enter new user's e-mail address.
 4. In the "Roles" area, activate the desired role. The "Standard user" role is activated by default.
 5. Select [Save].
- The new user has been created and they will receive an e-mail with the access details.

11.3 Changing User Privileges

1. Select "Configuration > User Management".
2. In the user line, select the edit icon.
3. In the "Roles" area, activate the desired role.
4. Select [Save].

11.4 Changing User Information

Every created user (except for "Guest") is sent an individual "User information" page. On this page, each user can enter their own data.

1. Select "User info/Logout".
2. Select "User Information".
3. Select [Edit].
4. Fill out the fields.
5. Select [Save].

11.5 Deleting a User



Never delete the e-mail address used by the communication product.

Never delete the user whose e-mail address is used by the communication product (e. g. Sunny WebBox, Cluster Controller) to send data to Sunny Portal. Otherwise, the communication product will no longer be able to send data to Sunny Portal. If you want to enter a new e-mail address in the communication product, proceed as follows:

- Create user with the new e-mail address in Sunny Portal and assign the role of "Administrator" or "Installer" (see Section 1 1.2 "Creating a New User", page 74).
- In the communication product, enter the new e-mail address for the sending of data to Sunny Portal.
- In Sunny Portal, delete the user with the old e-mail address in the manner described below.

1. Select "Configuration > User Management".
 - The "User Management" page opens.
2. In the line of the user, select the delete icon.
 - A confirmation prompt opens.
3. Click [Yes] to delete the user.

11.6 Changing the Password

Each user created (except "Guest") can change the password for their Sunny Portal access.

1. Select "User info/Logout".
2. Select "User Information".
3. Select the phrase underneath the table "If you want to change your password, please click here".
 - The "Change password" tab opens.
4. Enter the old password in the "Old password" field.
5. Enter the new password in the "New password" field.
6. Enter the new password again in the "Repeat new password" field.
7. Select [Save].

12 Troubleshooting

| Problem | Cause | Remedy |
|----------------------------------|---|--|
| The pop-up window does not open. | Pop-up windows are blocked by the web browser or additional programs (e.g. Google Toolbar). | Enable pop-ups in the web browser and any additional programs. |

13 Glossary

Azimuth Angle

The azimuth angle indicates by how many degrees the module surface deviates from the compass point South. In the southern hemisphere, it indicates the deviation from the compass point North. If the module surfaces are facing due south the azimuth angle is 0°.

kWp

See peak power

Nominal Power (kWp)

See peak power

Peak Power (kWp)

The peak power is the maximum power output calculated for a PV module under STC (Standard Test Conditions).

The peak power is measured in watt peak (Wp), kilowatt-peak (kWp), or megawatt-peak (MWp). Peak power is also called nominal power.

STC: standard test conditions in the laboratory under which the electrical characteristics of a PV module are measured. This allows different PV modules to be compared with one another. The PV modules are exposed to vertical irradiation of 1,000 W/m², an ambient temperature of 25°C, and a wind speed of 1 m/s. The electrical characteristics are then measured. The test conditions are designed to correspond to the ideal ambient conditions for operation of an installed PV module.

Plant Power in kWp

The plant power in kWp (kilowatt peak) is the maximum possible plant power. The plant power in kWp is also known as the nominal power of the plant.

The peak power of a PV plant is the sum of the peak powers of all PV modules installed (see peak power of a PV module). The peak power of a PV plant is used to compare the plant yield and plant costs with other PV plants, for example. The peak power of a PV plant is often referred to as "plant power (kWp)".

An installed plant can rarely achieve peak power because it is not installed in laboratory conditions.

Predicted Annual Yield (kWh)

The predicted annual yield of a plant is calculated using the specific annual yield (kWh/kWp) at the plant location and the plant power in kWp (also known as nominal power).

You can obtain the specific annual yield for the location of your PV plant from irradiation maps.

Specific annual yield (kWh/kWp) × nominal power (kWp) = predicted annual yield (kWh)

Example calculation for the predicted annual yield

The specific annual yield at a PV plant location is approximately 900 kWh/kWp. The nominal power of the PV plant is 4.8 kWp.

Predicted annual yield = 900 kWh/kWp × 4.8 kWp = 4320 kWh

PV Array Capacity

The PV array capacity is the maximum power of the PV modules that are connected to one inverter.

PV Module

Electrical circuitry of several PV cells that are encapsulated in an enclosure to protect the sensitive cells against mechanical stresses and environmental influences.

Specific Annual Yield (kWh/kWp)

The specific annual yield is the calculated average of the specific plant yield values for different PV plants at one location. You can obtain the specific annual yield for the location of your PV plant from irradiation maps. You can assess the efficiency of your PV plant by comparing the specific plant yield of your PV plant with the specific annual yield for your PV plant location.

Specific Plant Yield (kWh/kWp)

The specific plant yield is a key figure that describes the efficiency of a PV plant, regardless of its size. The specific plant yield is dependent on the irradiation in the location, the ambient temperature, shading, tilt and azimuth angle of the PV modules, and the module and inverter power.

You can assess the efficiency of your PV plant by comparing the specific plant yield of your PV plant with the specific annual yield for your PV plant location.

The specific plant yield is calculated from the actual measured energy yield (kWh) of a PV plant for a specific period (e.g. a year or a month) divided by the peak power (kWp) of the PV plant.

Example: Calculation of the specific plant yield for a year

Your PV plant consists of 40 PV modules, each with a peak power of 120 Wp (watt peak) as per manufacturer specification. Hence, your PV plant has a peak power of $40 \times 120 \text{ Wp} = 4,800 \text{ Wp} = 4.8 \text{ kWp}$.

To calculate the specific plant yield of your PV plant for the year 2011, for example, you will need the actual (measured) energy yield of your PV plant for 2011, e.g. 3,200 kWh. You can now calculate the specific plant yield of your PV plant for the year 2011: 3,200 kWh divided by 4.8 kWp = 666 kWh/kWp in 2011.

Tilt Angle

The tilt angle indicates by how many degrees the module surface deviates from the horizontal.

14 Contact

If you have technical problems concerning our products, contact the SMA Service Line. We require the following information in order to provide you with the necessary assistance:

- Plant name, plant identifier, or e-mail address (see Section 8.1, page 55)
- Type and serial number of communication product (see manual of the communication product)
- Type of data transmission (network, analog, ISDN, GSM)
- If there is a dial-up option to the communication device: phone number

| | | |
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