



System Monitoring

# **SMA Safety and Password Concept for Password-protected PV Plants with *Bluetooth*<sup>®</sup> Wireless Technology**

Technical Description





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# 1 About This Document

Every plant operator must have the ability to monitor their PV plant (photovoltaic plant) and access the devices of their PV plant. For security reasons, however, only qualified electricians are allowed to set or change the parameters of your plant. SMA Solar Technology AG has therefore set up two user groups, "user" and "installer", with different access rights for logging into devices. This measure helps ensure the operating reliability of your PV plant.

SMA Solar Technology AG strongly recommends choosing a separate plant password for each user group ("user" and "installer") and making sure each plant password is valid for all the devices of your PV plant. Setting up the plant passwords in this manner means that you, as the plant operator, only have to manage 1 password for each user group and also ensures that the devices of your PV plant can communicate with each other.

This document contains information on the following topics:

- User groups and their access rights to the PV plant
- Types of passwords
- Strength of passwords
- SMA Grid Guard
- Setting up a plant password
- Adding new devices to a PV plant
- Procedure for lost passwords

## 2 User Groups and Access Rights

SMA Solar Technology AG prompts you to choose between two user groups when logging into a device:

- "User"
- "Installer"

The following table shows which access rights each user group has to the devices of your PV plant:



User Group	Access Rights
"User"	<ul style="list-style-type: none"> <li>• View information such as instantaneous values and parameter settings</li> <li>• Change basic display settings in the user interface of Sunny Explorer or Sunny WebBox (e.g., plant name, device name)</li> <li>• Choose a plant password for the "user" user group</li> </ul>
"Installer"	<ul style="list-style-type: none"> <li>• View information such as instantaneous values and parameter settings</li> <li>• Select and modify plant parameters</li> <li>• Choose the plant password for the "installer" user group</li> <li>• Choose a plant password for the "user" user group</li> </ul>
	<p>When the SMA Grid Guard code is entered (see section 4.2.4 "SMA Grid Guard Code", page 11):</p> <ul style="list-style-type: none"> <li>• Change SMA Grid Guard parameters</li> </ul>

## 3 Icons for Access Rights

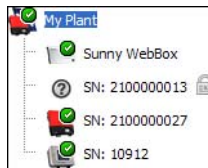
### 3.1 The icons used in Sunny Explorer und Sunny WebBox with Bluetooth

#### Icons in Plant Tree


The user interface of both Sunny Explorer and Sunny WebBox display the structure of your PV plant in the form of a tree. The icons in the plant tree indicate what access rights you have to the devices of your PV plant:

Icon	Meaning
	The password you entered matches the password of the device. You have the access rights to the device.
	The password you entered does not match the password of the device. You do not have the access rights to the device.

**Example: How access rights are shown in the plant tree of Sunny WebBox**





#### Icon next to SMA Grid Guard parameters

Icon	Meaning
	Grid-related plant parameter. To change this parameter, you need to enter the SMA Grid Guard code (see section 4.2.4 "SMA Grid Guard Code", page 11).

## 3.2 Icons used in Sunny Beam with *Bluetooth*

To view data from an inverter, Sunny Beam must have the access rights to that inverter. Before Sunny Beam can access an inverter, you must first enter the "user" user group password of the inverter in Sunny Beam. Sunny Beam will display the access rights it has to a particular inverter using the following icons:

Icon	Meaning
	The password you entered in Sunny Beam matches the password of the inverter. Sunny Beam can display data from the inverter.
	The password you entered in Sunny Beam does not match the password of the inverter. Sunny Beam is unable to display data from the inverter.



## 4 Passwords

### 4.1 Factory default passwords

All new SMA devices come with the following default passwords:

User group	Default password
"User"	0000
"Installer"	1111

### 4.2 Types of passwords

#### 4.2.1 Plant password

All devices that have the same installer password and NetID are part of one specific plant. Hence, any password that is the same for all the devices of a plant is referred to as the plant password by SMA Technology AG.

You can choose a separate plant password for each user group ("user" and "installer"). If you log into a device such as Sunny WebBox with the plant password, you will be simultaneously logged into all the other devices of the PV plant that have the same password and have the same access rights of your current user group.

SMA Solar Technology AG strongly recommends choosing separate plant password for each user group and making sure the passwords are valid for all the devices of your PV plant. Choosing plant passwords in this manner means that you, as the plant operator, will need only manage 1 parameter for each user group and also ensures that the devices of your PV plant can communicate with each other.

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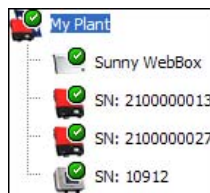
#### Example: Plant password

All the devices of your PV system and Sunny WebBoxes have the following passwords:

- "User": 0000
- "Installer": 1111

Log into your Sunny WebBox as an "installer" with the password **1111**.

The plant tree displays all the devices without a lock icon. As an "installer", you have the access rights to all devices.



### 4.2.2 Device password

A password that is only valid for a single device in a PV plant is referred to as a device password by SMA Solar Technology AG. If you log into a device using its device password, then you can only access that particular device.

SMA Solar Technology AG therefore recommends that you avoid using passwords that are only valid for individual devices. Doing so merely makes it more difficult for you to access the devices of your PV plant.

#### Example 1: Device password

Device "A" has the following passwords:

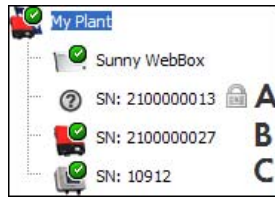
- "User": 1234
- "Installer": 5678

The devices "B" and "C" and the Sunny WebBox have the following passwords:

- "User": 0000
- "Installer": 1111

Log into your Sunny WebBox as an "installer" with the password **1111**.

The plant tree shows that you have access rights to the devices "B" and "C". Device "A", however, is displayed with a lock icon. You do not have access rights to device "A".



#### Example 2: Device password

Device "A" and the Sunny WebBox have the following passwords:

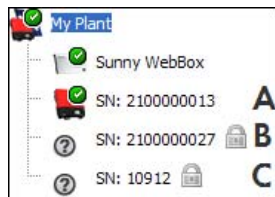
- "User": 1234
- "Installer": 5678

Devices "B" and "C" have the following passwords:

- "User": 0000
- "Installer": 1111

Log into your Sunny WebBox as an "installer" with the password **5678**. The plant tree indicates that you have access rights to device "A".

The devices "B" and "C" are displayed with a lock icon. You do not have access rights to devices "B" and "C".



### 4.2.3 Personal Unlocking Key (PUK)

If you have forgotten the plant password, you can always use a Personal Unlocking Key (PUK) to unlock the devices of your PV plant (see section 9 "Logging into a Bluetooth PV Plant without a Password", page 19). For every inverter and every Sunny WebBox there is 1 PUK for each user group ("user" and "installer").

You can request a PUK from SMA Solar Technology AG. The PUK is valid for the device and the user group it was assigned to by the SMA Serviceline.

- If you have any questions about PUKs, contact the SMA Serviceline (by e-mail, see section 10 "Contact", page 20).

### 4.2.4 SMA Grid Guard Code

The SMA Grid Guard code is a personal code that is required to change any grid-related parameters (SMA Grid Guard parameters) of your inverter (see section 6 "SMA Grid Guard", page 14).

You can request your own SMA Grid Guard code from SMA Solar Technology AG.

The application form is available at [www.SMA.de/en](http://www.SMA.de/en) in the Downloads section under the "Certificate" category of the inverter in question.

## 4.3 Purpose of Passwords

### 4.3.1 Password for Sunny Explorer

When you launch the Sunny Explorer, you will be asked to enter the plant password.

Entering the password for Sunny Explorer has the following purpose:

- Sunny Explorer needs the plant password to access the devices of your PV plant. Only when Sunny Explorer has access to the devices of your PV plant will you be able to read information and change settings (depending on the user group) via Sunny Explorer.

You do not need the password to access the Sunny Explorer user interface. If the password you entered in Sunny Explorer does not match the plant password, you will still be able to access the Sunny Explorer user interface. If the password you entered differs from the plant password, Sunny Explorer will display the devices in the plant tree with a lock icon.

### 4.3.2 Password for Sunny WebBox

You will be asked to enter a password when you go to the start page of Sunny WebBox. Entering a password for the Sunny WebBox has the following purpose:

- It authorizes you to access the Sunny WebBox user interface.
- It authorizes the Sunny WebBox to access the devices of your PV plant.

For the Sunny WebBox to be able to access the devices of your PV plant, the password for the Sunny WebBox must be the same as the plant password.

### 4.3.3 Password for Sunny Beam

Sunny Beam displays basic data from your PV plant. Sunny Beam does not allow you to make changes to security-related parameters for the devices of your PV plant. As a result, Sunny Beam does not distinguish between the "user" and "installer" user groups. Sunny Beam only uses the plant password of the "user" user group.

Entering the password for Sunny Beam has the following purpose:

- It authorizes the Sunny Beam to access the devices of your PV plant.

## 4.4 Strength of Passwords

### 4.4.1 Recommendations for Assigning Passwords

The strength of your password determines how secure your PV plant is from unauthorized access. Note the following when choosing your password:

- Enter a password that has 8 or more characters.
- Use a combination of upper and lowercase letters, special characters and numbers.
- Do not use names or common words (e.g., dog, cat, house).
- Avoid using words that have any personal relevance to you such as the names of persons or pets, personal identification numbers or car license plates.
- Do not repeat names or words (e.g., househouse, catcat).
- Do not combine numbers and letters in the same order as they appear on your keyboard (e.g., "12345", "qwerty").

### 4.4.2 Showing Password Strength

When choosing a password, Sunny Explorer and Sunny WebBox will indicate the strength of the password in the following steps:

very unsafe

unsafe

adequate

safe

very safe

## 5 Protecting your PV Plant from Unauthorized Access

- Change your passwords at regular intervals.
- Use different passwords for each user group.
- Never leave slips of paper with passwords lying around.
- Install a firewall in Ethernet networks.
- Close unnecessary ports in Ethernet networks.
- Use very strong passwords (see section 4.4.1 "Recommendations for Assigning Passwords", page 12).

## 6 SMA Grid Guard

### 6.1 SMA Grid Guard Parameters

You can control how an inverter operates on a grid via its disconnection point. This disconnection point is referred to as the SMA Grid Guard. The disconnection point monitors the grid by comparing the grid-relevant settings of your inverter (SMA Grid Guard parameters) with the parameters of the power grid.

If grid parameters differed from the SMA Grid Guard parameters, the disconnection point will stop the inverter from supplying power.

The SMA Grid Guard parameters of a new inverter are preset and do not normally have to be changed. In some cases, however, the default SMA Grid Guard parameters may need to be changed to match local grid conditions.

To change SMA Grid Guard parameters, you must meet the following requirements:

- You are a trained electrician.
- You have received a personal SMA Grid Guard code from SMA Solar Technology AG.
- The utility operator has allowed you to change the SMA Grid Guard parameters.

If you have the SMA Grid Guard code, then you can use either Sunny Explorer or Sunny WebBox to change the parameters of SMA Grid Guard.

Any changes you make to the SMA Grid Guard parameters will be recorded in the event logs of the inverter.

### 6.2 Requesting an SMA Grid Guard Code

You can request your own personal SMA Grid Guard code from SMA Solar Technology AG.

The application form is available at [www.SMA.de/en](http://www.SMA.de/en) in the Downloads section under the "Certificate" category of the inverter in question.

### 6.3 Entering the SMA Grid Guard Code

1. Log into your PV plant as an "installer" via Sunny Explorer or Sunny WebBox.
  2. Enter the Grid Guard code (see the user manual for either the Sunny Explorer or the Sunny WebBox with *Bluetooth* Wireless Technology).
- After a brief delay, Sunny Explorer and Sunny WebBox will show an SMA Grid Guard icon next to each device in the plant tree.



## 7 Choosing a Plant Password

### 7.1 Permissible Characters for Passwords

Passwords may not contain more than 12 characters. The following characters can be used:

- Uppercase letters
- Lowercase letters
- Numbers: 0 - 9
- Special characters: ? \_ ! -

### 7.2 Choosing a Plant Password with Sunny Explorer



**A connection must be made to the inverters before you can actually choose a plant password!**

Note that Sunny Explorer will not be able to connect to the inverters if they set to night mode.

- Do not change the password if the inverters are in night mode!

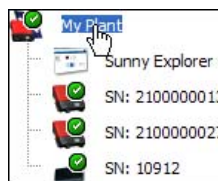


**After changing the plant password via Sunny Explorer, make sure the password of the Sunny WebBox matches the plant password!**

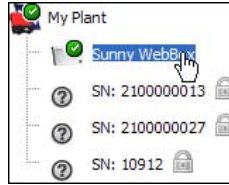
If you select a plant password via Sunny Explorer, then you must change the password of your Sunny WebBox to match the plant password. If the password of your Sunny WebBox does not match the plant password, the Sunny WebBox will be unable to access the PV plant after a restart.

- Change the password of the Sunny WebBox to match the plant password you selected through Sunny Explorer (see the user manual for the Sunny WebBox with *Bluetooth* Wireless Technology).

1. Start Sunny Explorer.
2. Log in as "installer".
3. Select the plant in the plant tree.
4. Choose the plant password:
  - Click the **Settings** tab.
  - Select the parameter group **User Rights > Access Control**.
  - Select [Edit].
  - Choose different plant passwords for the "user" and "installer" user groups.
  - Select [Save].



5. Change the password for the Sunny WebBox to match the plant password:
  - Log into the Sunny WebBox as the "installer".
  - Select the Sunny WebBox in the plant tree.
  - Click the **Settings** tab.
  - Select the parameter group **User Group > Access Control**.
  - Enter the plant password you chose via Sunny Explorer into the field of the relevant user group.
  - Select [Save].



### 7.3 Choosing a Plant Password via Sunny WebBox

**i** A connection must be made to the inverters before you can actually choose a plant password!

Note that the Sunny WebBox will not be able to connect to the inverters if they are in night mode.

- Do not change the password if the inverters are in night mode!

1. Log into the Sunny WebBox as the "installer".
2. Select the plant in the plant tree.
3. Change plant password:
  - Click the **Settings** tab.
  - Select the parameter group **User Group > Access Control**.
  - Choose different plant passwords for the "user" and "installer" user groups.
  - Select [Save].





## 8 Adding New Devices to a *Bluetooth* PV Plant

### 8.1 Using Sunny Explorer to Add Devices to a *Bluetooth* PV Plant

#### Requirements:

- You know the device password of the new device:
    - If the new device comes from SMA Solar Technology AG, its default passwords will be 0000 ("user") and 1111 ("installer").
    - If you want to use a device from another plant, then the password for "user" and "installer" is the same as the one used in the other plant.
  - You know the plant password of the PV plant.
  - You know the NetID of the PV plant.
1. Enter the NetID of the PV plant in the new device.
  2. Start Sunny Explorer.
  3. Log into devices such as "installer" with the device password.
  4. Select the new device in the plant tree.
  5. Make sure the device password of the new device is the same as the plant password of the PV plant.
- The new device has been added to your PV plant. You can use the plant password to access all the devices of your PV plant.

### 8.2 Using Sunny WebBox to Add Devices to a *Bluetooth* PV Plant

#### Requirements:

- You know the device password of the new device:
    - If the new device comes from SMA Solar Technology AG, its default passwords will be 0000 ("user") and 1111 ("installer").
    - If you want to use a device from another plant, then the password for "user" and "installer" is the same as the one used in the other plant.
  - You know the plant password of the PV plant.
  - You know the NetID of the PV plant.
1. Enter the NetID of the PV plant in the new device.
  2. Log into the Sunny WebBox as an "installer" with the plant password.
  3. Select the plant in the plant tree.
  4. Make sure the plant password of your PV plant is the same as the device password of the new device (see section 7.3 "Choosing a Plant Password via Sunny WebBox", page 16).

5.  **Setting a new plant password can take a few minutes.**

It can take a few minutes for the Sunny WebBox to change the plant password for all devices of the PV plant to match the device password of the new device.

- Wait until all the devices in the plant tree appear without a lock icon.
6. Select the plant in the plant tree.
7. Choose any plant password (see section 7.3 "Choosing a Plant Password via Sunny WebBox", page 16).
- The new device has been added to your PV plant. You can use the plant password to access all the devices of your PV plant.

## 9 Logging into a *Bluetooth* PV Plant without a Password

If you have forgotten your plant password, you can always use a Personal Unlocking Key (PUK) to unlock the devices of your PV plant (see section 4.2.3 "Personal Unlocking Key (PUK)", page 11).



### Unlocking the inverter with PUK

Unlocking inverters with PUKs can only be done via Sunny Explorer (see Sunny Explorer user manual).

1. Request a PUK from SMA Solar Technology AG (see Sunny Explorer or Sunny WebBox with *Bluetooth* Wireless Technology user manual).
2. Unlock the device with a PUK (see Sunny Explorer or Sunny WebBox with *Bluetooth* Wireless Technology user manual).

## 10 Contact

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

- Type and serial number of the inverter
- Type and serial number or version of the communication device (e.g., Sunny Beam, Sunny Explorer, Sunny WebBox)
- Detailed description of the problem

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