



Plant monitoring

SMA Safety and Password Concept for Password-protected PV Plants with *Bluetooth*[®] Wireless Technology

Technical Description



Copyright © 2011 SMA America, LLC. All rights reserved.

No part of this document may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photographic, magnetic or otherwise, without the prior written permission of SMA America, LLC.

Neither SMA America, LLC nor SMA Solar Technology Canada Inc. makes representations, express or implied, with respect to this documentation or any of the equipment and/or software it may describe, including (with no limitation) any implied warranties of utility, merchantability, or fitness for any particular purpose. All such warranties are expressly disclaimed. Neither SMA America, LLC nor its distributors or dealers nor SMA Solar Technology Canada Inc. nor its distributors or dealers shall be liable for any indirect, incidental, or consequential damages under any circumstances.

(The exclusion of implied warranties may not apply in all cases under some statutes, and thus the above exclusion may not apply.)

Specifications are subject to change without notice. Every attempt has been made to make this document complete, accurate and up-to-date. Readers are cautioned, however, that SMA America, LLC and SMA Solar Technology Canada Inc. reserve the right to make changes without notice and shall not be responsible for any damages, including indirect, incidental or consequential damages, caused by reliance on the material presented, including, but not limited to, omissions, typographical errors, arithmetical errors or listing errors in the content material.

All trademarks are recognized even if these are not marked separately. Missing designations do not mean that a product or brand is not a registered trademark.

The *Bluetooth*[®] word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by SMA America, LLC and SMA Solar Technology Canada Inc. is under license.

SMA America, LLC
3801 N. Havana Street
Denver, CO 80239 U.S.A.

SMA Solar Technology Canada Inc.
2425 Matheson Blvd. E, 8th Floor
Mississauga, ON L4W 5K5, Canada

IMPORTANT SAFETY INSTRUCTIONS

Warnings in this document

A warning describes a hazard to equipment or personnel. It calls attention to a procedure or practice, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the SMA equipment and/or other equipment connected to the SMA equipment or personal injury.



DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

Other symbols in this document

In addition to the safety and hazard symbols described on the previous pages, the following symbol is also used in this manual:



Information

This symbol accompanies notes that call attention to supplementary information that you must know and use to ensure optimal operation of the system.

General warnings



General warnings

All electrical installations must be done in accordance with the local and *National Electrical Code*® ANSI/NFPA 70 or the *Canadian Electrical Code*® CSA C22.1. This document does not and is not intended to replace any local, state, provincial, federal or national laws, regulation or codes applicable to the installation and use of the product, including without limitation applicable electrical safety codes. All installations must conform with the laws, regulations, codes and standards applicable in the jurisdiction of installation. SMA assumes no responsibility for the compliance or noncompliance with such laws or codes in connection with the installation of the product.

Table of Contents

1	About This Document	9
1.1	Target Group	9
1.2	Nomenclature	9
2	User Groups and Access Rights	10
3	Icons for Access Rights	11
3.1	Icons Used in Sunny Explorer und Sunny WebBox with <i>Bluetooth</i>	11
3.2	Icons Used in Sunny Beam with <i>Bluetooth</i>	11
4	Passwords	12
4.1	Factory Default Passwords	12
4.2	Types of Passwords	13
4.2.1	Plant Password	13
4.2.2	Device Password	14
4.2.3	Personal Unlocking Key (PUK)	15
4.3	Purpose of Passwords	15
4.3.1	Password for Sunny Explorer	15
4.3.2	Password for Sunny WebBox	15
4.3.3	Password for Sunny Beam	15
4.4	Strength of Passwords	16
4.4.1	Recommendations for Assigning Passwords	16
4.4.2	Password Strength	16
5	Protecting your PV Plant from Unauthorized Access ...	17
6	Choosing a Plant Password	18
6.1	Permissible Characters for Passwords	18
6.2	Choosing a Plant Password with Sunny Explorer	18
6.3	Choosing a Plant Password with Sunny WebBox	19

- 7 Adding New Devices to a *Bluetooth* PV Plant 20**
- 7.1 Using Sunny Explorer to Add Devices to a *Bluetooth* PV Plant. 20
- 7.2 Using Sunny WebBox to Add Devices to a *Bluetooth* PV Plant 20
- 8 Logging into a *Bluetooth* PV Plant without a Password . 22**
- 9 Contact 23**

1 About This Document

Every plant operator must have the ability to monitor their PV plant (photovoltaic plant) and access the devices of the PV plants. Only an electrically qualified person may set or change all plant parameters. SMA therefore distinguishes between 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 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 one 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
- Setting up a plant password
- Adding new devices to a PV plant
- Procedure for lost passwords

1.1 Target Group

This manual is intended for end users.

1.2 Nomenclature

In this document, SMA America Production, LLC and SMA Solar Technology Canada Inc. are hereinafter referred to as SMA.

In this manual, the term "photovoltaic plant" will be abbreviated to "PV plant".

2 User Groups and Access Rights

SMA 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"> • View information such as instantaneous values and parameter settings • Change basic display settings in the user interface of Sunny Explorer or Sunny WebBox (e.g., plant name, device name) • Choose a plant password for the "user" user group.
"Installer"	<ul style="list-style-type: none"> • View information such as instantaneous values and parameter settings. • Select and modify plant parameters. • Select the plant password for the "installer" user group. • Choose a plant password for the "user" user group.

3 Icons for Access Rights

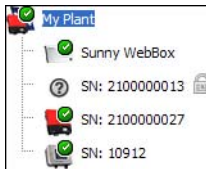
3.1 Icons Used in Sunny Explorer und Sunny WebBox with Bluetooth

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	Significance
	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 displayed in the plant tree of Sunny WebBox



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	Significance
	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



Protection against unauthorized access

You must change plant passwords using a communication product in order to protect the plant from unauthorized access.

If you do not communicate using *Bluetooth*, deactivate the *Bluetooth* communication. This protects your plant from unauthorized access.

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. Therefore, any password that is the same for all the devices of a plant is referred to as the plant password by SMA.

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 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 only need to manage 1 parameter for each user group and also ensures that the devices of your PV plant can communicate with each other.

Example: Plant password

All the devices of your PV plant as well as 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 displays all the devices without a lock icon. As an "installer", you have 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. If you log into a device using its device password, then you can only access that particular device.

SMA 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:

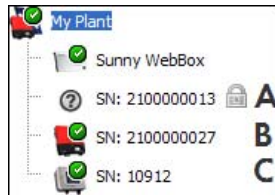
- "User": 1234
- "Installer": 5678

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:

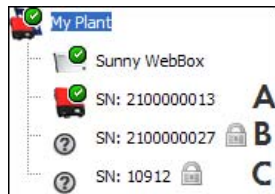
- "User": 1234
- "Installer": 5678

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 8 „Logging into a Bluetooth PV Plant without a Password“, Page 22). 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. The PUK is valid for the device and the user group it was assigned to by the SMA Service Line.

- If you have any questions about PUKs, contact the SMA Service Line (by email, see section 9 „Contact“, Page 23).

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", "qwertz").

4.4.2 Password Strength

When setting 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 16).

6 Choosing a Plant Password

6.1 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: ? _ ! -

6.2 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!

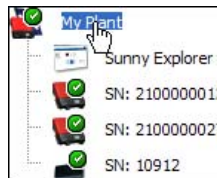


After changing the plant password via Sunny Explorer, make sure the password of the Sunny WebBox matches the plant password!

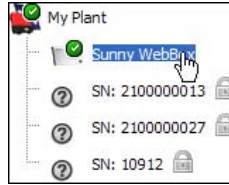
If you select a plant password via Sunny Explorer, then you must change the password of your Sunny WebBox to match the plant password. If the password of your Sunny WebBox does not match the plant password, the Sunny WebBox will be unable to access the PV plant after a restart.

- 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:
 - Select 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.
 - Select 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].



6.3 Choosing a Plant Password with Sunny WebBox

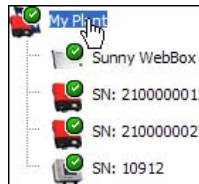


A connection must be made to the inverters before you can actually choose a plant password!

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 model!

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



7 Adding New Devices to a *Bluetooth* PV Plant

7.1 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, 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.

7.2 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, 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 6.3 „Choosing a Plant Password with Sunny WebBox“, Page 19).

**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.
5. Select the plant in the plant tree.
 6. Choose any plant password (see section 6.3 „Choosing a Plant Password with Sunny WebBox“, Page 19).
- 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 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 15).



Unlocking the inverter using PUK

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

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

9 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:

- 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

SMA America, LLC

6020 West Oaks Blvd, Ste 300

Rocklin, CA 95765

Tel. +1 916 625 0870

Tel. +1 877-MY SMA TECH

Tel. +1 877 697 6283 (Toll free, available for USA, Canada and Puerto Rico)

Fax +1 916 625 0871

Service@SMA-America.com

www.SMA-America.com

SMA Solar Technology Canada Inc.

2425 Matheson Blvd. E, 8th Floor

Mississauga, ON L4W 5K5

Canada

Tel. +1 877 506 1756 (Toll free, available for Canada)

Service@SMA-Canada.ca

www.SMA-Canada.ca

SMA Solar Technology

www.SMA-Solar.com

SMA America, LLC

www.SMA-America.com

