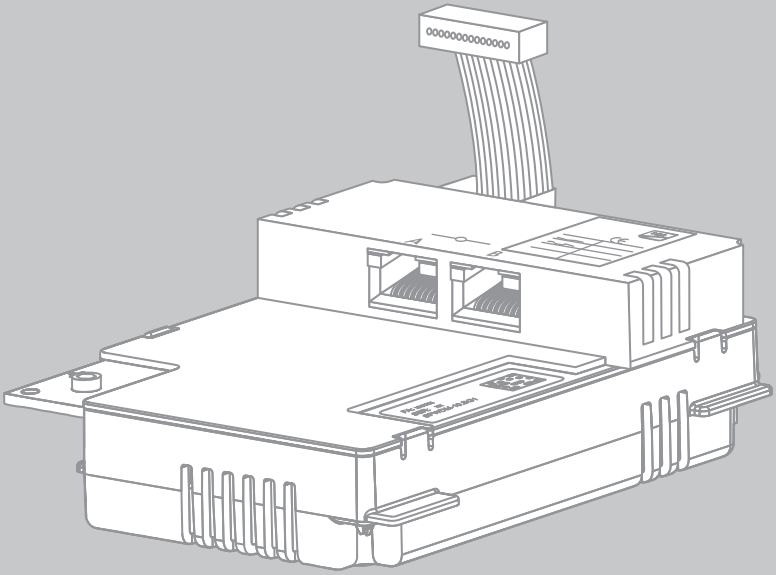
Communication Interface for SMA Inverters

SMA WEBCONNECT DATA MODULE

Installation Manual



WebconnectDM-IA-US_en-10 | 98-4111010 | Version 1.0

CA US

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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important instructions for the following product:

- SMA Webconnect Data Module

This manual must be followed during installation and maintenance.

The product is designed and tested according to 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.

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.

Symbol	Description
⚠ 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.

General Warnings

⚠ WARNING

General Warnings

All electrical installations must be made 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, regulations 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.

The product contains no user-serviceable parts.
For all repair and maintenance, always return the unit to an authorized SMA Service Center.

Before installing or using the product, read all of the instructions, cautions, and warnings in this manual.

Wiring of the product must be made by qualified personnel only.

Table of Contents

1 Information on this Document

Validity

This document is valid for device type "SWDM-US-10" with firmware version 1.00.00.R or higher.

Target Group

This document is intended for qualified persons. Only qualified persons with the appropriate skills are allowed to perform the tasks described in this document (see Section 2.2 "Skills of Qualified Persons", page 13).

Symbols

Symbol	Explanation
⚠ DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury
⚠ WARNING	Indicates a hazardous situation which, if not avoided, can result in death or serious injury
⚠ CAUTION	Indicates a hazardous situation which, if not avoided, can result in minor or moderate injury
NOTICE	Indicates a situation which, if not avoided, could result in property damage
i	Information that is important for a specific topic or goal, but is not safety-relevant
☐	Indicates a requirement for meeting a specific goal
☑	Desired result
✖	A problem that could occur

Typographies

Typography	Explanation	Example
bold	• Display texts • Elements on a user interface • Connections • Elements to be selected • Elements to be entered	• The value can be found in the **Energy** field. • Select **Settings**. • Enter value **10** in the **Minutes** field.
>	• Connects several elements to be selected	• Select **Settings > Date**.
[**Button/Key**]	• Button or key to be selected or pressed	• Select [**Next**].

Nomenclature

Complete designation	Designation in this document
Electronic Solar Switch	ESS
PV plant	Plant
SMA America Production, LLC	SMA
SMA Solar Technology Canada Inc.	SMA
SMA Speedwire	Speedwire
SMA Webconnect Data Module	Webconnect Data Module
SMA Webconnect function	Webconnect function
SMA inverter	Inverter

Abbreviations

Abbreviations	Designation	Explanation
AC	Alternating Current	–
DHCP	Dynamic Host Configuration Protocol	Protocol for the dynamic assignment of IP configurations
ESD	Electrostatic Discharge	–
IP	Internet Protocol	–
PIC	Product Identification Code	Identification key for registration in Sunny Portal
RID	Registration Identifier	Registration key for registration in Sunny Portal

Figures

In this document, the illustrations of the inverter type SB x000-TL-US-22 may deviate slightly.

2 Safety

2.1 Intended Use

The Webconnect Data Module is a Webconnect communication interface for inverters which is based on the SMA Speedwire technology.

Speedwire is a wire-based type of communication based on the Ethernet standard and the communication protocol SMA Data2+. This enables inverter-optimized 10/100 Mbit data transmission between Speedwire devices in PV plants.

The Webconnect function enables data transmission between the Internet portal Sunny Portal and the inverters. This data transmission takes place via a router with Internet access. A PC with the software Sunny Explorer* is also connected to the router.

* As of software version 1.04., Sunny Explorer is available free of charge at www.SMA-Solar.com.

The Webconnect Data Module performs the following tasks:

- Set-up of a Speedwire network
- Data exchange with the Internet portal Sunny Portal and Sunny Explorer via a router

A plant in Sunny Portal can consist of a maximum of four inverters with installed Webconnect Data Module. The Speedwire network can be set up with the following optional topologies:

- Linear topology
- Star topology

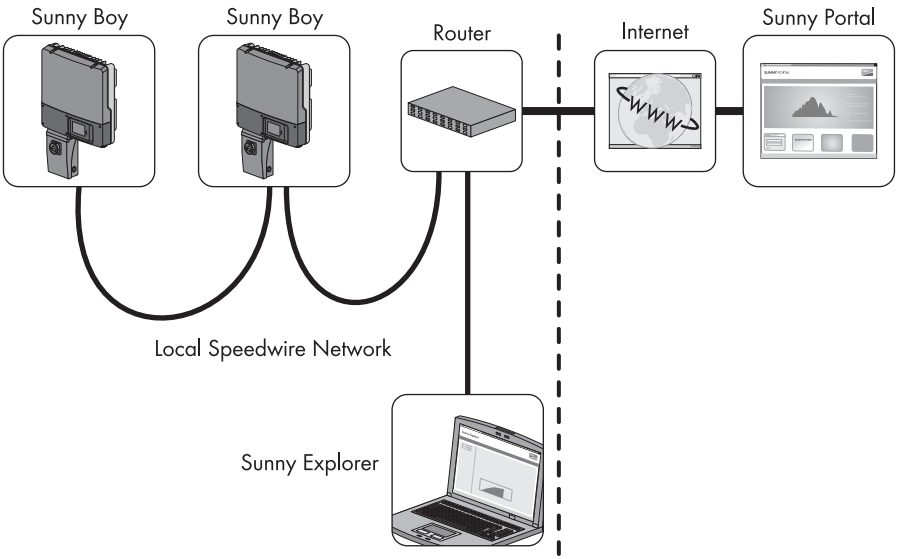

Figure 1: PV plant with a Speedwire network in linear topology (example)

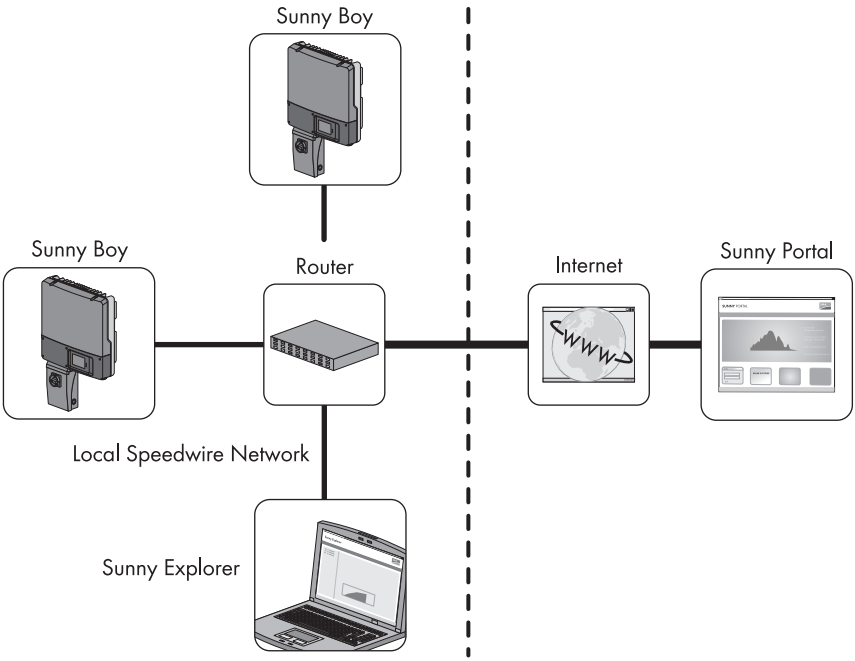

Figure 2: PV plant with a Speedwire network in star topology (example)

The Webconnect Data Module is provided as a retrofit kit or is pre-installed in the inverter.

The Webconnect Data Module can only be installed in the following inverters as of firmware version 2.51:

- Sunny Boy 3000TL-US-22 / 4000TL-US-22 / 5000TL-US-22
- Sunny Tripower 12000TL-US-10 / 15000TL-US-10 / 20000TL-US-10 / 24000TL-US-10

For information on firmware updates, refer to the Technical Description "Firmware Update with SD Card" at www.SMA-Solar.com. For safety reasons, it is forbidden to modify the product or install components that are not explicitly recommended for this product or distributed by SMA.

The enclosed documentation is an integral part of this product.

- Read and adhere to the documentation.
- Keep the documentation in a convenient place for future reference.

Only use the additional Webconnect Data Module in accordance with the specifications provided in the enclosed documentation. Any other use can result in personal injury or material damage.

2.2 Skills of Qualified Persons

The tasks described in this document must be performed by qualified persons only. Qualified persons must have the following skills:

- Training in the installation and commissioning of electrical devices and plants
- Knowledge of how to deal with the dangers and risks associated with installation and operation of electrical devices and plants
- Knowledge of all applicable standards and directives
- Knowledge of how an inverter works and is operated
- Acquaintance with this document and all safety precautions

2.3 Safety Precautions

⚠ DANGER

Danger to life due to electric shock

Lethal voltages are present in the conductive parts of the inverter.

- Prior to performing any work on the inverter, disconnect the inverter from all voltage sources on the AC and DC sides (see inverter installation manual). Observe the waiting time to allow the capacitors to discharge.

⚠ CAUTION

Burns from hot surfaces

Some parts of the inverter enclosure may get hot during operation.

- During operation, touch the inverter on the enclosure lid only.

NOTICE

Damage to the inverter due to electrostatic discharge

By touching electronic components, you can damage or even destroy the inverter through electrostatic discharge (ESD).

- Ground yourself before touching any inverter components.

3 Scope of Delivery

3.1 Order Option: Webconnect Data Module Pre-installed in the Inverter

Check the scope of delivery for completeness and any visible external damage. Contact your specialty retailer if the delivery is incomplete or you find any damage.

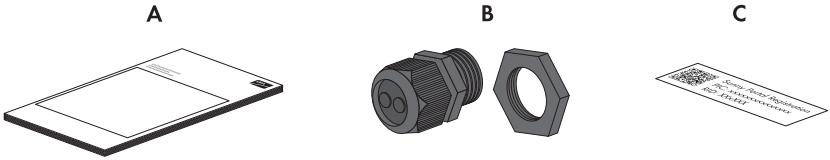

Figure 3: Components included in delivery: Webconnect Data Module pre-installed in the inverter

Item	Quantity	Designation
A	1	Installation manual
B	1	Cable gland
C	1	Sticker with PIC and RID for registration in Sunny Portal

3.2 Order Option: Webconnect Data Module as Retrofit Kit

Check the scope of delivery for completeness and any visible external damage. Contact your specialty retailer if the delivery is incomplete or you find any damage.

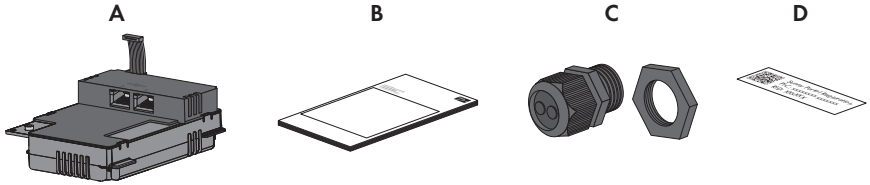

Figure 4: Components included in delivery: Webconnect Data Module as retrofit kit

Item	Quantity	Designation
A	1	Webconnect Data Module
B	1	Installation manual
C	1	Cable gland
D	2	Sticker with PIC and RID for registration in Sunny Portal

4 Product Description

4.1 Webconnect Data Module

The Webconnect Data Module is a Webconnect communication interface for inverters which is based on the SMA Speedwire technology.

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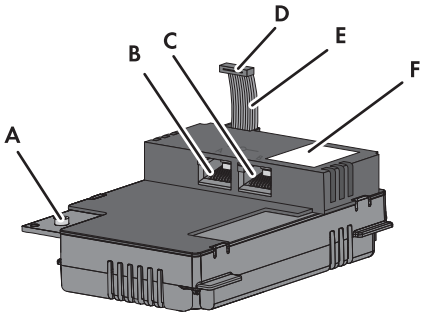


Figure 5: Components of the Webconnect Data Module

Item	Designation
A	Hexagon socket screw
B	Network jack A
C	Network jack B
D	Ribbon cable plug
E	Ribbon cable
F	Type label

Sticker with PIC and RID

To activate the data module in the Sunny Portal, you will need the PIC and RID numbers printed on the supplied sticker.

One of the two stickers should be affixed next to the type label on the inverter. The second sticker is for the customer or plant operator.

4.2 Type Label

The type label clearly identifies the Webconnect Data Module. The type label is located in the top right-hand corner at the front of the Webconnect Data Module. You can read the following data from the type label:

- Product designation
- Device type and hardware version
- Serial number
- MAC Address
- PIC and RID

The information on the type label is required for safe use of the Webconnect Data Module and for reference if customer support from the SMA Service Line is needed. The type label must be permanently affixed to the Webconnect Data Module.

4.3 Cable Gland

The cable gland provides a sturdy, tightly sealed connection of the network cables with the inverter enclosure. The cable gland also protects the inverter from dust and moisture penetration.

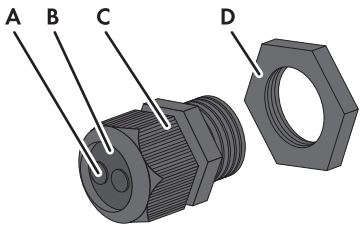
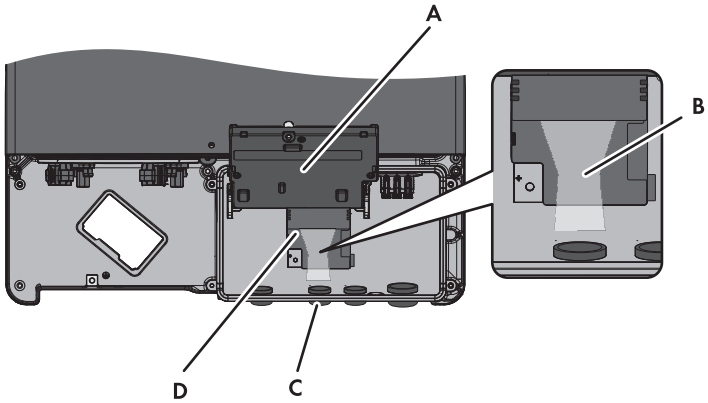


Figure 6: Product description: Cable gland

Item	Designation
A	Filler-plug
B	Seal
C	Swivel nut
D	Counter nut

5 Connection

5.1 Device Overview



Item	Designation
A	Flipped up display with screw
B	Cable route to the network jacks
C	Opening in the inverter enclosure with filler-plug
D	Mounting position of the Webconnect Data Module in the inverter

5.2 Cabling of the Local Speedwire Network

The cable length and quality have an effect on the signal strength in the Speedwire network. Note the following information regarding network cabling.

Interference of network data transmission due to AC cables

When AC cables are in operation, they generate an electromagnetic field which may induce leading or lagging interference in network cables during data transmission.

- Lay the network cables using suitable fastening material and with a minimum clearance of 2 in. (50 mm) to AC cables.

Cable requirements:

- ☐ Maximum cable length 328 ft. (100 m)
- ☐ Cross-section: min. 2 x 2 x 0.22 mm^2 or min. 2 x 2 AWG 24
- ☐ Cable type: 100BaseTx, CAT5 with shielding S-UTP, F-UTP or higher
- ☐ UV-resistant for outdoor use
- ☐ Type of plug: RJ45

SMA recommends the following cable types:

- For outdoor use: SMA COMCAB-OUTxxx*
- For indoor use: SMA COMCAB-INxxx*

* available in the following lengths xxx = 328 ft. (100 m); 656 ft. (200 m); 1,640 ft (500 m); 3,280 ft. (1,000 m)

5.3 Installing the Webconnect Data Module in the Inverter

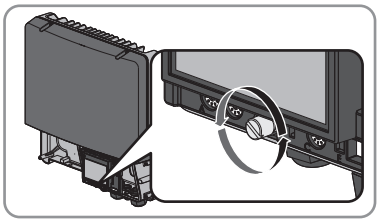
1. **⚠ DANGER**

   Danger to life due to electric shock when opening the inverter

   Lethal voltages are present in the conductive parts of the inverter.

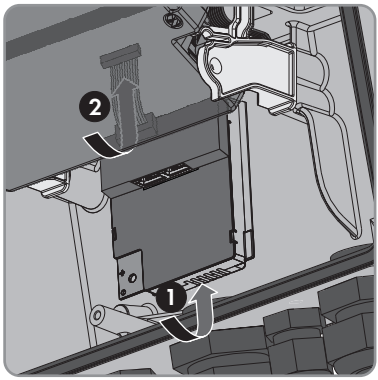
   - Disconnect the inverter from voltage sources on the AC and DC sides (see the inverter installation manual). Observe the waiting time to allow the capacitors to discharge.

2. Open the inverter (see inverter installation manual).
3. Release the screw of the display far enough to allow the display to be flipped up.

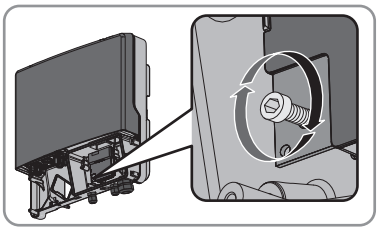


4. Flip the display up until it clicks into place.

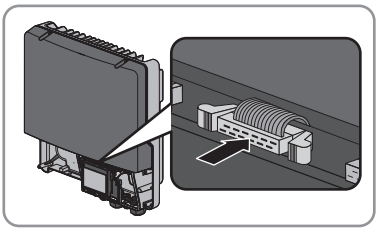
5. Insert the Webconnect Data Module and slide the ribbon cable upwards behind the display. The key at the top edge of the Webconnect Data Module must fit into the hole in the plastic retainer in the inverter.



6. Fasten the Webconnect Data Module hand-tight with the hexagon socket screw.



7. Flip the display down.
8. Plug the ribbon cable plug onto the center connector strip.



9. Attach one of the two supplied stickers with PIC and RID next to the type label of the inverter on the inverter enclosure.

5.4 Connecting the Webconnect Data Module

Requirements:

☐ All electrical installations must be carried out according to all electrical standards applicable on site and the *National Electrical Code®* (NE, ANSI/NFPA 70).

☐ Installations in Canada must be carried out in accordance with the applicable Canadian standards.

Supplementary material (not included in the scope of delivery):

☐ Cable for connection of the Webconnect Data Module(see Section 5.2 "Cabling of the Local Speedwire Network", page 18)

☐ If cables are routed in a conduit:

– 1 rain- or water-proof sleeve (diameter 1 in. (25.4 mm))

– 1 conduit (diameter: 1 in. (25.4 mm))

1. **⚠ DANGER**

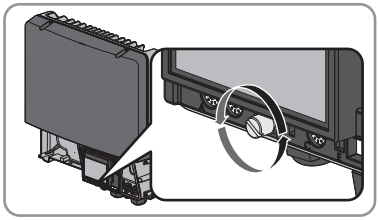
   Danger to life due to electric shock when opening the inverter

   Lethal voltages are present in the conductive parts of the inverter.

   • Disconnect the inverter from voltage sources on the AC and DC sides (see the inverter installation manual). Observe the waiting time to allow the capacitors to discharge.

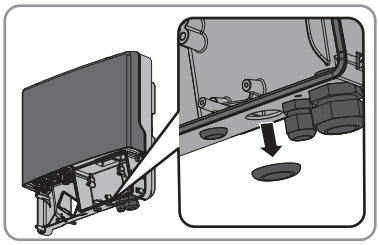
2. Open the inverter (see inverter installation manual).

3. Release the screw of the display far enough to allow the display to be flipped up.

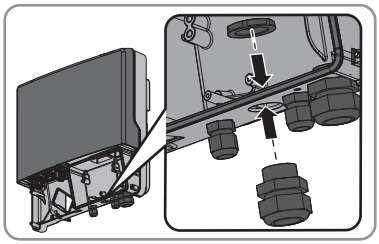


4. Flip the display up until it clicks into place.

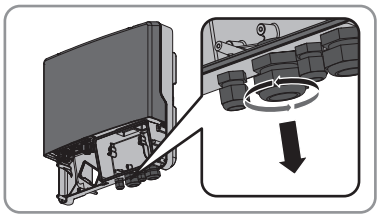
5. Push the pre-mounted filler-plug out of the second hole from the left in the inverter enclosure.



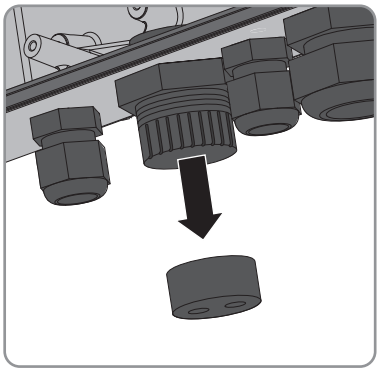
6. If a conduit is to be used, proceed as follows:
   - Insert one rain- or water-proof sleeve (diameter: 1 in. (25.4 mm)) into the enclosure opening and tighten from the inside using a counter nut.
   - Fit one conduit (diameter: 1 in. (25.4 mm) to the enclosure opening.
   - Lead one or two cables through the conduit into the inverter.
7. If no conduit is to be used, proceed as follows:
   - Attach the cable gland to the enclosure opening with the counter nut.



   - Unscrew the swivel nut of the cable gland on the inverter.

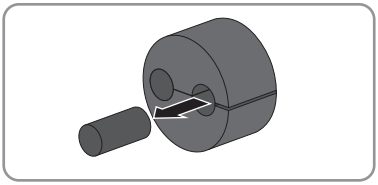


   - Press the seal out of the cable gland from the inside.

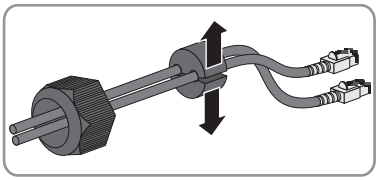


   - Depending on the plant topology, lead 1 or 2 network cables from the outside into the inverter through the loose swivel nut and the cable gland.

- Remove one of the filler-plugs from the seal for each network cable.



- Insert 1 or 2 network cables into the seal. Route the network cable plugs into the inverter to the network jacks.



- Press the seal into the cable gland. Make sure that any unused cable openings are sealed with filler-plugs.
- Screw the swivel nut of the cable gland on lightly.

8. Insert the network cables into the network jacks. This can be done in any order.
9. Fasten the swivel nut on the cable gland hand-tight. This will fix the network cables in place.
10. Flip the display down and fasten it hand-tight with the display screw.
11. Close inverter (see inverter installation manual).
12. Depending on the plant topology, connect at least one inverter directly to the router.

6 Commissioning

6.1 Commissioning the Plant

Requirements:

☐ The Webconnect Data Module must be installed in the inverter (see Section 5.3 "Installing the Webconnect Data Module in the Inverter", page 18).

☐ The Webconnect Data Module must be connected (see Section 5.4 "Connecting the Webconnect Data Module", page 20).

☐ Depending on the plant topology, at least one inverter must be connected to the router.

☐ DHCP must be enabled in the router.

- Commission all inverters with installed Webconnect Data Module (see inverter operating manual).

6.2 Plant Management with Sunny Explorer

6.2.1 Functions and Parameter Settings in Sunny Explorer

The following functions for plant management in Sunny Explorer are available:

- Overview of the plant status
- Graphic display of key plant data, device data and energy values
- Parameterization of individual devices or an entire device class
- Simple diagnostics due to display of faults and events
- Data export of inverter energy values and events in CSV format
- Device updates

You can change the following parameters in Sunny Explorer:

- Device name of the inverter
- Automatic IP configuration On/Off
- DNS-IP, gateway IP, IP address, subnet mask
- Webconnect function On/Off

6.2.2 Connection to Sunny Explorer

Requirement:

☐ The plant must be commissioned (see Section 6.1 "Commissioning the Plant", page 23).

1. Connect the computer to the plant router with a network cable.
2. Start Sunny Explorer and create plant (see Sunny Explorer user manual).

6.3 Monitoring the Plant in Sunny Portal

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

The following functions for monitoring your plant in Sunny Portal are available:

- Sending of status reports via e-mail to computer or cell phone
- Summary of key plant data in a plant overview and a plant profile
- Overview of the energy and power curves of your plant
- Report of plant yields in form of daily or monthly reports or as an annual summary
- Communication monitoring between Sunny Portal and a maximum of four inverters with Webconnect function per plant
- Plant monitoring based on inverter comparison, provided that there are at least two inverters in the plant
- Overview of device properties, parameters and messages

6.3.1 Registering a Plant in Sunny Portal

Requirements:

- ☐ The plant must be commissioned (see Section 6.1 "Commissioning the Plant", page 23).
- ☐ PIC and RID must be available for the Webconnect Data Module.
- ☐ Your computer must have an Internet connection.
- ☐ A JavaScript-enabled browser must be installed.

Maximum permissible number of devices for a plant in Sunny Portal

In Sunny Portal you can manage several plants. A maximum of four interconnected inverters with installed Webconnect Data Module per plant is permitted.

Starting the Plant Setup Assistant in Sunny Portal

The Plant Setup Assistant is a step-by-step guide of the processes required for user registration and the registration of your plant in Sunny Portal

1. Go to **www.SunnyPortal.com/Register** (see user manual for Webconnect plants in Sunny Portal).
   ☑ The Plant Setup Assistant opens.
2. Select [**Next**].

☑ The **User Registration** page opens.

Plant with Webconnect Data Module cannot be combined with other plants

Even if you already have a plant registered in Sunny Portal with another communication device, e.g. Sunny WebBox, you will still need to create a separate plant with Webconnect Data Module. It is not possible to combine the Webconnect Data Module and other communication devices within one plant in Sunny Portal. Sunny Portal treats the existing plant and the new plant with Webconnect Data Module as separate plants. An inverter with integrated Webconnect function can be assigned to max. 1 plant.

- If applicable, delete any existing WebBox plant in Sunny Portal. When doing so, ensure that the entire plant data is irrevocably erased.
- Create a new plant with Webconnect Data Module.

7 Decommissioning

7.1 Disassembling the Webconnect Data Module

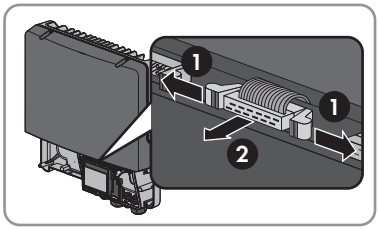
1. **⚠ DANGER**

   Danger to life due to electric shock when opening the inverter

   Lethal voltages are present in the conductive parts of the inverter.

   - Disconnect the inverter from voltage sources on the AC and DC sides (see the inverter installation manual). Observe the waiting time to allow the capacitors to discharge.

2. Open the inverter (see inverter installation manual).
3. Press the left and right lock catches outwards and remove the ribbon cable plug from the center connector-strip of the inverter.



4. Release the screw of the display far enough to allow the display to be flipped up.
5. Flip the display up until it clicks into place.
6. Unscrew the swivel nut of the cable gland.
7. Remove the network cables from the Webconnect Data Module.
8. Unscrew the counter nut of the cable gland.
9. Pull the cable gland and network cables out of the inverter.
10. Release the screw of the Webconnect Data Module and remove it.
11. Flip the display down and fasten the display screw hand-tight.
12. Close the enclosure opening with an appropriate filler-plug.
13. Close inverter (see inverter installation manual).

☑ The Webconnect Data Module is now disassembled.

7.2 Packaging the Webconnect Data Module for Shipping

- Pack the Webconnect Data Module. Use either the original packaging or other packaging suitable for the weight and size of the module (see Section 9 "Technical Data", page 29).

7.3 Disposing of the Webconnect Data Module

- Dispose of the Webconnect Data Module in accordance with the regulations for the disposal of electronic waste applicable at the site of installation.

  or

  Return the Webconnect Data Module to SMA at your own expense labelled "ZUR ENTSORGUNG" ("FOR DISPOSAL") (see Section 11 "Contact", page 31).

8 Troubleshooting

Problem	Cause and corrective measures
The Webconnect Data Module cannot be accessed.	There is no Speedwire connection. **Corrective measures:** • Check whether all network cable plugs are inserted and locked. • Check whether all inverters in the plant are in operation. • Check whether the plant router is switched on. • Check whether the ribbon cable plug of the Webconnect Data Module is correctly plugged into the center connector- strip in the inverter.
	The inverter does not recognize the Webconnect Data Module. **Corrective measures:** • Update the inverter firmware (download the update file from www.SMA-Solar.com).
	Firewall or IP filter settings are not correct. Corrective measures: • Adjust firewall or IP filter settings (see firewall or router manual).
	The Webconnect Data Module does not have a valid IP address. Corrective measures: • Double tap the computer to check whether a valid IP address has been assigned. If **N/A** appears on the display, no IP address has been assigned to the Webconnect Data Module. • Check whether DHCP is activated in the router or assign a manual IP address to the Webconnect Data Module.

9 Technical Data

General Data

Mounting location	in the inverter
Voltage supply	via inverter

Mechanical Data

Width x height x depth	2 7/8 in. x 3 7/16 in. x 1 3/8 in. (73 mm x 88 mm x 34 mm)

Communication

Communication interface	Speedwire/Webconnect
Maximum cable length	328 ft. (100 m)
Maximum data volume per Webconnect Data Module per month	550 MB
Additional data volume per hour when using the Sunny Portal Live interface	600 kB

Connections

Type of plug	RJ45
Number of RJ45 terminals	2

Ambient Conditions during Operation

Ambient temperature	− 40°F ... +185°F (− 40°C ... +85°C)
Relative humidity, non-condensing	5% ... 95%
Maximum height above sea level (MSL)	9,842 ft. (3,000 m)

Ambient Conditions for Storage/Transport

Ambient temperature	− 40°F ... +185°F (− 40°C ... +85°C)
Relative humidity, non-condensing	10% ... 100%
Maximum height above sea level (MSL)	9,842 ft. (3,000 m)

10 Compliance Information

FCC Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user is cautioned that changes or modifications not expressly approved by SMA America, LLC could void the user's authority to operate this equipment.

IC Compliance

This device complies with Industry of Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- This device may not cause interference, and

This device must accept any interference, including interferences that may cause undesired operation of the device.

11 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, serial number, and firmware version of the inverter
- Type, serial number, and firmware version of the Webconnect Data Module
- PIC and RID numbers of the Webconnect Data Module
- Number of connected inverters with integrated Webconnect function

Country	Company Name	Headquarters	SMA Service Line
America	SMA America, LLC	Rocklin, CA	+1 877-MY-SMATech (+1 877-697-6283)* +1 916 625-0870**
Canada	SMA Canada, Inc.	Toronto	+1 877-MY-SMATech (+1 877-697-6283)***

* toll free for USA, Canada and Puerto Rico

** international

*** toll free for Canada

SMA Solar Technology

www.SMA-Solar.com

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