



Communication Interface for SMA Inverters

SMA SPEEDWIRE/WEBCONNECT DATA MODULE

Installation Manual

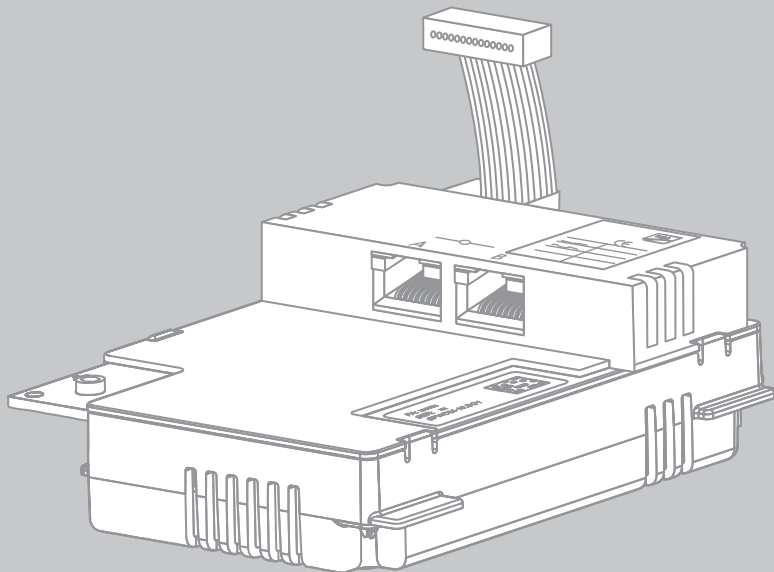


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1 Information on this Document

Validity

This document is valid for device type "SWDM-10.GR1" with firmware version 1.00.00.R or higher.

Target Group





This document is for skilled persons. Only skilled persons with appropriate qualification are allowed to perform the tasks set forth in this document (see Section 2.2 "Qualifications of Skilled Persons", page 9).

Additional Information

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

Document title	Document type
Firmware Update with SD Card	Technical description

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, could result in death or serious injury
 CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury
NOTICE	Indicates a situation which, if not avoided, could result in property damage
	Information that is important for a specific topic or goal, but is not safety-relevant
<input type="checkbox"/>	Indicates an essential requirement for achieving a specific goal
<input checked="" type="checkbox"/>	Desired result
x	A problem that might occur

Typography

Typography	Explanation	Example
bold	<ul style="list-style-type: none"> • Display messages • Elements of a user interface • Connections • Elements to be selected • Elements to be entered 	<ul style="list-style-type: none"> • The value can be read from the Energy field. • Select Settings. • Enter the value 10 in the Minutes field.
>	<ul style="list-style-type: none"> • Connects several elements that are to be selected 	<ul style="list-style-type: none"> • Select Settings > Date.
[Button/Key]	<ul style="list-style-type: none"> • Button or key to be selected or pressed 	<ul style="list-style-type: none"> • Select [Next].

Nomenclature

Full designation	Designation in this document
PV plant	Plant
Small-scale PV plant	Small plant
Large-scale PV plant	Large plant
SMA Cluster Controller	Cluster Controller
SMA Speedwire	Speedwire
SMA Speedwire/Webconnect data module	Speedwire/Webconnect data module
SMA Webconnect function	Webconnect function
SMA inverter	Inverter

Abbreviations

Abbreviation	Designation	Explanation
AC	Alternating Current	-
DC	Direct Current	-
DHCP	Dynamic Host Configuration Protocol	Protocol for the dynamic assignment of IP configurations
ESD	Electrostatic Discharge	-
ESS	Electronic Solar Switch	The Electronic Solar Switch and the DC connectors form a DC load disconnect unit
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

The figures in this document may deviate slightly for inverter types Sunny Tripower and Windy Boy.

2 Safety

2.1 Intended Use

The Speedwire/Webconnect data module is a Speedwire communication interface with Webconnect function for inverters.

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

The Webconnect function enables data transmission between the inverters of a small plant and the Internet portal Sunny Portal. In Sunny Portal, a maximum of four inverters can be combined in a Sunny Portal plant.

The Speedwire/Webconnect data module performs the following tasks:

- Set-up of a Speedwire network in small and large plants
- Direct data exchange with Sunny Portal:
 - In small plants via a router with Internet connection
 - In large plants via the Cluster Controller
- Data exchange with Sunny Explorer from version 1.05

The Speedwire/Webconnect data module is available as a retrofit kit or is pre-installed in the inverter.

The Speedwire/Webconnect data module may only be installed in the following inverters with at least firmware version 2.53:

Sunny Boy	Sunny Tripower	Windy Boy
SB 2500TLST-21	STP 8000TL-10	WB 3000TL-21
SB 3000TLST-21	STP 10000TL-10	WB 3600TL-21
SB 3000TL-21	STP 12000TL-10	WB 4000TL-21
SB 3600TL-21	STP 15000TL-10	WB 5000TL-21
SB 4000TL-21	STP 15000TLEE-10	
SB 5000TL-21	STP 15000TLHE-10	
	STP 17000TL-10	
	STP 20000TLEE-10	
	STP 20000TLHE-10	

For information on the firmware update, refer to the Technical Description "Firmware Update with SD Card" at www.SMA-Solar.com.

For safety reasons, it is not permitted to modify the product or install components that are not explicitly recommended or distributed by SMA Solar Technology AG for this product.

The enclosed documentation is an integral part of this product.

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

Only use the Speedwire/Webconnect data module in accordance with the specifications provided in the enclosed documentation. Any other use may result in personal injury or property damage.

2.2 Qualifications of Skilled Persons

The work described in this document must be performed by skilled persons only. Skilled persons must have the following qualifications:

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

2.3 Safety Precautions

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

Burn Hazards

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

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

Environmental Influences

When closed and with the ESS plugged in, the inverter has the degree of protection IP65. The inverter is thus protected against dust intrusion and water penetration. Dust intrusion and water penetration can damage the inverter.

- When the ESS is not plugged in, the inverter must be protected against dust and water.
- Firmly plug the ESS in again after performing any work on the inverter.

Electrostatic Discharge

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

- Earth yourself before touching any inverter components.

2.4 Operating Information

Selecting a Suitable Internet Tariff for Small Plants

When using the Webconnect function, a constant Internet connection is required.

Depending on the quality of the Internet connection, the transmission volume for an inverter is between 150 MB and 550 MB per month. When using the plant overview in Sunny Portal with live data display, there is an additional data volume of 600 kB per hour.

- SMA Solar Technology AG recommends using an Internet flat rate.
- Since there is a constant Internet connection to Sunny Portal, time-based billing systems should be avoided. High costs could be incurred.

3 Scope of Delivery

3.1 Order Option: Speedwire/Webconnect Data Module Pre-Installed in the Inverter

Check the scope of delivery for completeness and any visible external damage. Contact your specialist dealer if the delivery is incomplete or damaged.

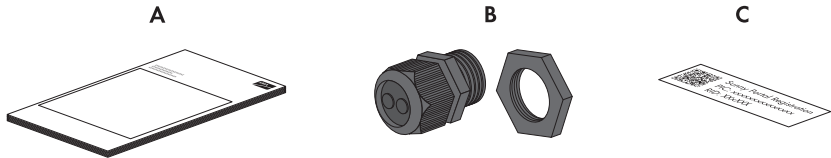


Figure 1: Components included in delivery: Speedwire/Webconnect data module pre-installed in the inverter

Item	Quantity	Description
A	1	Installation manual
B	1	Cable gland
C	1	Label with PIC and RID for registration of a small plant in Sunny Portal

3.2 Order Option: Speedwire/Webconnect Data Module as Retrofit Kit

Check the scope of delivery for completeness and any visible external damage. Contact your specialist dealer if the delivery is incomplete or damaged.

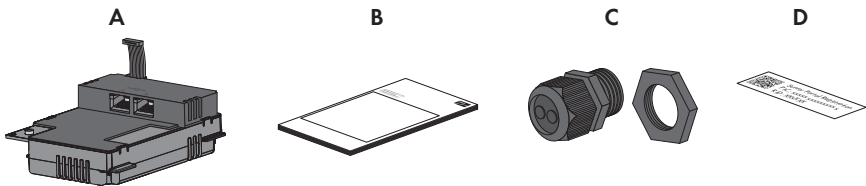


Figure 2: Components included in delivery: Speedwire/Webconnect data module as retrofit kit

Item	Quantity	Description
A	1	Speedwire/Webconnect data module
B	1	Installation manual
C	1	Cable gland
D	2	Label with PIC and RID for registration of a small plant in Sunny Portal

4 Product Description

4.1 Speedwire/Webconnect Data Module

The Speedwire/Webconnect data module is a Speedwire communication interface with Webconnect function for inverters.

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

The Webconnect function enables data transmission between the inverters of a small plant and the Internet portal Sunny Portal. In Sunny Portal, a maximum of four inverters can be combined in a Sunny Portal plant.

The Speedwire/Webconnect data module performs the following tasks:

- Set-up of a Speedwire network in small and large plants
- Direct data exchange with Sunny Portal:
 - In small plants via a router with Internet connection
 - In large plants via the Cluster Controller
 - Data exchange with Sunny Explorer from version 1.05

The Speedwire/Webconnect data module is available as a retrofit kit or is pre-installed in the inverter.

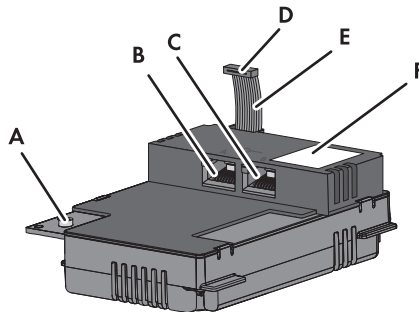


Figure 3: Components of the Speedwire/Webconnect data module

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

Label with PIC and RID for Registration of a Small Plant in Sunny Portal

To activate the Speedwire/Webconnect data module of a small plant in Sunny Portal, you will need the PIC and RID numbers printed on the supplied label. After installation of the Speedwire/Webconnect data module, attach the label on the exterior of the inverter in the vicinity of the type label. Keep the other label in a safe place for future reference.

Use in Small Plants with a Maximum of Four Inverters

A small plant in Sunny Portal can consist of a maximum of four inverters with installed Speedwire/Webconnect data module.

In small plants, the Speedwire network can be set up optionally with linear, star or tree topology. A PC with the Sunny Explorer software is connected to the router or switch, depending on the plant.

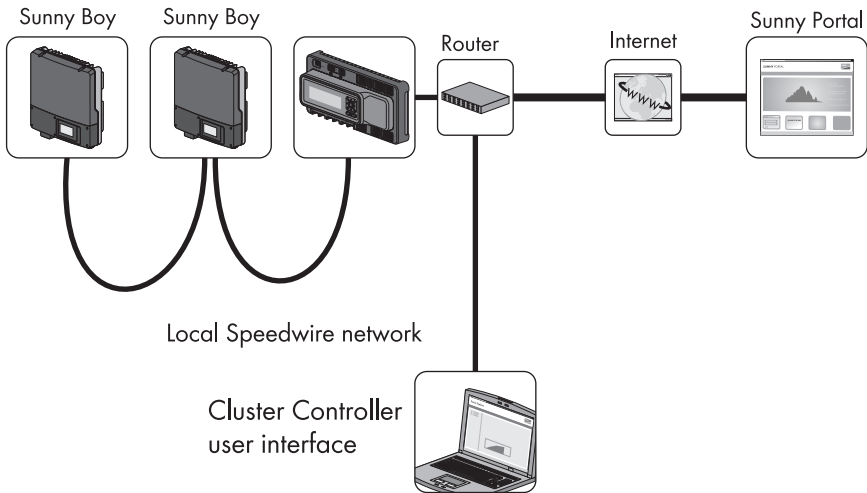


Figure 4: Small plant with two inverters in linear topology (example)

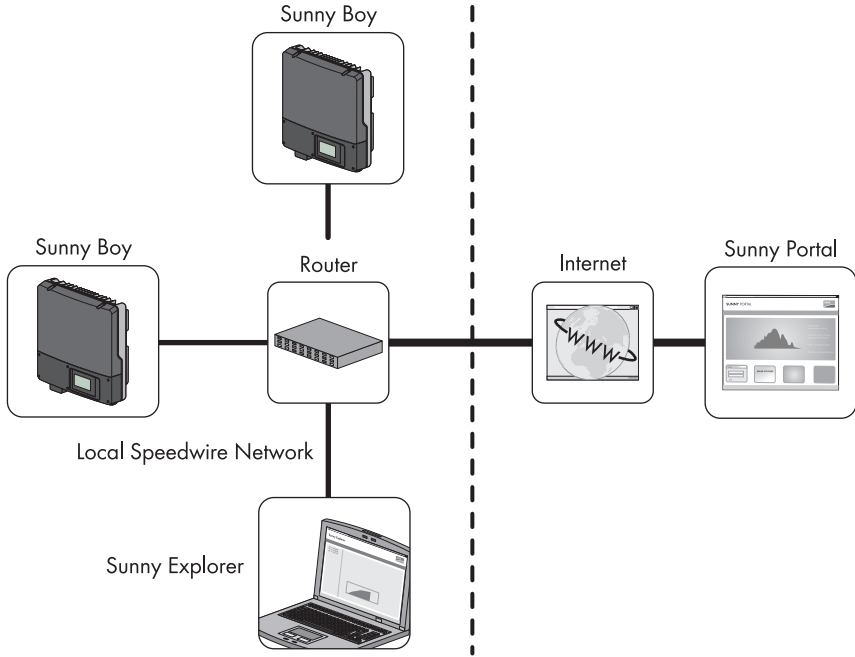


Figure 5: Small plant with two inverters in star topology (example)

Use in Large Plants with Cluster Controller

The Speedwire network can be set up optionally with linear, star or tree topology. In large plants with Cluster Controller, the data exchange with Sunny Portal does not take place via the individual inverters, but centrally via the Cluster Controller (see user manual of the Cluster Controller and user manual of the Cluster Controller in Sunny Portal).

i Deactivation of the inverter Webconnect function in large plants with Cluster Controller

In large plants with Cluster Controller, communication with Sunny Portal takes place via the Cluster Controller itself.

- For optimum operation of large plants with Cluster Controller, deactivate the Webconnect function of the inverters with installed Speedwire/Webconnect data module (see user manual of the Cluster Controller).

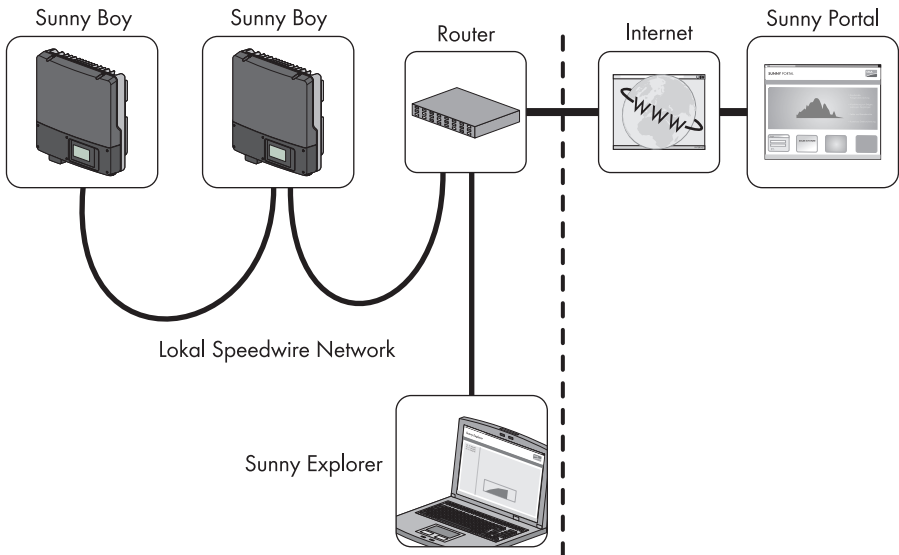


Figure 6: Large plant in linear topology (example)

4.2 Type Label

The type label clearly identifies the Speedwire/Webconnect data module. The type label is located in the right-hand top corner at the front of the Speedwire/Webconnect data module.

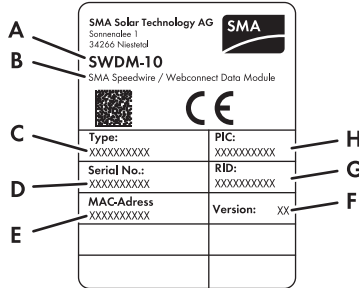


Figure 7: Layout of the type label

Item	Explanation
A	SMA order number
B	Product designation
C	Device type
D	Serial number of the Speedwire/Webconnect data module
E	MAC address
F	Hardware version of the Speedwire/Webconnect data module
G	RID
H	PIC

The information on the type label is required for safe use of the Speedwire/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 Speedwire/Webconnect data module.

Symbols on the Type Label

Symbol	Description	Explanation
CE	CE marking	The product complies with the requirements of the applicable EU directives.

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 intrusion and moisture penetration.

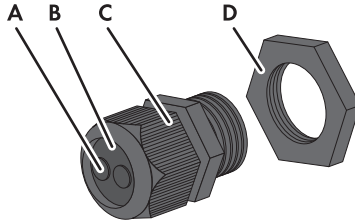
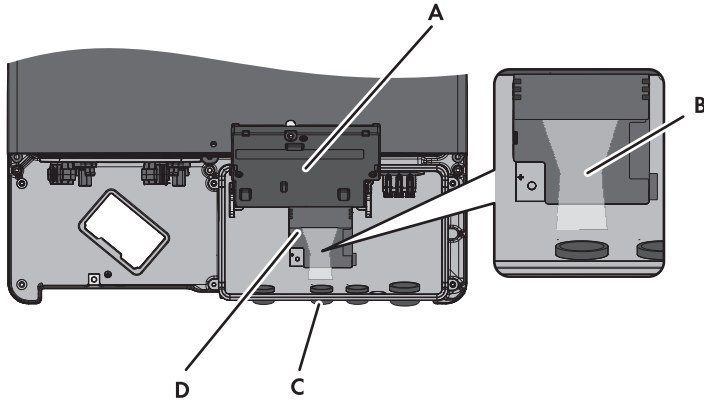


Figure 8: Product description: cable gland

Item	Description
A	Filler plug
B	Seal
C	Swivel nut
D	Counter nut

5 Connection

5.1 Device Overview



Item	Description
A	Display with screw
B	Cable route to network sockets
C	Opening in the inverter enclosure with filler plug
D	Mounting position of the Webconnect data module in the inverter

5.2 Cable Requirements and Information on Routing

The cable length and quality have an effect on the signal quality in the Speedwire network. Observe the following instructions regarding network cabling:

i Interference in data transmission due to AC cables

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

- Lay the network cables using suitable fastening material observing a minimum clearance of 50 mm to the AC cables.

Cable requirements:

- Cable length between network network nodes: max. 100 m
- Cross-section: at least $2 \times 2 \times 0.22 \text{ mm}^2$ or at least $2 \times 2 \text{ AWG } 24$
- Cable type: 100BaseTx, CAT5 with shielding S-UTP, F-UTP or higher
- UV-resistant for outdoor use

- Type of plug: RJ45

SMA Solar Technology AG recommends the following cable types:

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

The cables are available in the lengths xxx = 100 m, 200 m, 500 m and 1,000 m

5.3 Installing the Speedwire/Webconnect Data Module in the Inverter

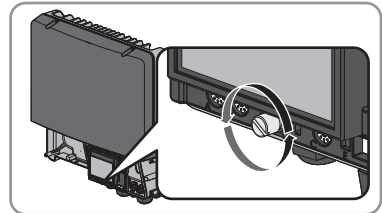
1. **⚠ DANGER**

Danger to life due to electric shock when the inverter is opened

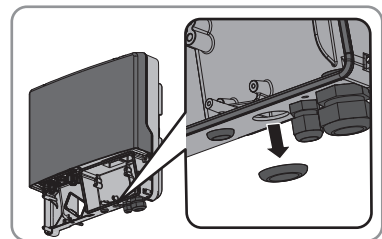
Death or serious injuries

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

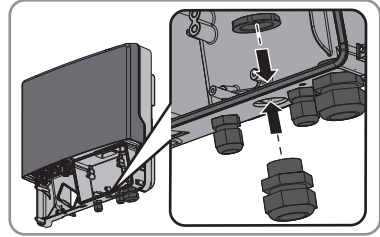
2. Loosen the screw of the display until the display can be flipped up.



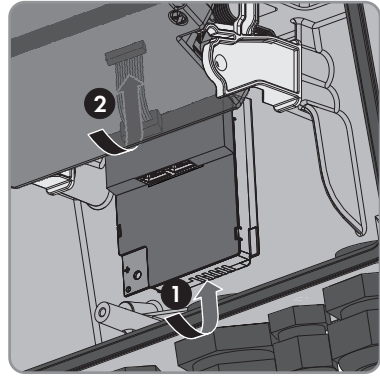
3. Flip the display up until it clicks into place.
4. Push the pre-mounted filler plug out of the second hole from the left in the inverter enclosure.



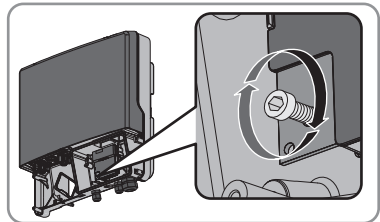
5. Attach the cable gland to the enclosure opening with the counter nut.



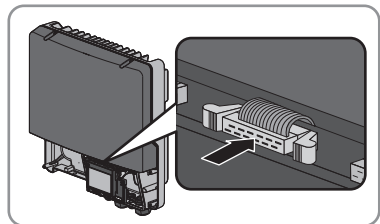
6. Insert the Speedwire/Webconnect data module and slide the ribbon cable upwards behind the display. The key on the top edge of the Speedwire/Webconnect data module must fit into the hole in the plastic retainer in the inverter.



7. Fasten the Speedwire/Webconnect data module hand-tight with the hexagon socket screw.



8. Flip the display down.
9. Plug the ribbon cable plug onto the centre connector strip.



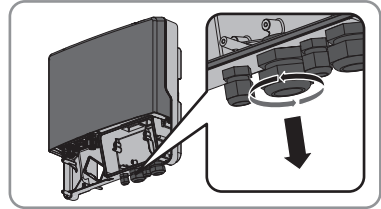
5.4 Connecting the Speedwire/Webconnect Data Module

Requirements:

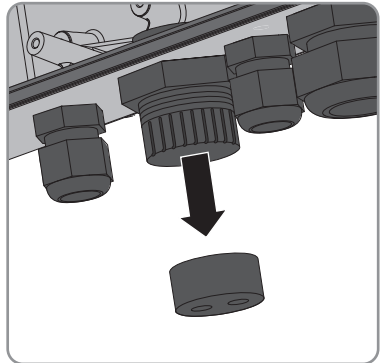
- The network cables must be pre-assembled according to the plant topology and the cable requirements (see Section 5.2 "Cable Requirements and Information on Routing", page 18).

Procedure:

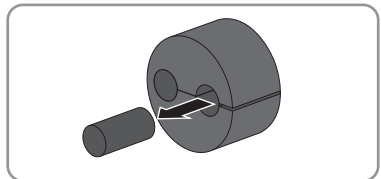
1. Flip the display up until it clicks into place.
2. Unscrew the swivel nut of the cable gland on the inverter.



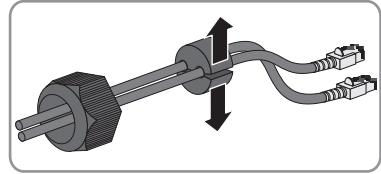
3. Press the seal out of the cable gland from the inside.



4. Lead the network cables from the outside into the inverter through the loose swivel nut and the cable gland.
5. Remove one filler plug from the seal for each network cable.



6. Insert the network cables into the seal. Route the network cable plugs into the inverter to the network sockets.



7. Push the seal into the cable gland. Make sure that any unused cable openings are sealed with filler plugs.
8. Screw the swivel nut of the cable gland on lightly.
9. Insert the network cables into the network sockets. This can be done in any order.
10. Fasten the swivel nut on the cable gland hand-tight. This will secure the network cables in place.
11. Flip the display down and fasten it hand-tight with the display screw.
12. Close the inverter (see inverter installation manual).
13. In a small plant, connect at least one inverter directly to the router depending on the plant topology.
14. In a large plant with Cluster Controller, connect the Cluster Controller to the Speedwire network depending on the required network topology (see the Cluster Controller installation manual).

6 Commissioning

6.1 Commissioning a Large Plant with Cluster Controller

Requirements:

- Speedwire/Webconnect data modules must be installed in the inverters (see Section 5.3 "Installing the Speedwire/Webconnect Data Module in the Inverter", page 19).
- The Speedwire/Webconnect data modules must be connected (see Section 5.4 "Connecting the Speedwire/Webconnect Data Module", page 21).
- The Cluster Controller must be connected to the Speedwire network in accordance with the desired network topology (see installation manual of the Cluster Controller).

Procedure:

1. Commission all inverters with installed Speedwire/Webconnect data module (see inverter installation manual).

2.  **Deactivating the Webconnect function of the inverters**

In large plants with Cluster Controller, communication with Sunny Portal takes place via the Cluster Controller itself.

For optimum operation of large plants with Cluster Controller, deactivate the Webconnect function of the inverters with installed Speedwire/Webconnect data module (see user manual of the Cluster Controller).

6.2 Commissioning a Small Plant

Requirements:

- A Speedwire/Webconnect data module must be installed in the inverter (see Section 5.3 "Installing the Speedwire/Webconnect Data Module in the Inverter", page 19).
- The Speedwire/Webconnect data module must be connected (see Section 5.4 "Connecting the Speedwire/Webconnect Data Module", page 21).
- At least one inverter must be connected to the router.
- DHCP must be enabled for the router.

Procedure:

- Commission all inverters with installed Speedwire/Webconnect data module (see inverter installation manual).

6.3 Managing a Small Plant with Sunny Explorer

6.3.1 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
- Parameterisation of individual devices or an entire device class
- Simple diagnostics thanks 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

6.3.2 Connection to Sunny Explorer

Requirements:

- The plant must be in operation (see Section 6.2 "Commissioning a Small Plant", page 23).

Procedure:

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

6.4 Plant Registration in Sunny Portal

6.4.1 Registering a Small Plant in Sunny Portal

Requirements:

- The small plant must be in operation (see Section 6.2 "Commissioning a Small Plant", page 23).
- PIC and RID must be available for the Speedwire/Webconnect data module.
- Your computer must have an Internet connection.
- JavaScript must be activated in the Internet browser.



Maximum permissible number of devices for a small plant in Sunny Portal

In Sunny Portal you can manage several plants. A maximum of four inverters with installed Speedwire/Webconnect data module per small plant is permitted.



Small plant with Speedwire/Webconnect data module cannot be combined with other plants

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 small plant with Speedwire/Webconnect data module. It is not possible to combine the Speedwire/Webconnect data module and other communication devices within one plant in Sunny Portal. Sunny Portal treats the existing plant and the new small plant with Speedwire/Webconnect data module as independent plants.

Create a new small plant with Speedwire/Webconnect data module.

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. Open **www.SunnyPortal.com**.
2. Select **[Plant Setup Assistant]**.
 - The Plant Setup Assistant opens.
3. Follow the instructions of the Plant Setup Assistant.

6.4.2 Registering a Large Plant with Cluster Controller in Sunny Portal

Requirements:

- The large plant with Cluster Controller must be in operation (see Section 6.1 "Commissioning a Large Plant with Cluster Controller", page 23).
- Your computer must have an Internet connection.
- The Cluster Controller must be connected to a router with Internet connection (see installation manual of the Cluster Controller).
- JavaScript must be activated in the Internet browser.
- In large plants with Cluster Controller, carry out registration in Sunny Portal via the user interface of the Cluster Controller (see user manual of the Cluster Controller).

7 Decommissioning

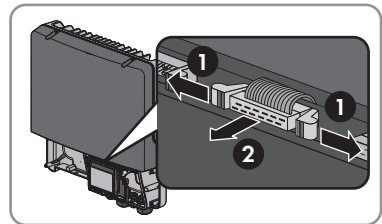
7.1 Disassembling the Speedwire/Webconnect Data Module

1. **⚠ DANGER**

Danger to life due to electric shock when the inverter is opened

Death or serious injuries

- Disconnect the inverter from voltage sources on the AC and DC sides and open it (see the inverter installation manual). Observe the waiting time to allow the capacitors to discharge.
2. Press the left-hand and right-hand lock hooks outwards and remove the ribbon cable plug from the centre connector strip of the inverter.



3. Loosen the screw of the display until the display can be flipped up.
 4. Flip the display up until it clicks into place.
 5. Unscrew the swivel nut of the cable gland.
 6. Remove the network cables from the Speedwire/Webconnect data module.
 7. Unscrew the counter nut of the cable gland
 8. Pull the cable gland and network cables out of the inverter.
 9. Release the screw of the Speedwire/Webconnect data module and remove the module.
 10. Flip the display down and fasten the display screw hand-tight.
 11. Seal the enclosure opening of the inverter with the corresponding filler plug.
 12. Close the inverter (see inverter installation manual).
- The Speedwire/Webconnect data module is disassembled.

7.2 Disposing of the Speedwire/Webconnect Data Module

- Dispose of the Speedwire/Webconnect data module in accordance with the regulations for the disposal of electronic waste applicable at the site of installation.

8 Troubleshooting

Problem	Cause and corrective measures
<p>The Speedwire/Webconnect data module cannot be accessed.</p>	<p>There is no Speedwire connection.</p> <p>Corrective measures:</p> <ul style="list-style-type: none"> • Ensure that all network cable plugs are inserted and locked. • Ensure that all inverters in the plant are in operation. • Make sure that the plant router is switched on. • Make sure that the ribbon cable plug of the Speedwire/Webconnect data module is correctly plugged into the centre connector strip in the inverter.
	<p>The inverter does not recognise the Speedwire/Webconnect data module.</p> <p>Corrective measures:</p> <ul style="list-style-type: none"> • Perform firmware update on the inverter (see technical description "Firmware Update with SD Card" at www.SMA-Solar.com).
	<p>Firewall or IP filter settings are not correct.</p> <p>Corrective measures:</p> <ul style="list-style-type: none"> • Adjust firewall or IP filter settings (see firewall or router manual).
	<p>The Speedwire/Webconnect Data Module does not have a valid IP address.</p> <p>Corrective measures:</p> <ul style="list-style-type: none"> • Ensure that DHCP is activated in the router or assign a manual IP address to the Speedwire/Webconnect data module.

9 Technical Data

General Data

Mounting location	in the inverter
Voltage supply	via inverter

Mechanical Data

Width x height x depth	73 mm x 88 mm x 34 mm
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Communication

Communication interface	Speedwire/Webconnect
Maximum cable length	100 m

Connections

Type of plug	RJ45
Number of RJ45 terminals	2

Ambient Conditions for Storage/Transport

Ambient temperature	- 40°C ... +85°C
Relative humidity, non-condensing	10% ... 100%

10 Contact

If you have technical problems concerning our products, please contact the SMA Service Line. We will need the following data 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 Speedwire/Webconnect data module
- For large plants: serial number and firmware version of the Cluster Controller
- For small plants: PIC and RID numbers of the Speedwire/Webconnect data module

Country	Company name	Subsidiary	SMA Service Line
Australia	SMA Australia Pty Ltd.	Sydney	Toll free for Australia: 1800 SMA AUS (1800 762 287) International: +61 2 9491 4200
Austria	See Germany		
Belgium	SMA Benelux bvba/sprl	Mechelen	+32 15 286 730
Bulgaria	See Greece		
China	SMA Beijing Commercial Company Ltd.	Beijing	+86 10 51501685-602
Czech Republic	SMA Central & Eastern Europe s.r.o.	Prague	+420 235 010 417
Denmark	See Germany		
France	SMA France S.A.S.	Lyon	Sunny Boy / Sunny Mini Central / Sunny Tripower Inverters: +33 472 09 04 40 Communication: +33 472 09 04 41 Sunny Island: +33 472 09 04 42 Sunny Central: +33 472 09 04 43
Germany	SMA Solar Technology AG	Niestetal	Sunny Boy / Sunny Mini Central / Sunny Tripower Inverters: +49 561 9522-1499 Communication: +49 561 9522-2499 SMS with "Rückruf": +49 176 888 222 44 Sunny Island: +49 561 9522-399 Sunny Central: +49 561 9522-299
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Hungary	See Czech Republic		
India	SMA Solar India Pvt. Ltd.	Mumbai	+91 22 61713844
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Korea	SMA Technology Korea Co., Ltd.	Seoul	+82 2 508-8599
Luxembourg	See Belgium		
Netherlands	See Belgium		

Country	Company name	Subsidiary	SMA Service Line
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Romania	See Czech Republic		
Slovakia	See Czech Republic		
Spain	SMA Ibérica Tecnología Solar, S.L.U.	Barcelona	+34 900 14 22 22
Switzerland	See Germany		
Thailand	SMA Solar (Thailand) Co., Ltd.	Bangkok	+662 670 6999
United Arab Emirates	SMA Middle East LLC	Abu Dhabi	+971 2 698-5080
United Kingdom	SMA Solar UK Ltd.	Milton Keynes	+44 1908 304899
Other countries	International SMA Service Line	Niestetal	00800 SMA SERVICE (+800 762 7378423)

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