



Solar Data Technology

## **DM-485CB-10**

**Installation Guide**





# Table of Contents

<b>1</b>	<b>Notes on this Guide</b> .....	<b>4</b>
1.1	Scope of Validity .....	4
1.2	Symbols Used .....	4
1.3	Terminology .....	5
<b>2</b>	<b>Safety</b> .....	<b>5</b>
2.1	Appropriate Usage .....	5
2.2	Safety Instructions .....	5
<b>3</b>	<b>Unpacking</b> .....	<b>6</b>
3.1	Packing List .....	6
3.2	Check for Transport Damage .....	6
3.3	Identification .....	6
<b>4</b>	<b>Electrical Connection</b> .....	<b>7</b>
4.1	Notes .....	7
4.2	Overview of the Connection Area .....	7
4.3	Cabling Recommendations .....	7
4.4	Installing the module in the inverter .....	8
4.5	Connecting the module to the RS485 bus .....	11
4.6	Terminating the RS485 Bus .....	15
<b>5</b>	<b>Decommissioning</b> .....	<b>16</b>
<b>6</b>	<b>Troubleshooting</b> .....	<b>17</b>
<b>7</b>	<b>Technical Data</b> .....	<b>18</b>
<b>8</b>	<b>Contact</b> .....	<b>19</b>

# 1 Notes on this Guide


## 1.1 Scope of Validity

This guide applies for the installation of the RS485 communication module (DM-485CB-10) for SMA inverters of type:

- SB 3000TL-20
- SB 4000TL-20
- SB 5000TL-20
- STP 8000TL-10
- STP 10000TL-10
- STP 12000TL-10
- STP 15000TL-10
- STP 17000TL-10
- WB 3600TL-20
- WB 5000TL-20


## 1.2 Symbols Used

The following types of safety instructions and general information appear in this document as described below:




**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 indicates a situation that can result in property damage if not avoided.



**Information**

Information provides tips that are valuable for the optimal installation and operation of your product.

## 1.3 Terminology

The RS485 communication module (DM-485CB-10) is referred to as "module" in the following chapters.

## 2 Safety

### 2.1 Appropriate Usage

The module enables the setup of a cable-connected RS485 communication for SMA inverters of type:

- SB 3000TL-20
- SB 4000TL-20
- SB 5000TL-20
- STP 8000TL-10
- STP 10000TL-10
- STP 12000TL-10
- STP 15000TL-10
- STP 17000TL-10
- WB 3600TL-20
- WB 5000TL-20

The module is only suitable for use with the above-named SMA inverter types. Also observe the relevant inverter manual. The module is provided as an upgrade kit or pre-installed in the inverter.

### 2.2 Safety Instructions



#### **DANGER!**

**Risk of lethal electric shock when opening the inverter.**

- All work on the inverter must be carried out by a qualified personnel.
- Disconnect the inverter on the AC and DC sides as described in the inverter manual.



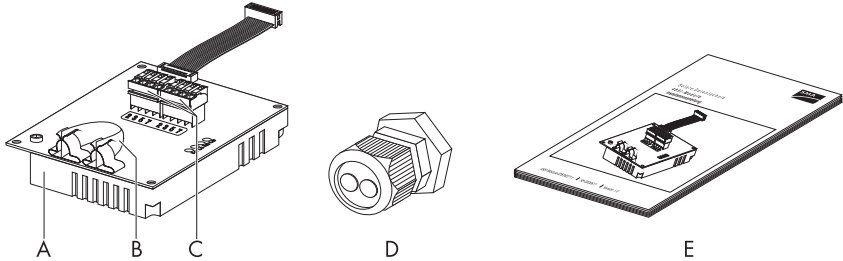
#### **NOTICE!**

**Electrostatic discharges can damage the module or the inverter.**

- Ground yourself before touching the component by touching PE or a grounded object.

### 3 Unpacking

#### 3.1 Packing List



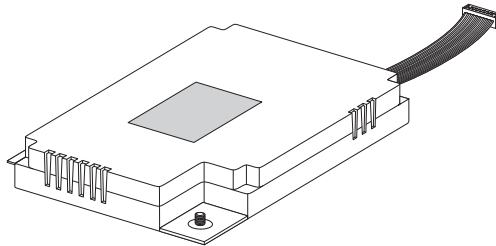
Marker	Number	Designation
A	1	Module (485I-MOD-G1.BGCB)
B	2	Conductive adhesive foil The adhesive foils are stuck to the shield clamps of the module upon delivery.
C	2	Connector In a plug a resistor is plugged for termination.
D	1	M32 cable gland
E	1	Installation guide with RS485 cabling plan poster

#### 3.2 Check for Transport Damage

Also check the module for visible external damage. Please contact your dealer if you find any damage.

#### 3.3 Identification

You can identify the module by the type plate. The type plate can be found on the rear of the module.



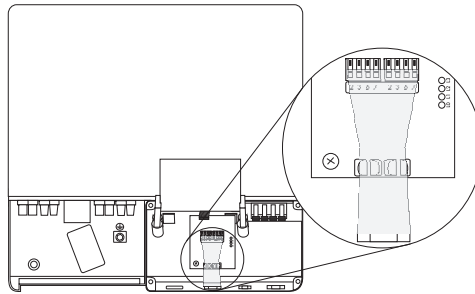
## 4 Electrical Connection

### 4.1 Notes

In this guide it is assumed that the inverter is situated in the middle of the RS485 bus. If the inverter is situated at the end of the RS485 bus, carry out the following steps for one cable only and connect the termination (see Section 4.6 ).

The illustrations for the inverter of type STP 1x000TL-10 can slightly deviate in this manual.

### 4.2 Overview of the Connection Area



Marker	Designation
A	Mounting location of the module
B	Cable opening at the bottom of the inverter
C	Cable route

### 4.3 Cabling Recommendations

The cable length and quality will affect the signal quality. To achieve a good quality signal, observe the following instructions regarding cabling:

- Cross-section: min.  $2 \times 2 \times 0.22 \text{ mm}^2$  or min.  $2 \times 2 \times \text{AWG } 24$
- shielded
- twisted pair conductors
- UV resistant (for outdoor use only)

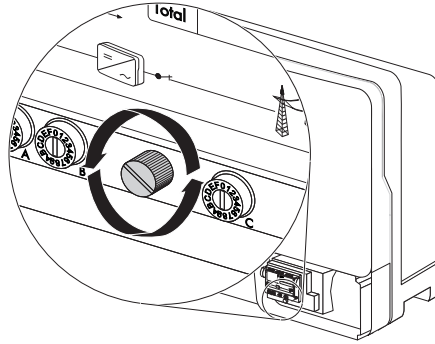
We recommend the following SMA cable types:

For installation outdoors: COMCAB-OUTxxx\*, for installation indoors: COMCAB-INxxx\*

\*available in the following lengths xxx=100 m/200 m/500 m and 1,000 m

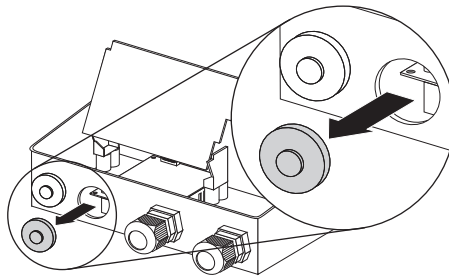
## 4.4 Installing the module in the inverter

1. Open the inverter as described in the inverter manual.
2. Loosen the screw of the display, until the display can be flipped up. Flip up the display until it clicks into place.

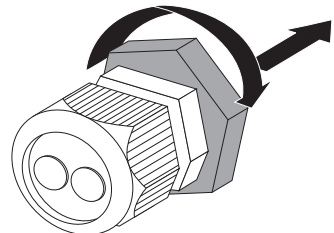


### Preparing the cable opening on the inverter

3. Press the filter plug out of the second cable opening on the left side.

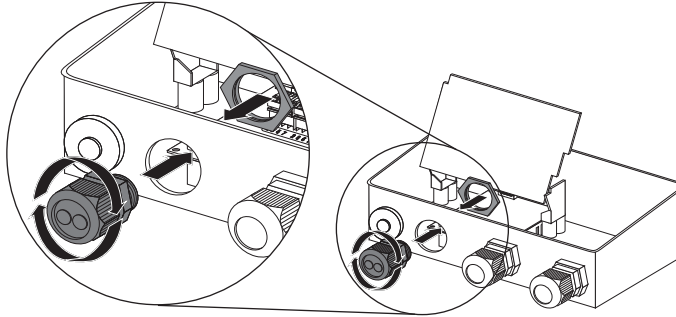


4. Unscrew counter nut from the delivered cable gland.





- Place the cable gland into the enclosure opening of the inverter and fastening it along with the counter nut from inside.

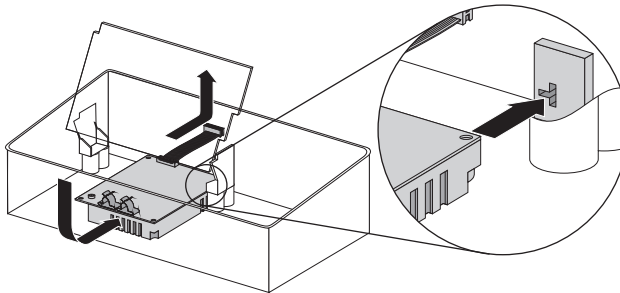


- The cable opening on the inverter is prepared.

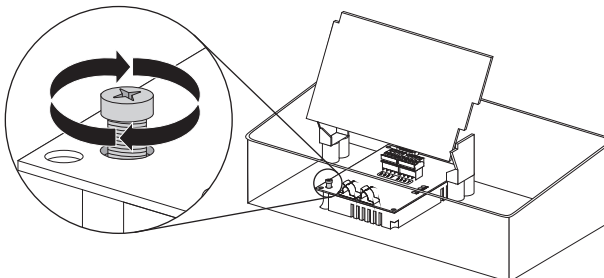
### Inserting the module

- Place the module as shown in the illustration and push the ribbon cable behind the display upwards.

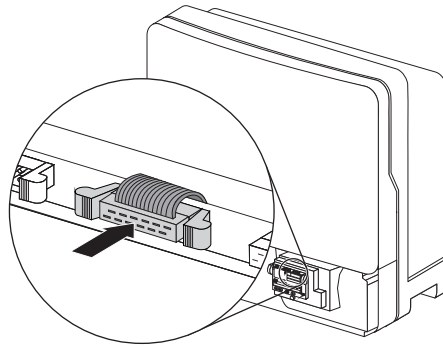
The guide lug at the rear edge of the module must fit into the hole in the plastic mount in the inverter.



- Secure the module with the screw.



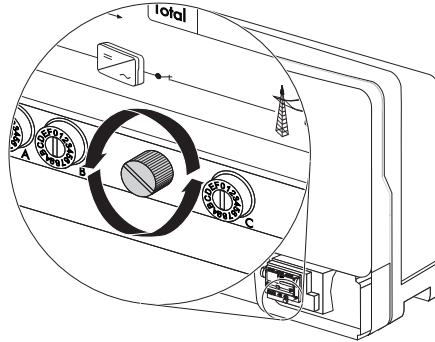
8. Flip down the display.
9. Place the ribbon cable on the connector strip.



- The module is installed.

## 4.5 Connecting the module to the RS485 bus

1. Open the inverter as described in the inverter manual.
2. Loosen the screw of the display, until the display can be flipped up. Flip up the display until it clicks into place.



### Preparing the cable

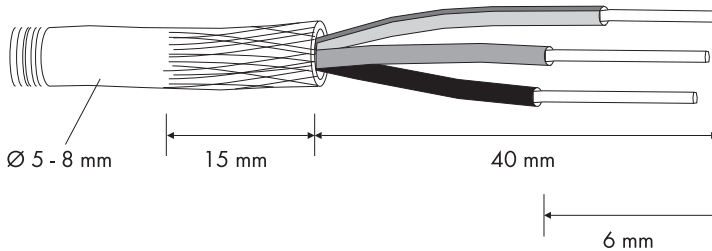


#### NOTICE!

**Metal or cable scraps in the enclosure can damage the inverter.**

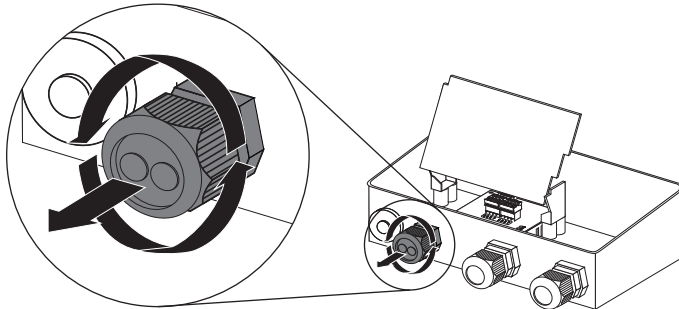
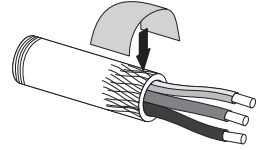
- Carry out the following steps outside the inverter to prevent any metal scraps from the shield or cable from falling into the open inverter.

3. Remove 40 mm of cable sheath.

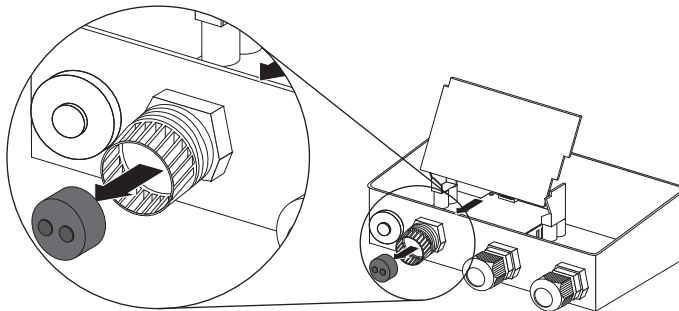


4. Shorten the cable shield to 15 mm and fold it back.
5. Cut off unused insulated conductors at the cable sheath to prevent a short-circuit. 3 insulated conductors are required. 2 insulated conductors must be twisted.
6. Strip 6 mm off the insulated conductors.

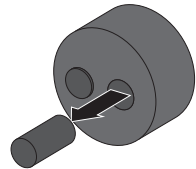
7. Cover the shield with the delivered conductive adhesive foil.
8. Unscrew the nut of the cable gland from the inverter.



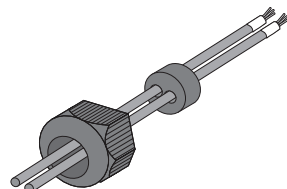
9. Press the seal out of the cable gland from the inside.



10. Remove 1 or 2 filler plugs from the cable gland.  
If only one cable (inverter at the end of the RS485 bus) is used, leave the second filler plug in place.

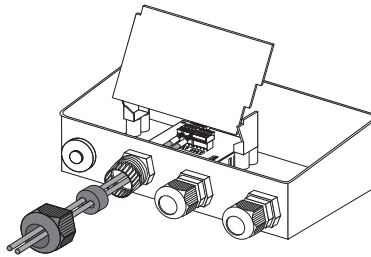
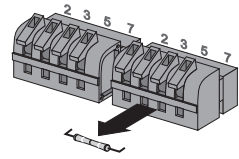


11. Plug 1 or 2 cables into the nut and the seal.  
 The cable is prepared.




### Connecting cable to the module

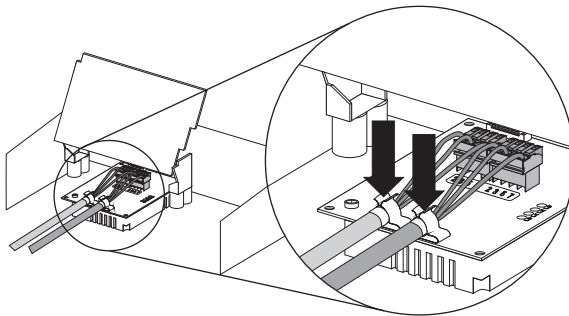
12. If two cables are connected (inverter in the middle of the RS485 bus), remove the resistor of the the termination plug.  
If one cable is connected (inverter at the end of the RS485 bus) leave the resistor connected. If the resistance is not correctly connected, see chapter 4.6 .
13. Insert the end of the cable through the cable gland in the inverter.



14. Loosely screw the nut of the cable gland.
15. Connect insulated conductors to the connector terminals and note down the color of the insulated conductors:

	Signal	RS485 communication module	Insulated conductor color	RS485 bus
	GND	5		5
	Data+	2		2
	Data-	7		7

16. Close the spring-type terminals.
17. Push 1 or 2 cables into the shielding clamp.



18. Screw the nuts tightly onto the cable gland to fix the cable.

19. Flip down the display and secure it with the display screw.
  20. Close the inverter as described in the inverter manual.
  21. Connect the other end of the cable to the RS485 bus.  
See the RS485 cabling plan poster for the connection layout and system wiring.
  22. Lay the cable using suitable fastening material.  
Do not lay the cable of the communication parallel to the AC cable. The high currents in the AC cables can have a negative effect on the communication of the PV system.
- The module is connected to the RS485 bus.

## 4.6 Terminating the RS485 Bus

You must set the termination only on the inverter that is located at the end of the RS485 bus. Upon delivery of the module, the resistance of the termination connector is connected to the plug connection on the right.

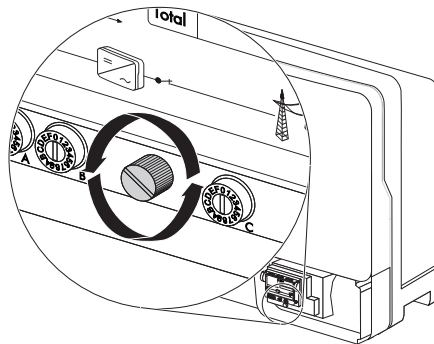


### Termination of the RS485 bus.

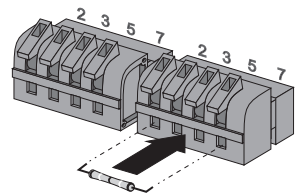
Refer to the RS485 cabling plan poster for the termination of an RS485 bus.

Proceed as follows:

1. Open the inverter as described in the inverter manual.
2. Loosen the screw of the display, until the display can be flipped up. Flip up the display until it clicks into place.



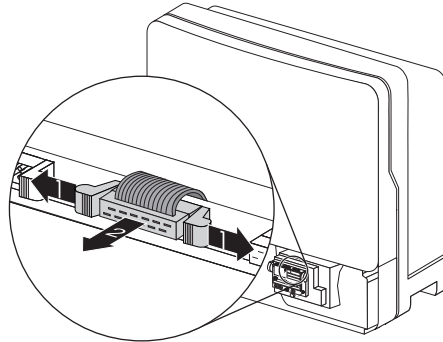
3. Open spring-type terminals 2 and 7 of the right connector.
4. Connect the resistor to terminals 2 and 7.



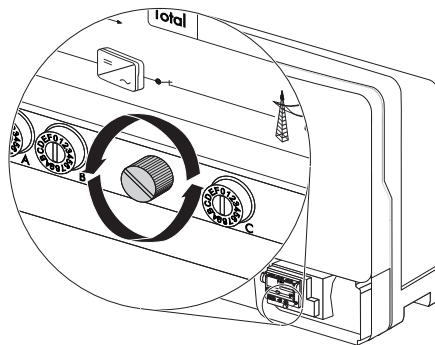
5. Close the spring-type terminals.
  6. Flip down the display and secure it with the display screw.
  7. Close the inverter as described in the inverter manual.
- The RS485 bus is terminated.

## 5 Decommissioning

1. Open the inverter as described in the inverter manual.
2. Remove the plug for the ribbon cable of the module as shown in the figure.



3. Loosen the screw of the display, until the display can be flipped up. Flip up the display until it clicks into place.



4. Open spring-type terminals of the connector on the module and remove all insulated conductors.
  5. Unscrew the nut of the cable gland.
  6. Remove the cable from the shield clamp.
  7. Pull the cable out from the inverter.
  8. Remove the nut and the seal of the cable gland from the cable.
  9. Loosen screw of the module, until the module can be removed. Remove the module.
  10. Unscrew counter nut and remove cable gland.
  11. Close the enclosure opening with the filler plug for the enclosure feed-throughs.
  12. Close the inverter as described in the inverter manual.
- The module has been decommissioned.



## 6 Troubleshooting

Problem	Cause	Rectification
<p><b>Emergency channel list "Emergency" or "EmgncyXX"</b></p> <p>After the installation of the module, the emergency channel list "Emergency" or "EmgncyXX" is displayed in the communication product (e. g. Sunny WebBox, Sunny Explorer). The inverter is displayed by device class "Other" in the Sunny Portal.</p>	<p>The module is installed in an inverter of type SB x000TL-20 without first disconnecting the inverter on the AC and DC sides.</p> <p>The inverter therefore does not recognize the newly installed module.</p>	<p>Before installation of the module, disconnect the inverter on the AC and DC sides, as described in the inverter manual.</p> <p>Information: It is not enough only to pull ESS for disconnecting the DC side. The DC plug must be disconnected as described in the inverter manual. If this does not rectify the fault, contact the SMA Serviceline.</p>
	<p>Several communication products query data simultaneously from the devices via <i>Bluetooth</i> (e.g. Sunny Explorer, Sunny Beam with <i>Bluetooth</i>) and RS485 communication (e.g. Sunny WebBox).</p> <p>This can cause a data congestion in case of high emerging data. If this condition lasts for more than 5 minutes, the inverter carries out a reset of the module. Due to the data congestion the inverter cannot recognize the module after the reset.</p>	<p>Disconnect the inverter on the AC and DC sides as described in the inverter manual.</p> <p><b>or</b></p> <p>Wait until the inverter restarts the next morning, then the inverter will recognize the module.</p>

## 7 Technical Data

<b>Interfaces</b>	
Field bus	2 x 4-pole spring-type terminals
<b>Communication</b>	
Communication interface	RS485
<b>Max. communication range</b>	
RS485	1,200 m
<b>Environmental conditions during operation</b>	
Ambient temperature	-25 °C to +85 °C
Relative humidity	5 % to 95 %, non-condensing
<b>Ambient conditions during storage</b>	
Ambient temperature	-40 °C to +85 °C
Relative humidity	5 % to 95 %, non-condensing
<b>General data</b>	
Dimensions (B/H/T)	73 mm / 88 mm / 34 mm
Weight	71 g
Mounting location	in the inverter

## 8 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:

- Inverter type
- Serial number of inverter
- Number of the modules connected
- Communication type

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