Operating manual

SMA DATA MANAGER M with SUNNY PORTAL powered by ennexOS

SMA

ennexOS
SUNNY PORTAL
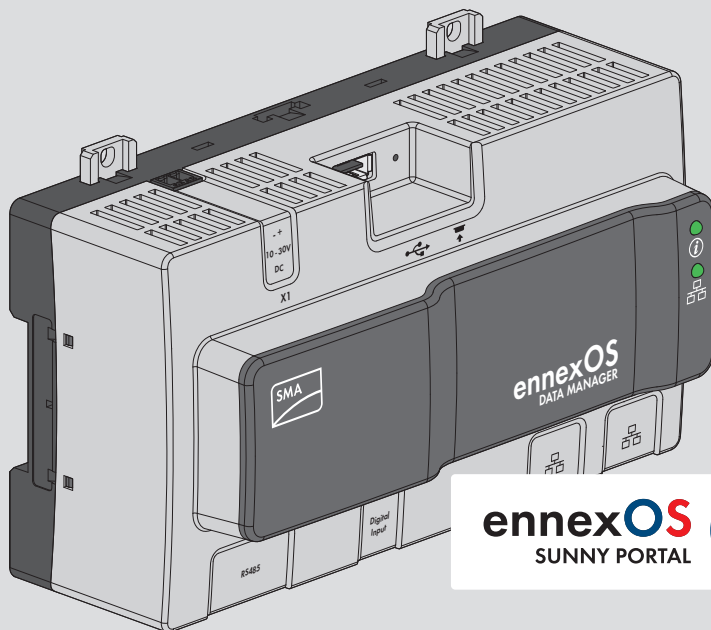
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SMA Warranty

You can download the current warranty conditions from the Internet at www.SMA-Solar.com.

Software licenses

The licenses for the used software modules can be called up on the user interface of the product.

Trademarks

All trademarks are recognized, even if not explicitly identified as such. Missing designations do not mean that a product or brand is not a registered trademark.

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1 Information on this Document

1.1 Validity

This document is valid for:

- EDMM-10 (Sunny Data Manager M) from firmware version 1.01.01.R.
- Sunny Portal powered by ennexOS

1.2 Target Group

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

- Training in the installation and configuration of IT systems
- Training in how to deal with the dangers and risks associated with installing, repairing and using electrical devices and installations
- Training in the installation and commissioning of electrical devices and installations
- Knowledge of all applicable laws, standards and directives
- Knowledge of and compliance with this document and all safety information

1.3 Content and Structure of this Document

This document describes the mounting, installation, commissioning, configuration, operation, troubleshooting and decommissioning of the product as well as the operation of the product user interface.

Illustrations in this document are reduced to the essential information and may deviate from the real product.

1.4 Levels of warning messages

The following levels of warning messages may occur when handling the product.

⚠ 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, can result in property damage.

1.5 Symbols in the Document

Symbol	Explanation
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 might occur

1.6 Typographies in the document

Typography	Use	Example
bold	• Messages • Terminals • Elements on a user interface • Elements to be selected • Elements to be entered	• Connect the insulated conductors to the terminals **X703:1** to **X703:6**. • Enter **10** in the field **Minutes**.
>	• Connects several elements to be selected	• Select **Settings > Date**.
[**Button**] [**Key**]	• Button or key to be selected or pressed	• Select [**Enter**].

1.7 Designation in the document

Complete designation	Designation in this document
SMA Data Manager M	Data Manager, product
SMA Speedwire fieldbus	SMA Speedwire network, Speedwire
Sunny Portal powered by ennexOS	Sunny Portal

1.8 Additional Information

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

Document title	Document type
"SMA SPEEDWIRE FIELDBUS"	Technical information
"PUBLIC CYBER SECURITY - Guidelines for a Secure PV System Communication"	Technical information
"Direct Marketing Interface"	Technical information

Further information on the operation and features of the product are available on the user interface.

Answers to frequently asked questions can be found in the tab **FAQ** on the product page at www.SMA-Solar.com.

2 Safety

2.1 Intended Use

The SMA Data Manager M is a data logger that acts as a system gateway and energy manager. PV system components and PV systems are integrated together with energy generators and loads into the SMA infrastructure and I/O systems and meters via the Ethernet interface. In the process, the SMA Data Manager M is supporting communication with up to 50 devices such as PV inverters, battery inverters, energy meters and I/O systems.

The product is designed for indoor use only.

All components must remain within their permitted operating ranges and their installation requirements at all times.

Use this product only in accordance with the information provided in the enclosed documentation and with the locally applicable standards and directives. Any other application may cause personal injury or property damage.

Alterations to the product, e.g. changes or modifications, are only permitted with the express written permission of SMA Solar Technology AG. Unauthorized alterations will void guarantee and warranty claims and in most cases terminate the operating license. SMA Solar Technology AG shall not be held liable for any damage caused by such changes.

Any use of the product other than that described in the Intended Use section does not qualify as the intended use.

The enclosed documentation is an integral part of this product. Keep the documentation in a convenient place for future reference and observe all instructions contained therein.

The type label must remain permanently attached to the product.

2.2 Safety Information

This section contains safety information that must be observed at all times when working on or with the product.

To prevent personal injury and property damage and to ensure long-term operation of the product, read this section carefully and observe all safety information at all times.

> ### ⚠ WARNING
>
> **Danger to life due to electric shock**
>
> Under fault conditions, when working on the power supply circuit there may be dangerous voltages present on the product.
>
> - With permanently connected power supply units, ensure that there is a disconnection unit (e.g. circuit breaker) present outside of the power supply unit.
> - With pluggable power supply units, ensure that the outlet for the power supply unit is close to the power supply unit.
> - The disconnect unit and the outlet for the power supply unit must be freely accessible at all times.

⚠ WARNING

Danger of fire due to incorrect installation

- Have the product mounted, installed and commissioned only by qualified persons with the appropriate skills.
- Never open the product.

⚠ CAUTION

Damage due to electromagnetic radiation

This product

- Persons must not remain closer than 20 cm to the product for long periods of time.

NOTICE

Damage to the product due to moisture

The product is not splash-proof. Moisture can penetrate the product and damage it.

- Only use the product in a dry, indoor environment.

NOTICE

Damage to the product due to condensation

If the product is moved from a cold environment to a warm environment, condensation may form in the product.

- When there is a large temperature difference, wait for the product to reach room temperature before connecting to the voltage supply.
- Make sure the product is dry.

NOTICE

Manipulation of PV system data in Ethernet networks

You can connect the supported SMA products to the Internet. When connected to the Internet, there is a risk that unauthorized users can access and manipulate the data of your PV system.

- Set up a firewall.
- Close unnecessary network ports.
- If absolutely necessary, only enable remote access via a virtual private network (VPN).
- Do not set up port forwarding at the used Modbus ports.

> **i** **DHCP Server is recommended.**
>
> The DCHP server automatically assigns the appropriate network settings to your nodes in the local network. A manual network configuration is therefore not necessary. In a local network, the Internet router is usually the DHCP server. If the IP addresses in the local network are to be assigned dynamically, DHCP must be activated in the Internet router (see the Internet router manual).
>
> In networks where no DHCP server is active, proper IP addresses must be assigned from the free address pool of the network segment to all network participants to be integrated during commissioning.

2.3   Supported Products

Supported SMA Products

> **i** **Availability of SMA products in your country**
>
> Not all SMA products are available in all countries. For information on whether an SMA product is available in your country, visit the website of your country's SMA subsidiary at www.SMA-Solar.com or contact your distributor.

Inverters:

- All SMA inverters with integrated or retrofitted Speedwire/Webconnect interfaces are supported. Information on whether an SMA inverter has an integrated Speedwire/ Webconnect interface or can be retrofitted with a Speedwire/Webconnect interface can be found on the SMA inverter product page at www.SMA-Solar.com.

Other products:

- SMA Com Gateway
- SMA Energy Meter from firmware version 1.1 (not available in all countries)
- Sunny Portal powered by ennexOS

Supported Products from Other Manufacturers

Energy meters:

- Power Analyser UMG 604-PRO from Janitza electronics GmbH

External I/O Systems:

- ioLogik E1242 of Moxa Europe GmbH (see Section 13 "Accessories", page 44)
- ioLogik E1260 of Moxa Europe GmbH (see Section 13 "Accessories", page 44)
- WAGO-I/O-SYSTEM 750 of WAGO Kontakttechnik GmbH & Co. KG (see Section 13 "Accessories", page 44)

Sensors (only in conjunction with external I/O systems):

- Irradiation sensors that can output a current signal in the range from 4 mA to 20 mA
- Temperature sensors with a Pt100 measuring shunt

Signal receivers and digital and analog signal sources:

• Signal sources with relay contacts

Routers and network switches:

• Routers and network switches for Fast Ethernet with a data transfer rate of at least 100 Mbit/s
  All network components used must support the IGMP version 1 protocol (IGMPv1).

3　Scope of Delivery

Check the scope of delivery for completeness and any externally visible damage. Contact your distributor if the scope of delivery is incomplete or damaged.
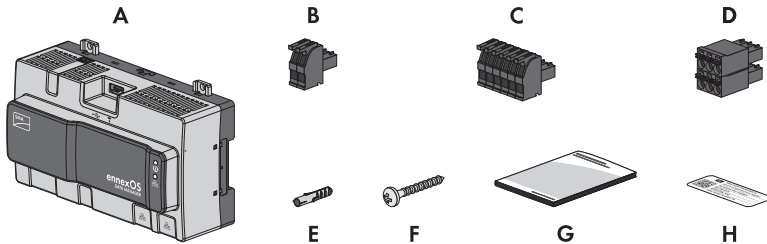
Figure 1: Components included in the scope of delivery

Position	Quantity	Designation
A	1	SMA Data Manager M
B	1	Two-pole plug
C	1	Six-pole plug
D	1	Six-pole plug
E	4	Screw anchors
F	4	Screws
G	1	Quick Reference Guide
H	2	Label with Internet address, registration ID (RID) and identification key (PIC) for product registration in Sunny Portal powered by ennexOS

4   Product Overview

4.1   SMA Data Manager M

The SMA Data Manager M is a data logger that acts as a system gateway and energy manager. PV system components and PV systems are integrated together with energy generators and loads into the SMA infrastructure and I/O systems and meters via the Ethernet interface. In the process, the SMA Data Manager M is supporting communication with up to 50 devices such as PV inverters, battery inverters, energy meters and I/O systems.
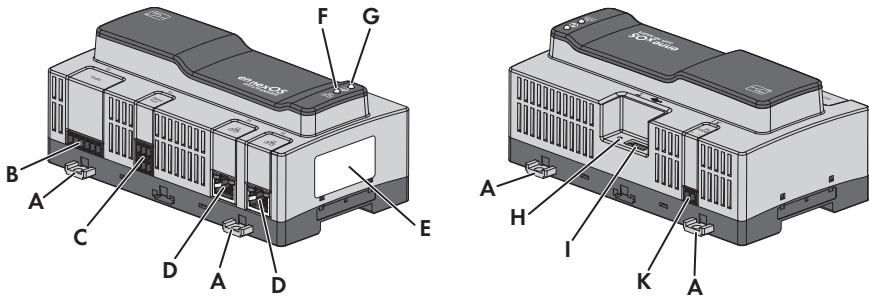
Figure 2: Design of the Data Manager

Position	Designation
A	Press-out brackets for wall mounting
B	Reserved for future applications
C	Jack for the connection of digital signals
D	Network ports with status LEDs for connecting to the network
E	Type label
	The type label clearly identifies the product. You will require the information on the type label to use the product safely and when seeking customer support from the SMA Service Line. You will find the following information on the type label:
	• Device type (Type)
	• Serial number
	• Date of manufacture
	• Device-specific characteristics
	• Registration ID (RID)
	• Identification key (PIC)
F	COM LED
	The COM LED, together with the system LED, indicates the operating state of the product (see Section 4.4 "LED Signals", page 15).

Position	Designation
G	System LED The system LED, together with the COM LED, indicates the operating state of the product (see Section 4.4 "LED Signals", page 15).
H	Function button
I	USB port for manual updates
K	Jack for connecting the voltage supply

4.2   Symbols on the Product

Symbol	Explanation
	USB
	Function button
	System LED
	Ethernet
	WEEE designation Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.
	The product is suitable for indoor installation.
	CE marking The product complies with the requirements of the applicable EU directives.

Symbol	Explanation
	RCM (Regulatory Compliance Mark)
	The product complies with the requirements of the applicable Australian standards.
	This equipment contains specified radio equipment that has been certified to the Technical Regulation Conformity Certification under the Radio Law.

4.3   Function Button

Depending on how long it is activated for, the function button performs the following functions:

- 1 to 5 seconds: no effect
- 5 to 10 seconds: restarts the Data Manager
- 10 to 15 seconds: resets password and administrator account of the Data Manager
- 15 to 20 seconds: resets the Data Manager to the default settings
- Longer than 20 seconds: no effect

The length of time the function button has been activated for is indicated via LED signals (see Section 4.4 "LED Signals", page 15).

4.4   LED Signals

System- and COM LED

The LEDs indicate the operating state and communication status of the Data Manager.

System LED	COM LED	Explanation
Startup process		
Off	Off	No power supply or no boot up procedure.
Glowing orange	Glowing orange	Boot up procedure started.
Flashing orange	Off	Update procedure running.
Glowing red	Off	Boot up procedure running.
Glowing red (for longer than 2 minutes)	Off	Errors during the Booting Procedure
Glowing green	Not relevant	Normal operation
Flashing red	Not relevant	System error
Communication status		
Not relevant	Flashing orange and green in alternation	WLAN access point is activated.

System LED	COM LED	Explanation
Not relevant	Flashing green	Connection to all devices is established.
Not relevant	Flashing orange	Connection to network or Internet is disrupted.
Not relevant	Glowing orange	Connection to at least one device is disrupted.
Not relevant	Glowing red	Connection to all devices is disrupted.
Function button		
Flashing orange and green in alternation	Off	Function button has been pressed for less than 5 seconds.
Flashing orange and green in alternation	Glowing green	Function button has been pressed for between 5 and 10 seconds.
Flashing orange and green in alternation	Glowing orange	Function button has been pressed for between 10 and 15 seconds.
Flashing orange and green in alternation	Glowing red	Function button has been pressed for between 15 and 20 seconds.
Glowing green	Off	Function button has been pressed for longer than 20 seconds.

Network port LEDs

ℹ️ **The colors of the network port LEDs and what each color indicates are not standardized**

The colors used by SMA Solar Technology AG for the Link LED and the Activity LED and what each color indicates may be different to those used in third-party products.
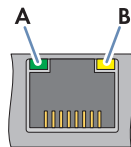

Figure 3: Network port LEDs

Position	Designation	Color	Explanation
A	Link LED	green	Shows the network connection status.
B	Activity LED	Yellow	Shows network connection activity.

4.5   Sunny Portal

Sunny Portal (www.SunnyPortal.com) is an Internet portal which allows you to monitor systems and to visualize system data.

Sunny Portal serves as the user interface for the extended configuration of the Data Manager, system sections, systems, system groups and entire system portfolio. The Sunny Portal monitors and analyzes the system and its components on all levels.

4.6   Interfaces and Functions

The product can be equipped or retrofitted with the following interfaces and functions: The availability of the functions depends on the product version and additional options purchased.

User interface for monitoring and configuration

The product is equipped as standard with an integrated webserver, which provides a user interface for configuring and monitoring the product. The product user interface can be called up via the web browser if there is an existing connection to an end device (e.g. computer, tablet PC or smartphone).

Grid management services

The product is equipped with service functions for grid management.

Depending on the requirements of the grid operator, you can activate and configure the functions (e.g. active power limitation) via operating parameters.

WLAN access point

The product is equipped with a WLAN interface as standard. By tapping on the product, a WLAN access point is activated. This point is used to connect the product to an end device (e.g. smartphone, tablet BC or computer). This allows to carry out commissioning and configuration via direct WLAN connection on site regardless of the wired network.

SMA Speedwire

The product is equipped with SMA Speedwire as standard. SMA Speedwire is a type of communication based on the Ethernet standard. SMA Speedwire is designed for a data transfer rate of 100 Mbps and enables optimum communication between Speedwire devices within systems.

Direct marketing

A direct marketer can use the product for remotely controlling the system via the built-in direct marketing interface. In this process, control signals of the direct marketer are transferred to the system. The function is activated via the installation assistant of the grid management services in the product.

Dashboard

On the dashboard of the user interface, system and component information are displayed clearly and at a glance by using widgets. The dashboard display can vary depending on the system's functional scope and user rights.

Information, such as yield forecast, system section visualization and inverter comparison, are available via the extended functions in Sunny Portal.

Modbus

The product is equipped with a Modbus interface. The Modbus interface is deactivated by default and must be configured as needed.

The Modbus interface of the supported SMA products is designed for industrial use – via SCADA systems, for example – and has the following tasks:

- Remote query of measured values
- Setpoint specifications for system control

Zero export

Some grid operators permit connection of PV systems only on condition that no active power is fed into the utility grid. The PV energy is therefore consumed exclusively at the place where it is generated.

This product enables to limit the active power feed-in of the connected SMA inverters to 0%.

Plant-wide parameterization

You can use the system parameter assistant to change parameters of connected devices at the same time. Simply select the desired devices from a list and change the parameters. The status of the parameter changes is accessable at all times.

Satellite-based data

Sunny Portal provides the possibility to display solar irradiation values, outside and cell temperatures, and wind speeds at the system's location without local sensors. These values can be used to determine the performance ratio of PV systems for example.

5   Mounting

5.1   Requirements for Mounting

Requirements for the Mounting Location:

⚠ WARNING
Danger to life due to fire or explosion
Despite careful construction, electrical devices can cause fires.
• Do not mount the product in areas containing highly flammable materials or gases.
• Do not mount the product in potentially explosive atmospheres.

⚠ CAUTION
Damage due to electromagnetic radiation
This product
• Persons must not remain closer than 20 cm to the product for long periods of time.

NOTICE
Damage due to dust and moisture ingress
Dust or moisture intrusion can damage the product and impair its functionality.
• The product is only suitable for indoor installation.
• The product may only be operated under the specified conditions.

☐ The mounting location must be suitable for the installation of the product.

☐ The mounting location must be suitable for the weight and dimensions of the product (see Section 12, page 42).

☐ The mounting location must be inaccessible to children.

☐ The support surface must be suitable for mounting, e.g. concrete, masonry.

☐ The mounting location should be freely and safely accessible at all times without the need for any auxiliary equipment (such as scaffolding or lifting platforms). Non-fulfillment of these criteria may restrict servicing.

☐ The mounting location should not be exposed to direct solar irradiation.

☐ All ambient conditions must be met (see Section 12, page 42).

☐ The labelling on the product must be readable after installation.

Recommended clearances:
☐ There must be a clearance of 50 mm above and below the SMA Com Gateway to other objects.

Permitted Mounting Position:
☐ The product may only be mounted in a horizontal position.

Dimensions for Wall Mounting:
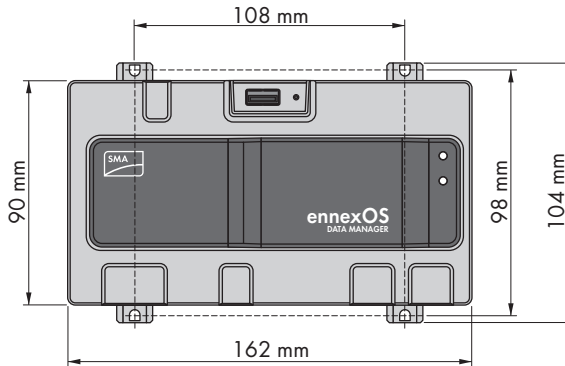
Figure 4: Dimensions for wall mounting

5.2 Mounting the Data Manager

There are two options for mounting the Data Manager:

- Mounting on the top-hat rail
- Mounting on a wall

Mounting the Data Manager on the top-hat rail

Additionally required mounting material (not included in the scope of delivery):

☐ Top-hat rail (TH 35-7.5)

Requirement:

☐ The top-hat rail must be securely mounted.

Procedure:

1. Place the Data Manager onto the top-hat rail from above and hook it in.
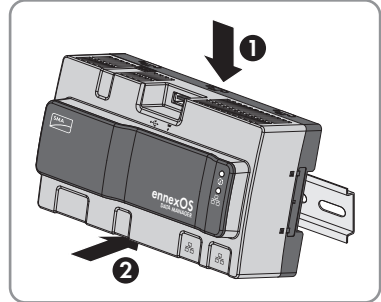
☑ The Data Manager snaps into place.

2. Ensure that the Data Manager is securely in place.

Mounting the Data Manager on the Wall

Procedure:

1. Press the four brackets on the back side of the Data Manager out from the inside.
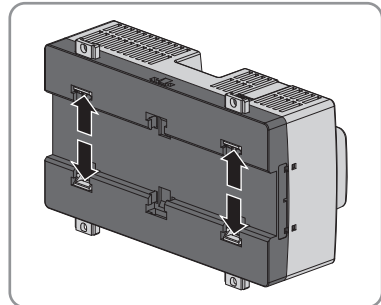
☑ The brackets snap into place.

2. Mark the drill holes using the brackets as a template.

3. Drill the holes and insert the provided screw anchors. Do not drill through the brackets.

4. Insert the provided screws through the brackets and tighten. Do not damage the brackets.
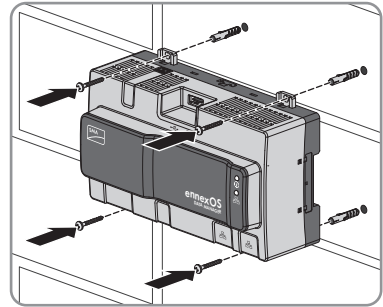
5. Ensure that the Data Manager is securely in place.

6   Connection

6.1   Overview of the Connection Area
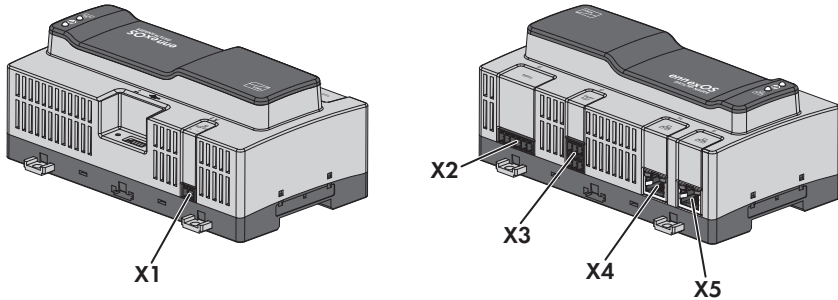
Figure 5: Overview of the connection area

Connection	Explanation
X1	Jack for connecting the voltage supply
X2	Reserved for future applications
X3	Jack for the connection of digital signals
X4	Network port with status LEDs for connecting to the SMA Speedwire network
X5	Network port with status LEDs for connecting to the SMA Speedwire network

6.2   Preparing the Connection Cable

Always proceed as follows to prepare each connection cable for connection to multipole plugs.

Procedure:

1. Strip 40 mm of cable sheath from the end of the connection cable to which the multipole plug is to be attached. When doing so, ensure that no pieces of cable fall into the enclosure.
2. Strip off 6 mm of the conductor insulation from each of the required connection cable conductors.
3. Trim unneeded insulated conductors of the connection cable flush with the cable sheath.
4. Push one bootlace ferrule onto each stripped insulated conductor up to the stop, if necessary.

6.3   Connecting a Signal Source to a Digital Input for Active Power Limitation

Digital signals for active power limitation can be transmitted to the jack **X3**. A ripple control receiver or a remote terminal unit can be used as a digital signal source, for example.

**Additionally required material (not included in the scope of delivery):**

☐ Up to four potential-free contacts

☐ Connection cable

Cable requirements:

The cable length and quality affect the quality of the signal. Observe the following cable requirements:

☐ Number of conductors: at least two

☐ Conductor cross-section: 0.2 mm² to 1.5 mm²

☐ Maximum cable length: 30 m

☐ UV-resistant for outdoor use

Requirements:

☐ The signal source must be technically suitable for connection to the digital inputs (see Section 12, page 42).

☐ The connection cable must be prepared for connection to the multipole plug (see Section 6.2, page 23).
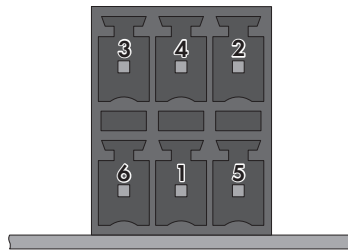
Figure 6: Pin assignment for terminal **X3**

Pin	Pin assignment	Explanation
1	DI1	Digital Input
2	DI2	Digital Input
3	DI3	Digital Input
4	DI4	Digital Input
5	DI5	Fast-stop*
6	24 V	Voltage supply output

* For information on SMA products with fast stop function see manual of the SMA products.
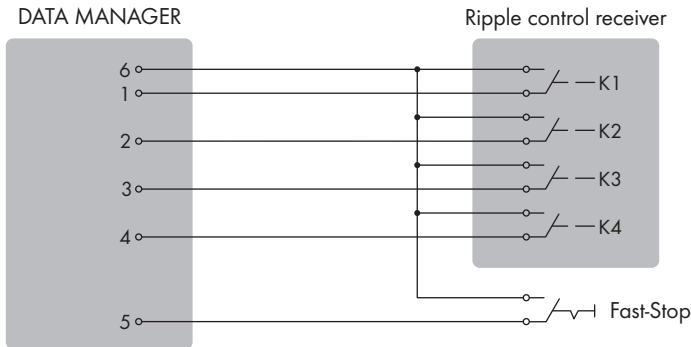
Circuitry overview:

Figure 7: Connection of a Ripple Control Receiver

Procedure:

1. Connect the connection cable to the digital signal source (see the manual from manufacturer).
2. Connect the connection cable to the supplied six-pole plug. For this, unlock the required terminal positions using a suitable tool and plug the conductors into these terminal positions.
3. Connect the six-pole plug to terminal **X3**. Observe the pin assignment.
4. Note the terminal assignment.

6.4 Connecting the cable to the router

[i] **Interference in data transmission due to unshielded power cables**

If unshielded power cables are used, they generate an electromagnetic field during operation which may induce interference in network cables during data transmission.

- When laying network cables, observe the following minimum clearances to unshielded energy cables:
  - For installation without separating strip: at least 200 mm
  - For installation with aluminum separating strip: at least 100 mm
  - For installation with steel separating strip: at least 50 mm

Additionally required material (not included in the scope of delivery):

☐ 1 network cable

Cable requirements:

The cable length and quality affect the quality of the signal. Observe the following cable requirements:

☐ Cable type: 100BaseTx, from Cat5 with shielding S-UTP, F-UTP or higher
☐ Plug type: RJ45 of Cat5, Cat5e, Cat6 or Cat6a
  (Cat7 plugs cannot be used)
☐ Maximum cable length between two nodes when using patch cables: 50 m

☐ Maximum cable length between two nodes when using installation cables: 100 m

☐ UV-resistant for outdoor use

Procedure:

1. Plug the RJ45 plug of the network cable into the network port **X4** or **X5** until the RJ45 plug snaps into place. The assignment of the network cables to the ports is not relevant, as the ports constitute a switch function.
2. Connect the other end of the network cable to the network.

6.5   Connecting the Voltage Supply

⚠ WARNING

Danger to life due to electric shock

Under fault conditions, when working on the power supply circuit there may be dangerous voltages present on the product.

- With permanently connected power supply units, ensure that there is a disconnection unit (e.g. circuit breaker) present outside of the power supply unit.
- With pluggable power supply units, ensure that the outlet for the power supply unit is close to the power supply unit.
- The disconnect unit and the outlet for the power supply unit must be freely accessible at all times.

NOTICE

Damage to the product due to condensation

If the product is moved from a cold environment to a warm environment, condensation may form in the product.

- When there is a large temperature difference, wait for the product to reach room temperature before connecting to the voltage supply.
- Make sure the product is dry.

Additionally required material (not included in the scope of delivery):

☐ 1 power supply unit

☐ 1 AC connection cable

☐ 1 connection cable for connecting the power supply unit to the Data Manager

Requirements for the power supply unit:

☐ Short-circuit current: < 8 A

☐ Nominal output power: 5 W

☐ DC output voltage: 10 V to 30 V

☐ Compliance with the requirements on current sources with limited power in accordance with IEC 60950

Requirements on the connection cable for connecting the power supply unit to the Data Manager:

☐ Core cross-section: 0.2 to 1.5 mm²

☐ The cable must have at least two insulated conductors

☐ Maximum cable length: 3 m

Plug assignment:

Plug	Position	Assignment
	1	Input voltage 10 to 30 V DC
	2	Ground (GND)

Procedure:

1. Mount the power supply unit (see the manufacturer manual).

2. Connect the connection cable to the power supply unit (see the manufacturer manual). Make a note of the insulated conductor colors and trim the unused insulated conductors back to the cable sheath.

3. Release the conductor entries on the supplied two-pole plug.
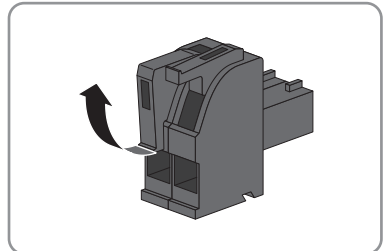
4. Connect the connection cable to the supplied two-pole plug. To do so, plug the conductors into the conductor entries and close the conductor entries. Observe the plug assignment.
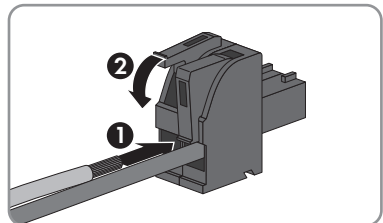
5. Trim unused insulated conductors flush with the cable sheath.

6. Plug the two-pole plug into the jack **X1** on the Data Manager.

7. Connect the AC connection cable to the power supply unit (see the manufacturer manual).

8.

⚠ **WARNING**
Danger to life due to electric shock
Lethal voltages are present at the connection point of the utility grid.
• Disconnect the connection point from voltage sources and ensure that the connection point is voltage-free.

9. Connect the other end of the AC connection cable to the voltage supply.

10. Connect the connection point to the utility grid.

☑ The Data Manager starts operating (see Section 7 "Commissioning", page 29).

7 Commissioning

7.1 Establishing a direct connection via WLAN

Requirements:

☐ An end device (e.g. computer, tablet PC or smartphone) must be available.

☐ The respective latest version of one of the following web browsers must be installed: Chrome, Edge, Firefox, Internet Explorer or Safari.

☐ JavaScript must be enabled in the web browser of the end device.

| i | **SSID, IP address and necessary passwords**

- SSID in WLAN: SMA[serial number] (e.g. SMA0123456789)
- Device-specific WLAN password: see WPA2-PSK on the inverter type label or the label included in delivery
- Standard IP address for a direct connection via WLAN outside of a local network: 192.168.12.3

| i | **Access addresses of the product**

To connect a web browser to the product, the serial number of the product must be available. The serial number is part of the access addresses of the product.

- Access address for Apple and Linux systems: SMA[serial number].local (e.g. SMA0123456789.local)
- Access address for Windows and Android systems: https://SMA[serial number] (e.g. https://SMA0123456789)

The procedure can be different depending on the end devices. If the procedure described does not apply to your end device, establish the direct connection via WLAN as described in the manual of your end device.

There are two options to connect your end device to the Data Manager via WLAN:

- By entering the WLAN data located on the type label or the label included in delivery into your end device
- By scanning the QR code on the label included in delivery using your end device

Direct connection by entering the WLAN data

Procedure:

1. Activate the WLAN access point of the Data Manager. For this, tap on the enclosure lid twice.
   - ☑ The COM LED is intermittently flashing orange and green for approx. 5 seconds. The WLAN access point is then activated for approx. 30 minutes. Once this period has expired, the WLAN access point is deactivated automatically.
2. Search for WLAN networks with your end device.
3. Select the SSID of the Data Manager **SMA[serial number]** in the list with the found WLAN networks.

4. Enter the WLAN password.
5. Open the web browser of your end device, enter the access address of the product in the address line of the web browser and press the enter key.

☑ The login page of the user interface opens.

Direct connection by scanning the QR code

Requirement:

☐ A QR code scanner or a corresponding camera function must be available on the end device.

Procedure:

1. Activate the WLAN access point of the Data Manager. For this, tap on the enclosure lid twice.
   ☑ The COM LED is intermittently flashing orange and green for approx. 5 seconds. The WLAN access point is then activated for approx. 30 minutes. Once this period has expired, the WLAN access point is deactivated automatically.
2. Scan the QR code on the label included in delivery using your end device.
3. Confirm the connection to the WLAN access point of the Data Manager on your end device. It may be necessary to deactivate the mobile data connection on your end device.
4. Open the web browser of your end device, enter the access address of the product in the address line of the web browser and press the enter key.

☑ The login page of the user interface opens.

7.2   Establishing a Connection via Ethernet in the local network

i **Access addresses of the product**

To connect a web browser to the product, the serial number of the product must be available. The serial number is part of the access addresses of the product.

- Access address for Apple and Linux systems: SMA[serial number].local (e.g. SMA0123456789.local)
- Access address for Windows and Android systems: https://SMA[serial number] (e.g. https://SMA0123456789)

Requirements:

☐ The product must be connected to the local network via a network cable (e.g. via a router).

☐ The IPv4 protocol must be used.

☐ An end device (e.g. computer, tablet PC or smartphone) must be available.

☐ The end device must be in the same local network as the product.

☐ The respective latest version of one of the following web browsers must be installed: Chrome, Edge, Firefox, Internet Explorer or Safari.

☐ JavaScript must be enabled in the web browser of the end device.

Procedure:

1. Open the web browser of your end device, enter the access address of the product in the address line of the web browser and press the enter key.

2. ⓘ **Web browser signals a security vulnerability**

   After the IP address has been confirmed by pressing the enter key, a message might appear indicating that the connection to the user interface of the product is not secure. SMA Solar Technology AG guarantees that calling up the user interface is secure.

   • Continue loading the user interface.

☑ The login page of the user interface opens after a few seconds.

7.3   Commissioning the Data Manager

Once you have connected the Data Manager to the local network, the login page of the user interface opens.
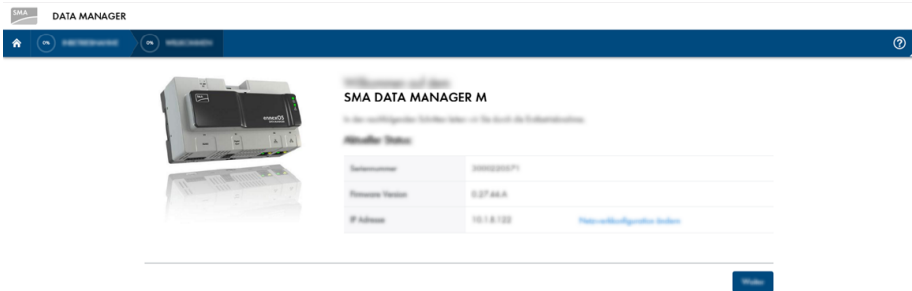
Figure 8: Login page of the user interface

Requirements:

☐ All devices in the local network must be in operation and connected to the Data Manager via an Internet router.

☐ An active Internet connection must be established.

Configuring the network settings

• To configure the network settings, select **Change the network configuration**. Observe that the automatic network configuration is set by default via DHCP server and recommended by SMA Solar Technology AG.

   • If the network settings are to be configured manually, select [**No**].

   • Configure network settings and confirm with [**Save**].

Starting the installation assistant

1. Select [**Continue**] on the login page of the user interface.

2. Create administrator account and select [**Register**]. Observe that only one user with administrator authorization can be created on each Data Manager.

   ☑ The installation assistant will open.

3. Follow the installation assistant steps listed and make the settings appropriate for your system.

- Device registration
- Meter configuration
- Grid management service
- Sensor configuration

☑ A successful commissioning is confirmed by a message.

7.4 Registering in Sunny Portal

Once you have carried out the first installation on the user interface of the Data Manager, you can make further system configurations in Sunny Portal.

Requirements:

☐ The Data Manager must be in operation and connected to the local network via an Internet router.

☐ The registration ID (RID), identification key (PIC) and the Internet address of the type label or of other provided labels must be available.

☐ The system LED must glow green.

Procedure:

1. Call up the Internet address https://ennexOS.SunnyPortal.com in the web browser.
2. Register as a new user in Sunny Portal.

   or

   Log in to Sunny Portal as an existing user.
3. Start the System Setup Assistant.

Register as a new user in Sunny Portal.

1. Call up the Internet address https://ennexOS.SunnyPortal.com in the web browser.
2. Select **I require a user account**.
3. Enter the necessary data for registration.
4. Select [**Register**].

   ☑ After a few minutes you will receive an e-mail containing a link and your access data to Sunny Portal.

   ✖ You did not receive an e-mail from Sunny Portal?

   The e-mail may have been automatically redirected to your spam mail folder.

   - Check whether the e-mail is in the spam mail folder.

   ✖ You did not receive an e-mail from Sunny Portal?

   You may have stated a different e-mail address.

   - Check whether the e-mail was sent to another e-mail address.
   - If the other e-mail address is an unknown address, register as a new user again.
5. Follow the link in the confirmation e-mail within 48 hours.

   ☑ Sunny Portal opens a separate window to confirm successful registration.
6. Call up the Internet address https://ennexOS.SunnyPortal.com in the web browser.

7. Enter the e-mail address and the Sunny Portal password in the fields **User** and **Password**.

8. Select [**Login**].

Log in to Sunny Portal as an existing user.

Requirement:

☐ You must already have a user account in Sunny Portal, Sunny Places or Sunny Design.

Procedure:

1. Call up the Internet address https://ennexOS.SunnyPortal.com in the web browser.

2. Enter the e-mail address and the Sunny Portal password in the fields **User** and **Password**.

3. Select [**Login**].

Starting the System Setup Assistant

The system setup assistant is a step-by-step guide to the processes required for user registration and the registration of your system in Sunny Portal

| i | **Service access**

    To ensure a better quality of service, activate the switch for service access during registration.

Procedure:

1. Log into Sunny Portal.

2. Select the menu **Configuration**.

3. Select [**Create system**] in the context menu.

    ☑ The installation assistant will open.

8 Using the Inverter User Interface

8.1 Design of the User Interface

Figure 9: Design of the user interface in Sunny Portal (example)

The user interface of the Data Manager and Sunny Portal are consistent. The Data Manager is configured and commissioned on site via its user interface.

Sunny Portal serves as the user interface for the extended configuration of the Data Manager, system sections, systems, system groups and entire system portfolio. The Sunny Portal monitors and analyzes the system and its components on all levels.

The number of functions and menus depends on whether you are on the local user interface of the product or in Sunny Portal.

Position	Designation	Description
A	Focus navigation	Enables the navigation between the following levels: • System portfolio • System group • System section • System • Device
B	User settings	Provides the following functions: • Configuring personal data • Log out
C	Help	Redirecting to help pages

Position	Designation	Description
D	System information	Displays the following information: • System time • Firmware version • Serial number • IP address • Terms of use • Data protection declaration • Publication information • Licenses
E	System search	Search for systems
F	Content area	Displays the dashboard or content of the selected menu
G	Configuration	Offers depending on the number of connected devices the following functions: • Device configuration • System Configuration
H	Analysis Pro	Offers information on power and yield values depending on the number of connected devices.
I	Monitoring	Displays depending on the selected device the following information on the current level and the superior levels: • Energy and power • Instantaneous values • Event monitor
J	Dashboard	Displays instantaneous values of the device or system currently selected.
K	Home	Opens the user interface homepage

8.2   User Groups and User Rights

One user with administrator authorization can be created on each Data Manager via the user interface of the Data Manager. As administrator, you can add further system users in Sunny Portal. Thus, users have access to their Sunny Portal system and local access via the user interface of the Data Manager. In Sunny Portal, you can assign users to different user groups. The user groups have different rights in their Sunny Portal system. The following user groups are possible:

• Administrator
• Installer
• User

The scope of functions can be changed by means of updates and purchase of additional apps.

Rights	User group		
	Administrator	Installer	User
Displaying analysis tool	✓	✓	✓
Accessing system properties	✓	✓	✓
Displaying system properties	✓	✓	✓
Configuring system properties	✓	✓	−
Creating and configuring system groups	✓	−	−
Displaying system monitoring	✓	✓	✓
Configuring system monitoring	✓	✓	−
Displaying configuration of system monitoring	✓	✓	−
Displaying user rights	✓	−	−
Configuring user rights	✓	−	−
Configuring notifications	✓	✓	−
Displaying notification configuration	✓	✓	−
Displaying CO_2 widget	✓	✓	✓
Displaying energy balance	✓	✓	✓
Displaying energy balance widget	✓	✓	✓
Displaying energy and power	✓	✓	✓
Displaying event monitor	✓	✓	−
Displaying yield widget	✓	✓	✓
Change device properties	✓	✓	−
Adding devices to systems	✓	✓	−
Displaying GMS widget	✓	✓	✓
Configuring parameter values	✓	✓	−
Displaying performance ratio widget	✓	✓	✓
Activating service access	✓	✓	−
Displaying status widget	✓	✓	✓
Creating and configuring system sections	✓	✓	−
Displaying weather widget	✓	✓	✓

9 Configuration

9.1 Managing System Groups

In Sunny Portal, systems can be bundled together in system groups for better management. Rights and notifications that have been configured for system groups are automatically adopted for all systems of a system group.

Procedure:

1. Select the portfolio 🏠 in Sunny Portal.
2. Select the menu item **System group** in the menu **Configuration**.
3. To delete system groups, select the button 🗑 behind the system group.
4. To create system groups, select the button ⊕, fill out the input fields and click on **Save**.
5. To delete systems and members of a system group, open the submenu of the system group via the button ⌄, fill out the input fields and click on **Save**.

☑ System groups are shown as a separate level above the system level in the focus navigation.

9.2 Managing System Sections

In Sunny Portal, system can be divided in system sections for better analysis or structuring purposes. Systems can be divided into sections, such as buildings, PV module orientation or expansion stage of system project.

Procedure:

1. Select a system in Sunny Portal.
2. Select the menu item **System section configuration** in the menu **Configuration**.
3. To delete system sections, select the button 🗑 behind the system section.
4. To create system sections, select the button ⊕, follow the instructions of the installation assistant and click on **Save**.
5. To modify system sections, select the system section, follow the instructions of the installation assistant and click on **Save**.

☑ System sections are shown as a separate level below the system level in the focus navigation.

9.3 Configuring Limitation of Active Power Feed-In

With the Data Manager, you can implement grid operator specifications for the limitation of the active power feed-in to 0% in your system. No further inverter settings are necessary.

NOTICE

Responsibility of the system operator for limitation of active power feed-in

The system operator is responsible for the correctness of information on limiting the active power feed-in and nominal PV system power.

- Set the limitation of active power feed-in required by the grid operator. If you are not sure about this, contact your grid operator.
- Ensure you have correct information on the nominal PV system power. If you extend the system, adjust the value for the nominal PV system power accordingly.

---

i **Supported inverters for the limitation of the active power feed-in to 0%**

The limitation of the active power feed-in to 0% are only supported by inverters that support the fallback function. In the event of a communication failure between the product and the inverter, the inverter is reduced to an output power of 0% during fallback). For more information see the inverter manual at www.SMA-Solar.com.

Requirement:

☐ The configuration for the active power limitation must be agreed upon with the responsible grid operator.

☐ The inverter must support the limitation of the active power feed-in to 0%.

☐ There must be an appropriate energy meter installed at the grid-connection point within the system.

Procedure:

1. Log into the user interface of the Data Manager.
2. Select the menu item **Grid management service** in the menu **Configuration**.
3. Select **Active power**.
   - ☑ The installation assistant will open.
4. Confirm every step with [**Continue**]
5. Select the operating mode **Closed-loop control**.
6. Select the signal source **Manual control**.
7. Enter the value 0 in the field **Active power setpoint**.
8. Enter the value 1 in the field **Time interval**.
9. Enter the value 100 in the field **Active power gradient**.
10. In the field **Total system power**, enter the desired value.
11. Select [**Save**].

10 Troubleshooting

10.1 Errors in the Data Manager or the Connected Devices

Problem	Cause and corrective measures
Obsolete or incorrect measured values are displayed.	**Connection to VPN or Internet is disrupted.** • Ensure that the network cable is connected correctly and that the network port Link LED is glowing. or • Check the status of the connected devices in the device overview in Sunny Portal.
	The energy meter is connected incorrectly. • Connect the energy meter correctly (see energy meter manual). or • Swap the channels for purchased-electricity and feed-in meters in the meter configuration on the user interface.
	The display in your web browser is not updated. • Reload the page in your web browser.
Not all devices are being detected.	**Not all devices are in operation.** • Ensure that all devices are in operation.
	There are too many devices in the system. • Ensure that no more than permissible devices are in the system.
	The network configuration of the local network is incorrect. • Ensure that the network configuration is correct. SMA recommends the automatic network configuration.
Geänderte Parameter werden auch nach etwa einer Minute Wartezeit nicht übernommen.	**Parameters are modified by two users at the same time.** • Ensure that parameters cannot be modified at the same time on the user interface of the product and in Sunny Portal.
The Data Manager cannot be registered in Sunny Portal.	**The Internet connection via a proxy server is not possible.** • Contact your network administrator.
	The PIC or RID entry is incorrect. • Verify your entry.

10.2 Updating the Firmware

There are two ways to update the product firmware:

• Enabling Automatic Firmware Update (recommended)
• Updating the Firmware at the product via USB Flash Drive

Automatically updating the firmware

- Activate the automatic firmware update via the user interface. By activating the automatic firmware update, the product searches and installs new firmware versions automatically provided an Internet connection exists. In the process, an available firmware update may take up to 24 hours since the product only searches once in 24 hours for a firmware update.

Updating the Firmware at the product via USB Flash Drive

Requirements:

☐ A USB flash drive with maximum 32 GB storage capacity and file system FAT32 must be available.

☐ USB flash drive at least in the version 2.0

☐ The product must be commissioned.

Procedure:

1. Create an "update" folder on the USB stick.
2. Save the update file with the desired firmware in the "update" folder on the USB flash drive. The update file is available directly from the Service (see Section 14, page 45).
3. The update file will be renamed as "update.upd".
4. Plug the USB flash drive into the USB port on the product.
   - ☑ The System LED flashes orange during the firmware update. This process can take several minutes.
   - ☑ Once the firmware has been updated successfully, the System LED glows green continuously.
   - ✖ The SYSTEM LED is not glowing green continuously?
     - Update the firmware again.
5. Pull the USB flash drive out of the USB port of the Data Manager.

11 Decommissioning the Data Manager

⚠ WARNING

Danger to life due to electric shock

Lethal voltages are present at the connection point of the utility grid.

• Disconnect the connection point from the utility grid using the separator (e.g. circuit breaker).

1. Pull the two-pole power supply unit plug out of the jack **X1** on the Data Manager.
2. Release the RJ45 network cable plug and pull out of the network port **X4** or **X5** on the Data Manager.
3. Pull the six-pole power supply unit plug out of the jack **X3** on the Data Manager.
4. Disassembling the Data Manager

   • If mounted on a top-hat rail, detach the Data Manager from the top-hat rail. Tilt the lower edge of the Data Manager forwards and lift it up and off the top-hat rail.
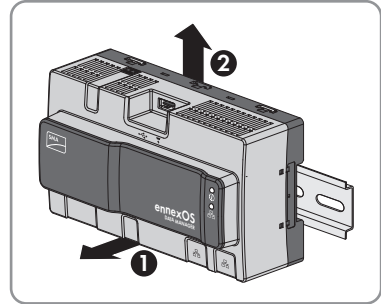
   • If mounted on a wall, remove the screws from the brackets and remove the Data Manager.
5. If the Data Manager is to be disposed of, dispose of the Data Manager in accordance with the locally applicable disposal regulations for electronic waste.

12 Technical Data

Communication

SMA devices	Max. 50 devices, Speedwire, 100 Mbit/s
I/O systems and meters	Ethernet, 10/100 Mbit/s, Modbus TCP

Connections

Voltage supply	2-pole connection, MINI COMBICON
Network (LAN)	2 x RJ45 switched, 10BaseT / 100BaseT
USB	1 x USB 2.0, type A

Voltage supply

Voltage supply	External power supply unit (available as an accessory)
Input voltage range	10 V to 30 V DC
Power consumption	Type 4 W

Ambient Conditions in Operation

Environment	Restricted class 3K7 reg. IEC60721-3-3
Ambient and storage temperature	-20°C to +60°C
Max. permissible value for relative humidity (non-condensing)	5% to 95%
Maximum operating altitude above mean sea level (MSL)	0 m to 3000 m (≥70 kPa)
Degree of protection	IP20

General Data

Dimensions (W x H x D)	161.1 mm x 89.7 mm x 67.2 mm
Weight	220 g
Mounting location	Indoors
Mounting type	Top-hat rail mounting / wall mounting
Status display	LEDs for system and communication status

Digital inputs

Quantity	5
Input voltage	24 V_{DC}
Maximum cable length	30 m

Equipment

Warranty	2 years
Certificates and approvals	www.SMA-Solar.com

13 Accessories

You will find the accessories for your product in the following overview. If required, these can be ordered from SMA Solar Technology AG or your distributor.

Designation	Brief description	SMA order number
Top-hat rail power supply unit*	Top-hat rail power supply unit for SMA Data Manager M	CLCON-PWRSUPPLY
ioLogik E1242	I/O system by Moxa Europe GmbH (4AI/4DI/4DIO)	eIO-E1242
ioLogik E1260	I/O system by Moxa Europe GmbH (6RTD)	eIO-E1260
WAGO-I/O-SYSTEM 750	I/O system by WAGO Kontakttechnik GmbH & Co. KG (8DI, 8DO, 4AI, 4AO, 2RTD)	eIO-750Bundle

* Not available in all countries. For information on whether an accessory is available in your country, visit the website of your country's SMA subsidiary at www.SMA-Solar.com or contact your distributor.

14 Contact

If you have technical problems with our products, please contact the SMA Service Line. The following data is required in order to provide you with the necessary assistance:

- Device type
- Serial number
- Firmware version
- Event message

Deutschland Österreich Schweiz	SMA Solar Technology AG Niestetal Sunny Boy, Sunny Mini Central, Sunny Tripower: +49 561 9522-1499 Monitoring Systems (Kommunikationsprodukte): +49 561 9522-2499 Fuel Save Controller (PV-Diesel-Hybridsysteme): +49 561 9522-3199 Sunny Island, Sunny Boy Storage, Sunny Backup: +49 561 9522-399 Sunny Central, Sunny Central Storage: +49 561 9522-299 SMA Online Service Center: www.SMA-Service.com	Belgien Belgique België Luxemburg Luxembourg Nederland	SMA Benelux BVBA/SPRL Mechelen +32 15 286 730 SMA Online Service Center: www.SMA-Service.com
		Česko Magyarország Slovensko	SMA Service Partner TERMS a.s. +420 387 6 85 111 SMA Online Service Center: www.SMA-Service.com
		Türkiye	SMA Service Partner DEKOM Ltd. Şti. +90 24 22430605 SMA Online Service Center: www.SMA-Service.com
France	SMA France S.A.S. Lyon +33 472 22 97 00 SMA Online Service Center : www.SMA-Service.com	Ελλάδα Κύπρος	SMA Service Partner AKTOR FM. Αθήνα +30 210 8184550 SMA Online Service Center: www.SMA-Service.com
España Portugal	SMA Ibérica Tecnología Solar, S.L.U. Barcelona +34 935 63 50 99 SMA Online Service Center: www.SMA-Service.com	United Kingdom	SMA Solar UK Ltd. Milton Keynes +44 1908 304899 SMA Online Service Center: www.SMA-Service.com

Italia	SMA Italia S.r.l. Milano +39 02 8934-7299 SMA Online Service Center: www.SMA-Service.com	Australia	SMA Australia Pty Ltd. Sydney Toll free for Australia: 1800 SMA AUS (1800 762 287) International: +61 2 9491 4200
United Arab Emirates	SMA Middle East LLC Abu Dhabi +971 2234 6177 SMA Online Service Center: www.SMA-Service.com	India	SMA Solar India Pvt. Ltd. Mumbai +91 22 61713888
ไทย	SMA Solar (Thailand) Co., Ltd. กรุงเทพฯ +66 2 670 6999	대한민국	SMA Technology Korea Co., Ltd. 서울 +82-2-520-2666
South Africa	SMA Solar Technology South Africa Pty Ltd. Cape Town 08600SUNNY (08600 78669) International: +27 (0)21 826 0600 SMA Online Service Center: www.SMA-Service.com	Argentina Brasil Chile Perú	SMA South America SPA Santiago de Chile +562 2820 2101
Other coun-tries	International SMA Service Line Niestetal 00800 SMA SERVICE (+800 762 7378423) SMA Online Service Center: www.SMA-Service.com		

15 EU Declaration of Conformity

within the scope of the EU directives

- Electromagnetic compatibility 2014/30/EU (29.3.2014 L 96/79-106) (EMC)
- Low Voltage Directive 2014/35/EU (29.3.2014 L 96/357-374) (LVD)
- Radio Equipment Directive 2014/53/EU (22.5.2014 L 153/62) (RED)
- Restriction of the use of certain hazardous substances 2011/65/EU (RoHS)

SMA Solar Technology AG confirms herewith that the products described in this document are in compliance with the fundamental requirements and other relevant provisions of the above-mentioned directives. The entire EU Declaration of Conformity can be found at www.SMA-Solar.com.