



SUNSPEC MODBUS

ennexOS

Legal Provisions

The information contained in these documents is the property of SMA Solar Technology AG. No part of this document may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, be it electronic, mechanical, photographic, magnetic or otherwise, without the prior written permission of SMA Solar Technology AG. Internal reproduction used solely for the purpose of product evaluation or other proper use is allowed and does not require prior approval.

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

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

Specifications are subject to change without notice. Every attempt has been made to make this document complete, accurate and up-to-date. Readers are cautioned, however, that product improvements and field usage experience may cause SMA Solar Technology AG to make changes to these specifications without advance notice or per contract provisions. SMA Solar Technology AG shall not be responsible for any damages, including indirect, incidental or consequential damages, caused by reliance on the material presented, including, but not limited to, omissions, typographical errors, arithmetical errors or listing errors in the content material.

SMA Solar Technology AG reserves the right to modify the implementation of communication interfaces and protocols at any time without notifying the user. It is the user's responsibility to determine whether the downloaded content is up to date and to comply with it. SMA Solar Technology AG shall not be held liable for any damage as well as any assumption of consequential costs for customer systems by SMA Solar Technology AG that may result from the user's failure to do so.

SMA Warranty

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

Software licenses

You will find the software licenses for the installed software modules (open source) on the Internet at www.SMA-Solar.com.

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.

SMA Solar Technology AG

Sonnenallee 1

34266 Niestetal

Germany

Phone +49 561 9522-0

Fax +49 561 9522-100

www.SMA.de

E-mail: info@SMA.de

Status: 7/19/2023

Copyright © 2023 SMA Solar Technology AG. All rights reserved.

Table of Contents

1 **Validity**..... 4

2 **Safety** 4

 2.1 Intended Use..... 4

 2.2 IMPORTANT SAFETY INSTRUCTIONS 4

3 **Information on the activation of the SunSpec Modbus** 5

4 **Determine Modbus devices**..... 5

5 **Configure SunSpec Modbus** 6

6 **Supported Information Models** 6

1 Validity

This document is valid for:

- SMA products powered by ennexOS with SunSpec Modbus interface.

2 Safety

2.1 Intended Use

The Modbus interface of the SMA products is designed for industrial use and has the following tasks:

- Remote control of grid management services
- Remote-controlled querying of measured values
- Remote-controlled changing of parameters
- Interface for direct marketing

The Modbus interface can only be used via the Modbus TCP protocol.

Use SMA products only in accordance with the information provided in the enclosed documentation and with the locally applicable laws, regulations, standards and directives. Any other application may cause personal injury or property damage.

Alterations to SMA products, e.g., changes or modifications, are only permitted with the express written permission of and according to the instructions from SMA Solar Technology AG. Unauthorized alterations can be dangerous and lead to personal injury. In addition, an unauthorized alteration 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 appropriate.

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

This document does not replace any regional, state, provincial, federal or national laws, regulations or standards that apply to the installation, electrical safety and use of the product. SMA Solar Technology AG assumes no responsibility for the compliance or non-compliance with such laws or codes in connection with the installation of the product.

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

2.2 IMPORTANT SAFETY INSTRUCTIONS

Keep the manual for future reference.

This section contains safety information that must be observed at all times when working.

The product has been designed and tested in accordance with international safety requirements. As with all electrical or electronical devices, some residual risks remain despite careful construction. 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.

NOTICE

Damage of SMA products due to cyclical changing of parameters

The writable Modbus registers (RW) of the SMA products are intended for long-term storage of device settings. Cyclical changing of these parameters leads to destruction of the flash memory of the SMA products. The following parameters are excluded. The parameters may be changed cyclically.

- **Information model 123:**

Conn
WMaxLimPct
OutPFSet
VArWMaxPct
VArMaxPct

- **Information model 704:**

WMaxLimPct
WSet
WSetPct
VarSetPct
PF + Ext (WInj, Power factor & excitation setpoint when injecting active power)
PF + Ext (WAbs, Power factor & excitation setpoint when absorbing active power)

i Access to data points after activating the Modbus interface

After activating the Modbus interface, the read and write access to all data points is possible without further input of a password via Modbus.

i Deactivating the Modbus interface by resetting the SMA product

When the SMA product is reset to the default settings, the Modbus interface is deactivated.

- If the Modbus interface is to be used after the reset, reactivate the Modbus interface.

3 Information on the activation of the SunSpec Modbus

The Modbus interface of SMA products is deactivated by default. To use the Modbus interface and to communicate with the products via SunSpec Modbus, you must activate Modbus as the type of communication and set the TCP port. If you have a system in which the inverters are addressed via the Modbus Unit ID instead of via the IP address, the Unit ID must be set in addition to the TCP port. The Unit ID in the SunSpec Modbus profile is 126.

4 Determine Modbus devices

Following the instructions listed below helps detect the Modbus devices. For further information on Modbus ennexOS, see the Technical Information "SMA Modbus® Interface - ennexOS" at www.SMA-Solar.com.

Procedure:

1. Select at the system level the menu item **Device administration** in the menu **Configuration**.
2. Add and configure Modbus devices via the button **+**. Note the information on the user interface of the inverter.
3. Select **[Modbus devices]**.
4. Select **[Continue]**.
5. Select the Modbus profile. If necessary, import the saved Modbus profiles via **[Modbus profile management]** or create a new Modbus profile.
6. If necessary, change the IP address.
7. If necessary, change the port (default setting: 502).
8. If necessary, change the unit ID (default setting: 1).

9. Click **[Continue]** to confirm.
10. Select the device.
11. Click on **[Save]**.



5 Configure SunSpec Modbus

If changes are to be made to the configuration of the Modbus interface after completing the commissioning wizard process, this can be done via the product's user interface.

Requirements:

- ☐ The Modbus devices must already be detected (see Section 4, page 5).
- ☐ The device to be configured is selected on the user interface. For systems with multiple devices, the System Manager must be selected.

Procedure:

1. Select the **External communication** menu item under the **Configuration** menu.
2. If the SunSpec Modbus needs to be configured for the first time, click the **[Perform initial configuration]** button.
3. If the configuration needs to be reset, use the button  to edit it.
4. Enable the Modbus server. Note the information on the user interface of the inverter.
5. Change the standard port address of the Modbus server if required.
6. In the **Unit ID assignment** area, add subdevices via the button  and configure the devices if necessary.
7. Click on **[Save]**.

Also see:

- [Supported Information Models](#) ⇒ page 6

6 Supported Information Models

The SunSpec profile only contains the information models that are supported by the product. All information models not supported by the product are excluded dynamically. This ensures that battery inverters, for example, do not contain information models for PV inverters and vice versa. Within an information model, blocks are used that are repeated in order to accommodate data areas with different lengths (e.g., for a different number of DC inputs).

Determine Modbus addresses

All information models start with an ID register and a length register. This information is used to cycle through or scan the information models even if the ID and the contents of an information are not understood during the scan. In this way, information models can be found and used, or ignored if the definition is unknown.

The following information models are supported:

- 001 - Common
- 123 - Inverter Immediate Controls (704 is recommended)
- 701 - DER AC Measurement
- 702 - DER Capacity
- 703 - Enter Service
- 704 - AC Controls
- 705 - DER Volt-Var Q(V)
- 706 - DER Volt-Watt P(V)
- 707 - DER Trip LV
- 708 - DER Trip HV

- 709 - DER Trip LF
- 710 - DER Trip HF
- 711 - DER Frequency Droop $P(f)$
- 712 - DER Watt-Var $Q(P)$
- 713 - DER Storage Capacity (only with battery inverters)
- 714 - DC Monitoring (only for Sunny Tripower X)