



Connection & Settings Instructions for SEVEN Sensors to SMA Data Manager M



1. Introduction

This document is prepared for SMA Data Manager M users. The steps are explained below to connect SEVEN Sensor Box to SMA Data Manager M.

The following meteorological data can be provided by SEVEN Sensor Box. The Communication is provided via RS485 with Modbus RTU protocol.

1. 3S-IS, Irradiance Sensor (W/m²)
2. 3S-MT-PT1000, Module Temperature Sensor (°C)
3. 3S-AT-PT1000, Ambient Temperature Sensor (°C)
4. 3S-WS-PLS, Wind Speed Sensor (m/s)
5. 3S-RH&AT, Relative Humidity Sensor (%)

2. Cable Connection

Connect the green wire of the output cable of the Sensor Box to Data (+) (RS485 A / Data (+)) port of the SMA Data Manager M and connect the yellow wire of the output cable of the Sensor Box to Data (-) (RS485 B / Data (-)) port of the SMA Data Manager M.

White and brown wires of the output cable of the Sensor Box power up the Sensor Box as shown in Table 1.

Brown	Power (+)
White	Power (-)
Green	(RS485 A / Data (+))
Yellow	(RS485 B / Data (-))

Table 1: Communication and Power Cable Color Coding

Plug assignment:

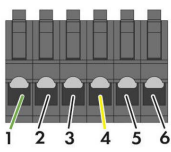


Plug	Position	Assignment
	1	Data+ (D+)
	2	Not assigned
	3	Ground (GND)
	4	Data- (D-)
	5	Line termination (optional)
	6	Line termination (optional)

Figure 1: Plug Assignment

 A cable with magnetic field protection must be used as communication and power cable between the sensor and the datalogger. Please don't use CAT 6 cable.

 SEVEN sensors are supplied with a voltage of 12-30 VDC. The recommended voltage value is 24 VDC. A high quality power supply must be used for the sensor supply.

 SEVEN has the right to make modifications on this documentation without notice.

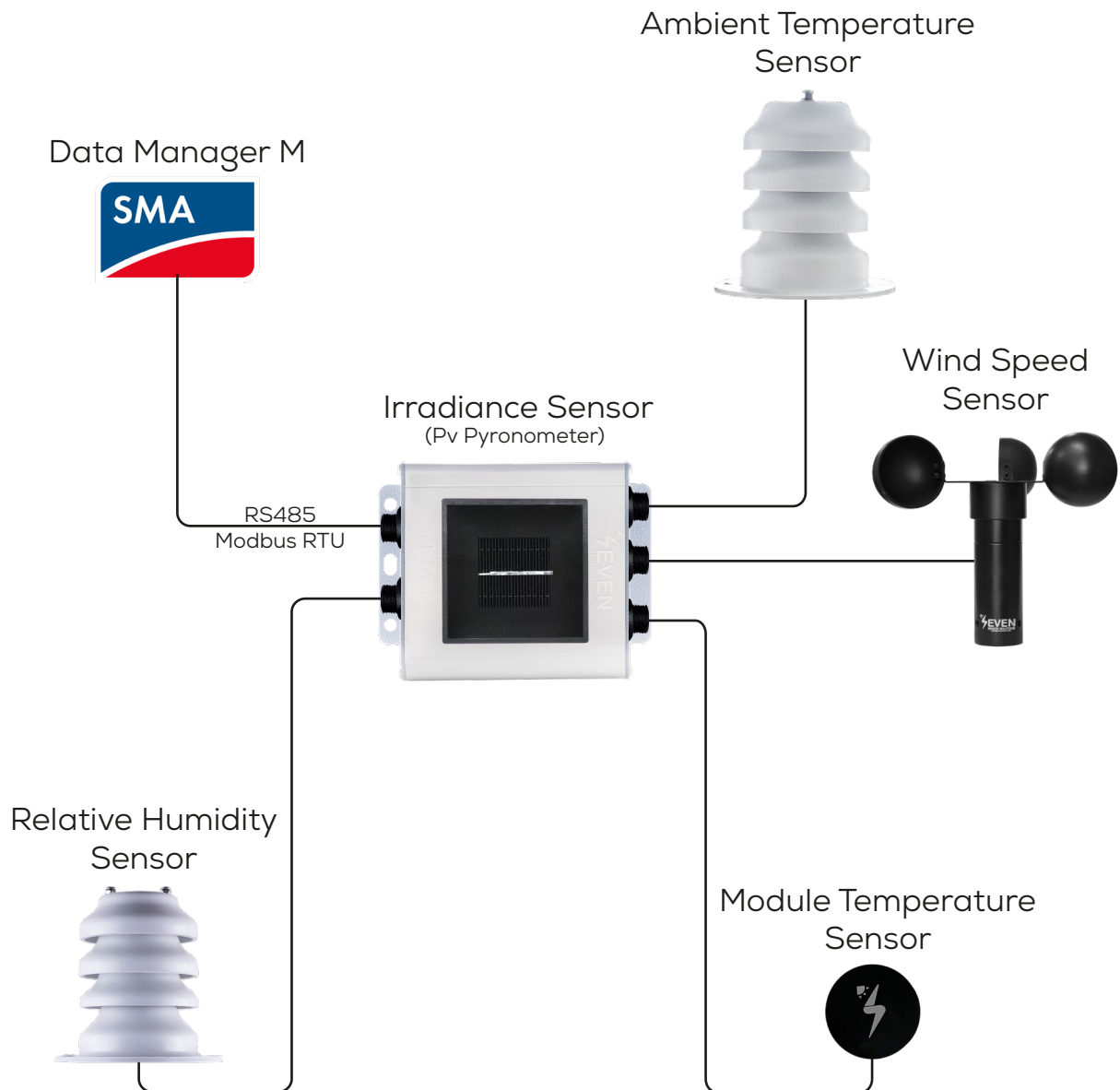


Figure 2: SMA Weather Station



The sensor model can be different as per the customer's request.



If your sensor model is 3S-2IS, 3S-3IS, 3S-4IS or 3S-CWS, enter each orientation's module number to the configuration tool to monitor the total effective irradiance and total effective module temperature before configuring in SMA Monitoring System.

3. Settings

SEVEN Sensor Box will not be automatically detected by SMA Data Manager M. Therefore, the settings shall be proceeded manually.

Step 1 and 2 : To login to enter the SMA Data Manager M user interface, enter the SMA Data Manager M IP address in the browser of your PC which must be on the same network as SMA Data Manager M and login to user interface.

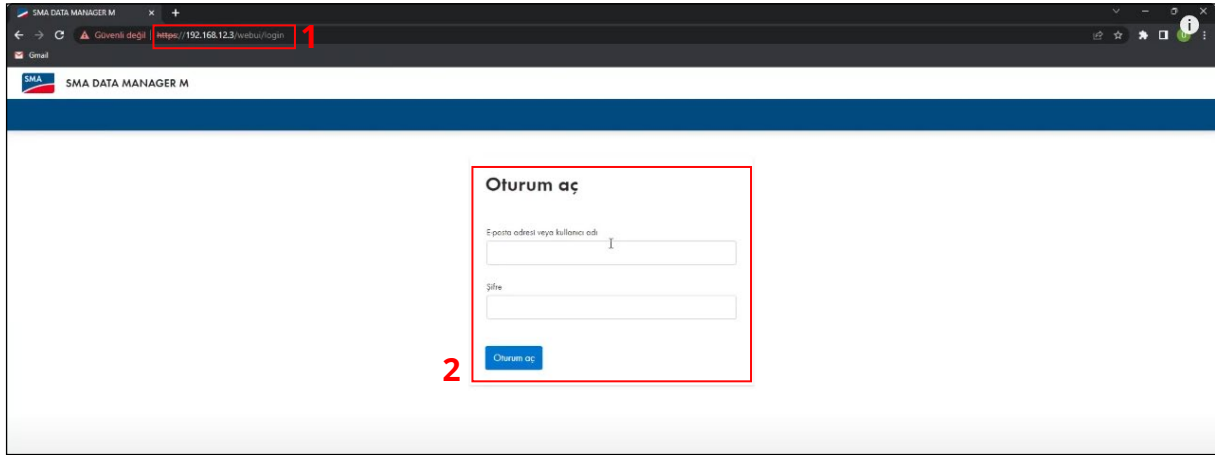


Figure 3: Data Manager M Interface

Step 3 and 4 : Click on "Device administration" in the menu "Configuration".

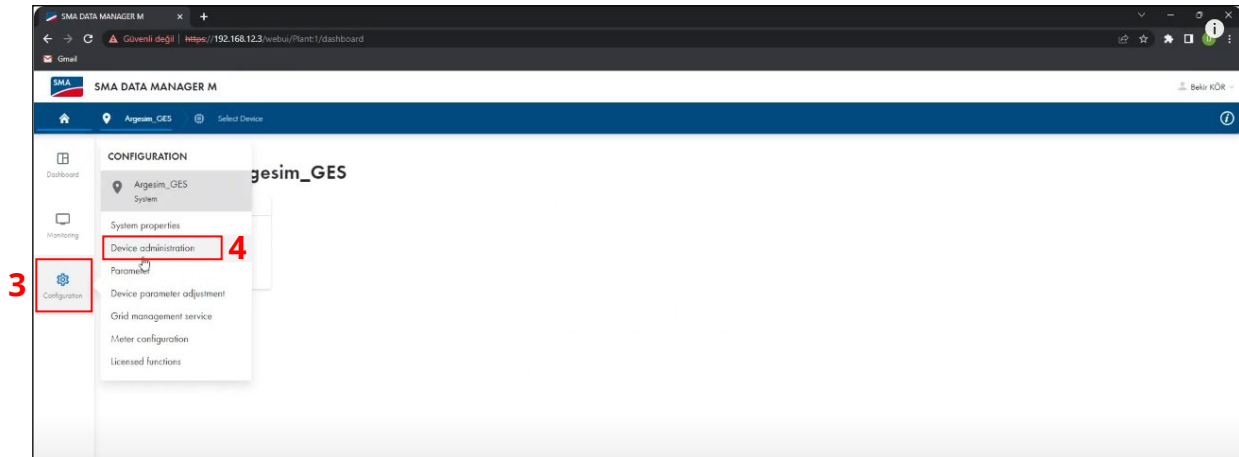


Figure 4: Configuration Menu

Step 5 : Click on **+** button.

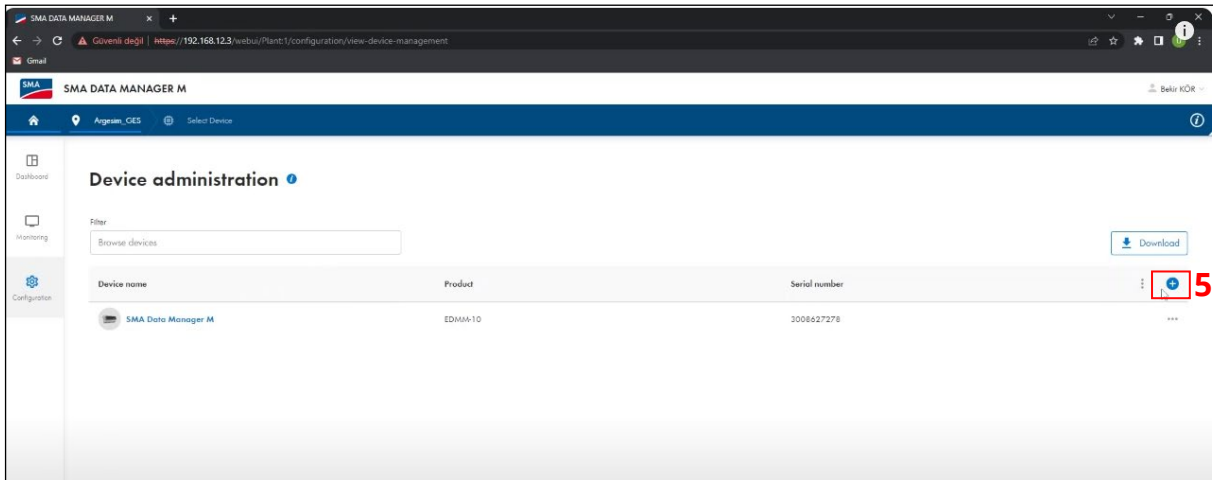


Figure 5: Configuration Settings of SEVEN Sensor Box

Step 6 and 7 : On the opened window, choose **"Modbus Devices"** and click on **"Continue"** button.

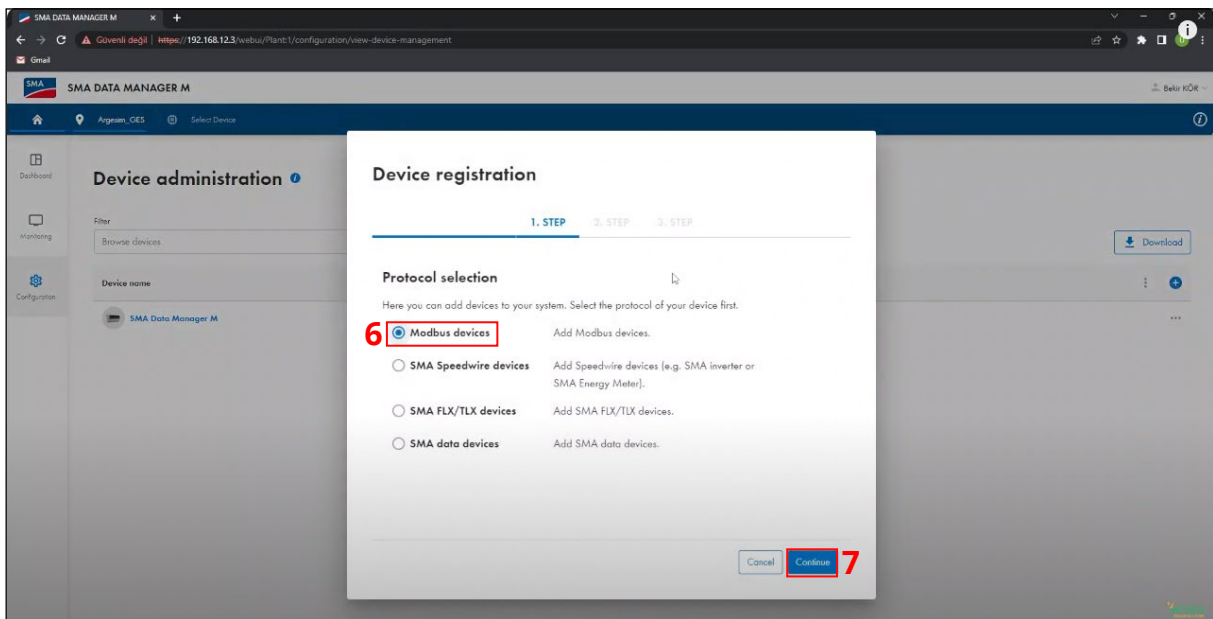


Figure 6: Configuration Settings of SEVEN Sensor Box

Step 8 : Click on "Managing Modbus profiles".

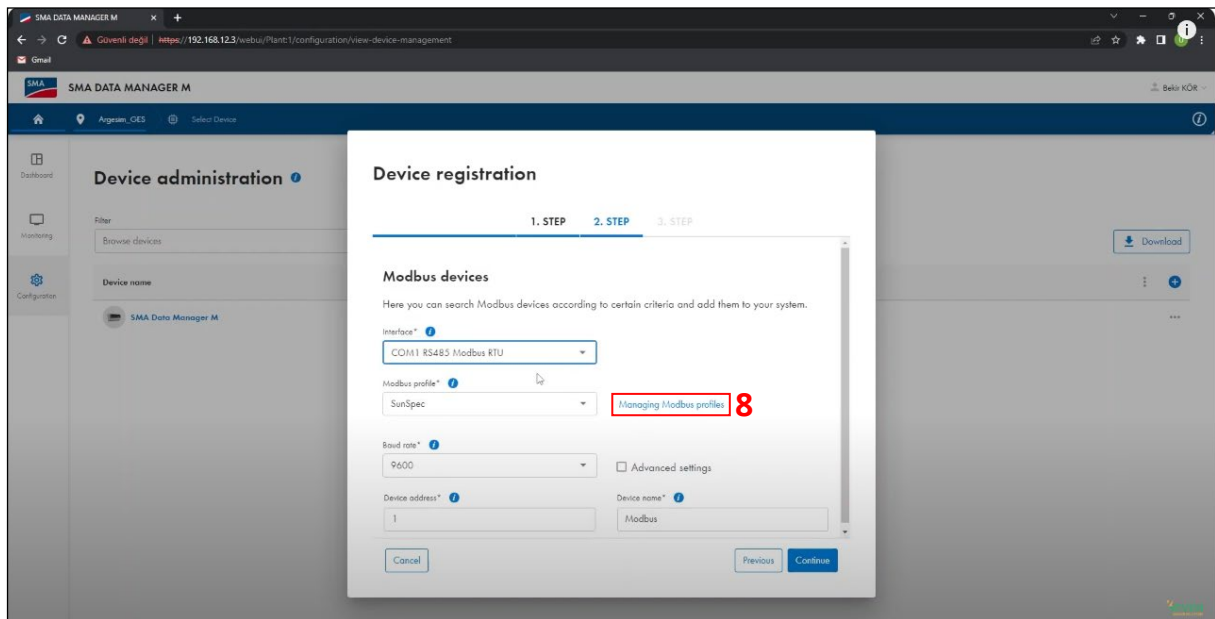


Figure 7: Configuration Settings of SEVEN Sensor Box

Step 9 : Click on "Create a new Modbus profile".

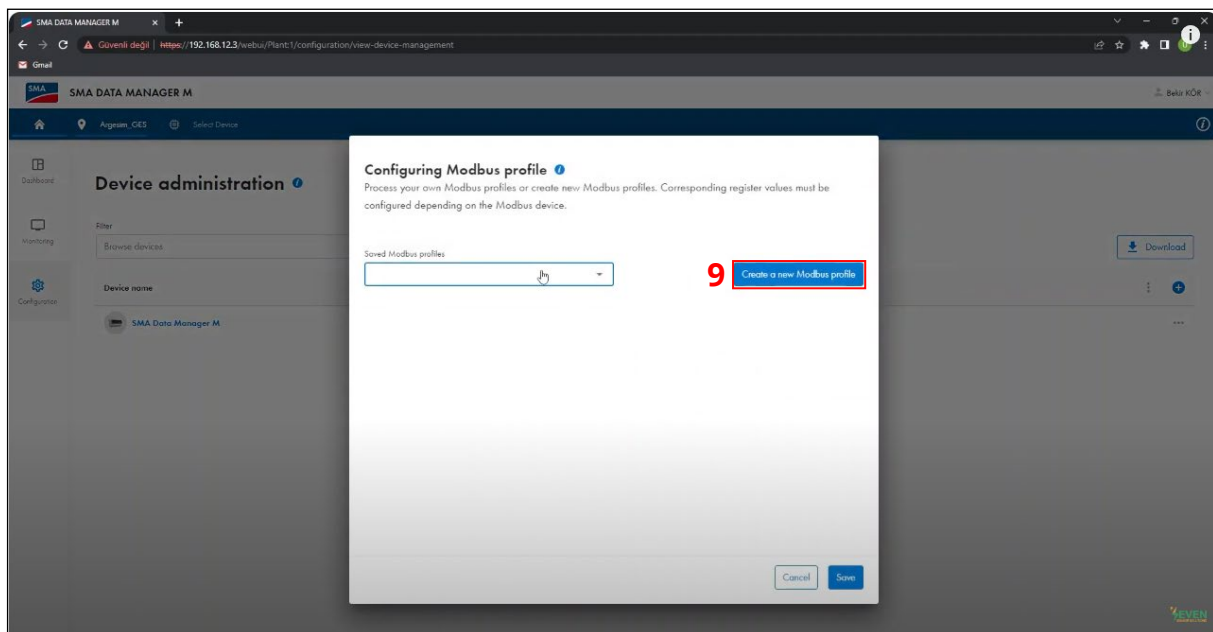


Figure 8: Configuration Settings of SEVEN Sensor Box

Step 10 : Fill the gaps as shown below :

- Name of Modbus profile : SEVEN Sensor Solutions
- Device type : Sensor System in General
- Byte sequence : Big-Endian
- Model designation : Enter the sensor model.
- Mapping template : Monitoring

Step 11 : Click on **+** button from the section that opens at the bottom of the window.

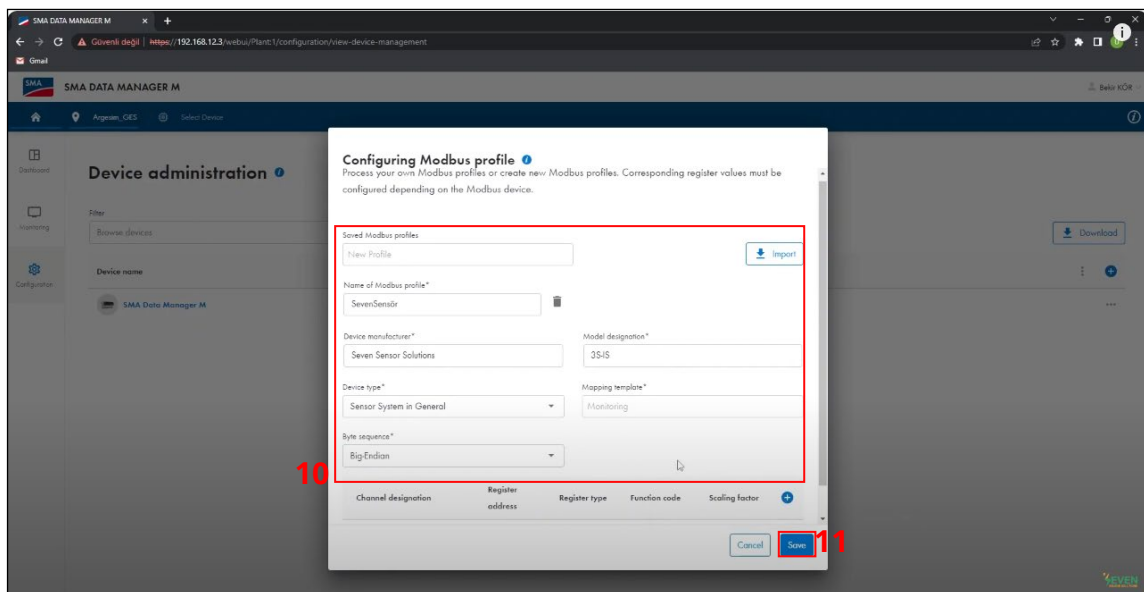


Figure 9: Configuration Settings of SEVEN Sensor Box

Step 12 : Define the information about the sensors as shown in Figure 10* for the configuration of the sensors that you have.

Step 13 : Click on "Save" button.

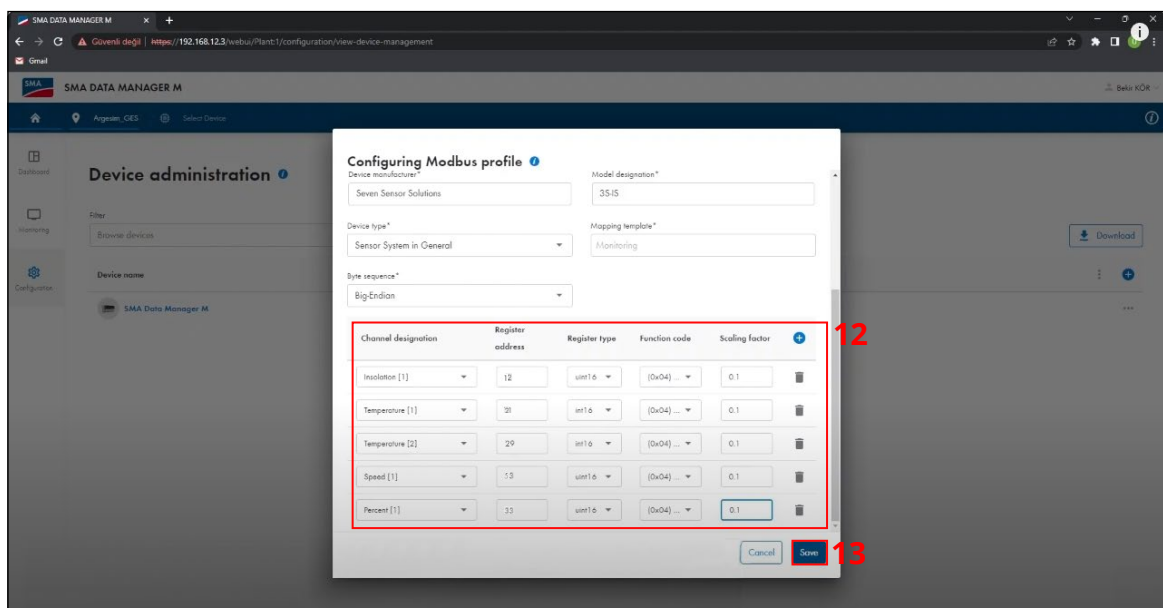




Figure 10: Configuration Settings of SEVEN Sensor Box

*The register addresses can be different as per the sensor's software version.

Step 14 ve 15 : Make the following definitions in the **"Device registration-2.Step"** window and click on **"Continue"** button.

- Interface : COM 1 RS485 Modbus RTU
- Modbus profile : SEVEN (Choose the defined sensor).
- Baudrate : 9600
- Device address : 1
- Device name : Modbus

 ID is 1 and Baudrate is 9600 for SEVEN Sensor Box as factory default. If these values are changed by the user, please enter the new values.

 In case more than one device is connected to the port you have connected the sensor to, device ID's must be different while baudrate and parity values must be the same. You can change the device ID via SEVEN configuration tool.

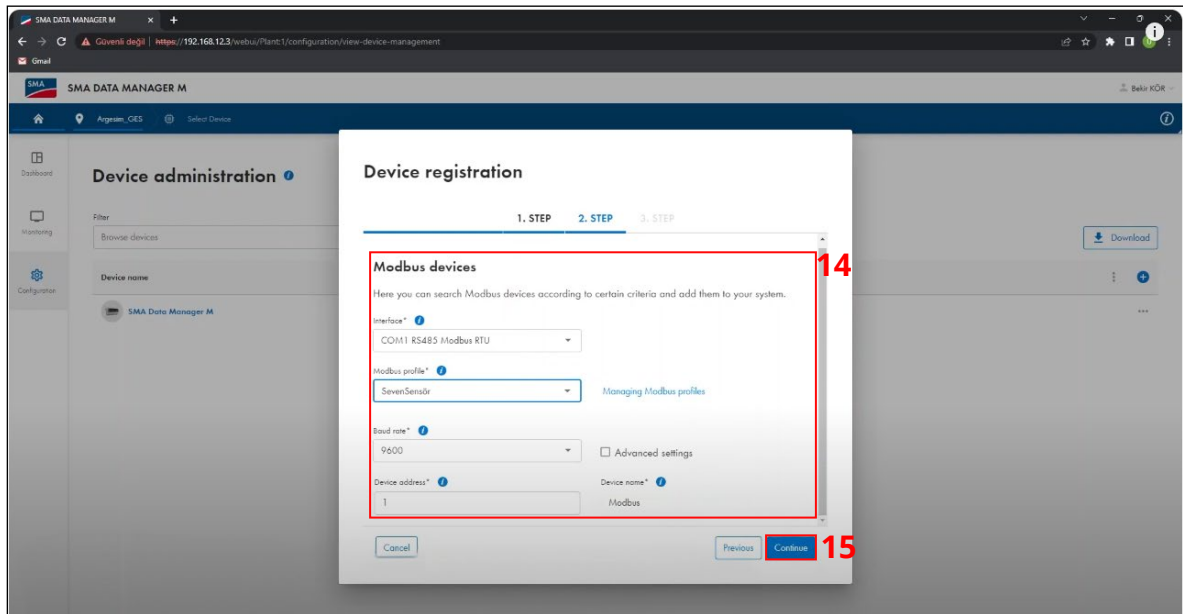


Figure 11: Configuration Settings of SEVEN Sensor Box

Step 16 : The sensor which configuration is completed will be found as a result of the scan in the **"Device registration-3.STEP"** window. After finding the sensor, ☒ tick the box and write the sensor serial number in **"Serial Number"** section.

Step 17 : Click on **"Save"** button.

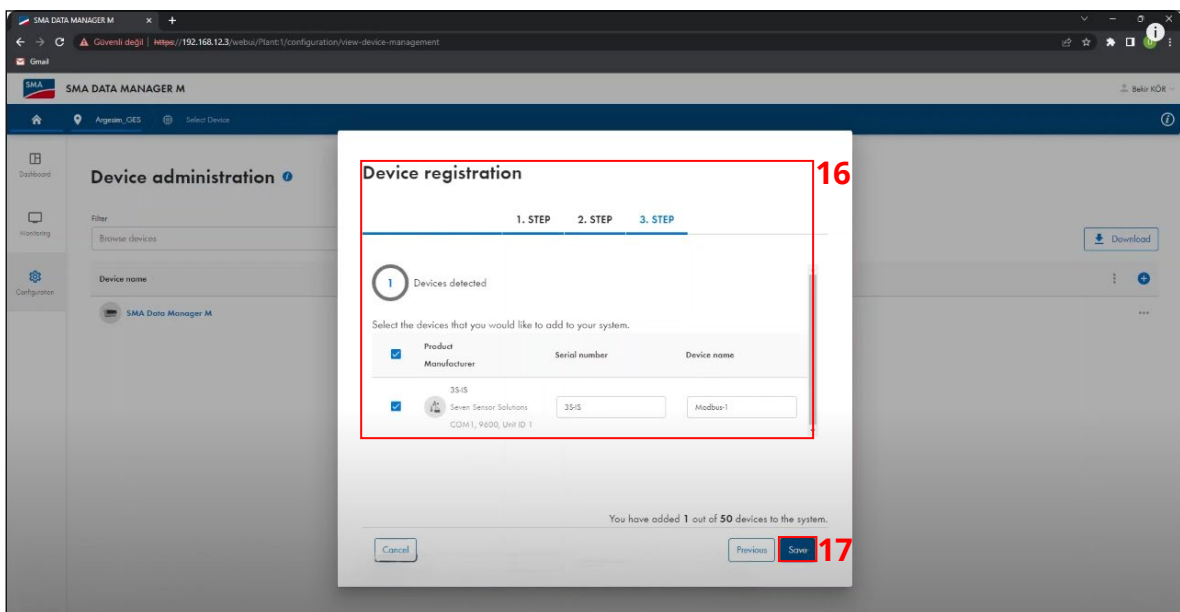


Figure 12: Configuration Settings of SEVEN Sensor Box

Step 18 : After completing configuration steps, the sensor will appear in the **"Devices administration"** page.

Step 19 ve 20 : Click on **"Select Device"** in the top menu. And then click on **"Modbus-1"** (Defined sensor).

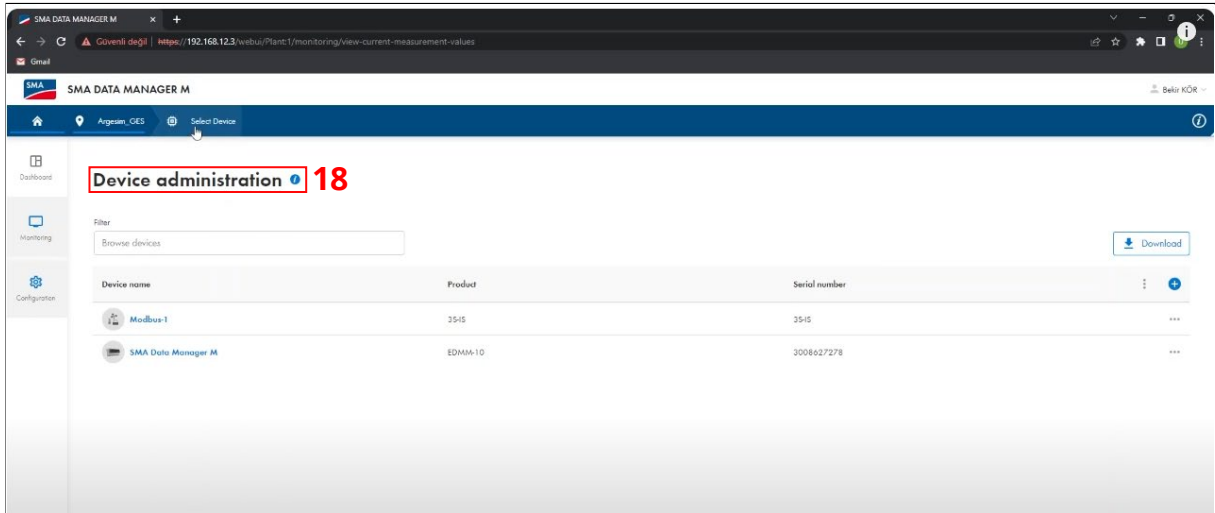


Figure 13: Configuration Settings of SEVEN Sensor Box

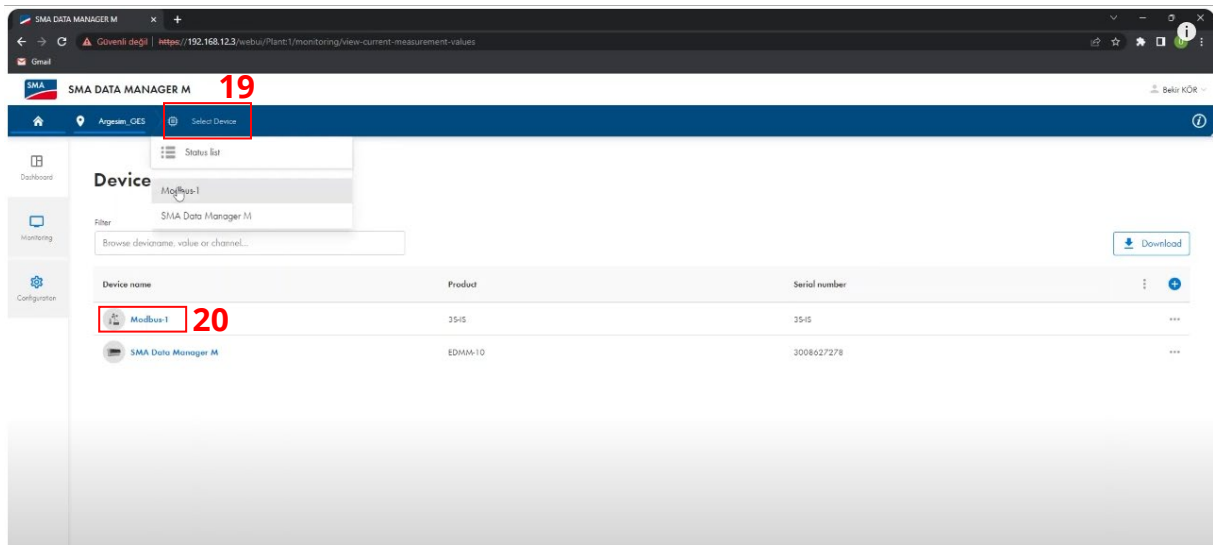


Figure 14: Configuration Settings of SEVEN Sensor Box

Step 21 : On the dashboard page that opens, click on **“Monitoring”** option in left menu.

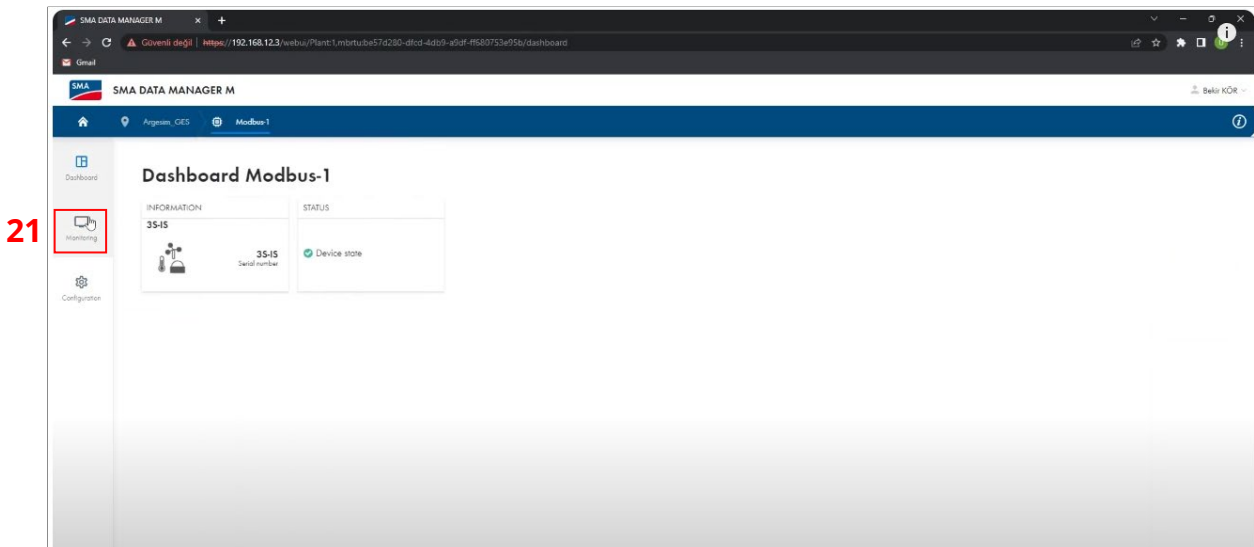


Figure 15 : Configuration Settings of SEVEN Sensor Box

Step 22 : On the opened window, choose **“Instantaneous values”**.

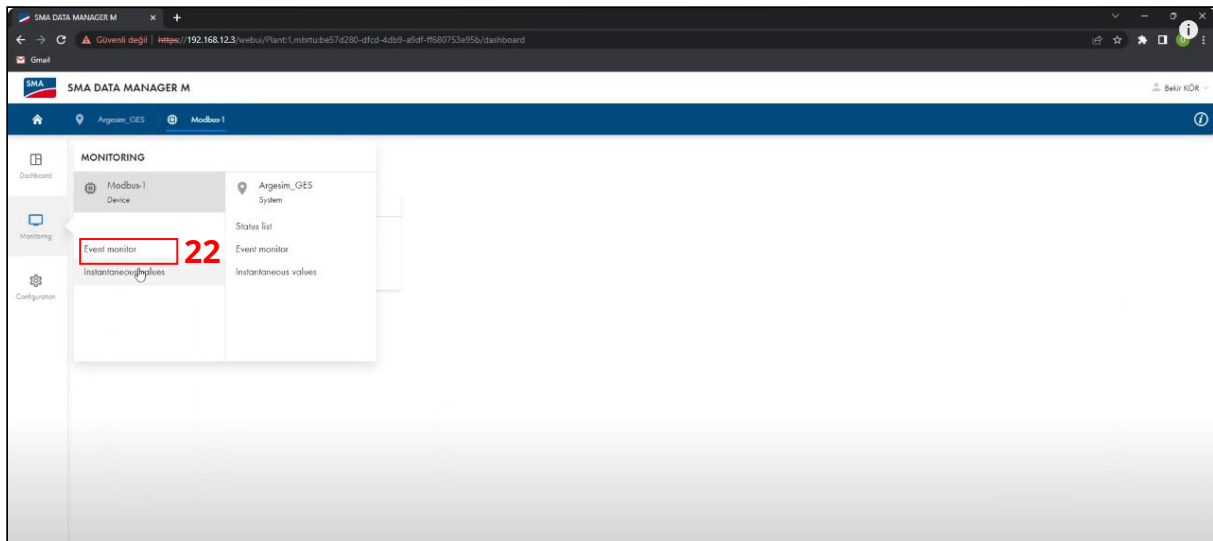
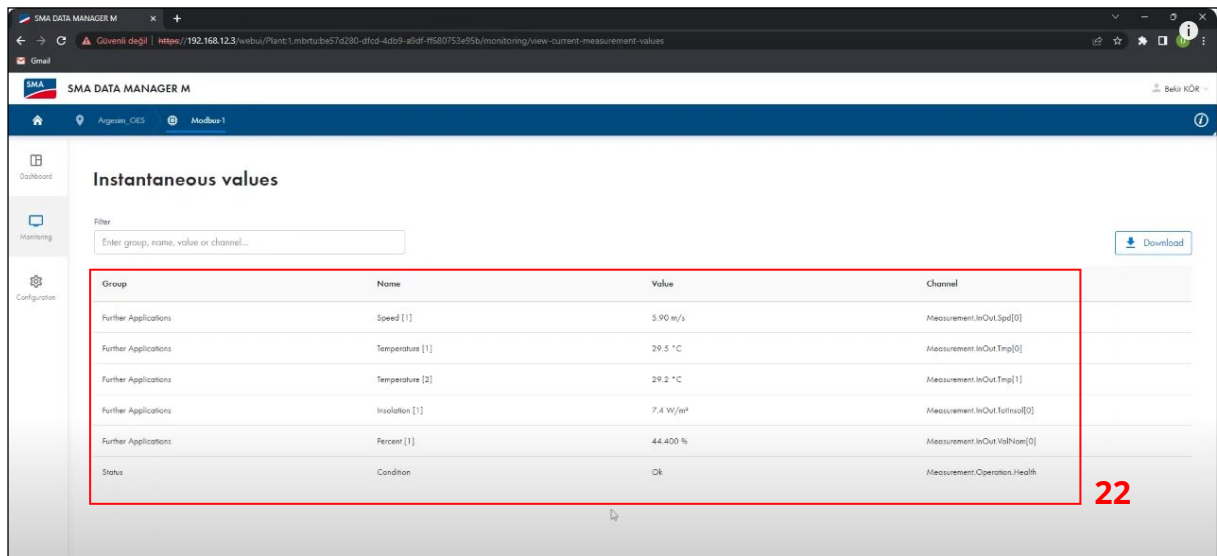


Figure 16 : Configuration Settings of SEVEN Sensor Box

Step 23 : You can see defined sensor data instantly.



Group	Name	Value	Channel
Further Applications	Speed [1]	5.90 m/s	Measurement.InOut.Spd[0]
Further Applications	Temperature [1]	29.5 °C	Measurement.InOut.Tmp[0]
Further Applications	Temperature [2]	29.2 °C	Measurement.InOut.Tmp[1]
Further Applications	Insolation [1]	7.4 W/m²	Measurement.InOut.TotInsol[0]
Further Applications	Percent [1]	44.400 %	Measurement.InOut.ValName[0]
Status	Condition	Ok	Measurement.Operation.Health

Figure 17 : Data Monitoring

After completing all the settings, the meteorological data will appear on the dashboard screen of Sunny Portal monitoring system as shown in Figure 18.

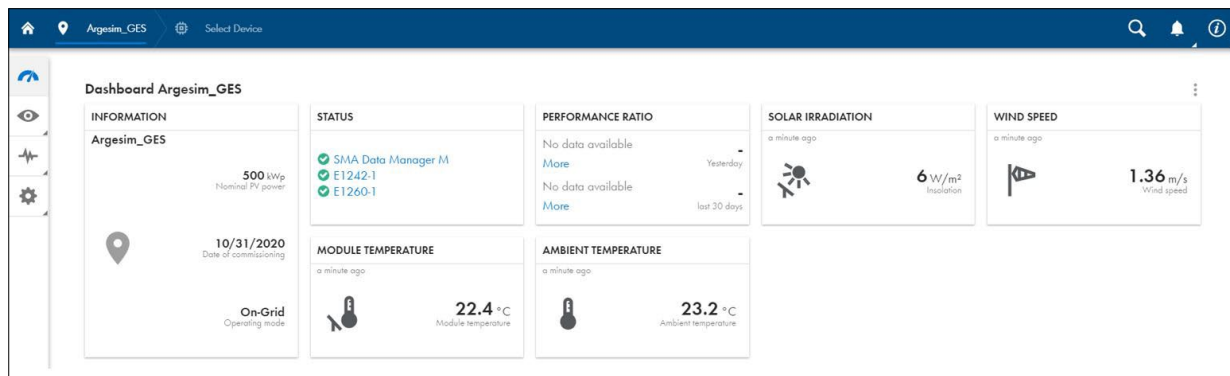


Figure 18: Sunny Portal Monitoring System

Modbus RTU Specifications

Supported Bus Protocol

BaudRate: 4800, 9600, 19200, 38400

Parity: None, Even, Odd

Stop Bit: 1, 2 (only at no parity)

Factory Default: 9600 Baud, 8N1, Address: 1

Transmission mode: MODBUS RTU

Supported function codes: 0x04: Read Input Register

Register Map:

The following Modbus data* can be read individually or in blocks.

ID-Dec.	ID-Hex	Value	Data Type
53	0x35	Wind Speed, 0...6000, 1/100 m/s	US
12	0x0C	Temperature Compensated Irradiance Value, 0...1600 in 0.1 W/m ²	US
15	0x0F	Cell Temperature, -400 ... +850 [range -40 ... +85°C] in 0.1°C	S
21	0x15	External Temperature 1, -400 ... +850 [range -40 ... +85°C] in 0.1°C	S
29	0x1D	External Temperature 2, -400 ... +850 [range -40 ... +85°C] in 0.1°C	S
33	0x21	Relative Humidity, 0...100 [%] in 1%	US
52	0x34	Wind Direction, 0...359 in 1°	US

Table 2: Modbus Map

*This Modbus Map is valid for Software 8 and newer versions.

Contact Informations:

Please feel free to contact our technical team if you face any difficulties during settings.

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