

SolarMON

Setup Instructions

V1.1 – 24.08.2021

1 How SolarMON works

SolarMON allows real-time monitoring of your SolarEdge PV system and can be used alongside with the SolarEdge monitoring portal or App.

In contrast to the SolarEdge monitoring SolarMON connects directly via your local LAN to the Inverter using the standardized and officially supported MODBUS interface and SunSpec protocol.

2 Valid use cases

- What SolarMON does
 - Show real-time data directly from the inverter without delay
 - Does not require an internet connection or any cloud server to be up.
 - Show additional infos and data not available in the SolarEdge monitoring web site / App
- What SolarMON can not do
 - Reporting on solar module level – SolarEdge simply does not provide this data over the MODBUS interface
 - Historic or statistical data – Practically not possible, since SolarMON can only retrieve data as long as the smartphone is logged into your local WiFi. And even then, SolarMON does only retrieve data when the App is in foreground. SolarMON does not store data.

This clearly gives you two distinct use cases and you can and should use SolarMon and SolarEdge Monitoring in parallel.

- SolarMON to instantly check what your system is doing and how much its producing this moment while you are at home.
- SolarEdge to see statistics and graphs of your production and module level monitoring or when you are not at home (you can also use SolarMON over the internet, please see “7 Using SolarMON over the Internet”)

3 Supported PV Systems

SolarMON supports up to three SolarEdge inverters and one battery connected directly to one of the inverters. The inverters can be Single Phase or Three Phase inverters.

The battery must be directly connected to one of the SolarEdge inverters. If you can see your battery in the SolarEdge monitoring platform it should also show up in SolarMON.

The inverters must support the SunSpec Protocol, which is the case for all SetApp configured SolarEdge inverters. Inverters with LCD must have at least Firmware version 3.x or newer installed.

See the SolarEdge documentation <https://www.solaredge.com/sites/default/files/sunspec-implementation-technical-note.pdf> chapter “SunSpec Supported Inverters” page 3 for more details on this and how to check the firmware version.

For Inverters made by vendors other than SolarEdge, please see “8 Non-SolarEdge Inverters”.

4 Prerequisites

- 1) Your inverter is connected to your local network (LAN). In case of a multiple inverter installation using RS-485 connection, the Master (Leader) inverter must be connected to the LAN.
- 2) All inverters connected to the LAN must have the “**MODBUS over TCP**” option enabled (unfortunately its disabled by default, see 5 “Enabling MODBUS over TCP” on how to enable it)
- 3) If you have an inverter with LCD, it must have at least Firmware version 3.x or newer installed
- 4) For configuring SolarMON you need the following infos for every inverter that is connected to the LAN
 - a. The IP Address (usually something like 192.168.x.x)
 - b. The Modbus port (usually 1502 or 502)
 - c. The Device ID (usually 1)

All this should be pretty easy for most installations,

➔ however regarding 2) MODBUS over TCP **you must do something** since this option is disabled by default unfortunately. See next chapter.

5 Enabling MODBUS over TCP

Enabling “MODBUS over TCP” is easily done via just one option,

➔ and **MUST BE DONE** for SolarMON to be able to connect.

You must do this for every inverter that is connected to the LAN. If you have multiple inverters connected via RS-485 in a Master-Slave setup (Leader-Follower as SolarEdge calls it now) you only need to do this for the Master (Leader) which is the only one that should have a LAN connection.

Depending if your inverter has an LCD or is configured via SetApp follow the instructions in the corresponding subchapters

5.1 For LCD configured Inverters

Go to the configuration menu and change the following setting for every inverter that is connected to the LAN

- Select „**Communication → LAN Conf → Modbus TCP**“
- The default **port is 502**. You can leave it like that

Please write down the Port, as you need to enter it in the Settings screen in SolarMON.

5.2 For SetApp configured Inverters

Unfortunately SolarEdge has put up quite a challenge for PV system owners with SetApp inverters to configure their own system, but you have the following options:

1.1.1 Let SolarEdge enable MODBUS TCP remotely!

Best and easiest is to call SolarEdge or open a support ticket and let them remotely enable MODBUS TCP for every Inverter that is connected to the LAN.

In Germany the SolarEdge support number is 089 2019 40 40

➔ If you don't know already you should also ask SolarEdge for the IP Address, the Modbus Port and the Device ID of every inverter connected to the LAN. You will need to input this in the SolarMON settings.

5.2.1 Configure using SolarEdge SetApp

If you have an SolarEdge installer account or access to your installer/solateur you/he can use the SolarEdge SetApp to change the configuration

1. Start the SolarEdge SetApp. You must be logged in with an installer account.
2. Follow the instructions in the SetApp to connect.
3. Change the settings as described in next chapter

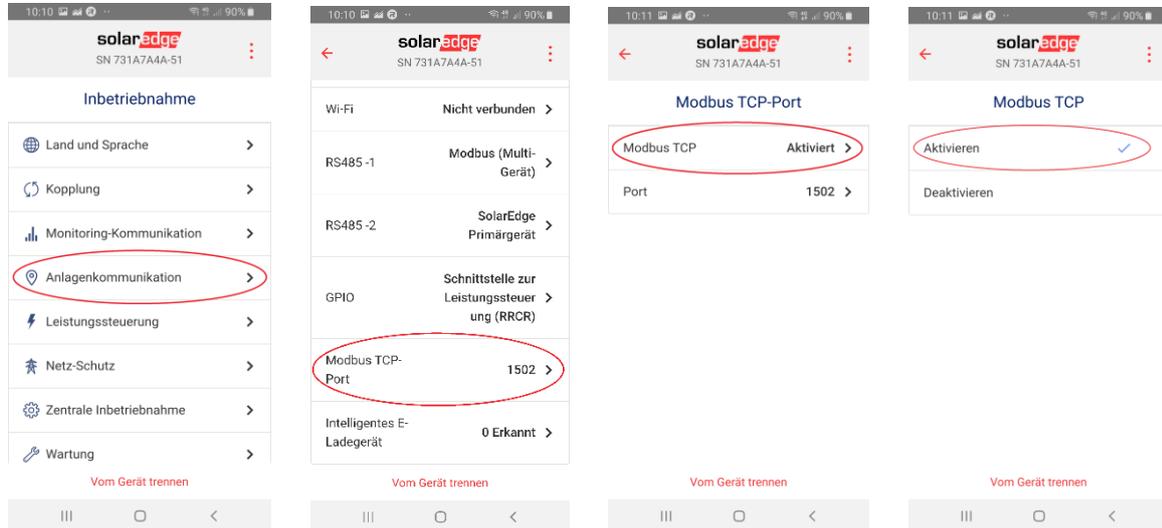
5.2.2 Enabling MODBUS TCP

Change the following setting for every inverter that is connected to the LAN

- Select „Site Communication → Modbus TCP“ and set it to „Enable“
- The default port is 1502. You can leave it like that

Please write down the Port, as you need to enter it in the Settings screen in SolarMON.

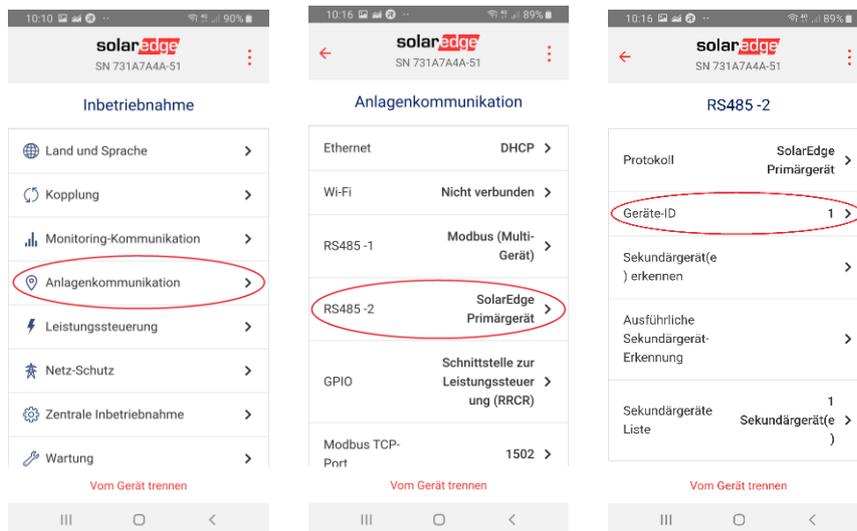
Here are some screenshots of SetApp (yes, they are in German)



5.3 Find out the Device ID

If your installer does not know the Device ID of the inverter he can check it in the SetApp.

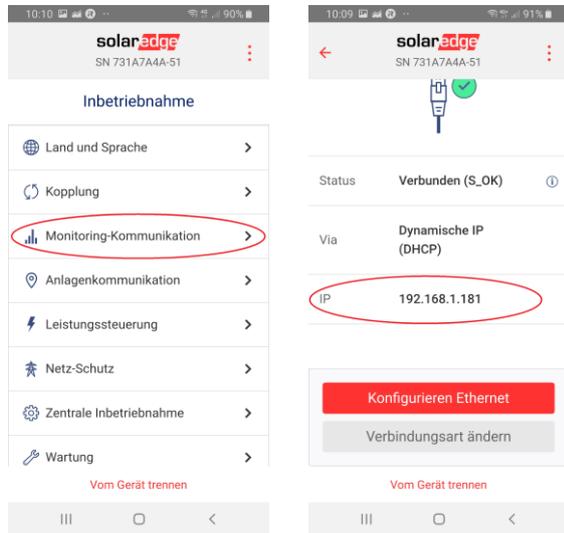
If you have only one inverter the **Device ID is usually 1**, like in the screen shots below.



If you have multiple inverters you must do this for every inverter connected via RS-485 and every inverter **must** have a different Device ID. This is also recommended by SolarEdge, see “5.5 Further reading SolarEdge documentation”

5.4 Find out the IP Address

In SetApp you can also check the IP Address of your inverter. Of course this can also be done in your Router.



5.5 Further reading SolarEdge documentation

SolarEdge has a great documentation regarding their MODBUS interface and the SunSpec Protocol.

<https://www.solaredge.com/sites/default/files/sunspec-implementation-technical-note.pdf>

Please see the chapters “MODBUS over TCP Support“ regarding enabling MODBUS on SetApp and LCD configured inverters.

6 Configuring SolarMon

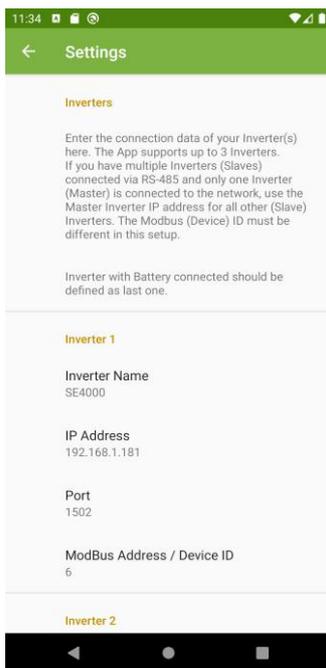
After you have enabled “MODBUS over TCP” (see “5 Enabling MODBUS over TCP”) its time to configure your inverters in SolarMON.

All you need is the following data for every that is connected to the LAN

- a. The IP Address (usually something like 192.168.x.x)
- b. The Modbus port (usually 1502 or 502)
- c. The Device ID (usually 1)

Go to **Main Menu (three dots at top right) → Settings** and enter the connection data for every inverter that is connected to the LAN.

If one of your inverters has a battery connected please enter this inverter as the last one. SolarMON will also work and show correct values if this is not the case, but the structure on the main screen makes more sense since the battery is always shown underneath the last inverter.



- **Inverter Name** – here you can put every name you like. The name will be shown on top of the inverter in the main screen and in the detail screen. Its only for you to easily recognize this inverter. The name should max 10 characters long.
- **IP Address** – the IP Address of your inverter on your LAN. If you have multiple inverters connected via RS-485 than only the Master (Leader) inverter should be connected to the LAN and every inverter should have a different Device ID. This is also what SolarEdge recommends (see “5.5 Further reading SolarEdge documentation”). In this setup enter the IP of the Master (Leader) also for the Slave (Follower) inverters.
- **Port** – the MODBUS port, see “5.1 For LCD configured Inverters” or “5.2 For SetApp configured Inverters”. If you have multiple inverters connected via RS-485 enter the Port of the Master (Leader) for all inverters.

- **Device ID** – the Device ID, i.e. the MODBUS Address of this inverter. See “5.3 Find out the Device ID”. If you have multiple inverters connected via RS-485 every inverter should have a different Device ID. This is also what SolarEdge recommends (see “5.5 Further reading SolarEdge documentation”).

If you have only one inverter than you are done and you should see the data now on the main screen.

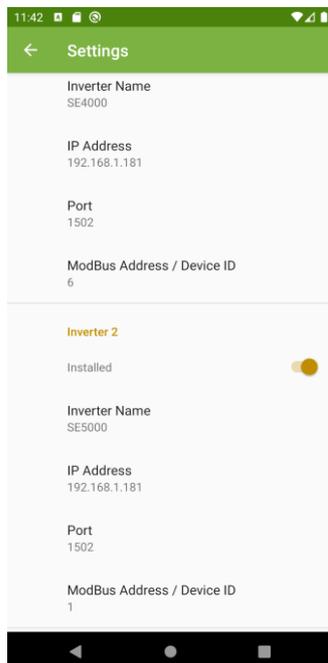
If you have multiple inverters, you can switch them on and configure them as described above.

Example:

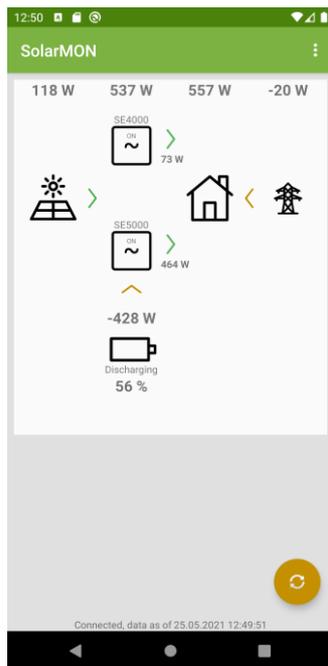
In the example setup below we have 2 one phase inverters that are connected via RS-485 in a Master-Slave (Leader-Follower) setup.

- One SE5000h which is the Master (Leader) and is connected to the LAN with IP 192.168.1.181 and default Modbus Port 1502 and default Device ID 1. The “MODBUS over TCP” option is enabled on this inverter.
- One SE4000h which is the Slave (Follower) and not connected to LAN, only connected via RS-485 to the Master (Leader). The SE4000 has Device ID 6.
- A SolarEdge Meter connected to the Master.
- A LG high-voltage Battery connected to the Master.

Please note we defined the SE5000 as the second inverter so that the battery is shown underneath it in the main screen.



With this setup the main screen will look like



7 Using SolarMON over the Internet

SolarMON connects directly to your inverter, hence your smartphone and your inverter must be on the same local network. This is totally sufficient as long as you are home.

When you are on the go and still want to use SolarMON versus SolarEdge Monitoring you can easily do this by setting up a VPN to your home network. Every newer Android phone supports this out of the box.

Setting up a VPN requires some configuration on your Router. Please consult the manual of your router. In Germany commonly used Fritz-Box makes it really easy to set up a VPN.

SolarMON uses very little data so that it's very efficient over a mobile data connection using the VPN.

8 Non-SolarEdge Inverters

SolarMON uses the SunSpec protocol specified by the SunSpec Alliance, which is an industry standard supported by many inverter vendors. Therefore it should also be possible to use SolarMON with inverters from other manufacturers that support the SunSpec protocol (e.g. SMA).

We would be very interested to get feedback or work with you on this.

9 Contact

In case of questions or problems you are having with the setup please contact us via email: apps@abare.de

