HOW TO SETUP FRONIUS SENSOR BOX/CARD

FOR FRONIUS SNAPINVERTER (FRONIUS GALVO, PRIMO, SYMO, ECO)

Quick Guide

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Fronius Solar Energy

TABLE OF CONTENTS

....

Quick Guide: How to setup Fronius Sensor Box/Card   3/14

1 SCOPE OF USE

The Fronius Sensor Box/Card collects data from connected sensors and communicates this data to the Fronius Datamanager Box/Card via the Fronius Solar.Net communication loop.

It is not possible to retrieve data directly from the Fronius Sensor Box/Card without a Fronius Datamanager Box/Card to manage communication.

2 HOW TO CONNECT A FRONIUS SENSOR BOX/CARD INTO A FRONIUS SOLAR.NET LOOP

SnapINverters come equipped with 2 RJ45 sockets labelled IN and OUT. The Ethernet cable connection should always run from the OUT socket on one inverter, to the IN socket on the next inverter or Fronius Sensor Box/Card.

RJ45 termination plugs (supplied with the Fronius Datamanager) must then be installed in the empty Solar Net IN and OUT connection sockets at the start and end of the daisy chain.

Up to 99 slave inverters and up to 10 Fronius Sensor Boxes/Cards can be connected to a master inverter.

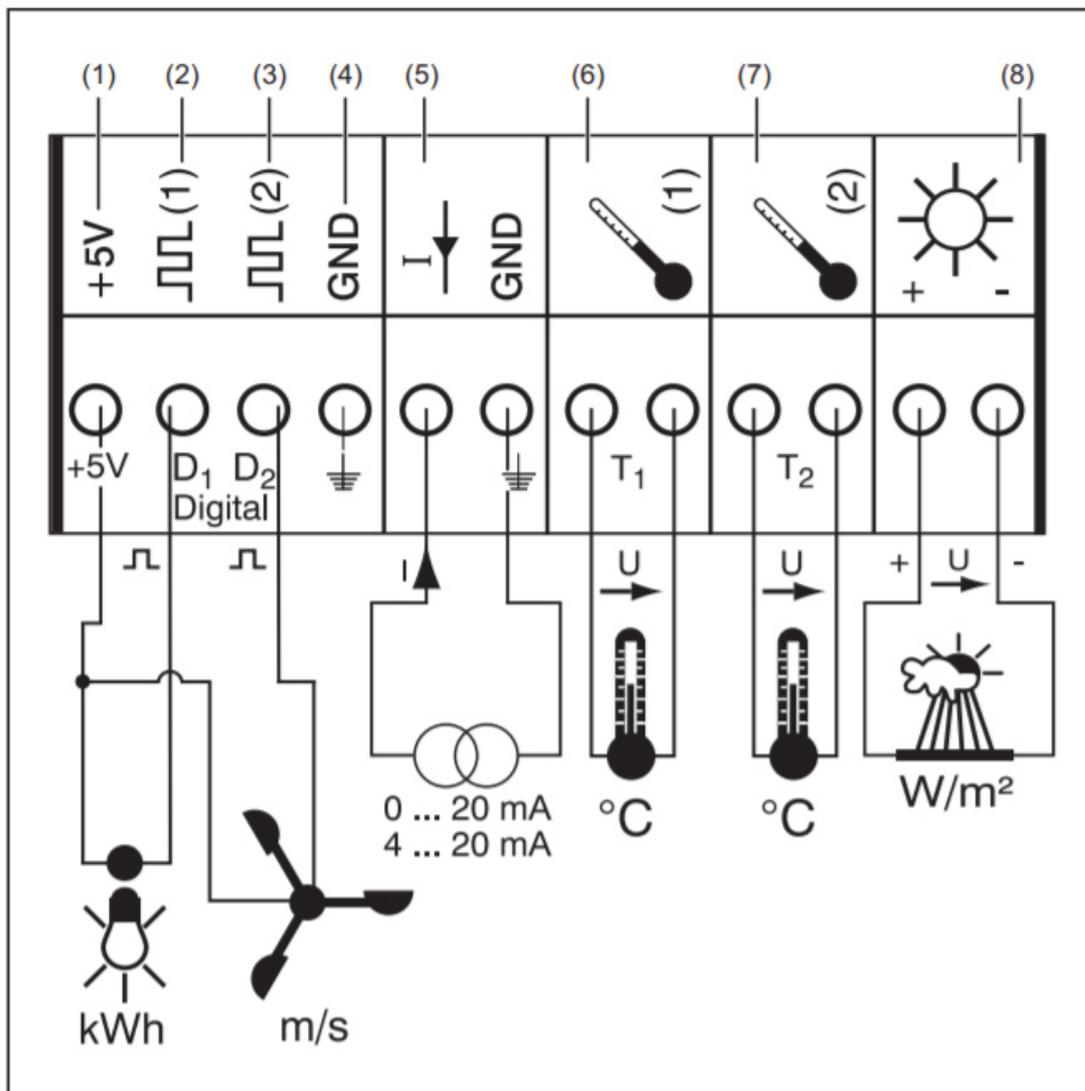To maximise communication speed, the number of devices and cable lengths should be kept to a minimum.
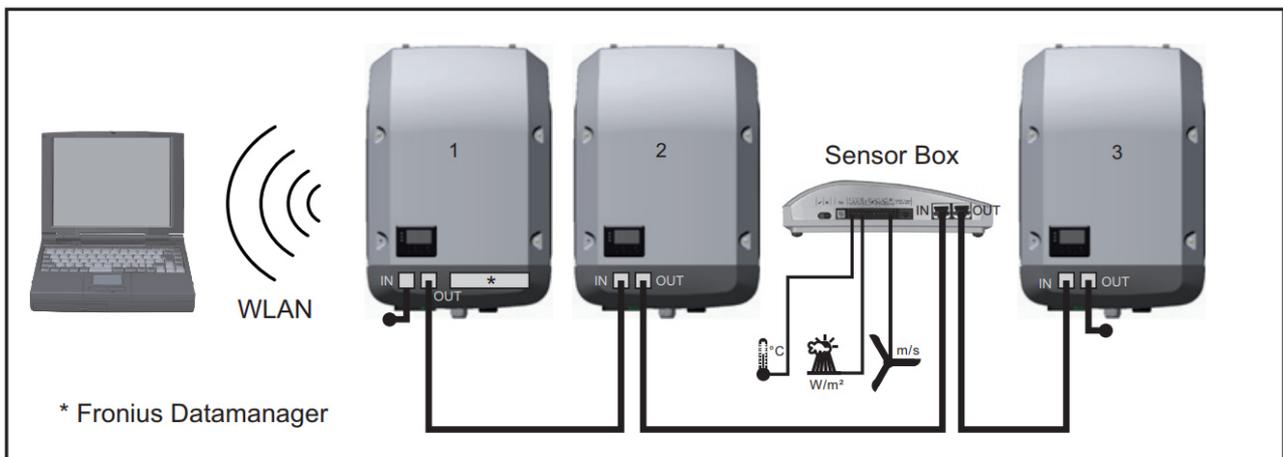
Data network with 3 inverters and a Fronius Sensor Box:
- Inverter 1 with Fronius Datamanager
- Inverters 2 and 3 without Fronius Datamanager!

= Terminating plug

3 FRONIUS SENSOR BOX/CARD TERMINAL OVERVIEW

(1) Power supply +5V for digital channel

(2) Digital input channel D1

(3) Digital input channel D2

(4) GND for digital channel

(5) Analog input for current signal

(6) Temperature measurement T1 (only for PT1000)

(7) Temperature measurement T2 (only for PT1000)

(8) Analog input for voltage signal (0-1000mV)

4 DIGITAL INPUTS
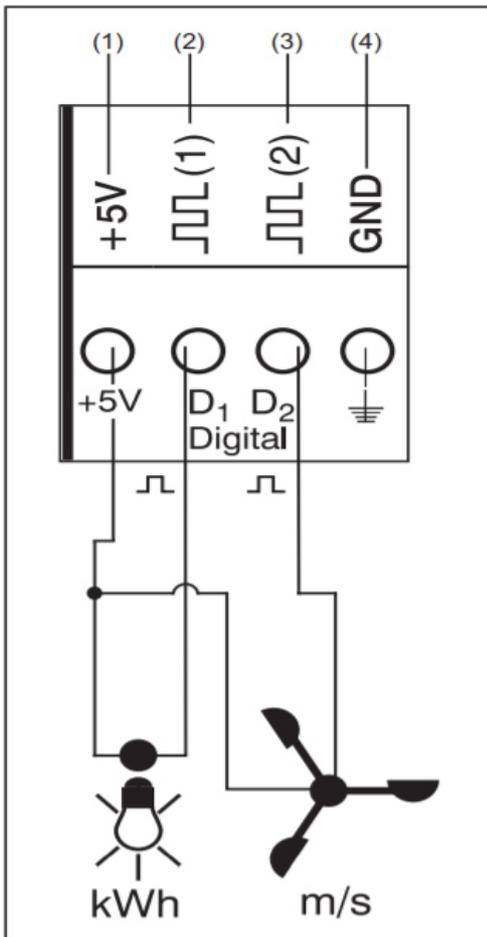
Channel assignment example:

- Channel D1 (2) for electricity meter
- Channel D25 (3) for wind speed sensor

Connect sensors without their own power supply to:

- D1 (2) or D2 (3)
- "+5 V" (4)

Connect sensors with their own power supply to:

- D1 (2) or D2 (3)
- "GND" (4)

Functional principle using electricity meter as an example:

- The Fronius Sensor Card/Box counts the pulses of the electricity meter
- The Fronius Sensor Card calculates the kWh being used form the number of pulses

Functional principle using wind speed sensor as an example:

- The Fronius Sensor Card counts the pulses of the wind speed sensor
- The Fronius Sensor Card calculates the wind speed from the number of pulses per second

For this purpose, you need to set the conversion factor using the Fronius Solar.Service software (e.g. 7 pulses/second = one km/h)

Set up and commissioning first example:

Measuring the energy used via the electricity meter at channel D1 (2)

1. Install electricity meter on the corresponding AC lines
2. Connect the pulse output of the electricity meter to channel D1 (2) and "+5 V" (1)
3. Activate channel D1 (2) via the Fronius Solar.Service software
   - Assign desired channel name (e.g., "Power Consumption")
   - Select unit (e.g., "kWh")
   - Enter conversion factor

5   ANALOG INPUT FOR CURRENT SIGNAL
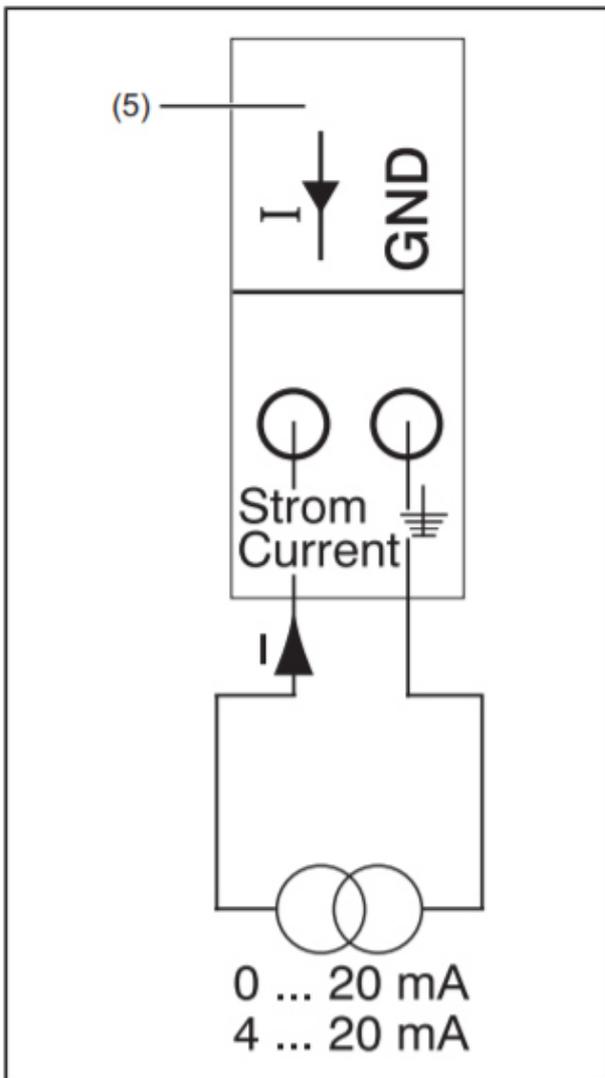
Channel assignment example:
- Connecting a humidity sensor with a current signal to the analog input (5)

Functional principle:
- A humidity sensor with a current signal is an active sensor that sends out current that rises as the humidity increases
- The Fronius Sensor Card measures the current between both connections of the analog input (5)
- The humidity level is derived directly from the measured current

Parameters:

The Fronius Sensor Card/Box has two measuring ranges at the analog input (5).

Select the measuring range using the Fronius Solar.Service software:

- Measuring range 1 … 0 to 20 mA
- Measuring range 2 … 4 to 20 mA

Set up and commissioning example:

Measuring the humidity via the humidity sensor at the analog input (5)

1. Install the humidity sensor in a suitable positon
2. Connect humidity sensor to the analog input (5)
3. Activate the analog input (5) via the Fronius Solar.Service software
    - Assign channel name (e.g., "Humidity")
    - Select unit (e.g., "%")
    - Enter conversion factor

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Quick Guide: How to setup Fronius Sensor Box/Card   7/14

6 TEMPERATURE CHANNELS (T1 / T2)
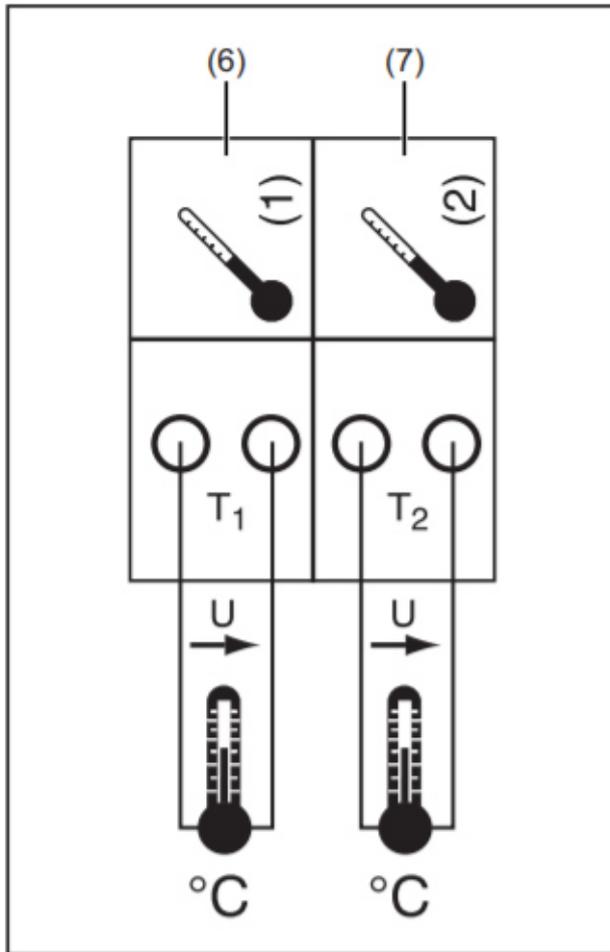
Channel assignment example:
- Channel T1 (6) for solar module temperature
- Channel T2 (7) for outside temperature
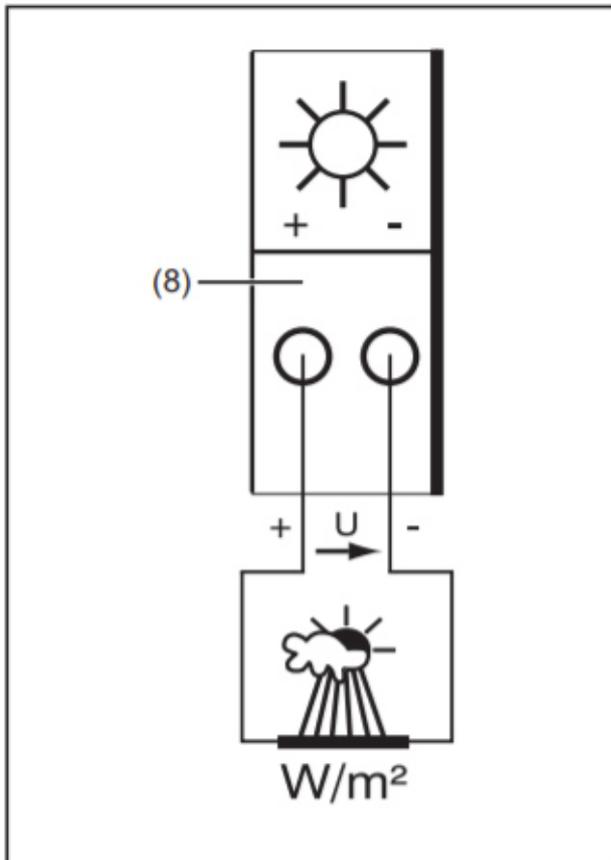
Functional principle:
- Temperature sensors consist of resistors that change their resistance value in response to changes in temperature
- The Fronius Sensor Card/Box measures the voltage droop at the resistor when a constant current is flowing through the resistor
- The Fronius Sensor Card calculates the temperature from the voltage drop

Set-up and commissioning example:

Temperature measurement at solar modules using PT1000 temperature sensor at connection T1 (15)

1. Attach PT1000 temperature sensor to solar module
2. Connect PT1000 temperature sensor to channel T1 (6)
3. Activate channel T1 (6) via the "Fronius Solar.Service" software
   - Assign desired channel name (e.g., "Module Temperature")
   - Select unit (°C/°F)

7 ANALOG INPUT FOR VOLTAGE SIGNAL

Channel assignment example:

- Irradiance sensor at solar module level

Functional principle:

- An irradiance sensor with a voltage signal is an active sensor that outputs voltage that rises as the irradiance increases.
- The Fronius Sensor Card/Box measures the voltage between both connections of the analog input (8)
- The irradiance level is derived directly from the measured voltage.

Parameters:

The Fronius Sensor Card has three measuring ranges at the analog input (8).

Select the measuring rage using the "Fronius Solar.Service" software:

- Measuring range 1 … 0 to 100 mV
- Measuring range 2 … 0 to 200 mV
- Measuring range 3 … 1000 mV

8 COMMISSIONING THE SENSOR BOX/CARD

Download the Software Fronius Solar.Service and install it:

https://www.fronius.com/~/downloads/Solar%20Energy/Software/SE_SW_Fronius_Solar.Service_MULTI.zip

Activate the WiFi Access point of the Fronius Datamanager via the SnapINverter display:

Setup Menu am Wechselrichterdisplay auswählen

Choose **WiFi Access Point** in the Setup Menu

Activate WiFi AP

Note the WiFi access point name (SS) and password for your device.

**Connecting to the WiFi Access point of the Fronius Datamanager:**

There may be some variation depend on your computer and operating system, but the steps below indicate the typical process based on Windows 10:

Locate the Network Settings on the task bar (Standard: bottom right corner of screen) or using the windows search function
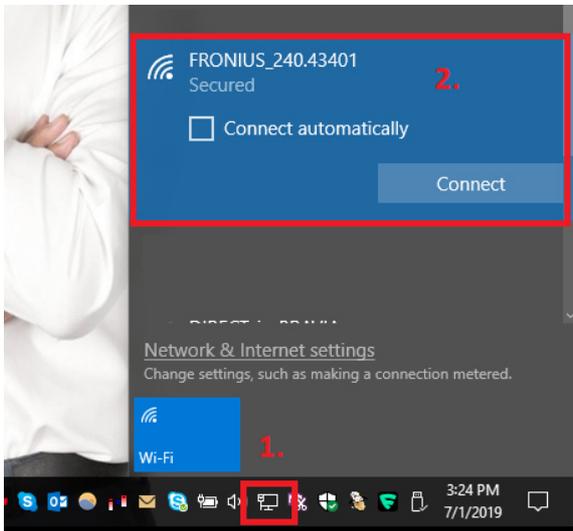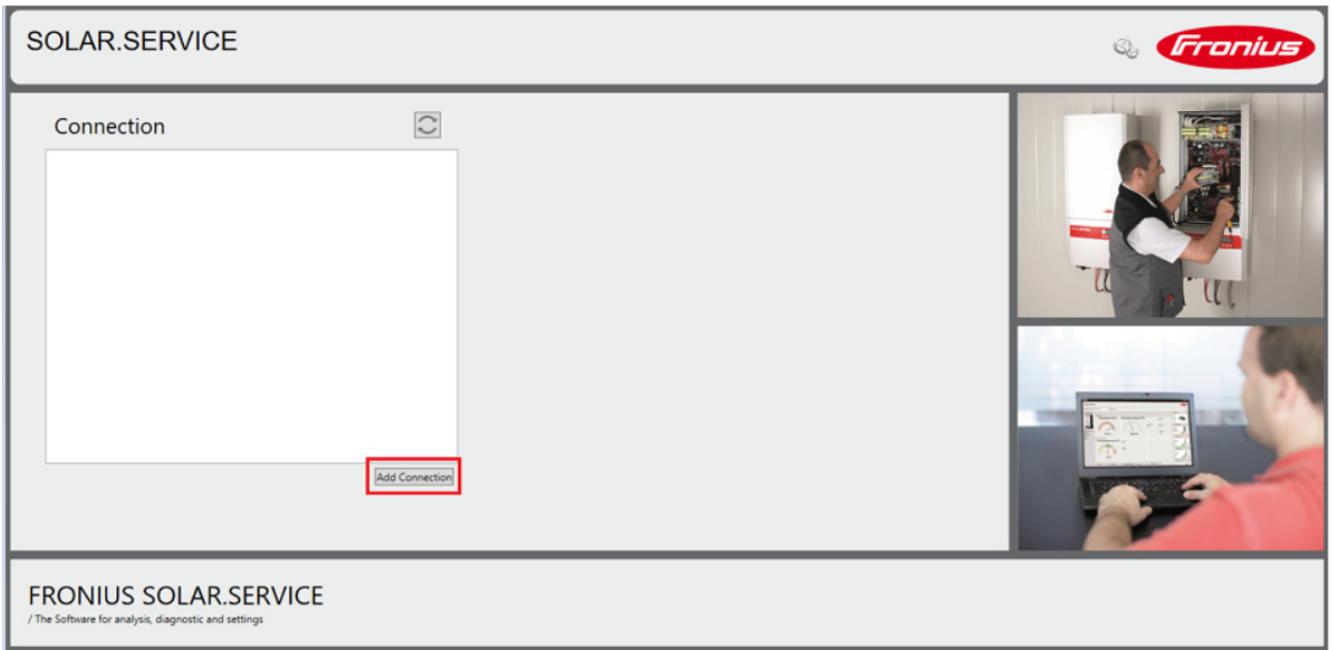

Select the Fronius Access Point from the list of available networks.

(the access point must be active, and your computer must be in range of the Access Point signal)
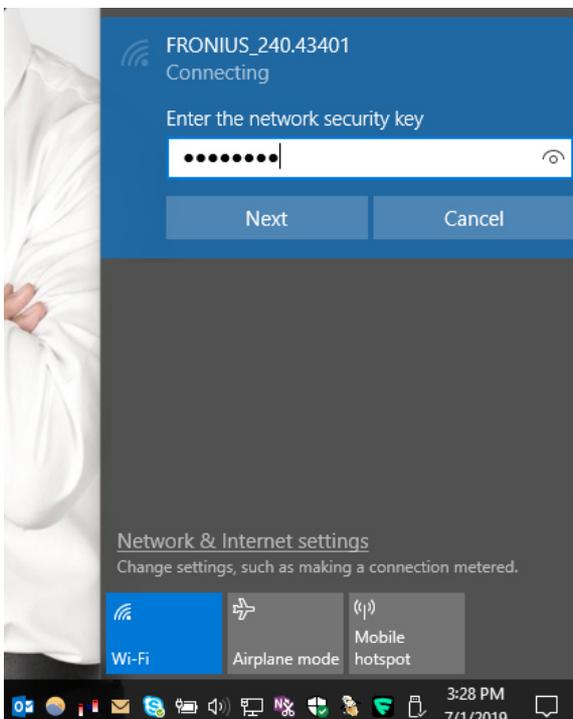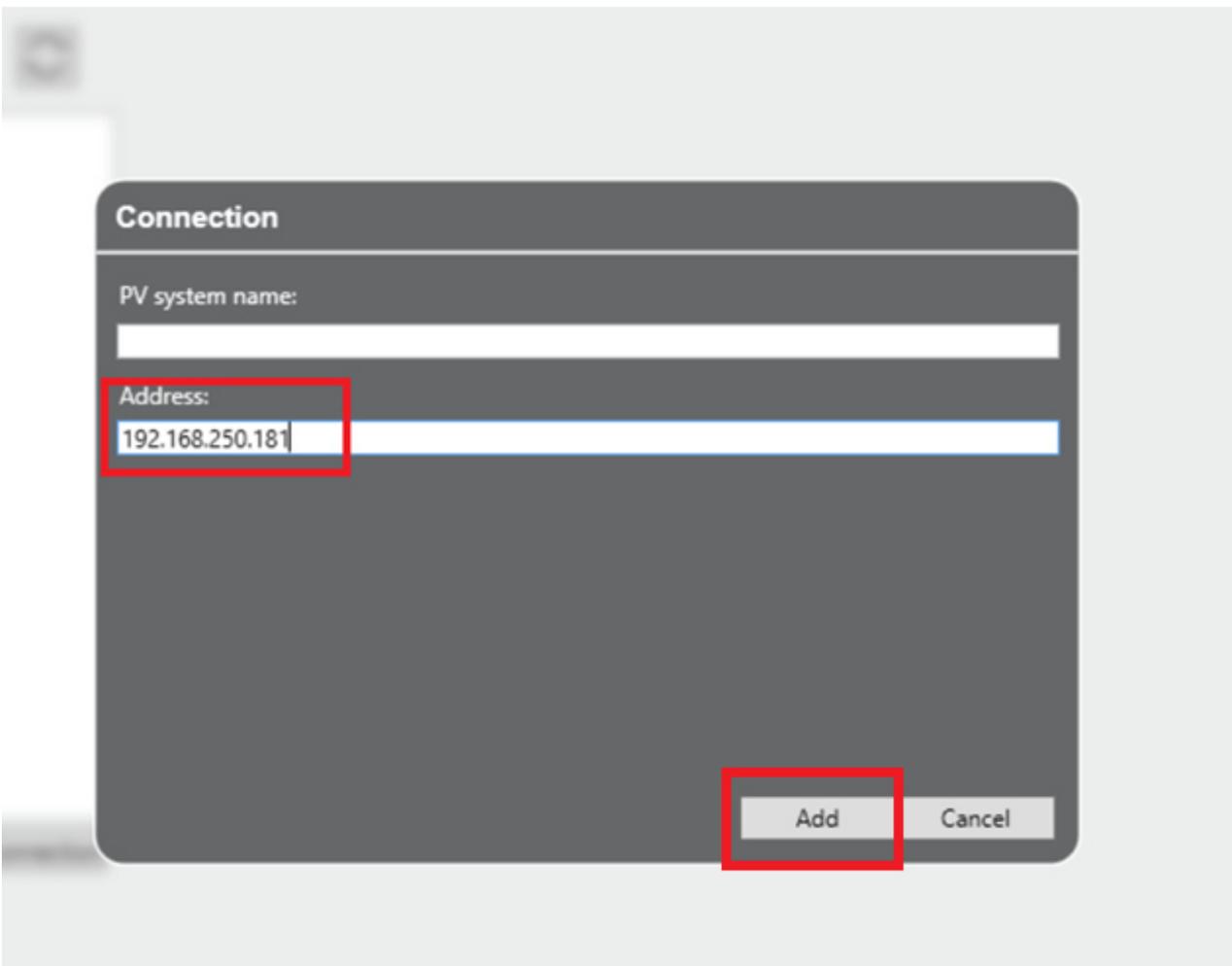

Enter the Access Point Password (12345678) to connect

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Quick Guide: How to setup Fronius Sensor Box/Card   11/14
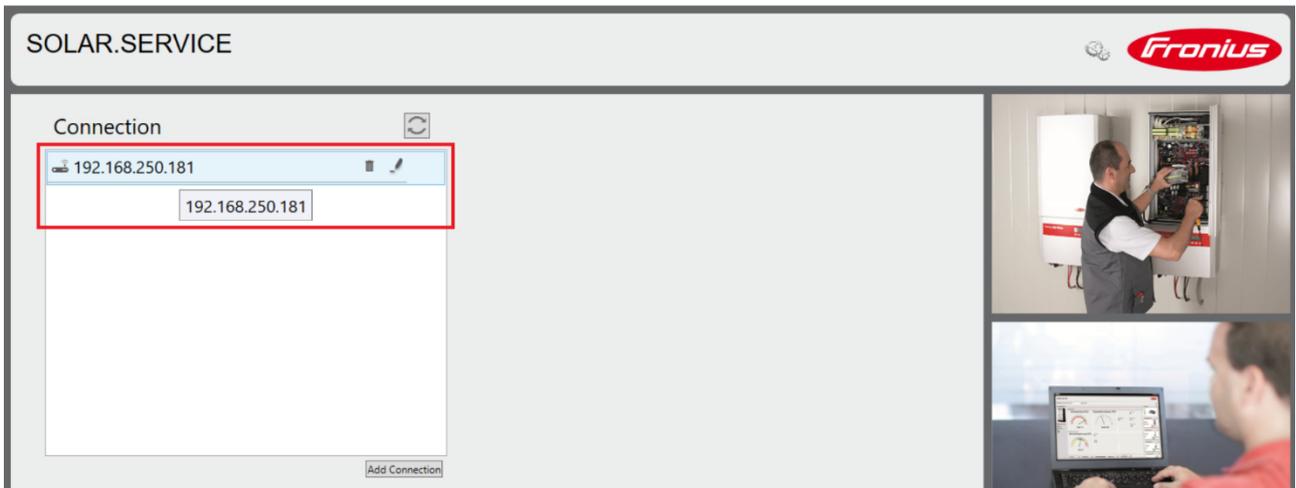
Start the program Fronius Solar.Service and click on **Add Connection**
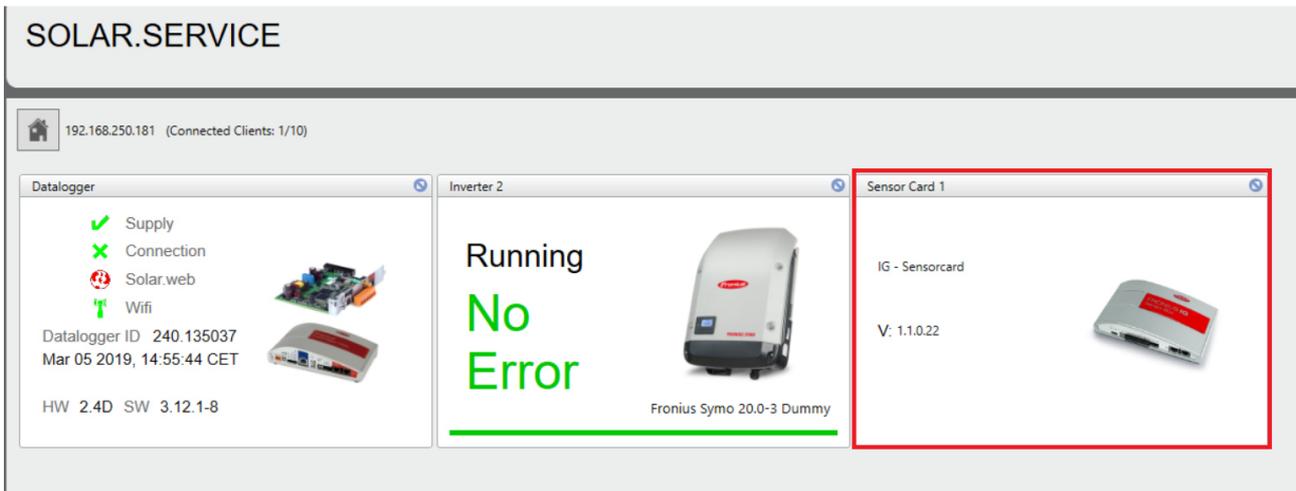

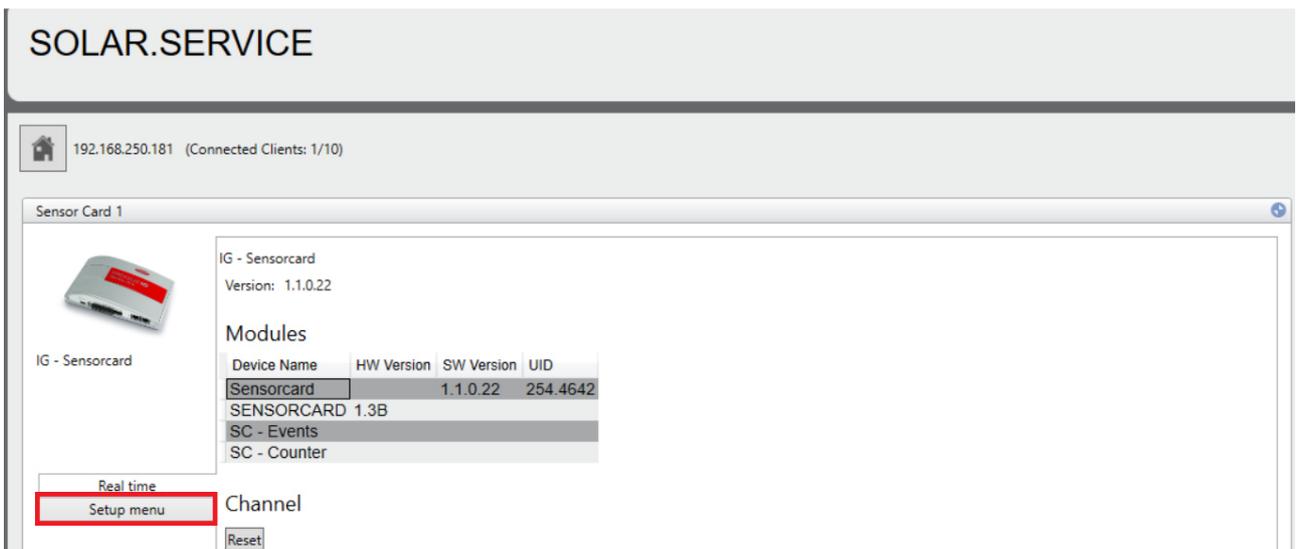Enter the IP address: **192.168.250.181** and click on **Add**

Click on the IP Address **192.168.250.181**

Click on the **Sensor Box** / **Card 1**

Click on **Setup menu**

Choose the **Channels**, depending on the Sensor enter a **calibration factor** and click on **Save**

➔ Temperature 1 = °C / °F

➔ Temperature 2 = °C / °F

➔ Insolation = W/m² = 0-100mV / 0-200mV / 0-1V

It is necessary to enter the calibration factor. **The calibration factor for the Fronius Insolation Sensor is at the label on the insolation sensor**

➔ Digital 1 = Wh / V / W/m² / A / °C / °F /kg CO_2/kWh / km/h / mph / mbar / W / l / m³ / m/s / % hPa / Ω / Hz / kg / t/ Wh/m² / kWh/m² / h /min / s / rpm /Ah / VA / var)

It is necessary to enter the calibration factor. The calibration factor for the Fronius Wind Sensor is **1.45 = 1km/h or 5.22 = 1/ms**

➔ Digital 2 = Wh / V / W/m² / A / °C / °F /kg CO_2/kWh / km/h / mph / mbar / W / l / m³ / m/s / % hPa / Ω / Hz / kg / t/ Wh/m² / kWh/m² / h /min / s / rpm /Ah / VA / var)

➔ Current [A] = Wh / V / W/m² / A / °C / °F /kg CO_2/kWh / km/h / mph / mbar / W / l / m³ / m/s / % hPa / Ω / Hz / kg / t/ Wh/m² / kWh/m² / h /min / s / rpm /Ah / VA / var)