

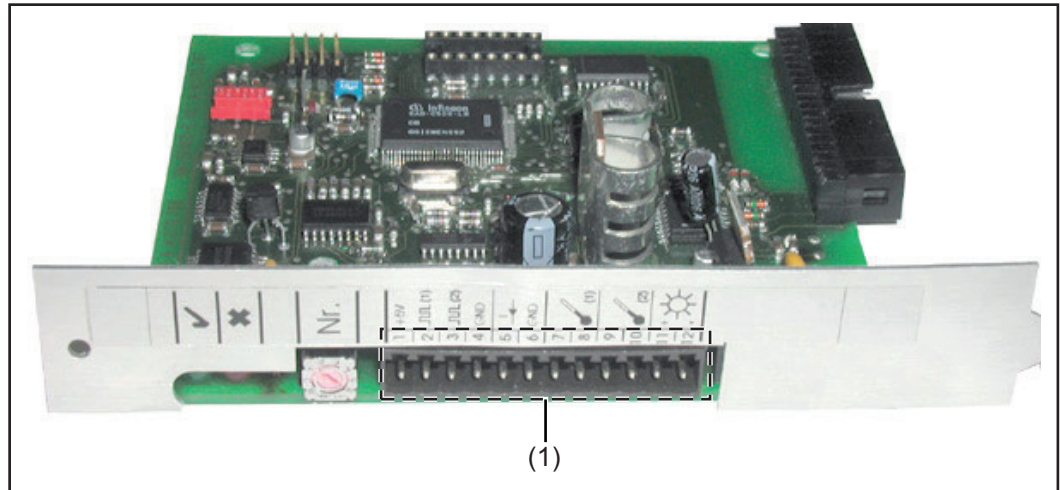
# Fronius Sensor Card / Box

## General

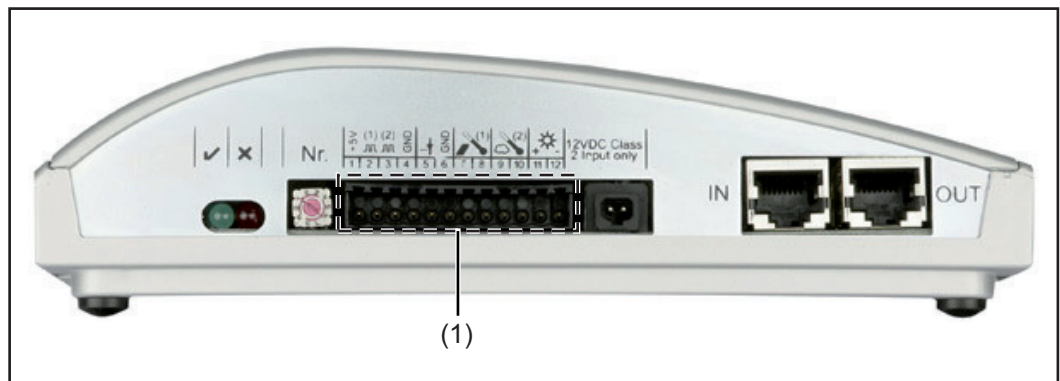
The Fronius Sensor Card is available as a card or box. The Fronius Sensor Card / Box is equipped with inputs for a total of six measurement signals:

- Two analog inputs for two Pt1000 temperature sensors
- One analog input for analyzing a voltage signal from an irradiance sensor
- Two digital inputs, e.g., for a power consumption sensor and a wind speed sensor
- One analog input for analyzing a current signal (0 to 20 mA, 4 to 20 mA)

## Connections




Fronius Sensor Card



Fronius Sensor Box

- (1) Connection area for measurement signal inputs  
Screw-type terminals are used to connect the sensor wires

 **NOTE!** The maximum cross section of the sensor wires at the screw terminals should not exceed 1.5 mm<sup>2</sup> (AWG 17).

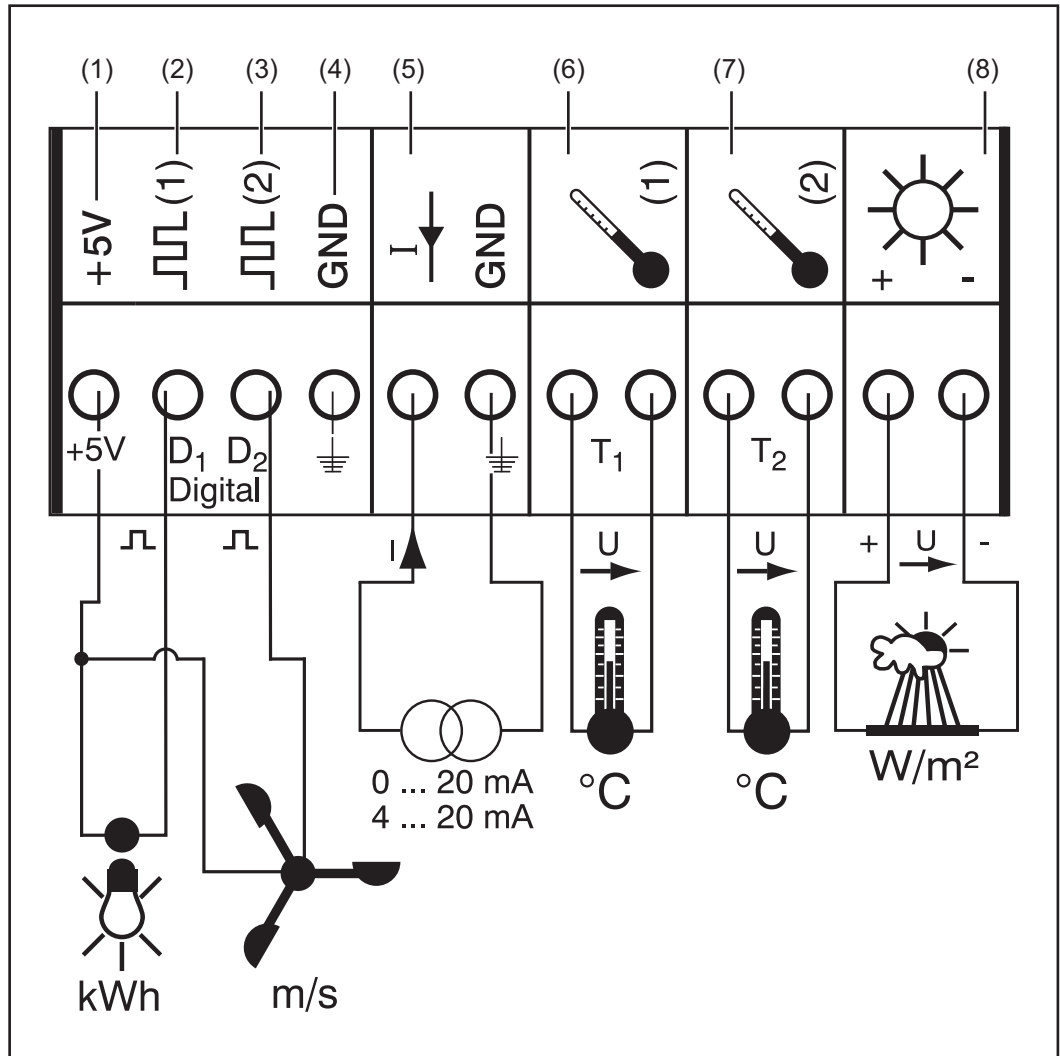
## Overview of measuring signal inputs

Fronius also offers ready-made sensors for measuring ambient temperature, module temperature, irradiance, wind speed and energy.



**NOTE!** Each measuring signal input must be activated and configured before use via the "Fronius Solar.access" software. Always connect an appropriate sensor to activated inputs. Otherwise, free inputs will also be recorded by the datalogger. The result is a misleading value for the parameter that is not based on a measurement signal.

When using a Fronius Datamanager with a software > V 3.3.1-x, the configuration no longer works via Fronius Solar.access – use Fronius Solar.service.



**Calibration Factors for Fronius Wind Sensors:**

km/h ... 1.45 Hz

m/s ... 5.22 Hz



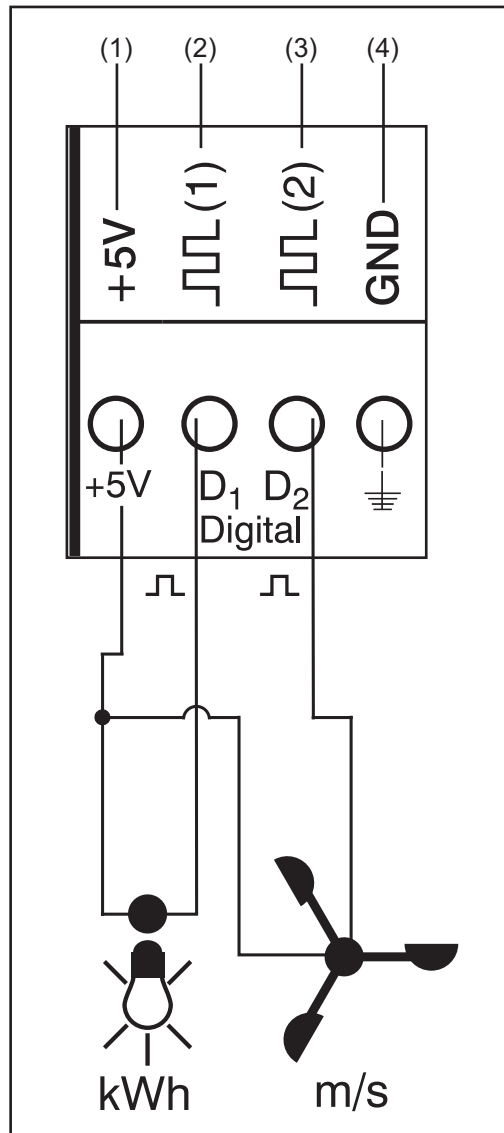
**NOTE!** For Fronius radiation sensors, the calibration factor is specified on the reverse of the sensor.

- (1) Power supply +5 V 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
- (7) Temperature measurement T2
- (8) Analog input for voltage signal

## Digital inputs

Digital input channels (2) and (3) are used to analyze voltage pulses (e.g., from an electricity meter). Sensor data is analyzed using the "Fronius Solar.access" software.

When a sensor is connected to one of the digital channels (2) or (3), the signal can also be analyzed on the inverter display.



### Channel assignment example:

- Channel D1 (2) for electricity meter
- Channel D2 (3) for wind speed sensor

Connect sensors without their own power supply to:

- D1 (2) or D2 (3)
- "+5 V" (1)

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 from the number of pulses

For this purpose, you need to set the conversion factor using the "Fronius Solar.access" software (e.g. 10240 pulses = one kWh)

When using a Fronius Datamanager with a software > V 3.3.1-x, the configuration no longer works via Fronius Solar.access – use Fronius Solar.service.

### 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.access" 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.access" software
  - Assign desired channel name (e.g., "Power Consumption")
  - Select unit (e.g., "kWh")
  - Enter conversion factor

When using a Fronius Datamanager with a software > V 3.3.1-x, the configuration no longer works via Fronius Solar.access – use Fronius Solar.service.

#### Set up and commissioning second example:

Measuring the wind speed via the wind speed sensor at channel D2 (3)

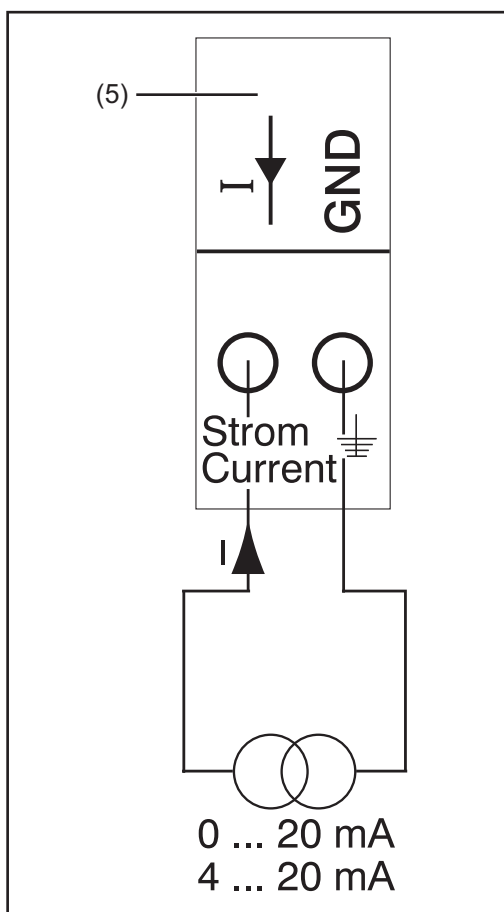
- 1 Install wind speed sensor in the proper position
- 2 Connect the wind speed sensor to channel D2 (3) and "+5 V" (1) or "GND" (4)
- 3 Activate channel D2 (3) via the "Fronius Solar.access" software
  - Assign desired channel name (e.g., "Wind Speed")
  - Select unit (e.g., "km/h")
  - Enter conversion factor



**NOTE!** The length of the sensor cable should not exceed 30 m so that measurement results are not distorted.

#### Analog input for current signal

The analog input (5) is used to connect a sensor using a standard 20 mA current interface. Analysis can only take place using the "Fronius Solar.access" software.



#### 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.access" software:

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

**IMPORTANT!** Enter the conversion factor using the "Fronius Solar.access" software so that the Fronius Sensor Card/Box can convert from mA to the desired unit. The conversion factor depends on the sensor and can be obtained from the respective sensor datasheet.

When using a Fronius Datamanager with a software > V 3.3.1-x, the configuration no longer works via Fronius Solar.access – use Fronius Solar.service.


**Set up and commissioning example:**

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

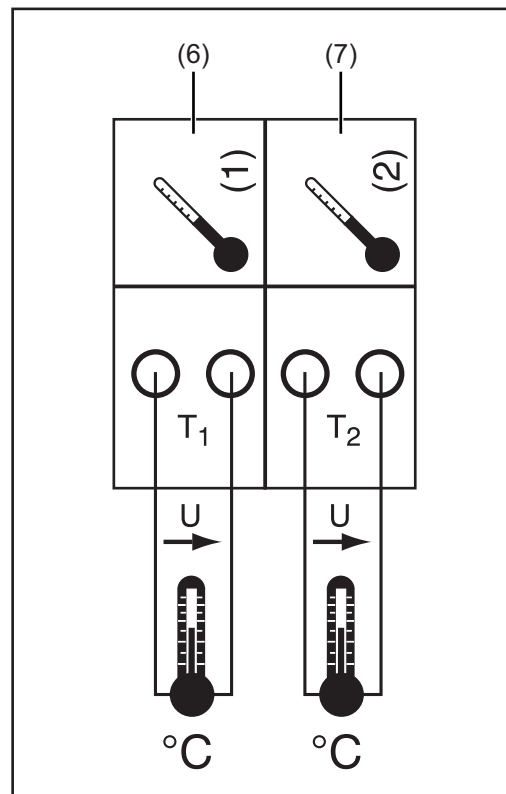
- 1 Install the humidity sensor in a suitable position
- 2 Connect humidity sensor to the analog input (5)
- 3 Activate the analog input (5) via the "Fronius Solar.access" software
  - Assign channel name (e.g., "Humidity")
  - Select unit (e.g., "%")
  - Set measuring range
  - Enter conversion factor

**Temperature channels**

Channels T1 (6) and T2 (7) are used for temperature measurements using Pt1000 temperature sensors.

 **NOTE!** Pt100 temperature sensors are not permitted.

The analysis can take place on the inverter display as well as via the "Fronius Solar.access" software. Channel T1 is used for the solar module temperature and channel T2 is used for the ambient temperature.



**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 drop at the resistor when a constant current is flowing through the resistor
- The Fronius Sensor Card calculates the temperature from this 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.access" software
  - Assign desired channel name (e.g., "Module Temperature")
  - Select unit (°C/°F)

When using a Fronius Datamanager with software > V 3.3.1-x, Fronius Solar.access no longer works – use Fronius Solar Service.

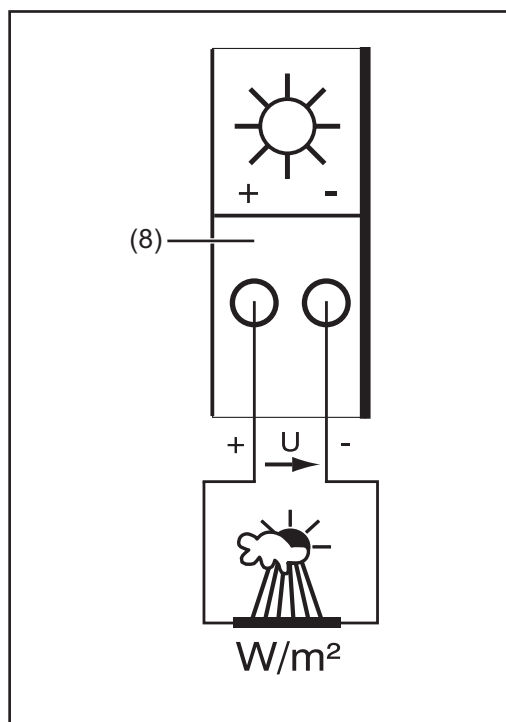


**NOTE!** The length of the sensor cable should not exceed 20 m so that measurement results are not distorted.

### Analog input for voltage signal

The analog input (8) is used to analyze a voltage signal from an irradiance sensor. The analysis can take place on the inverter display as well as via the "Fronius Solar.access" software.

When using a Fronius Datamanager with software > V 3.3.1-x, Fronius Solar.access no longer works – use Fronius Solar Service.



### 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 range using the "Solar.access" software:

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

**IMPORTANT!** Enter the conversion factor using the "Fronius Solar.access" software so that the Fronius Sensor Card can convert from mV to the desired unit. The conversion factor depends on the irradiance sensor and is specified in the sensor datasheet (e.g., 70 mV corresponds to 1000 W/m<sup>2</sup>).

When using a Fronius Datamanager with software > V 3.3.1-x, Fronius Solar.access no longer works – use Fronius Solar Service.