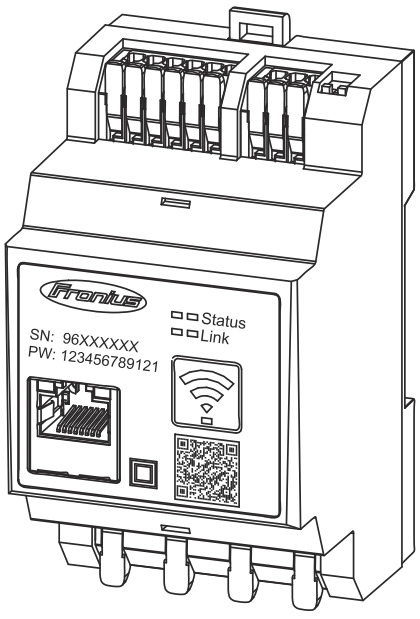
Operating Instructions

Fronius Smart Meter IP



EN-US | Operating instructions

42,0426,0464,EA 013-30102025

Table of contents

General information

Safety information

Explanation of warnings and safety instructions

The warnings and safety instructions in these instructions are intended to protect people from possible injury and the product from damage.

⚠ DANGER!

Indicates an immediately dangerous situation
Serious injury or death will result if appropriate precautions are not taken.
▶ Action step to escape the situation

⚠ WARNING!

Indicates a potentially dangerous situation
Death or serious injury may result if appropriate precautions are not taken.
▶ Action step to escape the situation

⚠ CAUTION!

Indicates a potentially dangerous situation
Minor or moderate injury may result if appropriate precautions are not taken.
▶ Action step to escape the situation

NOTE!

Indicates impaired work results and/or damage to the device and components

The warnings and safety instructions are an integral part of these instructions and must always be observed to ensure the safe and proper use of the product.

Safety instructions and important information

The device has been manufactured in line with the state of the art and according to recognized safety standards.

⚠ WARNING!

Incorrect operation or misuse
Serious to fatal injuries to the operator or third parties as well as damage to the device and other property of the operator may result.
▶ All persons involved in the commissioning, maintenance, and servicing of the device must be appropriately qualified and have knowledge of working with electrical installations.
▶ Read these operating instructions in full and follow them carefully and precisely.
▶ The operating instructions must always be kept to hand wherever the device is being used.

IMPORTANT!
In addition to the operating instructions, observe the following general and local rules:
- Accident prevention
- Fire protection
- Environmental protection

IMPORTANT!
Labels, warning notices, and safety symbols are located on the device. A description can be found in these operating instructions.

IMPORTANT!

All safety and danger notices on the device:
- Must be kept in a legible state
- Must not be damaged/marked
- Must not be removed
- Must not be covered, have anything stuck on them, or painted over

⚠ WARNING!

Tampered-with and non-functioning protection devices
Serious to fatal injuries as well as damage to the device and other property of the operator may result.
- ▶ Never bypass or disable protection devices.
- ▶ Any protection devices that are not fully functional must be repaired by an authorized specialist before the device is switched on.

⚠ WARNING!

Loose, damaged, or under-dimensioned cables
An electric shock can be fatal.
- ▶ Use undamaged, insulated, and adequately dimensioned cables.
- ▶ Fasten the cables according to the specifications in the operating instructions.
- ▶ Loose, damaged, or under-dimensioned cables must be repaired or replaced immediately by an authorized specialist.

NOTE!

Installations or modifications to the device
The device may be damaged
- ▶ Do not carry out any alterations, installations, or modifications to the device without first obtaining the manufacturer's permission.
- ▶ Damaged components must be replaced.
- ▶ Only use original spare parts.

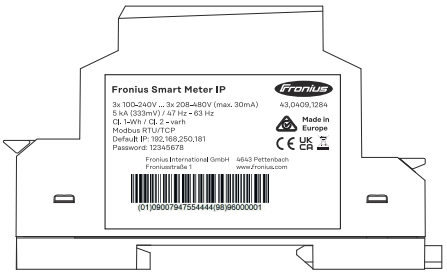
Environmental conditions

Operation or storage of the device outside the stipulated area will be deemed as not in accordance with the intended purpose.

General

Information on the device

Technical data, labels, and safety symbols are located on the Fronius Smart Meter IP. This information must be kept in a legible condition and must not be removed, covered, pasted over, or painted over. The notices and symbols warn against incorrect operation, which may result in serious injury and property damage.



Symbols on the rating plate:

CE label – confirms compliance with applicable EU directives and regulations. The product has been tested by a specific notified body.

WEEE marking – waste electrical and electronic equipment must be collected separately and recycled in an environmentally sound manner in accordance with the European Directive and national law.

UKCA marking – confirms compliance with applicable UK directives and regulations.

RCM marking – tested according to the requirements of Australia and New Zealand.

How information is presented in the document

The conventions regarding how information is presented in the document, which are set out below, have been defined in order to increase the readability and comprehensibility of the document.

Application notes

IMPORTANT! Indicates application notes and other useful information. It does not indicate a harmful or dangerous situation.

Software

Software functions and elements of a graphical user interface (e.g., buttons, menu items) are highlighted in the text with this **mark up**.

Example: Click **Save**.

Instructions for action

1 Action steps are displayed with consecutive numbering.

✓ *This symbol indicates the result of the action step or the entire instruction.*

Target group

This document provides detailed information and instructions to ensure that all users can use the device safely and efficiently.

- The information is intended for the following groups of people:
  - **Technical specialists:** People with appropriate qualifications and fundamental electronic and mechanical knowledge, who are responsible for the installation, operation, and maintenance of the device.
  - **End users:** People that use the device in daily operation and want to understand its basic functions.
- Regardless of any qualifications, only perform the activities listed in this document.
- All persons involved in the commissioning, maintenance, and servicing of the device must be appropriately qualified and have knowledge of working with electrical installations.
- The definition of professional qualifications and their applicability are subject to national law.

Copyright

Text and illustrations were accurate at the time of printing, subject to change. We are grateful for suggestions for improvement and information on any discrepancies in the operating instructions.

Data security

With regard to data security, the user is responsible for:

- backing up any changes made to the factory settings
- saving and storing personal settings.

Fronius Smart Meter IP

Description of the device

The Fronius Smart Meter IP is a bidirectional electricity meter which optimizes self-consumption and records a household's load curve. The Fronius Smart Meter IP provides an overview of a user's own power consumption in conjunction with a Fronius inverter or Fronius Datamanager 2.0 and a Fronius data interface.

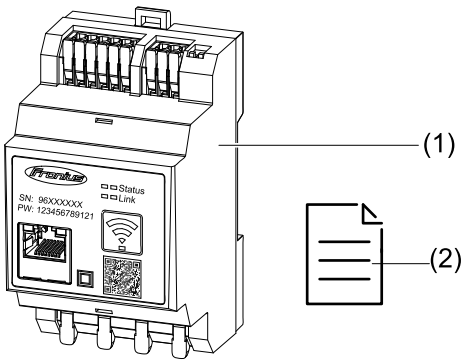
The meter measures the energy flow to the loads or to the public grid and forwards the information via the Modbus RTU/RS485- or TCP interface (LAN/WLAN) to the Fronius inverter or the Fronius Datamanager 2.0.

Intended use

The Fronius Smart Meter IP is a fixed piece of equipment for public grids of TN/TT systems and may only be used to measure loads and self-consumption. The Fronius Smart Meter IP is required for systems with a battery storage system and/or a Fronius Ohmpilot installed for communication between the individual components.

The installation is carried out on an indoor DIN rail with corresponding back-up fuses, which are adapted to the cable cross-sections of the copper conductors and to the maximum current of the meter. The Fronius Smart Meter IP must only be operated in accordance with the specifications in the enclosed documentation and in accordance with local laws, regulations, provisions, standards, and within the limits of technical possibilities. Any use of the product other than as described in the intended use shall be deemed to be not in accordance with the intended purpose.
The available documentation forms part of the product and must be read, observed, and kept in good condition. It must also be accessible at all times at the place of installation. Fronius International GmbH assumes no responsibility for compliance with or non-compliance with these laws or regulations in connection with the installation of the product.

Scope of supply

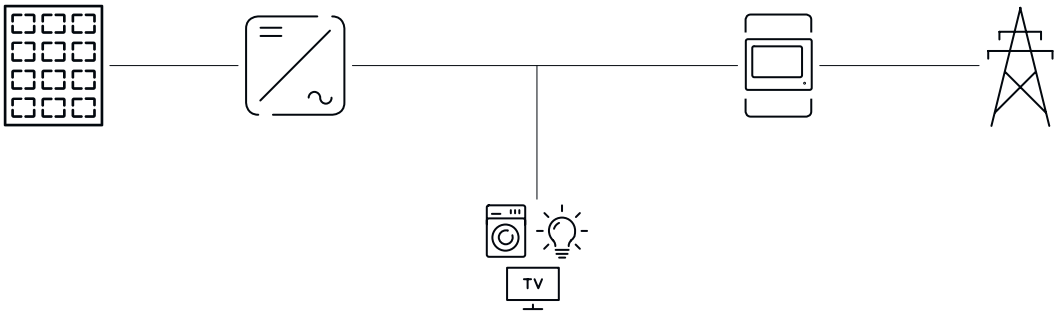


(1) Fronius Smart Meter IP
(2) Quick Start Guide

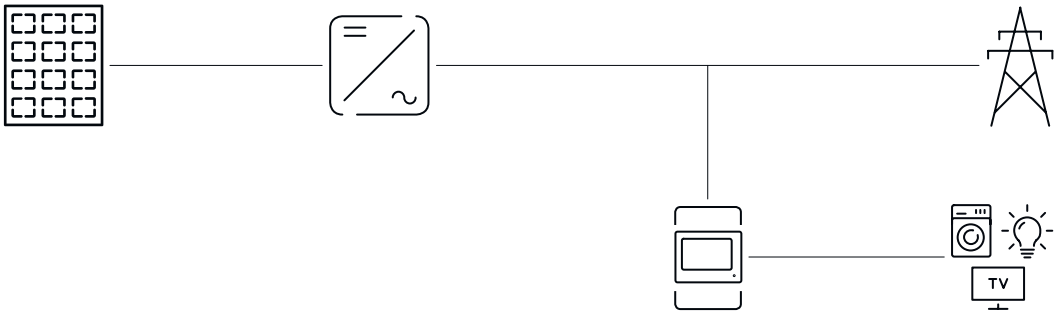
Positioning

The Smart Meter can be installed in the following positions in the system:

Positioning at the feed-in point



Positioning at the consumption point



Measuring accuracy

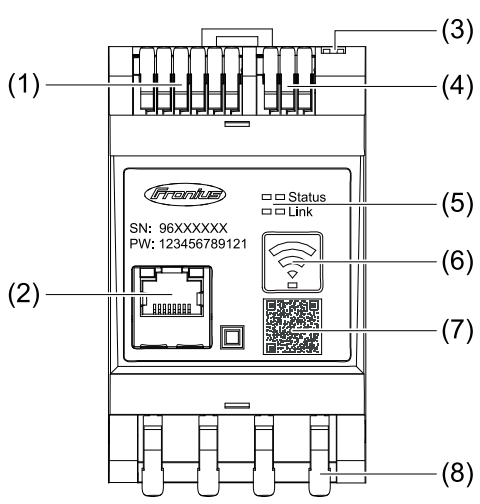
The Fronius Smart Meter IP has accuracy class 1 when measuring active energy (EN IEC 62053-21) in the voltage ranges 208-480 VLL and 100-240 VLN. For further details see Technical data on page 50.

Backup power mode

The Fronius Smart Meter IP is backup power capable with Modbus RTU/TCP data cabling. When connecting via Modbus TCP, make sure that the grid reset time is increased by starting the network. Fronius recommends a Modbus RTU connection.

Controls, connections and indicators

Product overview



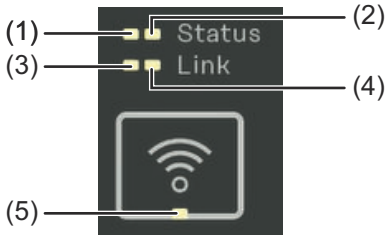
(1) Voltage transformer connection area
(2) LAN port
(3) DIP switch
- BIAS
- Terminating resistor

(4) Modbus RTU connection area
(5) LED indicators
(6) WLAN access point and reset function button
- Activate WLAN access point
- Carry out device reset

(7) QR code to start the Setup wizard
(8) AC connection area

LED status indicators

The LED status indicators show the operating status and data connection of the Fronius Smart Meter IP.



(1)	**Status 1 LED** Lights up green: Ready for operation
(2)	**Status 2 LED** Lights up: Device starting up / restarting
(3)	**Link 1 LED** Steady green: Data connection established with the network
(4)	**Link 2 LED** Lights up red: No data connection Flashing red: Open WLAN access point
(5)	**WLAN LED** Flashing green: WLAN connection is being established Lights up green: WLAN connection is active

Installation

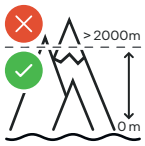
Preparation

Choice of location

Please note the following criteria when choosing a location for the Smart Meter:

Only install on a solid, non-flammable surface.

When installing the Smart Meter in a switch cabinet or similar enclosure, make sure that it is of the appropriate safety class and that the hot air that develops will be dissipated by forced-air ventilation.

	The Smart Meter is suitable for indoor installation.
	The Smart Meter must not be installed or used at altitudes above 2,000 m.

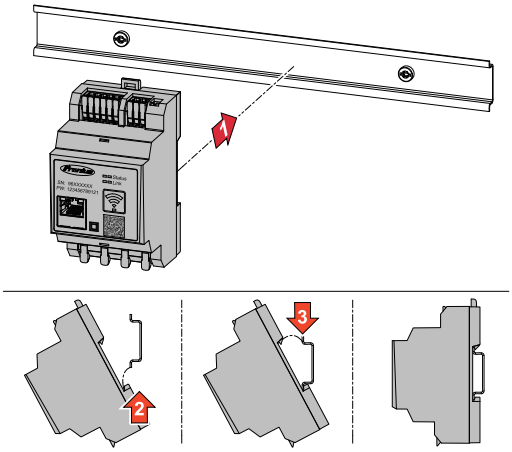
Installation

Checklist for installation

For installation information, see the following chapters:

1. Switch off the power supply before connecting to the public grid.
2. Mount the Fronius Smart Meter IP (see Installation on page 19).
3. Connect the automatic circuit breaker (see Protective circuit on page 19).
4. Connect the mains voltage inputs to the Fronius Smart Meter IP (see Cabling on page 20).
5. Note down the nominal current of the current transformer for each meter. These values are required during commissioning.
6. Connect the current transformers and Fronius Smart Meter IP (see Suitable current transformers on page 21).
7. Mount the current transformers on the conductors. Make sure that the current transformers are pointing in the correct direction. An arrow either points to the connected load or the outlet to the public grid (see Connecting the current transformers on page 22 or the current transformer user information).
8. Make sure that the current transformer phases match the mains voltage phases (see Connecting the current transformers on page 22).
9. Establish the data connection of the Fronius Smart Meter IP. The data connection can be established in three different ways:
   - Modbus RTU (recommended for backup power operation), see 23 on page 23.
   - LAN, see Connecting the LAN on page 23.
   - WLAN, see WLAN configuration on page 23.
10. With Modbus RTU connection: Set terminating resistor (see Setting the Modbus RTU terminating resistor on page 25).
11. With Modbus RTU connection: Set the BIAS switch (see Setting the Modbus RTU BIAS on page 26).
12. Check the single conductors/plug connections on the Smart Meter IP are secure.
13. Switch on the power supply to the Fronius Smart Meter IP.
14. Check the firmware version of the Fronius system monitoring (see "Technical data"). To ensure compatibility between the inverter and the Fronius Smart Meter IP, the software must always be kept up to date. The update can be started via the user interface of the inverter or using Fronius Solar.web (see "Advanced settings").
15. Configure the Fronius Smart Meter IP and put it into operation (see Commissioning on page 27).

Installation



The Fronius Smart Meter IP can be mounted on a 35 mm DIN rail. The housing comprises 3 modules according to DIN 43880.

Protective circuit

The Fronius Smart Meter IP is a hard-wired device and requires a disconnecting device (automatic circuit breaker).

The Fronius Smart Meter IP consumes 30 mA, the nominal capacity of the disconnecting devices and the overcurrent protection is determined by the conductor cross-sections, the mains voltage, and the required breaking capacity.

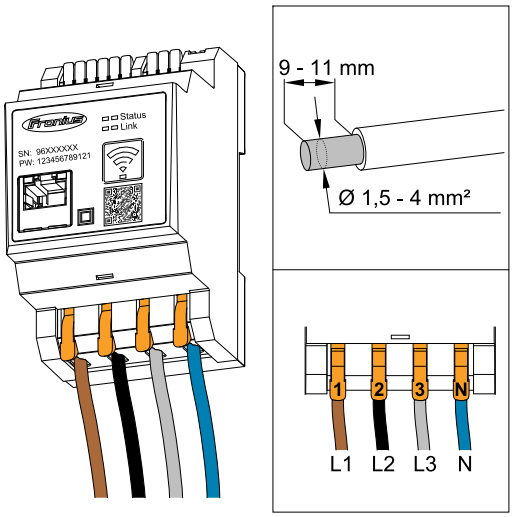
- The disconnecting devices must be mounted in the same enclosure (e.g., switch cabinet) as the Fronius Smart Meter IP.
- The disconnecting devices must satisfy the requirements of IEC 60947-1 and IEC 60947-3, as well as all national and local regulations for electrical systems.
- To monitor multiple mains voltages, use connected automatic circuit breakers.

NOTE!

Disconnecting device for the mains terminals

▶ The automatic circuit breaker must protect the mains terminals marked L1, L2, and L3. In rare cases, the neutral conductor has a disconnecting device, which must interrupt both neutral and non-earthed cables concurrently.

Cabling



⚠ WARNING!

Danger from live mains voltage inputs

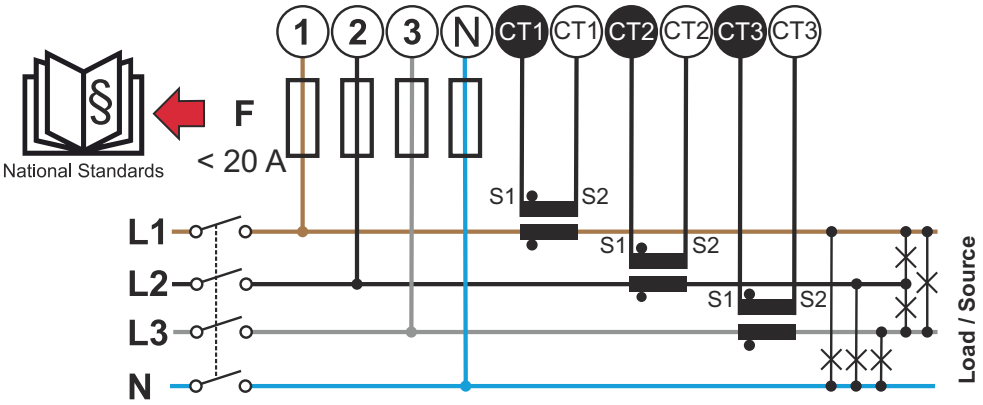
An electric shock can be fatal.

▶ Switch off the power supply before connecting the mains voltage inputs.

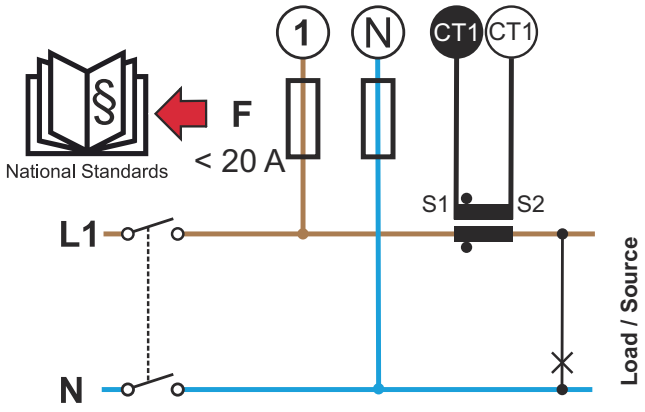
Permissible conductor cross-section of AC terminals:

- Wire: 1.5-4 mm²

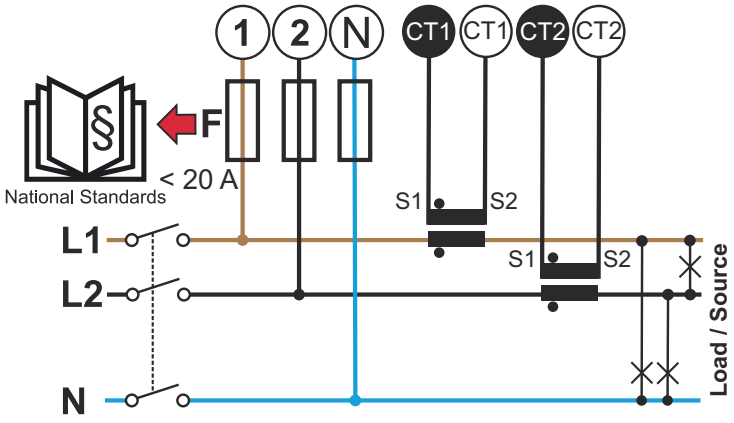
Each live conductor must be connected to the AC terminals as shown in the figures below.



3 phases, 4 conductors (CT connection)



1 phase, 2 conductors (CT connection)



2 phases, 3 conductors (CT connection)

Suitable current transformers

It is recommended to use Fronius CT current transformers (item numbers 41,0010,0104 / 41,0010,0105 / 41,0010,0232). In order to ensure problem-free operation of the Fronius Smart Meter IP and accurate measurement results, all connected current transformers must meet these requirements:

- The current transformer must generate 333 mV at nominal current. The nominal current of the current transformers is specified in the current transformer datasheet.
- Do not use current transformers with 1 ampere or 5 ampere output current.
- Observe the maximum input current according to the current transformer datasheets.
- Only use Rogowski coils with integrators. Failure to use integrators will result in erroneous measurement results.
- Folding and rigid current transformers can be installed. Rigid current transformers often have better performance and accuracy values. Folding current transformers have a split core and can be opened for attachment to the conductor and installed in a system without voltage interruption.

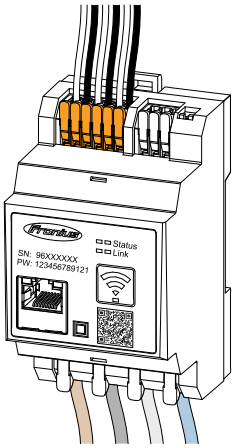
⚠ CAUTION!

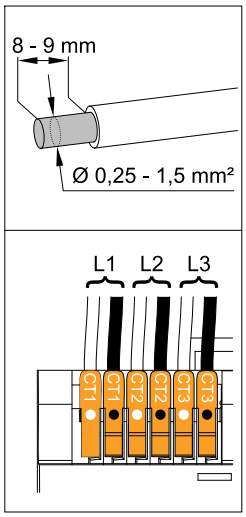
Danger of electric shock due to unintentional opening of folding current transformers

This can result in severe injury and damage to property.

- ▶ Switch off the power when working on the current transformers.
- ▶ Attach plastic cable ties to the current transformer to prevent unintentional opening.

Connecting the current transformers





1 Make sure that the current transformers match the live phases. Make sure that current transformer L1 measures the current on the same phase that is monitored by voltage input L1. The same applies for phases L2 and L3. This is the only way to display correct measured values.

2 Make sure that the current transformers are pointing in the correct direction.

NOTE!

Observe direction information when installing the current transformers
Negative power values occur when the current transformers are connected incorrectly.

- ▶ Observe the data sheet and the marking on the current transformer (arrow indicates the direction to the load or to the public grid)
- ▶ Check the correct position of the black and white cable.

3 Note down the nominal current of the current transformer for each meter. These values will be required for commissioning.

4 Attach the current transformers to the conductor to be measured and connect the current transformer cables to the Fronius Smart Meter IP.

⚠ WARNING!

Danger from mains voltage
An electric shock can be fatal.

- ▶ Switch off the power supply before disconnecting live conductors.

5 Connect the current transformers to the terminals CT1 (white / black), CT2, and CT3. Excessively long cables can be shortened accordingly. Observe the sequence in which the phases are connected.

6 Route the mains conductors through the current transformers (see Cabling).

NOTE!

Cable length of the current transformers
Cables that are too long can have a negative effect on the measuring accuracy.

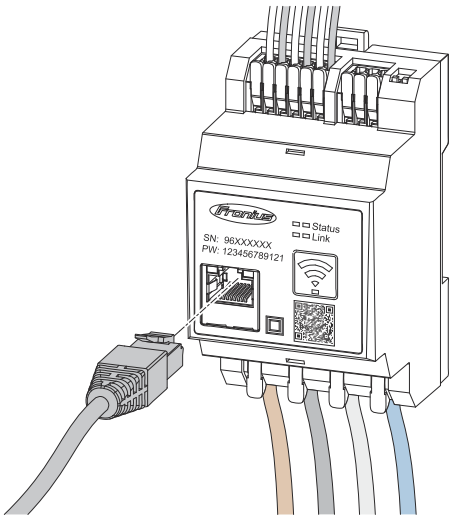
- ▶ If a cable extension is necessary, use a shielded 0.34 to 1.5 mm2 (AWG 22-16) CAT 5 STP (Shielded Twisted Pair) cable rated for 300 V or 600 V (higher than the operating voltage).

NOTE!

Unusual measured values on unused phases

- ▶ If unusual measured values occur on unused phases, bypass the unused current transformer inputs.
- ▶ To do so, for each unused current transformer, connect the terminal marked with a white dot to the terminal marked with a black dot using a short cable.

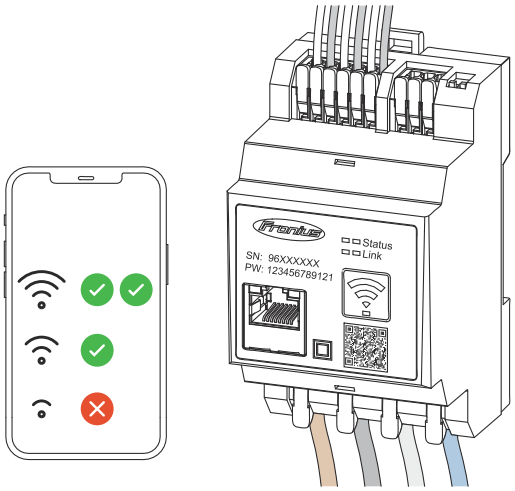
Connecting the LAN



Observe the following instructions:

- Use a shielded data cable of type CAT 5 STP (Shielded Twisted Pair) or higher.
- If the data lines are close to the mains cabling, use cables that are designed for 300 to 600 V (never less than the operating voltage).
- Use double-insulated or sheathed data cables when they are close to bare conductors.
- The use of a static IP address is recommended.

WLAN configuration



IMPORTANT!
Ensure sufficient WLAN signal strength at the installation site. If the signal strength is low, a WLAN booster must be installed, for example.

The use of a static IP address is recommended.

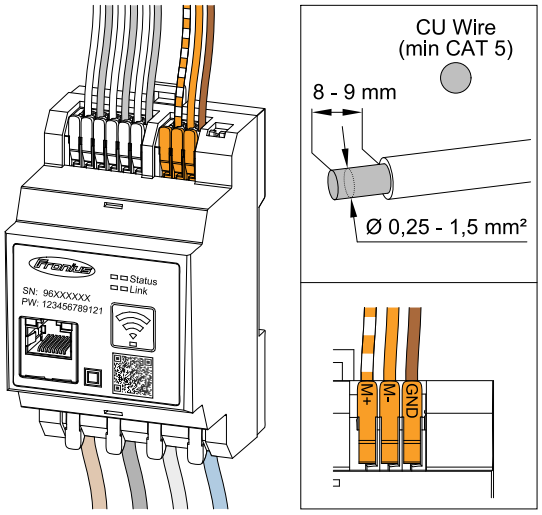
Connecting the Modbus RTU

Connect the data communication connections of the Fronius Smart Meter IP to the Modbus interface of the Fronius inverter using a CAT 5 STP (Shielded Twisted Pair) or higher data cable.

The Fronius Smart Meter IP can also be connected to the network (LAN / WLAN). This allows software updates to be carried out.

Standard Modbus address & TCP port:

- Address: 1
- TCP port: 502



SnapINverter		
	Smart Meter	Modbus
	M+	D+
	M-	D-
	GND	-

GEN24		
	Smart Meter	Modbus
	M+	M0+
	M-	M0-
	GND	GND

To avoid interference, the terminating resistor must be used (see chapter Setting the Modbus RTU terminating resistor on page 25).

If a battery is installed in the system, the BIAS switch must be set (see chapter Setting the Modbus RTU BIAS on page 26).

Further settings are necessary on the user interface of the inverter and the Fronius Smart Meter IP (see Advanced settings).

IMPORTANT!
A loose wire can disable an entire area of the network. The data communication connections of the Fronius Smart Meter IP are electrically isolated from hazardous voltages.

Further information for commissioning
Observe the following information on connecting the data communication cable to the inverter.
- Use a shielded CAT 5 STP (Shielded Twisted Pair) or higher data cable to avoid interference.
- Use a mutual twisted cable pair for corresponding data lines (D+/D-, M1+/M1-).
- If the data lines are laid close to the mains cabling, cables or wires that are designed for 300 to 600 V must be used (never less than the operating voltage).
- Use double-insulated or sheathed data lines when they are close to bare conductors.
- Two wires can be installed in each terminal; the wires are twisted first, inserted into the terminal, and tightened.

Terminating resistors - Explanation of symbols

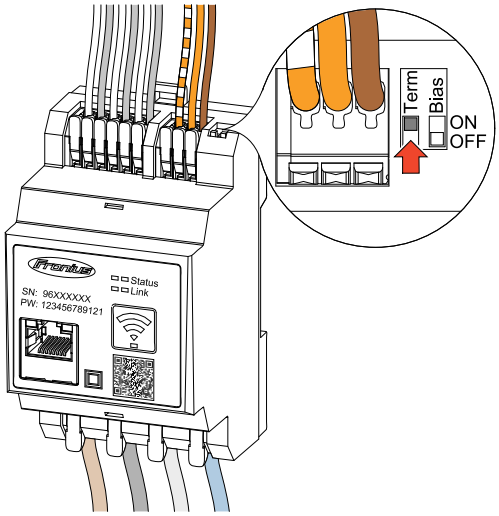
Inverter in the system
e.g., Fronius Symo

Meter - Fronius Smart Meter IP
Terminating resistor is set to ON with the DIP switch.

Fronius or third-party device, connection via Modbus TRU
e.g., Fronius Ohmpilot, battery, etc.

Terminating resistor
R 120 Ohm

Setting the Modbus RTU terminating resistor



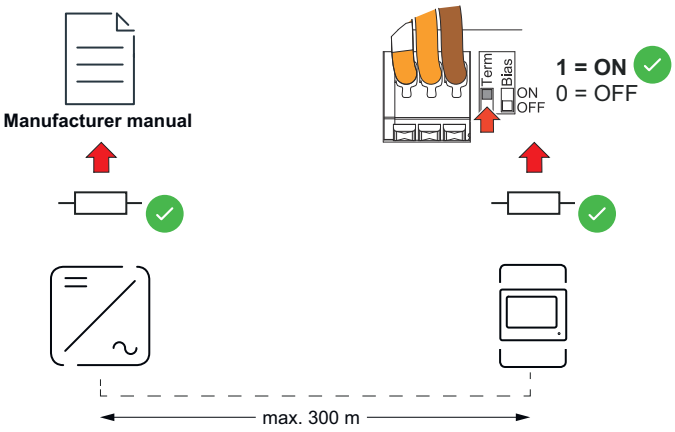
The terminating resistor is integrated in the Fronius Smart Meter IP and is set by a switch.

For information on whether the terminating resistor must be set or not, see chapter Terminating resistors on page 25.

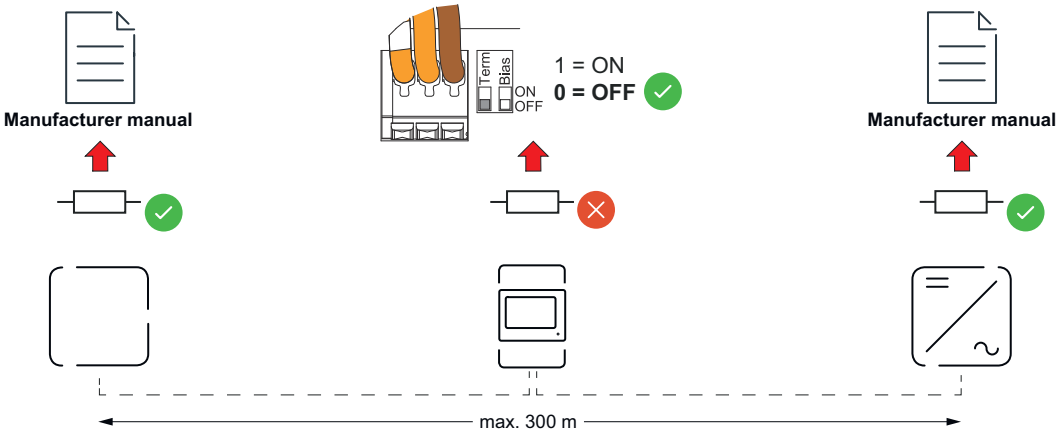
Terminating resistors

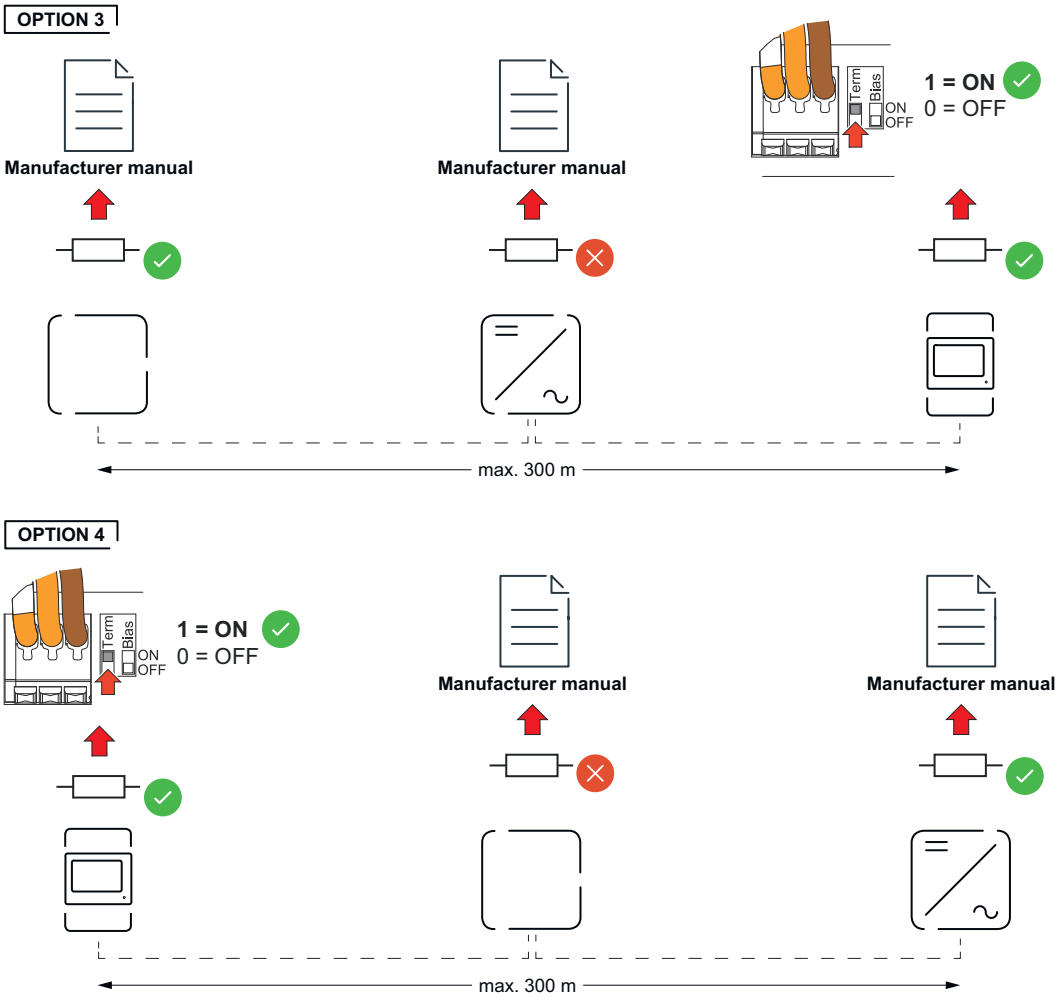
Due to interference, it is recommended that terminating resistors are used as illustrated below to ensure proper functioning.

OPTION 1



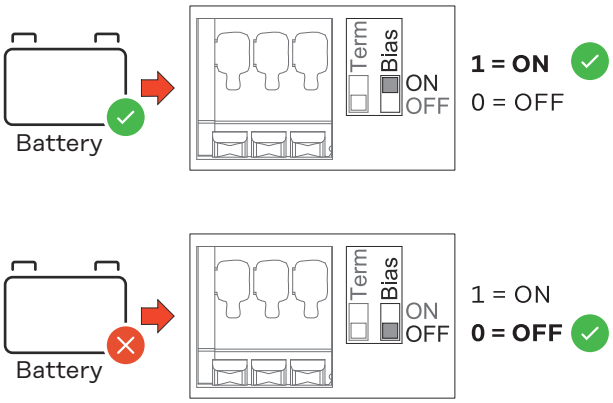
OPTION 2





Setting the Modbus RTU BIAS

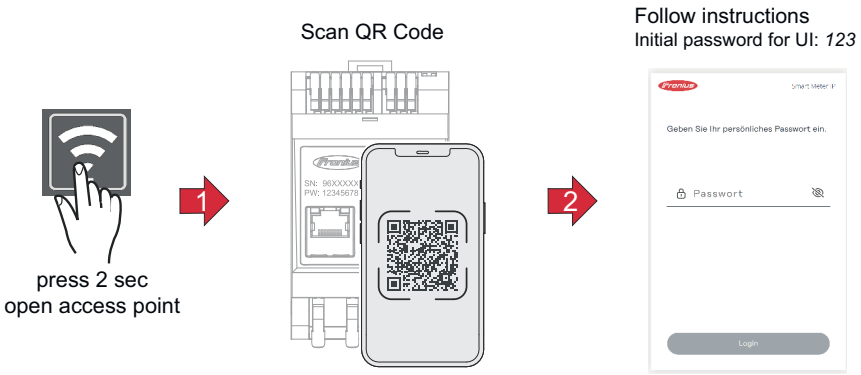
If the Smart Meter is connected to the same Modbus interface (MB0 or MB1) as the battery, the BIAS switch must be set to ON.



Commissioning

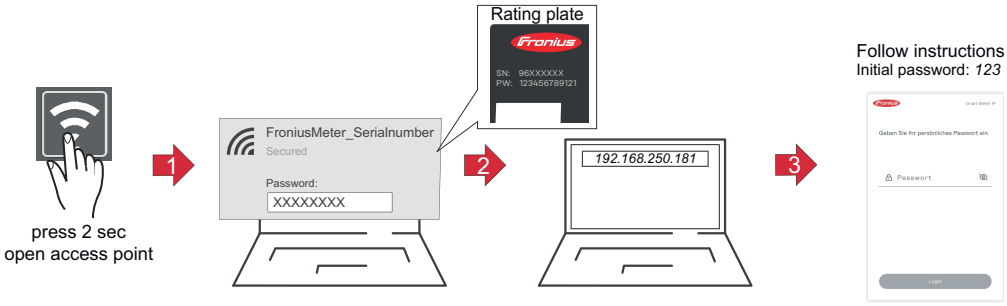
Commissioning the Fronius Smart Meter IP

Opening the user interface with the QR code



1. Press the access point button for two seconds. Link 2 LED flashes red.
2. Scan the QR code on the front of the device.
3. Enter the initial password and press **Login**.
4. Follow the instructions in the installation wizard and complete the installation.
5. Add the Smart Meter IP on the user interface of the inverter (see Commissioning GEN24 / SnapINverter).

Opening the user interface with the IP address



1. Press the access point button for two seconds. Link 2 LED flashes red.
2. Establish a connection from the end device to the access point
   SSID = FroniusMeter_xxxxx (xxxx = serial number)
   Password = see Smart Meter (PW)
3. In the browser address bar, enter and confirm the IP address 192.168.250.181. The installation wizard is opened.
4. Follow the installation wizard in the individual sections and complete the installation.
5. Add the Smart Meter IP on the user interface of the inverter (see Commissioning GEN24 / SnapINverter).

Software update

It is recommended to activate the **Automatic Updates** function during commissioning. The Fronius Smart Meter IP checks for available updates daily and automatically installs them between midnight and 6 am. A precise time can be set.

If this function is not activated, software updates can also be searched for and started manually on the user interface of the device.

The software of the Fronius Smart Meter IP is compatible with the following software versions of connected Fronius components:

- Fronius GEN24 & Tauro: full compatibility from version 1.24.1
- Fronius SnapINverter (Fronius Datamanager 2.0): full compatibility from version 3.28.1
- Fronius Symo Hybrid: full compatibility from version 1.28.1
- Fronius Wattpilot: full compatibility from version 1.9.29

Fronius SnapINverter

General

IMPORTANT! Settings under the **"Meter"** menu item are only to be made by trained and qualified personnel!

The service password must be entered in order to access the **"Meter"** menu item.

The meter is selected in the **Fronius Smart Meter** menu item. The Fronius Datamanager 2.0 automatically identifies the meter type.

A primary meter and several secondary meters can be selected. The primary meter needs to be configured first before a secondary meter can be selected.

The Fronius Smart Meter IP can be connected with Modbus TCP or Modbus RTU.

Connect to Fronius Datamanager 2.0

Access Point:

Activate the WiFi access point of the inverter:

1. Select the **Setup** menu on the inverter display.
2. Navigate to **WiFi Access Point**.
   ✓ *Network (**SS**) and password (**PW**) are displayed.*
3. Activate the **WiFi Access Point** with the Enter ↵ key.

Establish the connection from the inverter's WiFi access point to the PC:

1. Establish the connection to the inverter in the network settings (the inverter is displayed with the name "Fronius_240.XXXXXX").
2. Enter and confirm the password from the inverter display.
3. In the browser's address bar, enter the IP address http://192.168.250.181 and confirm.

✓ *The Fronius Datamanager 2.0 start page is displayed.*

LAN:

1. Connect the Fronius Datamanager and computer with a LAN cable.
2. Place the Fronius Datamanager 2.0 IP switch in the "A" position.
3. In the browser's address bar, enter the IP address http://169.254.0.180 and confirm.

Configuring the primary meter

1. Open the Fronius Datamanager 2.0 user interface.
   - Open a browser.
   - In the address bar of the browser, enter the IP address (for WLAN: 192.168.250.181, for LAN: 169.254.0.180) or the host and domain name of the Fronius Datamanager 2.0 and confirm.
   - The Fronius Datamanager 2.0 user interface is displayed.
2. Click the **Settings** button.
3. Log in to the login area with the **service** user and the service password.
4. Open the **Meter** menu area.
5. Select the **Fronius Smart Meter (RTU)** or **Fronius Smart Meter (TCP)** primary meter from the drop-down list.

6 Click the **Settings** button.

7 If using **Fronius Smart Meter (TCP)**, enter the IP address of the Fronius Smart Meter IP. A static IP address is recommended for the Fronius Smart Meter.

8 Set the position of the meter (**feed-in point** or **consumption point**). For more information on the position of the Fronius Smart Meter IP, see Positioning on page 11.

9 Click the **Ok** button when the **OK** status is displayed. If the **Timeout** status is displayed, try again.

10 Click the ✓ button to save the settings.

The Fronius Smart Meter IP is configured as the primary meter.

The **Current general view** menu area displays the power of the PV modules, self-consumption, the energy fed into the grid, and the battery charge (if available).

Configuring secondary meters

1 Log in to the Smart Meter IP (IP WLAN: 192.168.250.181) and change the Modbus address accordingly under **Advanced settings** > **Data interface** > **Modbus address** accordingly (1 = primary meter)
IMPORTANT
A Modbus address can only be assigned once.

2 Open the Fronius Datamanager 2.0 user interface.
- Open a browser.
- In the address bar of the browser, enter the IP address (for WLAN: 192.168.250.181, for LAN: 169.254.0.180) or the host and domain name of the Fronius Datamanager 2.0 and confirm.
- The Fronius Datamanager 2.0 user interface is displayed.

3 Click the **Settings** button.

4 Log in to the login area with the **service** user and the service password.

5 Open the **Meter** menu area.

6 Select the secondary meter from the drop-down list.

7 Click the **Add** button.

8 Enter the name of the secondary meter in the **Name** input field.

9 Enter the previously assigned address in the **Modbus address** input field. The secondary meter address must match the Modbus address set on the Smart Meter IP.

10 Add meter description.

11 Click the ✓ button to save the settings.

The Fronius Smart Meter IP is configured as a secondary meter.

Modbus participant - Fronius SnapInverter

Modbus RTU: A maximum of 4 Modbus stations can be connected to the Modbus terminal.

Modbus TCP: Fronius recommends using a maximum of 7 secondary meters in the system.

IMPORTANT!
Only one primary meter, one battery, and one Ohmpilot can be connected per inverter. Due to the high data transfer of the battery, the battery occupies two participants.

Example:

Input	Battery	Fronius Ohmpilot	Number of primary meters	Number of secondary meters
Modbus	✓	✓	1	0
	✓	✗	1	1
	✗	✓	1	2
	✗	✗	1	3

Multi meter system - Explanation of symbols

Grid
Supplies the loads in the system if insufficient power is being generated by the PV modules or supplied by the battery.

Inverter in the system
e.g. Fronius Primo, Fronius Symo, etc.

Utility meter
Measures the metering data relevant for the billing of electricity quantities (primarily the kilowatt hours of grid purchases and grid power feed). On the basis of the data relevant for billing, the electricity retailer invoices a grid purchase and the purchaser of the surplus pays for the grid power feed.

Primary meter
Records the load curve of the system and makes the measured data available for energy profiling in Fronius Solar.web. The primary meter also regulates the dynamic feed-in control.

Secondary meter
Records the load curve of individual loads and producers (e.g. washing machine, lights, television, heat pump, etc.) in the consumption branch and makes the measured data available for energy profiling in Fronius Solar.web.

Modbus RTU, Third-party device
e.g. Fronius Ohmpilot, battery, etc.

Loads in the system
e.g. washing machine, lamps, TV, etc.

Additional loads in the system
e.g. heat pump

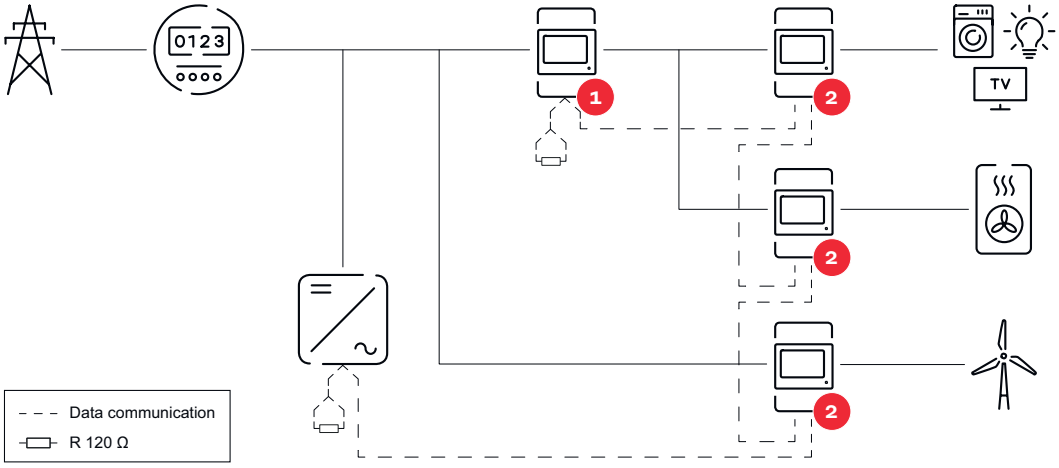
Additional producers in the system
e.g. wind power plant

Terminating resistor
R 120 Ohm

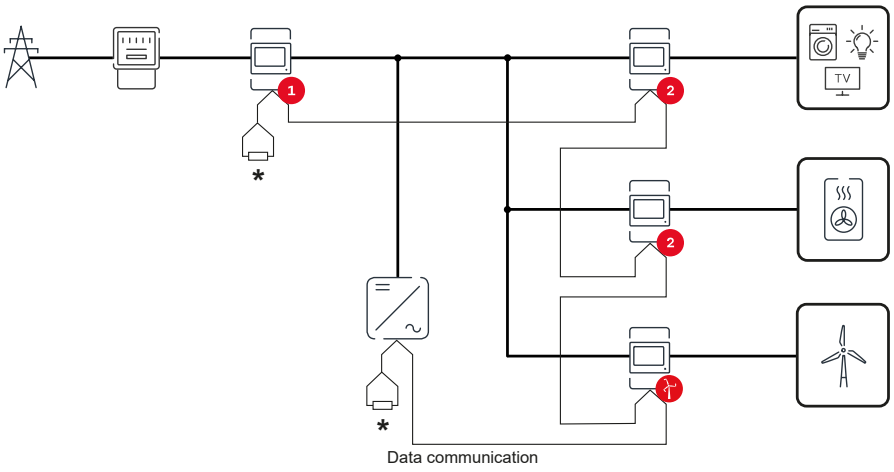
Multi meter system – Fronius SnapINverter

If several Fronius Smart Meters are installed, a separate address must be set for each one. The primary meter always receives the address 1. All other meters are numbered consecutively in the address range from 2 to 14. Different Fronius Smart Meter power categories can be used together.

IMPORTANT!
Use no more than 3 secondary meters in the system. To avoid interference, it is recommended to install the terminating resistors according to the chapter Terminating resistors.



*Position of the primary meter in the consumption branch. *Terminating resistor R 120 Ohm*



*Position of the primary meter at the feed-in point. *Terminating resistor R 120 Ohm*

The following must be observed in multi-meter systems:
- Each Modbus address is assigned only once.
- Place the terminating resistors individually for each channel.

Fronius GEN24 inverter

General

IMPORTANT! Settings under the **Device configuration** menu item are only to be made by trained and qualified personnel!

The technician password must be entered in order to access the **Device configuration** menu item.

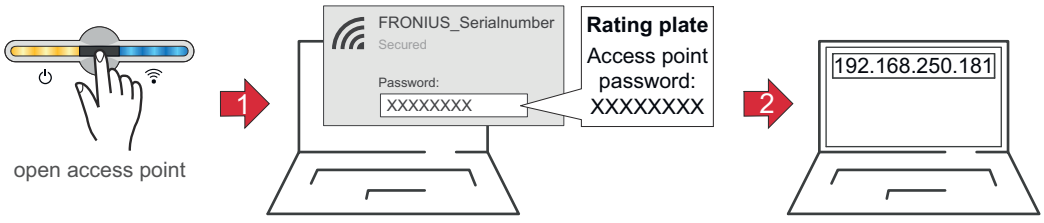
The Fronius Smart Meter IP can be operated in single-, two-, and three-phase mode. In all cases, the selection is made under the **Components** menu area. The meter type is determined automatically.

A primary meter and several secondary meters can be selected. The primary meter needs to be configured first before a secondary meter can be selected.

The Fronius Smart Meter IP can be connected with Modbus TCP or Modbus RTU.

Installation with the browser

WLAN:



1 Open the access point by touching the sensor

✓ *Communications LED flashes blue.*

2 Establish the connection to the inverter in the network settings (the inverter is displayed with the name "FRONIUS_" and the serial number of the device).

3 Enter the password from the rating plate and confirm.
IMPORTANT!
To enter the password in Windows 10, first select the **Connect using a security key instead** link to be able to establish the connection with the password.

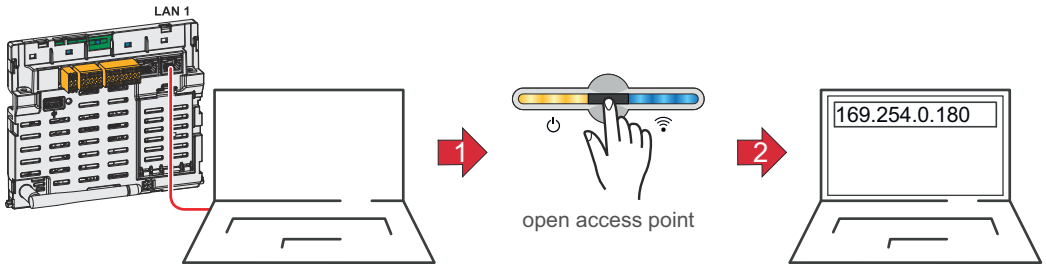
4 Enter the IP address 192.168.250.181 in the address bar of the browser and confirm. The installation wizard opens.

5 Follow the installation wizard and complete the installation in the individual areas.

6 Add the system components in Fronius Solar.web and commission the PV system.

The network wizard and product setup can be performed independently. A network connection is required for the Fronius Solar.web installation wizard.

Ethernet:



1. Establish a connection to the inverter (LAN1) using a network cable (min. CAT5 STP).
2. Open the access point by touching the sensor once
   ✓ *Communications LED flashes blue.*
3. Enter the IP address 169.254.0.180 in the address bar of the browser and confirm. The installation wizard opens.
4. Follow the installation wizard and complete the installation in the individual areas.
5. Add the system components in Fronius Solar.web and commission the PV system.

The network wizard and product setup can be performed independently. A network connection is required for the Fronius Solar.web installation wizard.

Configuring the primary meter

1. Open the user interface of the inverter.
   - Open a browser.
   - In the address bar of the browser, enter the IP address (for WLAN: 192.168.250.181, for LAN: 169.254.0.180) or the host and domain name of the inverter and confirm.
   - The user interface of the inverter is displayed.
2. Click the **Device configuration** button.
3. Log in to the login area with the **Technician** user and the technician password.
4. Access the **Components** menu area.
5. Click the **Add component** button.
6. Select connection type (**Fronius Smart Meter (RTU)** or **Fronius Smart Meter (TCP)**).
7. In the **Position** drop-down list, set the position of the meter (**feed-in point** or **consumption point**). For more information on the position of the Fronius Smart Meter IP, see Positioning on page 11.
8. If using **Fronius Smart Meter (TCP)**, enter the IP address of the Fronius Smart Meter IP. A static IP address is recommended for the Fronius Smart Meter.
9. Click the **Add** button.
10. Click the **Save** button to save the settings.

The Fronius Smart Meter IP is configured as the primary meter.

Configuring secondary meters

1. Establish a connection to the Smart Meter IP (IP WLAN: 192.168.250.181).
2. Open a browser.
3. Log in to the Smart Meter IP user interface and change the Modbus address accordingly under **Advanced settings** > **Data interface** > **Modbus address** (1 = primary meter)
   This setting is necessary when using Modbus TCP and RTU.
4. Open the user interface of the inverter.
   - Open a browser.
   - In the address bar of the browser, enter the IP address (IP address for WLAN: 192.168.250.181, IP address for LAN: 169.254.0.180) or the host and domain name of the inverter and confirm.
   - The user interface of the inverter is displayed.
5. Click the **Device configuration** button.

6 Log in to the login area with the **Technician** user and the technician password.

7 Access the **Components** menu area.

8 Click the **Add component** button.

9 Select connection type (**Fronius Smart Meter (RTU)** or **Fronius Smart Meter (TCP)**).

10 In the **Position** drop-down list, select the meter type (producer/load meter).

11 Enter the previously assigned address in the **Modbus address** input field. The secondary meter address must match the Modbus address set on the Smart Meter IP.

12 Enter the name of the meter in the **Name** input field.

13 In the **Category** drop-down list, select the category (**producer** or **load**).

14 If using **Fronius Smart Meter (TCP)**, enter the IP address of the Fronius Smart Meter IP under **IP Address**. A static IP address is recommended

15 Click the **Add** button.

16 Click the **Save** button to save the settings.

The Fronius Smart Meter IP is configured as a secondary meter.

Modbus participants - Fronius GEN24

Modbus RTU: The inputs M0 and M1 can be selected for this purpose. A maximum of 4 Modbus participants each can be connected to the Modbus terminal at inputs M0 and M1.

Modbus TCP: A maximum of 7 secondary meters can be used in the system.

IMPORTANT!
Only one primary meter, one battery, and one Ohmpilot can be connected per inverter. Due to the high data transfer of the battery, the battery occupies 2 participants.

Example 1:

Input	Battery	Fronius Ohmpilot	Number of primary meters	Number of secondary meters
Modbus 0 (M0)	✗	✗	0	4
	✓	✗	0	2
	✓	✓	0	1
Modbus 1 (M1)	✗	✗	1	3

Example 2:

Input	Battery	Fronius Ohmpilot	Number of primary meters	Number of secondary meters
Modbus 0 (M0)	✗	✗	1	3
Modbus 1 (M1)	✗	✗	0	4
	✓	✗	0	2
	✓	✓	0	1

Multi meter system - Explanation of symbols

Grid
Supplies the loads in the system if insufficient power is being generated by the PV modules or supplied by the battery.

Inverter in the system
e.g. Fronius Primo, Fronius Symo, etc.

Utility meter
Measures the metering data relevant for the billing of electricity quantities (primarily the kilowatt hours of grid purchases and grid power feed). On the basis of the data relevant for billing, the electricity retailer invoices a grid purchase and the purchaser of the surplus pays for the grid power feed.

Primary meter
Records the load curve of the system and makes the measured data available for energy profiling in Fronius Solar.web. The primary meter also regulates the dynamic feed-in control.

Secondary meter
Records the load curve of individual loads and producers (e.g. washing machine, lights, television, heat pump, etc.) in the consumption branch and makes the measured data available for energy profiling in Fronius Solar.web.

Modbus RTU, Third-party device
e.g. Fronius Ohmpilot, battery, etc.

Loads in the system
e.g. washing machine, lamps, TV, etc.

Additional loads in the system
e.g. heat pump

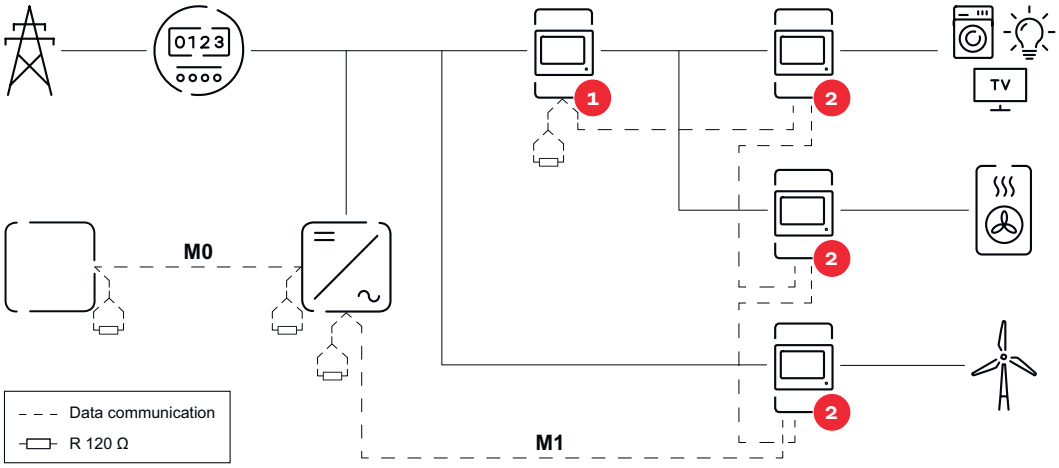
Additional producers in the system
e.g. wind power plant

Terminating resistor
R 120 Ohm

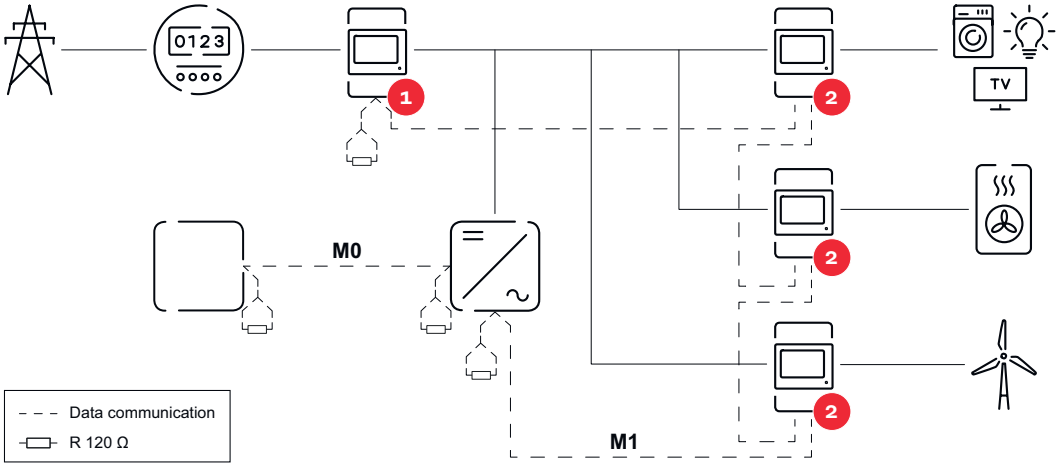
Multi-meter system – Fronius GEN24 inverter

If several Fronius Smart Meters are installed, a separate address must be set for each one. The primary meter always receives the address 1. All other meters are numbered consecutively in the address range from 2 to 14. Different Fronius Smart Meter power categories can be used together.

IMPORTANT!
Use no more than 7 secondary meters in the system. Data connection via RTU and TCP is possible. To avoid interference, it is recommended to install the terminating resistors according to the chapter Setting the Modbus RTU terminating resistor.



*Position of the primary meter in the consumption branch. *Terminating resistor R 120 Ohm*



*Position of the primary meter at the feed-in point. *Terminating resistor R 120 Ohm*

The following must be observed in multi-meter systems:
- Connect the primary meter and a battery to different channels (recommended).
- Distribute the remaining Modbus participants evenly.
- Each Modbus address is assigned only once.
- Place the terminating resistors individually for each channel.

User interface

Overview

Overview

		**Measurement data and connections** An overview of the measurement data (e.g., voltage, amperage, frequency, etc.) and the data communication connections is displayed.
		**Language** The desired language can be set here via the drop-down menu.
		**Change password** After entering the initial password (123), a new password must be assigned: Password guidelines - At least 6 characters - At least 3 of the following 4 properties: Upper case letters, lower case letters, numbers, special characters If the password has been forgotten, the Smart Meter must be reset (see chapter Restoring the factory settings on page 45.
		**Advanced settings** For more information on the settings, see chapter Advanced settings on page 44.
		**Info** Various information about the Fronius Smart Meter IP is displayed here. This information can be helpful in support cases.
		**Logout** The current user is logged out.

Settings

Advanced settings

Network
The WLAN or LAN connection can be configured here. The use of a static IP address is recommended.

Meter values
Here all values can be set to 0 or meter values can be corrected manually.
The input current of the current transformers can be changed, see Changing the input current of the current transformers on page 45.

Software update
Software update settings can be made here. It is possible to configure an automatic update.

Data interfaces
Several data interfaces can be used simultaneously.

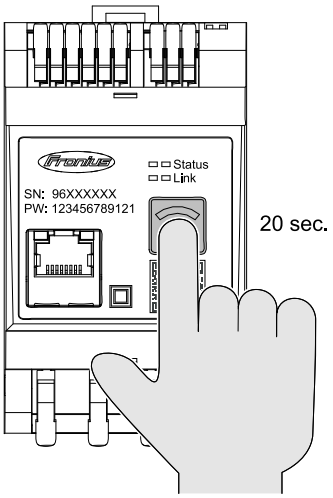
Detailed views - Entering the login data is required.
- **Expert view**: All available measured values of the Fronius Smart Meter IP are displayed.
- **REST/JSON**: The current measured data are displayed.
- **REST/XML**: Only visible if the **REST/XML** interface is enabled under **Data interfaces**. The current measured data are displayed.

Data interfaces
- **REST/XML**: To enable the REST/XML interface.
- **Fronius Backend**: A connection to a Message Queuing Telemetry Transport (MQTT)-Broker can be set up via the Fronius backend. This setting is required for Fronius EMIL, for example. For further information, please contact your Fronius system partner.
- **Modbus (TCP and RTU)**:
  - **Modbus address**: Must be changed accordingly when multiple meters are in operation (1 = primary meter)
  - **Modbus TCP Port**: This value must match the setting on the inverter (standard port: 502).

Single-phase/multiphase
The connection type of the Fronius Smart Meter IP can be selected here.

Restart device
Click on **Restart device** to restart the Fronius Smart Meter IP.

Restoring the factory settings



Press and hold the **WLAN access point and reset** button for 20 seconds to reset the Fronius Smart Meter IP to factory settings.

- All LEDs on the Fronius Smart Meter IP go out and the device restarts (can take max. 10 minutes).
- All measured values are set to 0 and the configuration is reset.
- If the factory settings are restored, the device must be reconfigured (see Commissioning the Fronius Smart Meter IP).

Changing the input current of the current transformers

The input current of the current transformers can be changed after commissioning:

1. Open the menu **Advanced settings** > **Meter values**.
2. Click the **Current transformer** button.
3. Enter the input current of the connected current transformers in amperes and click **Next**.
   The input current value is stated in the current transformer user information.
4. Confirm the change of the value by clicking on **Save**.

Appendix

Service, maintenance and disposal

Maintenance

Maintenance and service work may only be carried out by a trained technician.

Cleaning

Clean the Fronius Smart Meter as required with a damp cloth.
Do not use cleaning agents, abrasives solvents, or similar to clean the Smart Meter.

Disposal

Waste electrical and electronic equipment must be collected separately and recycled in an environmentally sound manner in accordance with the European Directive and national law. Used equipment must be returned to the distributor or through a local authorized collection and disposal system. Proper disposal of the used device promotes sustainable recycling of resources and prevents negative effects on health and the environment.

Packaging materials
- Collect separately
- Observe local regulations
- Crush cardboard boxes

Fronius manufacturer's warranty

Detailed, country-specific warranty conditions are available at www.fronius.com/solar/warranty.

To obtain the full warranty period for your newly installed Fronius product, please register at www.solarweb.com.

Technical data

Technical data

Measurement input	
Nominal voltage (3-phase) incl. tolerance	208 - 480 V
Nominal voltage (1-phase) incl. tolerance	100 - 240 V
Self-consumption	30 mA
Rated frequency Tolerance	50 - 60 Hz 47 - 63 Hz
Maximum current, I_{max}	5000 A
Short-time overload (EN IEC 62053-21, EN IEC 62053-23)	3x I_{max} / 20 s
Self-consumption (max. current)	max. 5 W
Current distortion factor	according to EN IEC 62053-21
Power factor Working range (EN IEC 62053-21, EN IEC 62053-23)	active cosφ 0.5 ind - 0.8 cap, reactive sinφ 0.5 ind - 0.5 cap
Current transformer (kCT)	1 - 5000 e.g., CT 800/333 mV Only use Rogowski coils with integrators. Failure to use integrators will result in erroneous measurement results.

Energy	
Active energy accuracy (EN IEC 62053-21) / Class B (EN IEC 50470-3)	Class 1
Reactive energy accuracy (EN IEC 62053-23)	Class 2
Response time after switching on (EN IEC 62053-21, EN IEC 62053-23)	< 5 s

Output	
RS485 communication Electrically isolated from input and auxiliary voltage	
Standard	RS485 - 3 conductors
Transfer	serial, asynchronous
Protocol	Modbus RTU
Addresses	1 - 255
Bit count	8
Stop bit	1
Parity bit	none - even - odd

Output	
Baud rate (Modbus transmission speed)	9600 bit/s
Response time	≤ 200 ms

WiFi	
Frequency range	2412 - 2472 MHz
Channels used	Channel: 1-13 b,g,n HT20 Channel: 3-9 HT40
Power	<18 dBm
Modulation	802.11b: DSSS (1Mbps DBPSK, 2Mbps DQPSK, 5.5/11Mbps CCK) 802.11g: OFDM (6/9Mbps BPSK, 12/18Mbps QPSK, 24/36Mbps 16-QAM, 48/54Mbps 64-QAM) 802.11n: OFDM (6.5 BPSK, QPSK, 16-QAM, 64-QAM)

Insulation (EN IEC 62052-11, EN IEC 62053-21)	
Installation category	II
Pollution degree	PD2
Insulation voltage	4 kV RMS
Surge withstand capability Test circuit	4 kV 1.2/60 µs Voltage input, current transformer input, communication
Test voltage Test circuit	2.5 kV RMS. 50 Hz/1 min Voltage input, current transformer input, communication
Test voltage Test circuit	4 kV RMS. 50 Hz/1 min All circuits and ground

Electromagnetic compatibility	
Test standard	Test according to EN IEC 62052-11

Environmental conditions	
Reference temperature	25 °C (± 5 °C)
Operating range	-25 to +55 °C
Limit temperature for storage and transport	-30 to +80 °C
Max. humidity	93%
Max. power loss (for thermal dimensioning of the switch cabinet)	≤ 6 W
Overvoltage category	III

Housing	
Housing	3 modules according to DIN 43880

Housing	
Connection	Spring-type terminals
Mounting	35 mm DIN rail
Housing material	PA-765 UL
Protection class (EN 60529)	IP20 housing, IP30 connections
Weight	132 grams

Terminals	
Voltage input	
Wire	min. 1.5 mm² / max. 4 mm²
Data output and current transformer input	
Wire	min. 0.25 mm² / max. 2.5 mm²

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At www.fronius.com/contact you will find the contact details of all Fronius subsidiaries and Sales & Service Partners.