FRONIUS SMART METER TS

The bidirectional meter for intelligent energy management

The Fronius Smart Meter TS is a bidirectional meter, which optimises self-consumption, records the load curve and controls the various energy flows. Thanks to highly accurate measurements and rapid communication via the Modbus RTU interface, dynamic feed-in control when feed-in limits are imposed is faster and more accurate than with the S0 meter.

Together with the Fronius Solar.web, the Smart Meter TS presents a clear overview of the power consumption. In combination with the Fronius storage solutions, the device ensures a perfect coordination of various energy flows, which optimises the entire energy management. The Fronius Smart Meter TS is ideally suited for use with the GEN24 Plus and Tauro, as well as all Fronius inverters with the Fronius Datamanager 2.0.
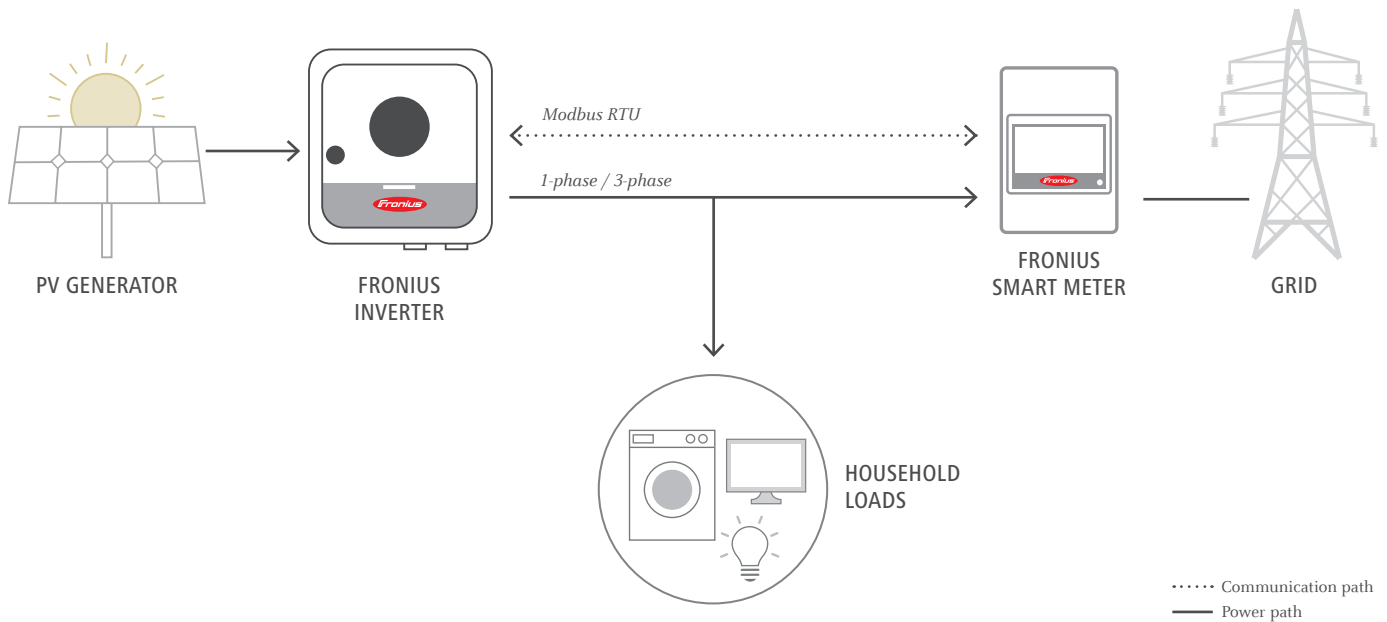
FRONIUS SMART METER TS

TECHNICAL DATA	FRONIUS SMART METER TS 100A -1	FRONIUS SMART METER TS 65A -3	FRONIUS SMART METER TS 5KA -3
Nominal voltage	230 V	208 - 400 V	400 - 480 V
Operating voltage range	-30% - +20%	-20% - +20%	-20% - +15%
Nominal frequency		50 to 60 Hz	
Grid frequency range		45 to 65 Hz	
Maximum current	1 x 100 A	3 x 65 A	3 x 5000 A
Power line cross section	1 - 25 mm²	1 - 16 mm²	1 - 4 mm²
Neutral line cross section	1 - 25 mm²	0.05 - 1.5mm²	1 - 4 mm²
Communication line cross section		0.05 - 1.5 mm²	
Power consumption		<=1W	
Starting current	40 mA	20 mA	10 mA
Accuracy class		1	
Active energy accuracy		Class 1 (EN62053-21) / Class B (EN50470-3)	
Reactive energy accuracy		Class 2 (EN 62053-23)	
Short-time overcurrent	3000A/10ms	1950A/10ms	30A/500ms
Mounting		Indoors (DIN rail)	
Housing	2 modules DIN 43880	3 modules DIN 43880	3 modules DIN 43880
Degree of protection		IP 51 (front frame), IP 20 (terminals)	
Ambient temperature range		-25 to +65°C	
Dimensions (Height x Width x Depth)	91.5 x 35.8 x 63.0	91.5 x 53.8 x 63.0 mm	91.5 x 53.8 x 63.0 mm
Interface to inverter		Modbus RTU (RS485)	
Display		3 x 8 digit / Touchscreen	

THE ADVANTAGES AT A GLANCE

/ Fast and accurate dynamic feed-in control

/ Clear overview of power consumption in Fronius Solar.web

/ Energy management with Fronius storage solutions

/ Identifiying opportunities to optimize the pv system

/ Monitoring and analyzing heavy loads

CONFIGURATION DIAGRAM

PV GENERATOR — FRONIUS INVERTER — HOUSEHOLD LOADS — FRONIUS SMART METER — GRID

Modbus RTU

1-phase / 3-phase

······ Communication path
—— Power path

The Fronius Smart Meter is compatible with all inverters with an RS485 interface (Modbus RTU). The Fronius Smart Meter can be retrofitted at any time together with the Fronius Datamanager 2.0 in inverters that have already been installed.

/ Perfect Welding / Solar Energy / Perfect Charging

THREE BUSINESS UNITS, ONE GOAL: TO SET THE STANDARD THROUGH TECHNOLOGICAL ADVANCEMENT.

What began in 1945 as a one-man operation now sets technological standards in the fields of welding technology, photovoltaics and battery charging. Today, the company has around 5,440 employees worldwide and 1,264 patents for product development show the innovative spirit within the company. Sustainable development means for us to implement environmentally relevant and social aspects equally with economic factors. Our goal has remained constant throughout: to be the innovation leader.

Further information about all Fronius products and our global sales partners and representatives can be found at **www.fronius.com**

Fronius India Private Limited
GAT no 312, Nanekarwadi
Chakan, Taluka - Khed District
Pune 410501
India
pv-sales-india@fronius.com
www.fronius.in

Fronius Australia Pty Ltd.
90-92 Lambeck Drive
Tullamarine VIC 3043
Australia
pv-sales-australia@fronius.com
www.fronius.com.au

Fronius UK Limited
Maidstone Road, Kingston
Milton Keynes, MK10 0BD
United Kingdom
pv-sales-uk@fronius.com
www.fronius.co.uk

Fronius International GmbH
Froniusplatz 1
4600 Wels
Austria
pv-sales@fronius.com
www.fronius.com

SOFTWARE REQUIREMENTS	
Fronius Datamanager 2.0	≥ 3.16.1 version
Fronius Symo Hybrid	≥ 1.16.1 version

MEASURING INPUT	
Nominal voltage (4-conductor) range	208 - 400 V (±20%)
Power consumption in the voltage path (max. voltage)	≤ 10 VA
Nominal frequency	50 - 60 Hz
Tolerance	45 - 65 Hz
Nominal current, I_b	5 A
Maximum current, I_{max}	65 A
Starting current	20 mA
Short-time overload (EN IEC 62053-21, EN IEC 62053-23)	30 I_{max} / 0.001 s
Self-consumption - current path (max. current)	≤ 1 W
Power factor Operating 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 distortion factor	in acc. with EN 50470

OUTPUT RS485 communication (Electrically isolated from measuring input)	
Standard	RS485 - 3 conductors
Protocol	Compatible with Modbus RTU
Addresses	1 - 255
Baud rate	300, 2400, 9600 bit/s
Response time	≤ 200 ms

INSULATION (EN IEC 62052-11, EN IEC 62053-21)	
Installation category	III
Degree of pollution	2
Insulation voltage	4 kVAC RMS (1 min)

ELECTROMAGNETIC COMPATIBILITY	
Emission test	In acc. with EN IEC 62052-11, EN 50470-3
Immunity test	In acc. with EN IEC 62052-11, EN 50470-3

OPERATING CONDITIONS	
Reference temperature	25 °C (± 5 °C)
Operating range	-25 to +55 °C
Temperature limit for storage and transport	-30 to +80 °C
Mechanical environment	M2
Electromechanical environment	E2

HOUSING	
Housing	3 modules according to DIN 43880
Sealable housing/terminal cover	
Connection	Screw connection
Mounting	Can be snapped onto 35 mm DIN rail
Housing material	Noryl, self-extinguishing
Degree of protection (EN 60529)	IP51 housing, IP20 connections
Weight	240 grams

TERMINALS - MEASURING INPUT	
Wire	min. 1 mm² / max. 16 mm²
Recommended torque	max. 2.8 Nm

TERMINALS - DATA OUTPUT (N-CONNECTOR)	
Wire	min 0.05 mm²
Recommended torque	max. 0.4 Nm

Detailed, country-specific warranty terms are available on: **www.fronius.com/solar/warranty**

/ Perfect Welding / Solar Energy / Perfect Charging

Fronius

FIND MORE INFORMATION
manuals.fronius.com/html/4204260349

QUICK START GUIDE

Fronius Smart Meter TS 65A-3

DE: WARNUNG! Fehlbedienung und fehlerhaft durchgeführte Arbeiten können schwerwiegende Personen- oder Sachschäden verursachen. Die Installation und Inbetriebnahme des Smart Meters darf nur durch geschultes Personal und nur im Rahmen der technischen Bestimmungen erfolgen. Vor Arbeiten mit dem Gerät, alle beiliegenden, aufgedruckten und online zur Verfügung gestellten Dokumente lesen und verstehen! Dieses Dokument beschreibt nicht alle möglichen Systemkonfigurationen.

EN: WARNING! Incorrect operation and incorrectly performed work can cause serious personal injury or material damage. The Fronius Smart Meter may only be installed and commissioned by trained personnel and only within the scope of the technical regulations. Before working with the device, read and understand all enclosed, printed and online documents! This document does not describe all of the possible system configurations.

FR: AVERTISSEMENT ! Une mauvaise utilisation et un travail mal effectué peuvent causer des blessures graves ou des dommages matériels. Le Fronius Smart Meter ne peut être installé et mis en service que par du personnel formé et uniquement dans le cadre des réglementations techniques. Avant de travailler avec l'appareil, lisez et comprenez tous les documents ci-joints, imprimés et en ligne ! Ce document ne décrit pas toutes les configurations possibles du système.

IT: ATTENZIONE! Un funzionamento non corretto e un lavoro eseguito in modo non corretto possono causare gravi lesioni personali o danni materiali. Lo Fronius Smart Meter può essere installato e messo in funzione solo da personale addestrato e solo nell'ambito delle norme tecniche. Prima di lavorare con l'apparecchio, leggere e comprendere tutti i documenti allegati, stampati e online! Questo documento non descrive tutte le possibili configurazioni di sistema.

ES: ¡ADVERTENCIA! El funcionamiento incorrecto y el trabajo realizado de forma incorrecta pueden causar graves lesiones personales o daños materiales. El Fronius Smart Meter sólo puede ser instalado y puesto en marcha por personal capacitado y sólo dentro del ámbito de los reglamentos técnicos. Antes de trabajar con el dispositivo, lea y entienda todos los documentos adjuntos, impresos y en línea! Este documento no describe todas las configuraciones posibles del sistema.

DA: ADVARSEL! Forkert betjening og forkert udført arbejde kan forårsage alvorlig personskade eller materielle skader. Fronius Smart Meter må kun installeres og idriftsættes af uddannet personale og kun inden for rammerne af de tekniske forskrifter. Læs og forstå alle vedlagte, trykte og online dokumenter, før du arbejder med enheden! Dette dokument beskriver ikke alle mulige systemkonfigurationer.

PB: ALERTA! Uma operação incorreta e trabalhos mal executados podem provocar graves danos às pessoas e aos equipamentos. A instalação e o comissionamento do Smart Meter podem ser realizados somente por pessoal treinado e dentro das determinações técnicas. Antes de trabalhar com o dispositivo, deve-se ler e compreender todos os documentos anexos, impressos e disponíveis online! Os módulos solares expostos à luz fornecem tensão ao inversor. Este documento não descreve todas as configurações de sistema possíveis.

PL: OSTRZEŻENIE! Błędy obsługi i nieprawidłowo wykonane prace mogą spowodować poważne obrażenia ciała oraz straty materialne. Montaż i uruchomienie inteligentnego licznika Fronius Smart Meter mogą zostać wykonane wyłącznie przez przeszkolony personel i wyłącznie w ramach wymagań technicznych. Przed przystąpieniem do wykonywania prac z urządzeniem należy zapoznać się dokładnie z treścią wszystkich dokumentów dołączonych do urządzenia, nadrukowanych na nim lub udostępnionych online! Niniejszy dokument nie opisuje wszystkich możliwych konfiguracji systemu.
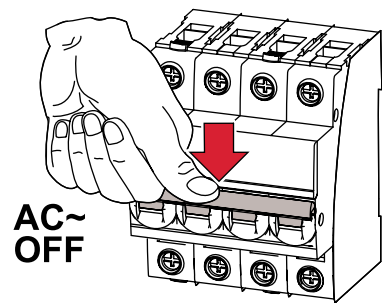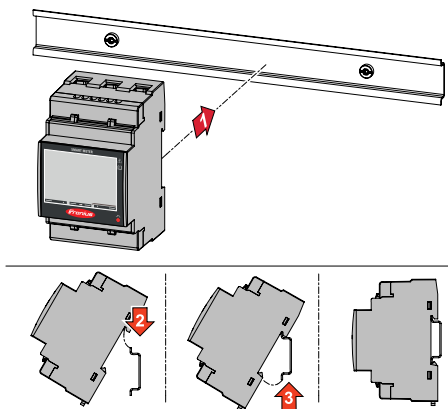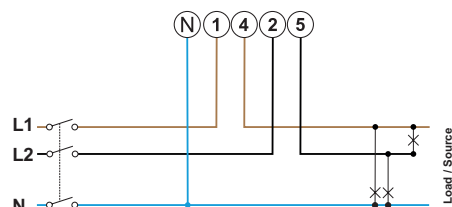
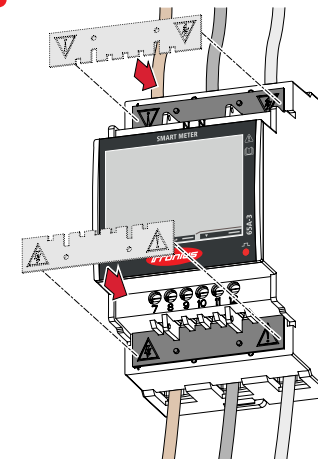| 1 | **SWITCH OFF THE CIRCUIT BREAKER** (Step: 1) | 2 | **MOUNT THE SMART METER** (Step: 2) | 3a | **2 PHASES, 3 WIRES** (Step: 3a) | 3b | **3 PHASES, 4 WIRES** (Step: 3b) | 3c | **3 PHASES, 3 WIRES** (Step: 3c) | 4 | **MOUNT THE PROTECTIVE COVERS** (Step: 4) |
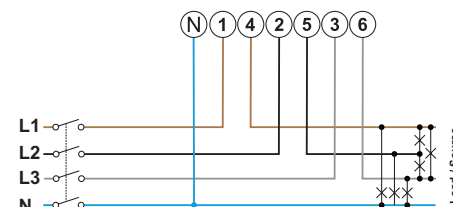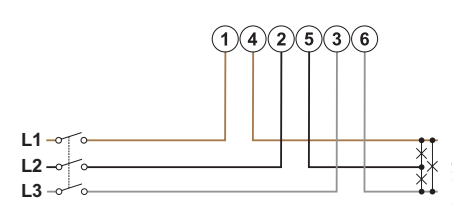
AC~ OFF

3a — N 1 4 2 5
L1
L2
N
Load / Source

3b — N 1 4 2 5 3 6
L1
L2
L3
N
Load / Source

3c — 1 4 2 5 3 6
L1
L2
L3
Load / Source

| 5 | **CONNECT THE DATA CABLES** (Step: 5) | 6 | **SET UP THE TERMINATING RESISTOR** (Steps: 6-7) | 7 | | 8 | **MOUNT THE CONNECTOR COVERS** (Step: 8) | 9 | **SWITCH ON THE CIRCUIT BREAKER** (Step: 9) |
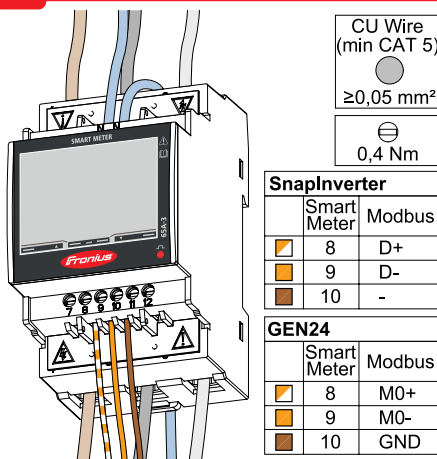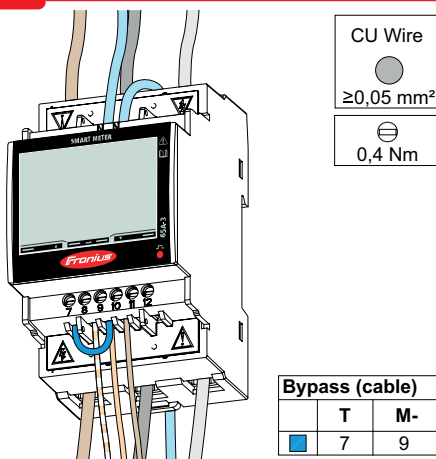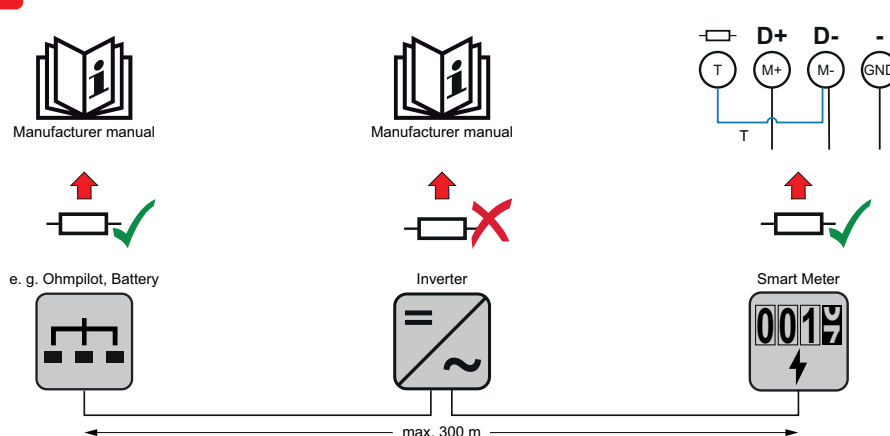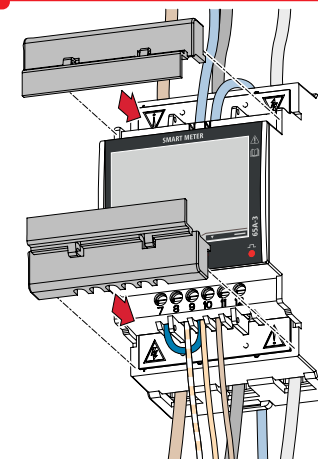
CU Wire (min CAT 5)
≥0,05 mm²
0,4 Nm

SnapInverter

	Smart Meter	Modbus
	8	D+
	9	D-
	10	-

GEN24

	Smart Meter	Modbus
	8	M0+
	9	M0-
	10	GND

CU Wire
≥0,05 mm²
0,4 Nm

Bypass (cable)

	T	M-
	7	9

D+   D-   -
T   M+   M-   GND
T

Manufacturer manual   Manufacturer manual   Smart Meter

e. g. Ohmpilot, Battery   Inverter   001

max. 300 m

AC~ ON
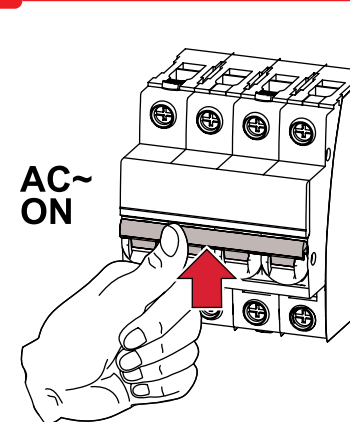
| 10 | **NAVIGATE IN THE SETTINGS** (Step: 10) | 11 | **ENTER THE SETTINGS** (Step: 11) | 12 | **SETUP THE PASSWORD** (Step: 12) | 13 | **SETUP THE ADDRESS** (Step: 13) | 14 | **EXIT THE SETTINGS** (Step: 14) | 15 | **START UP THE SMART METER** (Step: 15) |
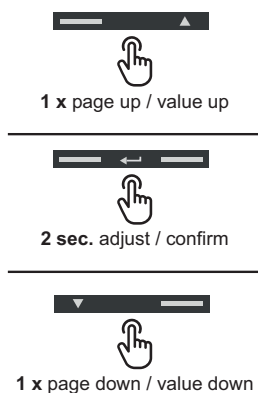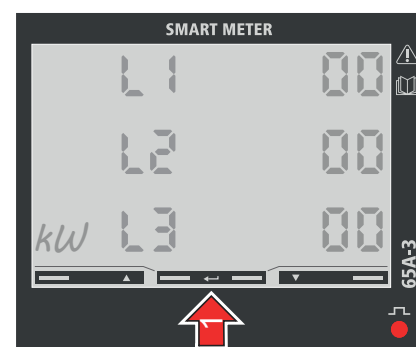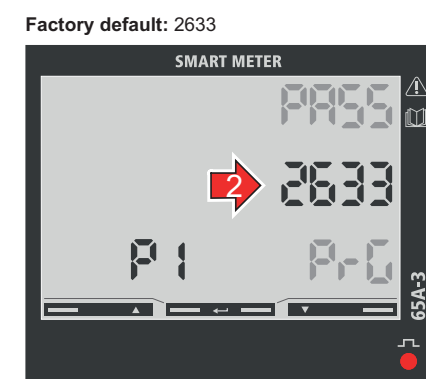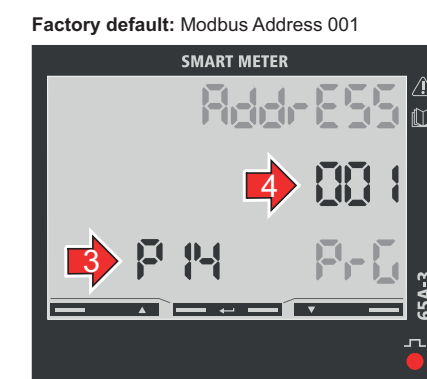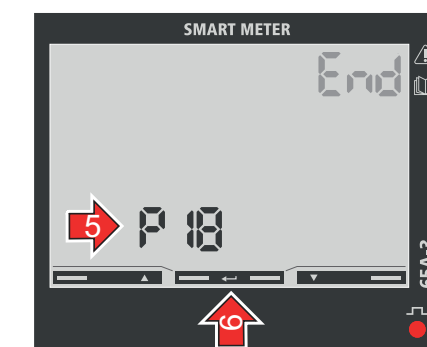
1 x page up / value up

2 sec. adjust / confirm

1 x page down / value down

SMART METER
L1   00
L2   00
kW L3 00
65A-3

Factory default: 2633

SMART METER
PASS
2633
P1   PrG
65A-3

Factory default: Modbus Address 001

SMART METER
Addr-ESS
001
P14   PrG
65A-3

SMART METER
End
P18
65A-3

Fronius Solar.start

Download on the App Store

GET IT ON Google Play

Fronius
Setup your PV system in a few minutes.
START INSTALLATION
LOGIN

Operating Instructions

Fronius Smart Meter TS 65A-3

Contents

Safety rules

Safety rules

Explanation of safety notices

⚠️ **DANGER!**

Indicates immediate danger.
▶ If not avoided, death or serious injury will result.

⚠️ **WARNING!**

Indicates a potentially hazardous situation.
▶ If not avoided, death or serious injury may result.

⚠️ **CAUTION!**

Indicates a situation where damage or injury could occur.
▶ If not avoided, minor injury and/or damage to property may result.

NOTE!

Indicates a risk of flawed results and possible damage to the equipment.

General

The device has been manufactured in line with the state of the art and according to recognized safety standards. If used incorrectly or misused, however, it can cause:
- Injury or death to the operator or a third party
- Damage to the device and other material assets belonging to the operating company.

All personnel involved in commissioning, maintenance, and servicing of the device must:
- Be suitably qualified
- Have knowledge of and experience in dealing with electrical installations and
- Have fully read and precisely followed these Operating Instructions

The Operating Instructions must always be at hand wherever the device is being used. In addition to the Operating Instructions, attention must also be paid to any generally applicable and local regulations regarding accident prevention and environmental protection.

All safety and danger notices on the device:
- Must be kept in a legible state
- Must not be damaged
- Must not be removed
- Must not be covered, pasted or painted over

The terminals can reach high temperatures.

Only operate the device when all protection devices are fully functional. If the protection devices are not fully functional, there is a danger of:
- Injury or death to the operator or a third party
- Damage to the device and other material assets belonging to the operating company

Any safety devices that are not fully functional must be repaired by an authorised specialist before the device is switched on.

Never bypass or disable protection devices.

For the location of the safety and danger notices on the device, refer to the section headed "General remarks" in the Operating Instructions for the device.

Any equipment malfunctions which might impair safety must be remedied before the device is turned on.

This is for your personal safety!

Environmental conditions

Operation or storage of the device outside the stipulated area will be deemed as not in accordance with the intended purpose. The manufacturer accepts no liability for any damage resulting from improper use.

Qualified personnel

The servicing information contained in these operating instructions is intended only for the use of qualified service engineers. An electric shock can be fatal. Do not carry out any actions other than those described in the documentation. This also applies to qualified personnel.

All cables and leads must be secured, undamaged, insulated and adequately dimensioned. Loose connections, scorched, damaged or inadequately dimensioned cables and leads must be immediately repaired by authorised personnel.

Maintenance and repair work must only be carried out by an authorised specialist.

It is impossible to guarantee that bought-in parts are designed and manufactured to meet the demands made on them, or that they satisfy safety requirements. Use only original spare parts (also applies to standard parts).

Do not carry out any alterations, installations, or modifications to the device without first obtaining the manufacturer's permission.

Components that are not in perfect condition must be changed immediately.

Copyright

Copyright of these operating instructions remains with the manufacturer.

The text and illustrations are all technically correct at the time of printing. We reserve the right to make changes. The contents of the operating instructions shall not provide the basis for any claims whatsoever on the part of the purchaser. If you have any suggestions for improvement, or can point out any mistakes that you have found in the instructions, we will be most grateful for your comments.

Data protection

The user is responsible for the safekeeping of any changes made to the factory settings. The manufacturer accepts no liability for any deleted personal settings.

General information

Fronius Smart Meter TS 65A-3

Device description The Fronius Smart Meter TS is a bidirectional electricity meter which optimises self-consumption and records the household's load curve. In conjunction with the Fronius inverter, Fronius Datamanager and Fronius data interface, the Fronius Smart Meter TS provides a clear overview of a user's own power consumption.

The meter measures the power flow to the loads or to the grid and forwards the information via the Modbus RTU/RS485 communication to the Fronius inverter and the Fronius Datamanager.

⚠ **CAUTION!**

Observe and follow safety instructions!
Failure to observe the safety instructions will result in damage to personnel and equipment.
▶ Switch off the power supply before establishing a mains connection.
▶ Observe the safety instructions.

Information on the device

Technical data, markings and safety symbols are located on the Fronius Smart Meter TS. These must NOT be removed or painted over. They warn against incorrect operation which can lead to serious injury and damage.
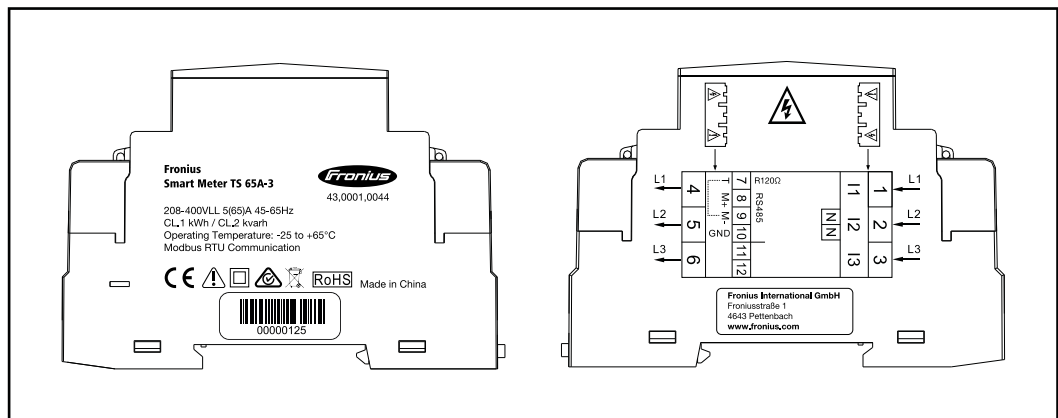
Markings:

CE The devices comply with all the requisite and relevant standards and guidelines that form part of the relevant EU Directive, and are therefore permitted to display the CE mark.

☐ Insulated (protection class II)

⬡ Regulatory Compliance Mark (RCM)
Complies with all applicable regulatory requirements in Australia and New Zealand regarding safety and electromagnetic compatibility, as well as specific requirements for radio equipment.

🗑 To comply with European Directive 2012/19/EU on Waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility. Any device that you no longer require must be returned to your distributor or disposed of at an approved collection and recycling facility in your area. Ignoring this European Directive may have potentially adverse effects on the environment and your health!

RoHS RoHS (Restriction of Hazardous Substances)
The limited use of certain hazardous substances in electrical and electronic equipment has been complied with in accordance with EU Directive 2011/65/EU.

Safety symbols:

⚠ Danger of serious injury and property damage due to incorrect operation.

⚡ Dangerous electrical voltage.

Intended use

The Fronius Smart Meter TS is a fixed piece of equipment for public grids of TN/TT systems and records self-consumption and/or individual loads in the system. The Fronius Smart Meter TS 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 TS 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. The available documents do not replace regional, state, provincial or national laws, or regulations or standards that apply to the installation, electrical safety and use of the product. 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.

Interventions on the Fronius Smart Meter TS, e.g. modifications and alterations, are not permitted. Unauthorised interventions will void the warranty and warranty claims and, as a rule, void the user's authority to operate the equipment. The manufacturer shall not be liable for any damage resulting from such use.

Reasonably foreseeable misuse:
The Fronius Smart Meter TS is not suitable for the supply of life-sustaining medical devices or for the billing of subtenants.
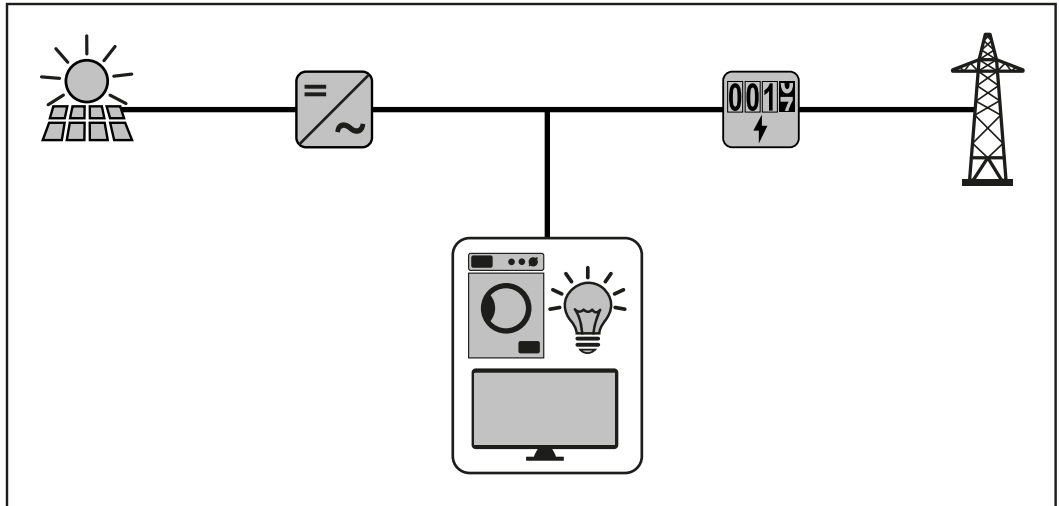
Scope of supply
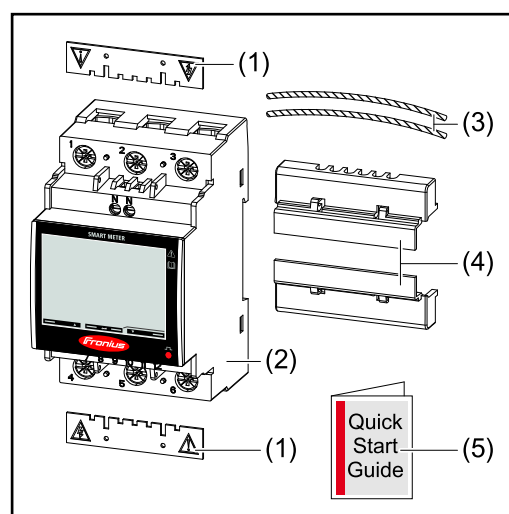
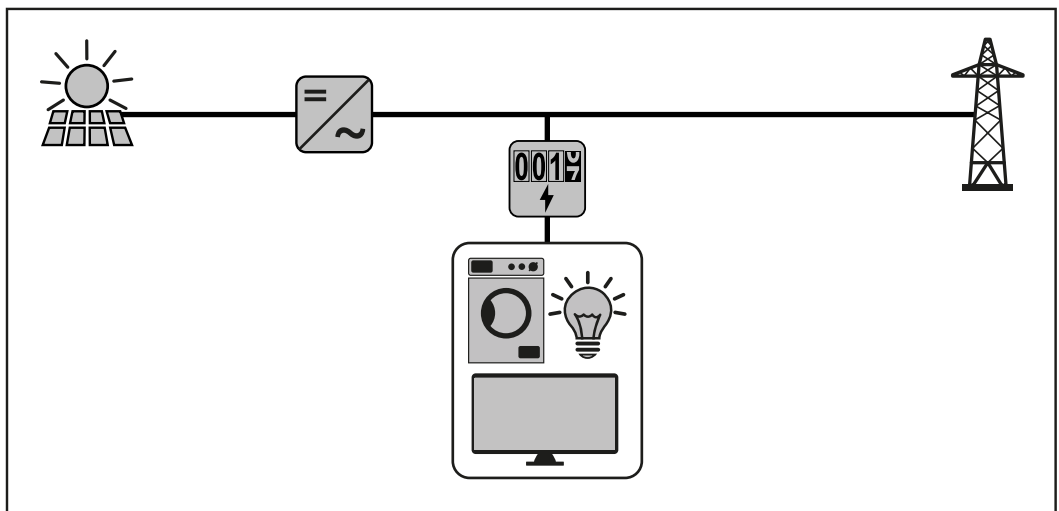| (1)	2x protective cover
(2)	Fronius Smart Meter TS 65A-3
(3)	2x seal wire
(4)	2x connection cover
(5)	Quick Start guide

Positioning

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

Positioning at the feed-in point:

Positioning at consumption point:

For use as a secondary meter to measure individual loads and producers, see chapter **Multi-meter system - Fronius SnapINverter** on page **24**.

Installation

Installation

Checklist for installation

For installation information, see the following chapters:

1 Switch off the power supply before establishing a mains connection.

2 Mount the Fronius Smart Meter TS (see "**Installation**" on page **17**).

3 Connect automatic circuit breakers or automatic circuit breakers and disconnectors (see"**Protective circuit**" on page **17**).

4 Connect the mains cable to the Fronius Smart Meter TS (see "**Cabling**" on page **18**).

5 Fit the protective cover for the terminals (see "**Fitting the protective cover for the terminals**" on page **19**).

6 Connect the data communication connections of the Fronius Smart Meter TS to the Fronius system monitoring using a suitable cable (see "**Connecting the data communication cable to the inverter**" on page **19**).

7 If necessary, set terminating resistors (see "**Connecting the terminating resistor**" on page **21**).

8 Tug on each wire and plug to make sure that they are securely connected to the terminal blocks.

9 Switch on the power supply to the Fronius Smart Meter TS.

10 Check the firmware version of the Fronius system monitoring. To ensure compatibility between the inverter and the Fronius Smart Meter TS, the software must always be kept up to date. The update can be started via the inverter web page or using Solar.web.

11 If several Fronius Smart Meter TS are installed in the system, set the address (see "Setting the address" under "**Setting the address on the Fronius Smart Meter TS**" on page **31**).

12 Configure and commission the meter (see **Start-up** on page **33**).

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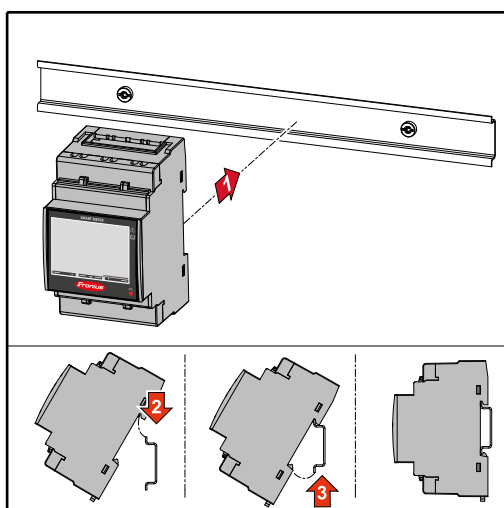
The Fronius Smart Meter TS can be mounted on a 35 mm DIN rail. The housing comprises 3 modules according to DIN 43880.

Protective circuit

The Fronius Smart Meter TS is a hard-wired device and requires a disconnecting device (circuit breaker, switch or disconnector) and overcurrent-protection (automatic-circuit breaker).

The Fronius Smart Meter TS consumes 10 - 30 mA, the nominal capacity of the disconnecting devices and the overcurrent-protection is determined by the wire thickness, the mains voltage and the required breaking capacity.

- Disconnecting devices must be mounted within sight and as close as possible to the Fronius Smart Meter TS; they must also be easy to use.
- 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.
- Use overcurrent-protection rated for max. 65 A.
- To monitor more than one mains voltage, use connected-automatic circuit breakers.
- The overcurrent-protection must protect the mains terminals with the designations L1, L2 and L3. In rare cases, the neutral conductor has an overcurrent-protection, which must interrupt both neutral and non-earthed cables concurrently.

Cabling

IMPORTANT!
Always switch off the power supply before connecting the mains voltage inputs to the Fronius Smart Meter TS.

Recommended thickness of stranded mains voltage cables for the terminals of the measuring input and measuring output:
- Wire: 1 - 16 mm²
- Recommended torque: max. 2.8 Nm

Recommended thickness of stranded wires for data communication terminals:
- Wire: min. 0.05 mm²
- Recommended torque: max. 0.4 Nm

Connect each voltage cable to the terminal strip as shown in the graphics below.
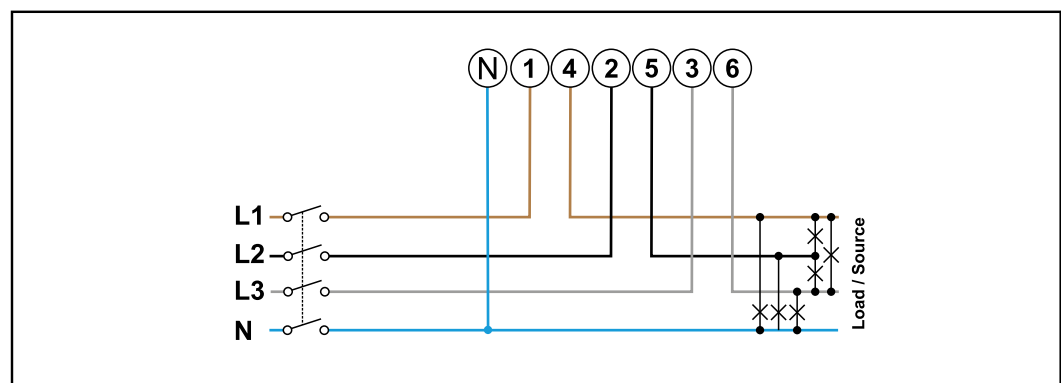
3 phases, 4 conductors
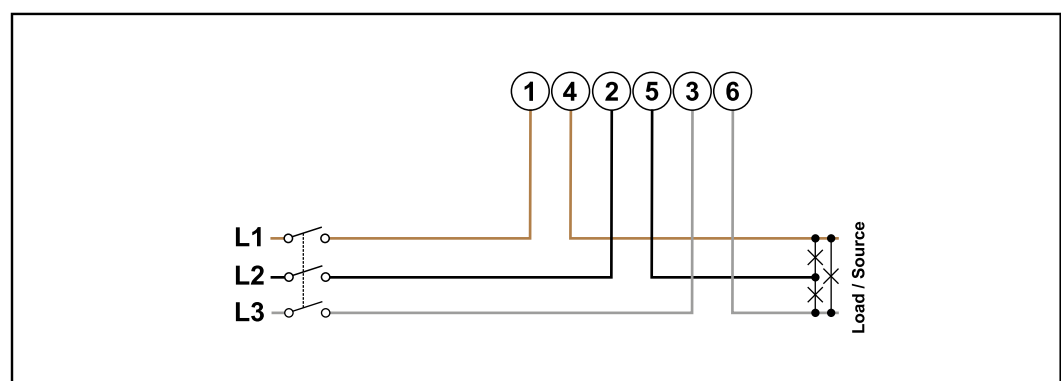
3 phases, 3 conductors
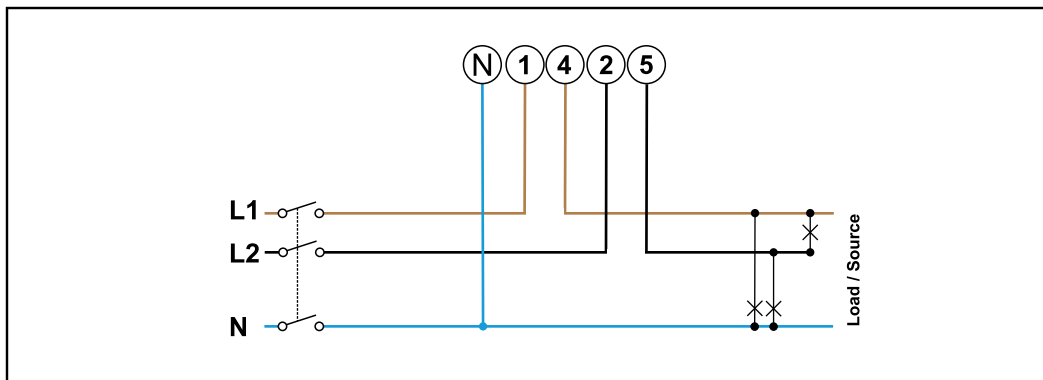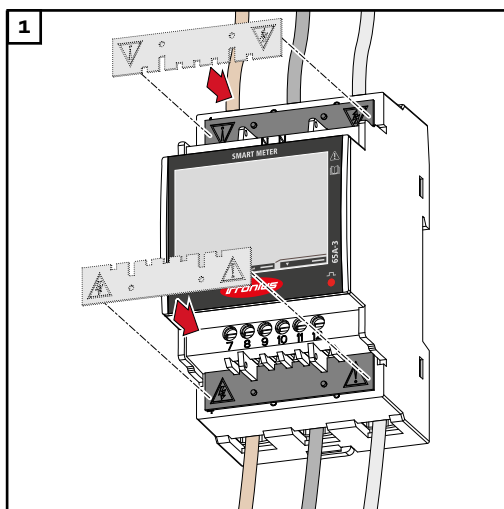
2 phases, 3 conductors

> ⚠️ **WARNING!**
>
> **Danger from mains voltage.**
> An electric shock can be fatal.
> ▶ Always switch off the power supply before connecting the mains voltage inputs to the Fronius Smart Meter TS.

Fitting the protective cover for the terminals

Insert the protective covers into the guides and press firmly.

> ⚠️ **WARNING!**
>
> **Danger due to electrical voltage from missing or improperly fitted protective covers.**
> An electric shock can be fatal and/or cause serious damage to property.
> ▶ Fit the protective covers immediately after installing the live cables.
> ▶ Fit the protective covers properly and check that they are secure.

Connecting the data communication cable to the inverter

Connect the data communication connections of the Fronius Smart Meter TS to the Modbus interface of the Fronius inverter using a network cable (type CAT5 or higher).

Several Smart Meters can be installed in the system, see chapter **Multi-meter system - Fronius SnapINverter** on page **24**.

19
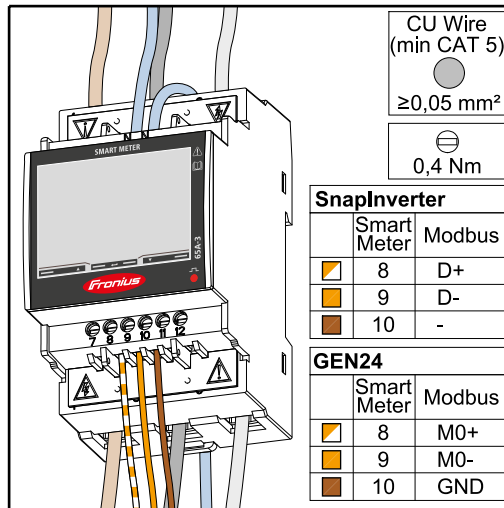
To avoid interference, the terminating resistor must be used (see chapter **Connecting the terminating resistor** on page **21**).

CU Wire (min CAT 5) ≥0,05 mm²
0,4 Nm

SnapInverter

	Smart Meter	Modbus
▨	8	D+
▨	9	D-
▨	10	-

GEN24

	Smart Meter	Modbus
▨	8	M0+
▨	9	M0-
▨	10	GND

IMPORTANT!

More information on successful commissioning.
Note the following information about connecting the data communication cable to the inverter.

- Use network cables of type CAT5 or higher.
- Use a mutual twisted cable pair for corresponding data lines (D+/D-, M1+/M1-).
- If the data lines are close to the mains cabling, use wires or cables that are designed for 300 to 600 V (never less than the operating voltage).
- Use double-insulated or sheathed data lines when they are close to bare conductors.
- Use shielded twisted pair cables to avoid faults.
- Two wires can be installed in each terminal; the wires are twisted first, inserted into the terminal and tightened.
  Note: A loose wire can disable an entire area of the network.
- The data communication connections of the Fronius Smart Meter TS are electrically isolated from hazardous voltages.

Terminating resistors - Explanation of symbols

Inverter in the system
e. g. Fronius Symo

Meter - Fronius Smart Meter TS
Terminating resistor R 120 Ohm is set with a wire jumper between **M-** and **T**.
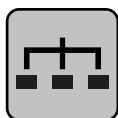
Modbus RTU slave
e. g. Fronius Ohmpilot, Fronius Solar Battery, etc.
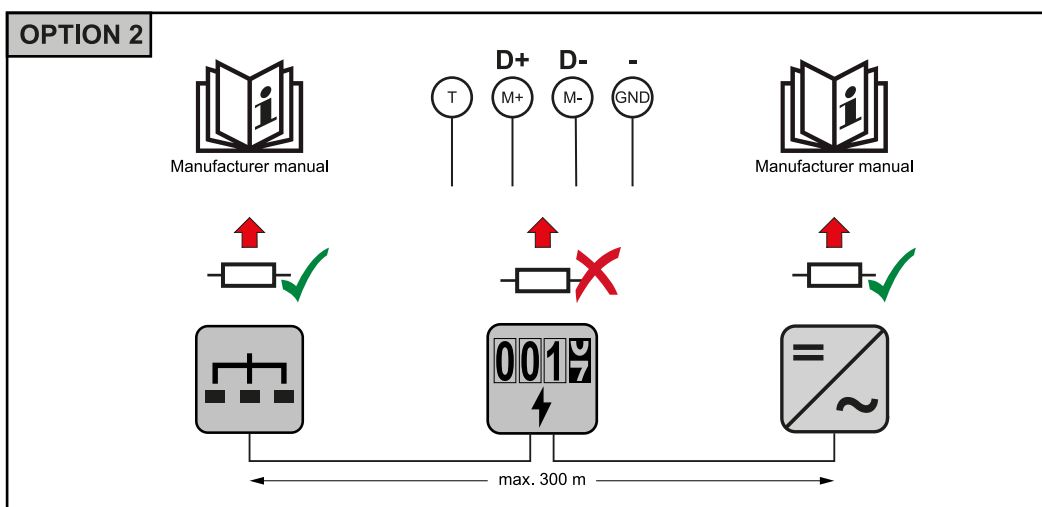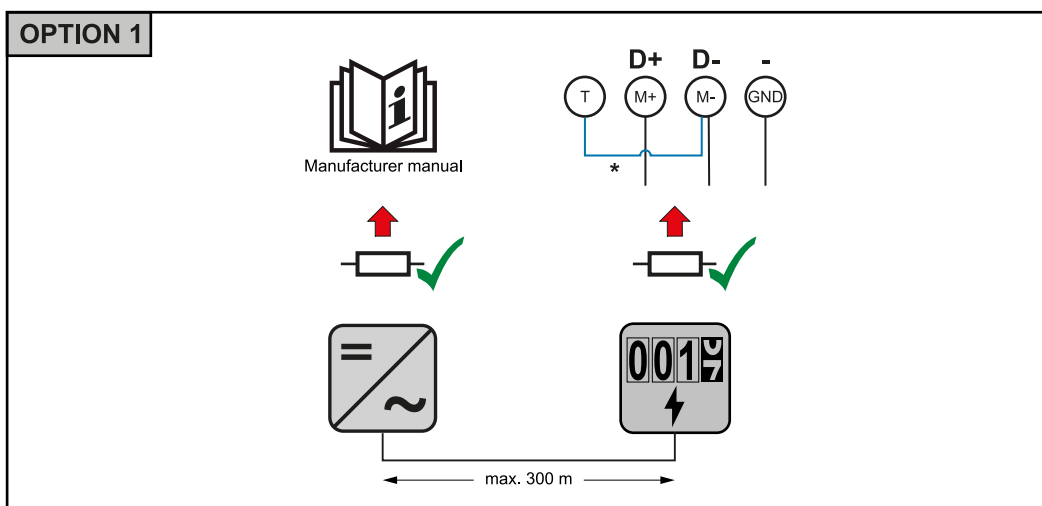

Terminating resistor
R 120 Ohm

Connecting the terminating resistor
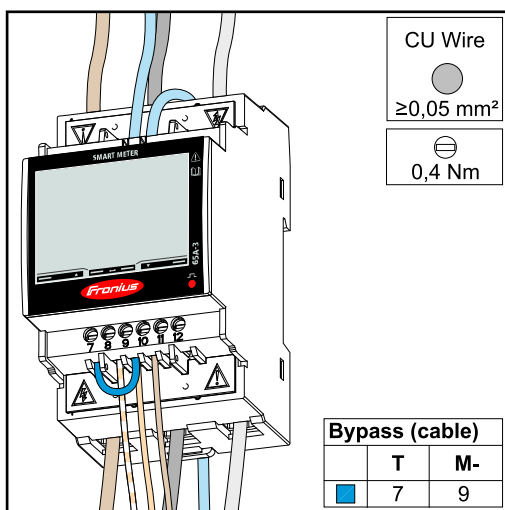
CU Wire
⬤
≥0,05 mm²

⊖
0,4 Nm

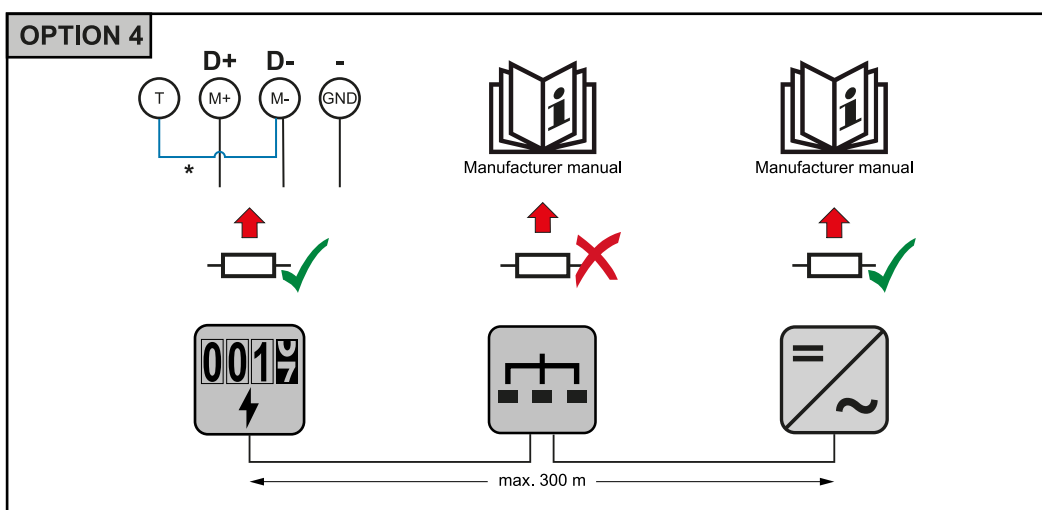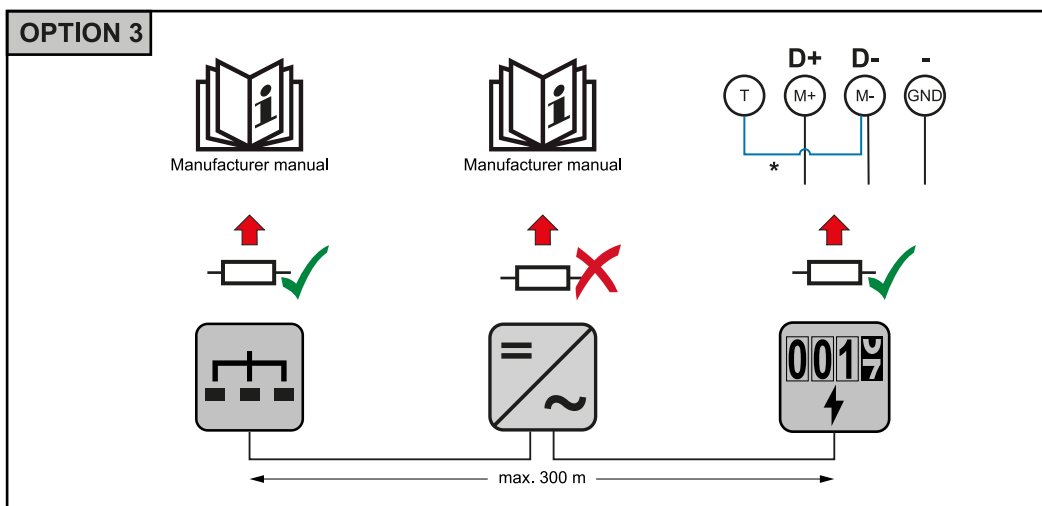| Bypass (cable)		
	T	M-
🟦	7	9

The terminating resistor is integrated in the Fronius Smart Meter TS and is manufactured with a bridge between the **M** and **T** connections (T = termination).

Terminating resistors

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

OPTION 1

Manufacturer manual

D+   D-   -

T   M+   M-   GND

*

max. 300 m

OPTION 2

Manufacturer manual

D+   D-   -

T   M+   M-   GND

Manufacturer manual

max. 300 m

OPTION 3

Manufacturer manual

Manufacturer manual

D+   D-   -

T   M+   M-   GND

*

max. 300 m

OPTION 4

D+   D-   -

T   M+   M-   GND

*

Manufacturer manual

Manufacturer manual

max. 300 m

* The terminating resistor is integrated in the Fronius Smart Meter TS and is manufactured with a bridge between the **M** and **T** connections (T = termination).

Mounting the connection cover

1
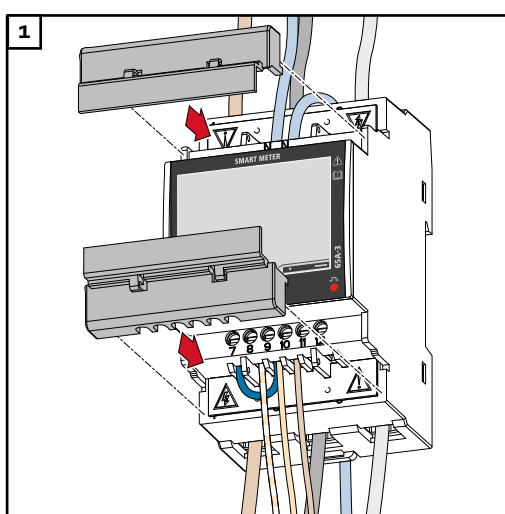
Insert the connection covers into the guides and press firmly.

IMPORTANT!
When fitting the connection covers, ensure that the cables are not kinked, pinched, crushed or otherwise damaged.

Multi-meter system - Explanation of symbols
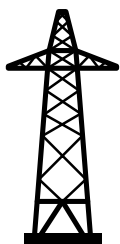
Grid
supplies the loads in the system if insufficient power is being generated by the PV modules or supplied by the battery.

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

Utility meter
Measures the measurement data relevant for billing amounts of energy (in particular kilowatt hours of energy sourced from the grid and energy fed into the grid). Based on the relevant billing data, the electricity retailer will invoice the energy sourced from the grid and the purchaser of the surplus energy will reimburse the energy fed into the grid.

Primary meter
Records the system's load curve and provides measurement data for energy profiling in Fronius Solar.web. The primary meter also controls the dynamic feed-in control.
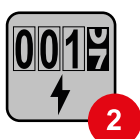
Secondary meter
Records the load curve of individual loads (e.g. washing machine, lamps, TV, heat pump, etc.) in the consumption branch and provides measurement data for energy profiling in Fronius Solar.web.

Producer meter
Records the load curve of individual producers (e.g. wind power plant) in the consumption branch and provides measurement data for energy profiling in Fronius Solar.web.
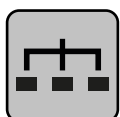
Modbus RTU slave
e. g. Fronius Ohmpilot, Fronius Solar Battery, etc.
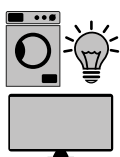
Loads in the system
e. g. washing machine, lamps, TV, etc.

Additional loads in the system
e. g. heat pump

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

Terminating resistor
R 120 Ohm

Modbus participants - Fronius SnapInverter

A maximum of 4 Modbus participants can be connected to the Modbus terminal.

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:

Input	Battery	Fronius Ohmpilot	Quantity Primary meter	Quantity Secondary meter
Modbus	✓	✓	1	0
	✓	✗	1	1
	✗	✓	1	2
	✗	✗	1	3

Multi-meter system - Fronius SnapINverter

If several Fronius Smart Meter TS are installed, a separate address must be set for each (see **Setting the address on the Fronius Smart Meter TS** on page **31**). The primary meter is always assigned address 1. All the other meters are numbered consecutively with the address range from 2 to 14. Different Fronius Smart Meter power categories can be used in combination.

IMPORTANT!
Max. Use 3 secondary meters in the system. To avoid interference, it is recommended to install the terminating resistors according to chapter **Connecting the terminating resistor** on page **21**.
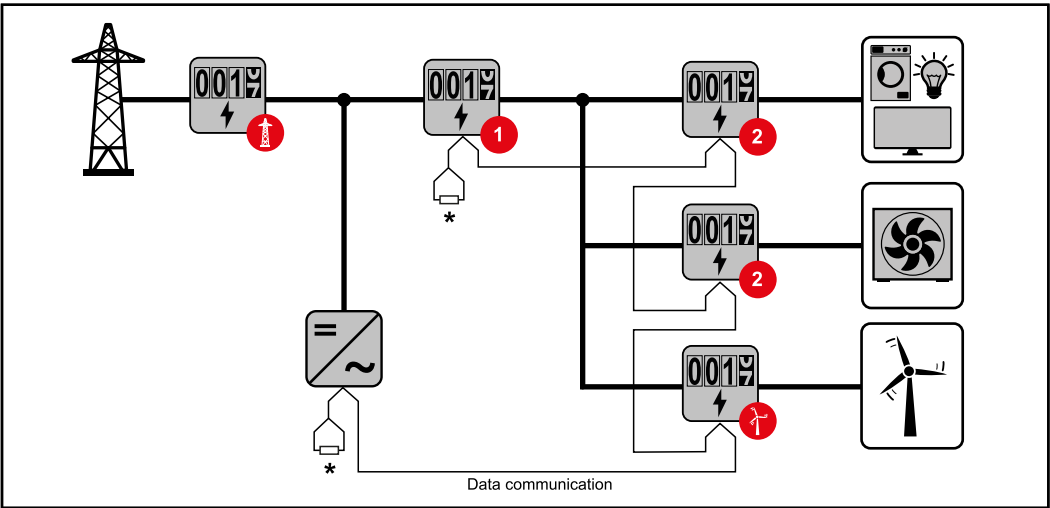
*Location of the primary meter in the consumption branch. *Terminating resistor R 120 Ohm*
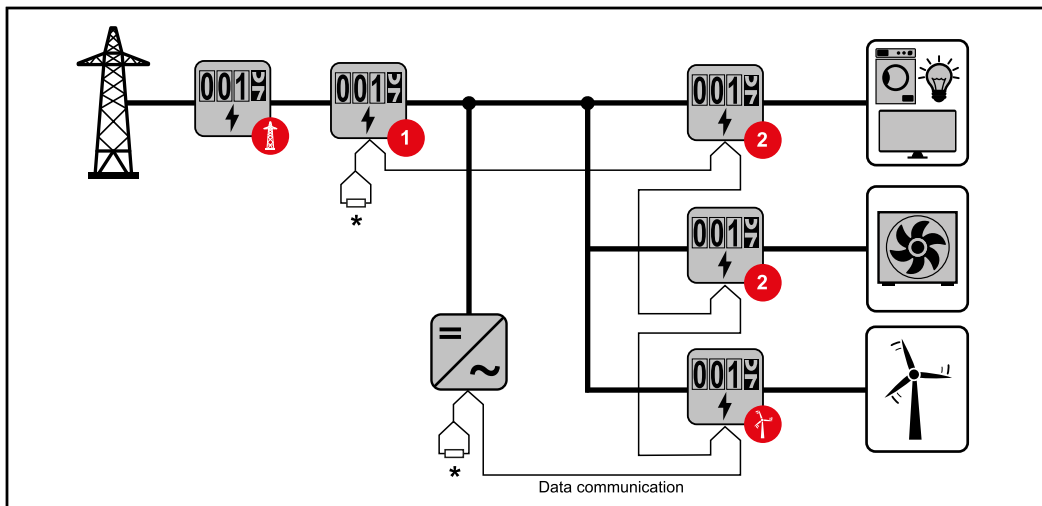
*Location of the primary meter at the feed-in point. *Terminating resistor R 120 Ohm*

The following must be observed in a multi-meter system:
- Only assign each Modbus address once.
- Terminating resistors must be positioned individually for each channel.

Modbus parti-cipants - Fronius GEN24

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

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	Quantity Primary meter	Quantity Secondary meter
Modbus 0 (M0)	✘	✘	0	4
	✔	✘	0	2
	✔	✔	0	1
Modbus 1 (M1)	✘	✘	1	3

Example 2:

Input	Battery	Fronius Ohmpilot	Quantity Primary meter	Quantity Secondary meter
Modbus 0 (M0)	✗	✗	1	3
Modbus 1 (M1)	✗	✗	0	4
	✓	✗	0	2
	✓	✓	0	1

Multi-meter system - Fronius GEN24 inverter

If several Fronius Smart Meter TS are installed, a separate address must be set for each (see **Setting the address on the Fronius Smart Meter TS** on page **31**). The primary meter is always assigned address 1. All the other meters are numbered consecutively with the address range from 2 to 14. Different Fronius Smart Meter power categories can be used in combination.

IMPORTANT!
Max. Use 7 secondary meters in the system. To avoid interference, it is recommended to install the terminating resistors according to chapter **Connecting the terminating resistor** on page **21**.
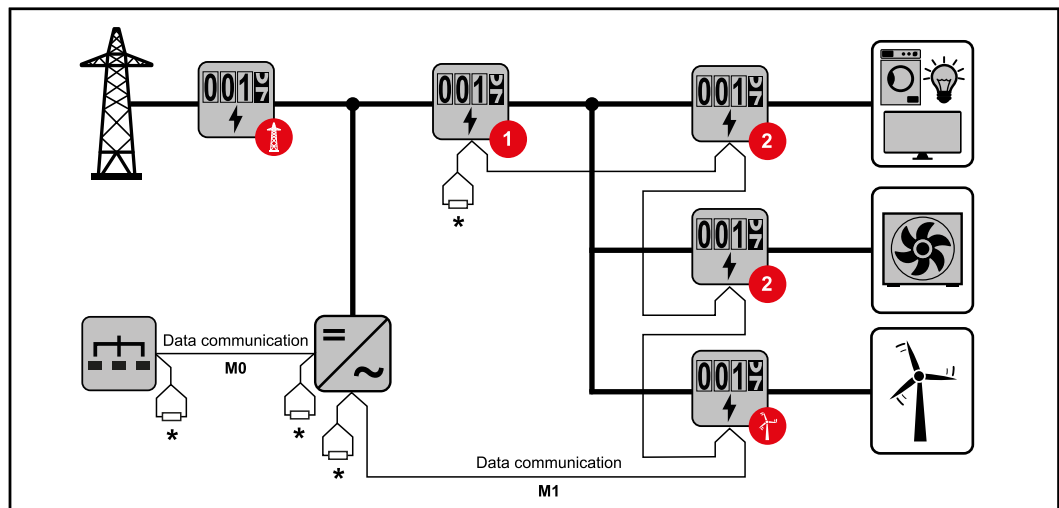
*Location of the primary meter in the consumption branch. *Terminating resistor R 120 Ohm*
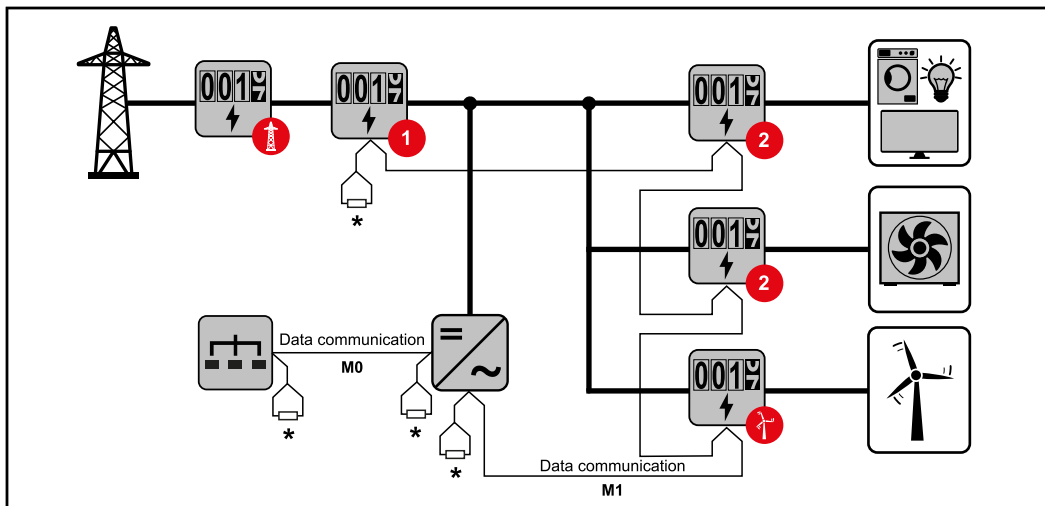
Location of the primary meter at the feed-in point. *Terminating resistor R 120 Ohm

The following must be observed in a multi-meter system:
- Connect the primary meter and the battery to different channels (recommended).
- The remaining Modbus participants must be distributed equally.
- Only assign each Modbus address once.
- Terminating resistors must be positioned individually for each channel.

Menu - Measured variables

Image	Screen	Description
	00	1. Total active energy drawn* 2. Total efficiency
	01	1. Total active energy supplied** 2. Total efficiency
	02	1. Total active energy drawn* 2. Average conductor voltage in the system
	03	1. Total active energy drawn* 2. Average phase voltage in the system

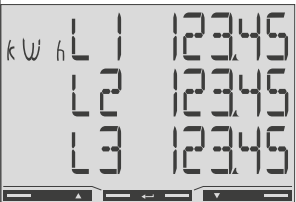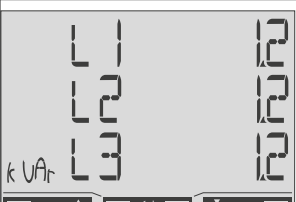| Image	Screen	Description
kWh 12345678 Pf L 0.98	04	1. Total active energy drawn* 2. Power factor (**L** = inductive, **C** = capacit-ive)
kWh 12345678 Hz 50.0	05	1. Total active energy drawn* 2. Frequency
kVArh 12345678 kVAr 1.2	06	1. Total active energy drawn* 2. Total reactive power
kVArh -- 1234 kVAr 1.2	07	1. Total reactive energy supplied** 2. Total reactive power
kWh 12345678 kVA 12.3	08	1. Total active energy drawn** 2. Total apparent power
kWh 12345678 P 12.3 kW dMd 12.3	09	1. Total active energy drawn* 2. Maximum demanded power (**P** = Peak de-mand) that has been reached since the last reset. 3. Average demanded power (**dMd** = de-mand), calculated for the set interval. The value remains unchanged for the en-tire interval. It is "0" in the first interval after the start.
kWh 12345678 t1 kW 12.3	10	- Not used
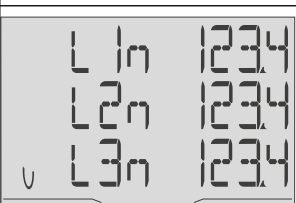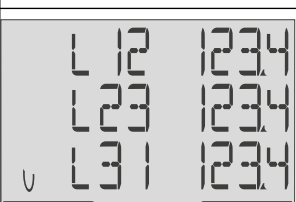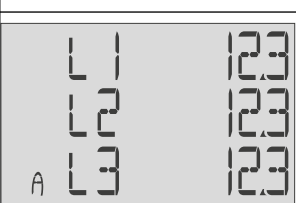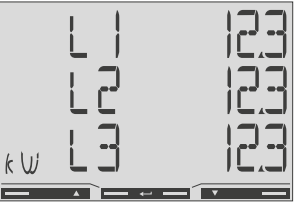
Image	Screen	Description
kWh 12345678 t2 kW 12.3	11	- Not used
kWh L1 123.45 L2 123.45 L3 123.45	12	1. Active energy drawn*
L1 12.3 L2 12.3 L3 12.3 kVA	13	1. Apparent power
L1 12 L2 12 L3 12 kVAr	14	1. Reactive energy drawn
L1 L0.98 L2 --L0.98 L3 --C0.98 Pf	15	1. Power factor (**L** = inductive, **C** = capacitive)
L1n 123.4 L2n 123.4 L3n 123.4 V	16	1. Phase voltage
L12 123.4 L23 123.4 L31 123.4 V	17	1. Conductor voltage
L1 12.3 L2 12.3 L3 12.3 A	18	1. Current

Image	Screen	Description
	19	1. Effective power

*   Displayed when easy connection mode is activated (**measurement** = A). This value indicates the total energy without considering the direction.

**   Factory setting - displayed when drawn and delivered energy are measured separately (**measurement** = b).

Configuration menu - structure and parameters

Screen	Code	Description	Values
PASS***	P1	Enter the current password	2633*
nPASS	P2	Password change **	Four digits (0000-9999)
SYStEM	P3	Type of system	3Pn*: three-phase system, 4-core 3P: three-phase system, 3-core 2P: two-phase system, 3-core
MEASurE	P6	Measurement mode **	A: easy connection, measures all energy without taking the direction into account. B*: measures imported and exported energy separately.
InStALL	P7	Connection check	On: activated Off*: deactivated
P int	P8	Average power calculation interval (minutes)	1* - 30
MOdE	P9	Display mode **	Full*: full display Easy: reduced display. The values that are not displayed are still transmitted via the serial interface.
tArIFF	P10	Tariff management **	On: activated Off*: deactivated
HoME	P11	Screen showing measured variables displayed at startup and after 120 seconds of inactivity **	For full display (Mode = Full): 0 - 20*
Ad-drESS***	P14	Modbus address	1* - 247
bAUd	P15	Baud rate (kBit/s) **	9.6* / 19.2 / 38.4 / 57.6 / 115.2
PArITY	P16	Parity **	Even/No*

| Screen	Code	Description	Values
STOP bit	P16-2	Only if parity = No. Stop bit. **	1* / 2
rESET	P17	Activation of the reset function for energy tariffs, maximum requested power and part values of active and reactive energy (the latter are only transmitted via the serial interface) **	No*: reset function deactivated. Yes: reset function activated.
End	P18	Returns to the measured variables start screen	None

*   Factory settings

**   The settings can be protected by changing the default password (password cannot be reset).

***   Settings that need to be configured.

**Setting the address on the Fronius Smart Meter TS**

Symbol	Name	Event	Function
▬▬▬▬ ▲	Up	1 x 🖑	Scroll one screen forward, increase the value by 1
▼ ▬▬▬▬	Down	1 x 🖑	Scroll one screen back, decrease the value by 1
▬▬ ↵ ▬▬	Enter	2 seconds 🖑	Call up settings, confirm value

SMART METER
PASS
2633
P1   PrG
65A-3
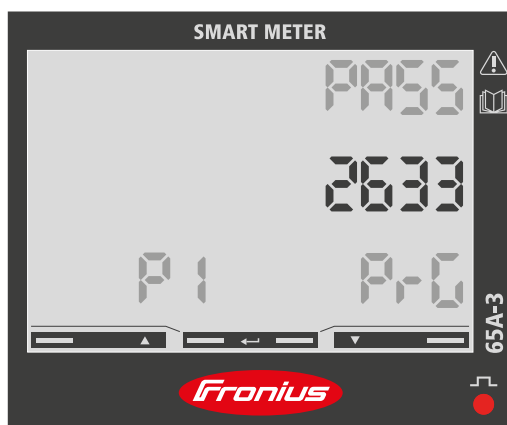
1 Press and hold "Enter" for 2 seconds.

2 Use "Up" or "Down" to access the P1 screen.

3 Set password "2633" with "Up" and "Down" and confirm each individual value with "Enter".

4 Note down the password.

IMPORTANT!
The password cannot be reset.

SMART METER
AddrESS
001
P14   PrG
65A-3
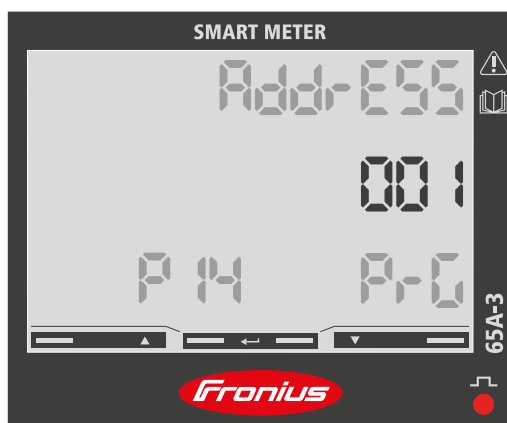
1 Use "Up" or "Down" to access the P14 screen.

2 Press and hold "Enter" for 2 seconds.

3 Set the address with "Up" and "Down" and confirm each individual value with "Enter".

4 Press "Up" to access screen P18 and press and hold "Enter" for 2 seconds to exit the settings.

Start-up

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.

Three-phase or single-phase Fronius Smart Meter TS can be used. In both cases, the selection is made under the "Fronius Smart Meter" item. The Fronius Datamanager 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.

Connecting to the Fronius Datamanager

Access point:

1	Select the "Setup" menu on the inverter display and enable the "Wi-Fi Access Point".
2	Establish the connection to the inverter in the network settings (the inverter is displayed with the name "Fronius_240.XXXXXX").
3	Password: Enter 12345678 and confirm.
4	In the browser address bar, enter and confirm the IP address **http://192.168.250.181** and confirm.

The Fronius Datamanager start page is displayed.

LAN:

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

Configuring the Fronius Smart Meter TS as the primary meter

1	Go to the Fronius Datamanager website.
	- Open the web 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 Fronius Datamanager and confirm.
	- The Fronius Datamanager website will be displayed.
2	Click the "Settings" button.
3	Log in to the login area with the "service" user and the service password.
4	Call up the "Meter" menu area.
5	Select the primary meter from the drop-down list.
6	Click the "Settings" button.
7	In the pop-up window, set the position of the meter (feed-in point or consumption point). For more information on the position of the Fronius Smart Meter TS, see **Positioning** on page **13**.
8	Click the "Ok" button when the OK status is displayed. If the *Timeout* status is displayed, try again.

| 9 | Click the ☑ button to save the settings. |

The Fronius Smart Meter TS is configured as a 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 the Fronius Smart Meter TS as a secondary meter

1	Go to the Fronius Datamanager website.
	- Open the web 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 Fronius Datamanager and confirm.
	- The Fronius Datamanager website will be displayed.
2	Click the "Settings" button.
3	Log in to the login area with the "service" user and the service password.
4	Call up the "Meter" menu area.
5	Select the secondary meter from the drop-down list.
6	Click the "Add" button.
7	Enter the name of the secondary meter in the "Name" input field.
8	Enter the previously assigned address in the "Modbus address" input field.
9	Add meter description.
10	Click the ☑ button to save the settings.

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

Fronius GEN24 inverter

General

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

The service password must be entered in order to access the "Device configuration" menu item.

Three-phase or single-phase Fronius Smart Meter TS can be used. In both 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.

Installation using the web browser

WLAN:

open access point

FRONIUS_PILOTxxx
Secured

Password:
12345678

192.168.250.181
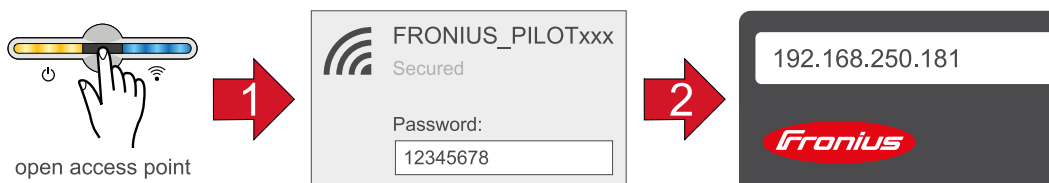
Fronius

| 1 | Open the access point by touching the sensor once 👆 → Communication LED: flashes blue. |

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

| 3 | Password: enter 12345678 and confirm.
IMPORTANT!
To enter the password on a Windows 10 operating system, the link "Connect using a security key instead" must first be activated to establish a connection with the password: 12345678. |

| 4 | In the browser address bar, enter and confirm the IP address 192.168.250.181. The installation wizard is opened. |

| 5 | Follow the installation wizard in the individual sections and complete the installation. |

| 6 | Add system components in Solar.web and start up the PV system. |

The network wizard and the product setup can be carried out independently of each other. A network connection is required for the Solar.web installation wizard.

Ethernet:

LAN 1

open access point

169.254.0.180

Fronius
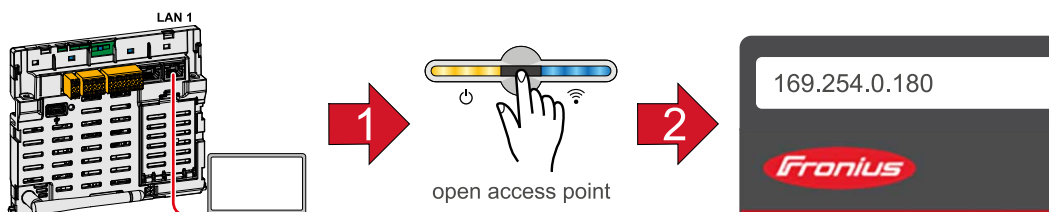
1 Establish a connection to the inverter (LAN1) with a network cable (CAT5 STP or higher).

2 Open the access point by touching the sensor once 🖑 → Communication LED: flashes blue.

3 In the browser address bar, enter and confirm IP address 169.254.0.180. The installation wizard is opened.

4 Follow the installation wizard in the individual sections and complete the installation.

5 Add system components in Solar.web and start up the PV system.

The network wizard and the product setup can be carried out independently of each other. A network connection is required for the Solar.web installation wizard.

Configuring the Fronius Smart Meter TS as the primary meter

1 Access the inverter website.
- Open the web 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 inverter website 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 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 TS, see **Positioning** on page **13**.

7 Click the "Add" button.

8 Click the "Save" button to save the settings.

The Fronius Smart Meter TS is configured as a primary meter.

Configuring the Fronius Smart Meter TS as a secondary meter

1 Access the inverter website.
- Open the web 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 inverter website 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 In the "Position" drop-down list, select the meter type (producer/load meter).

7 Enter the previously assigned address in the "Modbus address" input field.

8 Enter the name of the meter in the "Name" input field.

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

10 Click the "Add" button.

11 Click the "Save" button to save the settings.

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

Technical data

Technical data

Modbus transmission speed: 9600 baud
Parity bit:none

Software version:
- Fronius Datamanager 2.0 (from version 3.16.1 onwards)
- Fronius Symo Hybrid (from version 1.16.1 onwards)

Measuring input	
Nominal voltage Operating range	208 - 400 V 166.4 - 480 V
Power consumption in the voltage path (max. voltage)	≤ 10 VA
Nominal frequency Tolerance	50 - 60 Hz 45 - 65 Hz
Nominal current, I_b	5 A
Maximum current, I_{max}	65 A
Starting current	20 mA
Short-time overload (EN IEC 62053-21, EN IEC 62053-23)	30 I_{max} / 0.001 s
Self-consumption - current path (max. current)	≤ 1 W
Power factor Operating 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 distortion factor	in acc. with EN 50470

Data output	
RS485 communication Electrically isolated from measuring input	
Standard	RS485 - 3 conductors
Transmission	Serial, asynchronous
Protocol	Compatible with Modbus RTU
Addresses	1 - 255
Number of bits	8
Stop bit	1
Parity bit	None - odd - even
Baud rate	300, 2400, 9600 bit/s
Response time	≤ 200 ms

Insulation (EN IEC 62052-11, EN IEC 62053-21)	
Installation category	III
Pollution degree	2

Insulation (EN IEC 62052-11, EN IEC 62053-21)	
Insulation voltage	4 kVAC RMS (1min)

Electromagnetic compatibility	
Emission test	In acc. with EN IEC 62052-11, EN 50470-3
Immunity test	In acc. with EN IEC 62052-11, EN 50470-3

Operating conditions	
Reference temperature	25 °C (±5 °C)
Operating range	-25 bis +55 °C
Temperature limit for storage and transport	-30 to +80 °C
Mechanical environment Electromechanical environment	M2 E2

Housing	
Housing	3 modules according to DIN 43880
Sealable housing/terminal cover	
Connection	Screw connection
Mounting	Can be snapped onto 35 mm DIN rail
Housing material	Noryl, self-extinguishing
Degree of protection (EN 60529)	IP51 housing, IP20 connections
Weight	240 grams

Terminals	
Measuring input	
Wire	min. 1 mm² / max. 16 mm²
Recommended torque	max. 2.8 Nm

Data output	
Wire	min 0.05 mm²
Recommended torque	max. 0.4 Nm

Fronius manu-facturer's war-ranty

Detailed, country-specific warranty terms are available on the internet: www.fronius.com/solar/warranty

To obtain the full warranty period for your newly installed Fronius inverter or storage system, please register at: www.solarweb.com.

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products-solutions/moni-
toring-digital-tools

**MONITORING &
DIGITAL TOOLS**

Fronius International GmbH
Froniusstraße 1
4643 Pettenbach
Austria
contact@fronius.com
www.fronius.com

Under www.fronius.com/contact you will find the addresses
of all Fronius Sales & Service Partners and locations.

User Information

Einspeisebegrenzung Fronius Smart Meter

Fronius Smart Meter feed-in limitation

Contents

General information

Important notes about this document

Purpose of this document

Energy companies or grid operators may stipulate feed-in limitations for an inverter (e.g. 70% of the maximum power or max. 5 kW). This document describes the technical options for limiting the grid feed-in of Fronius inverters using the Fronius Smart Meter.

Target group

This User Information is intended exclusively for qualified personnel.

Feed-in limitation options

SnapINverters equipped with Datamanager 2.0 and the GEN 24 inverters offer the possibility of dynamic feed-in limitation. The self-consumption in the household is taken into account first, before the feed-in limitation is activated. This can be configured via external control by means of digital inputs, Modbus (RTU, TCP protocols) or using the Fronius Smart Meter.

The simplest way to limit feed-in with Fronius inverters is to use the Fronius Smart Meter. The Smart Meter measures the amount of energy fed into the grid or drawn from the grid. The inverter uses these values to calculate the appropriate output power to limit the feed-in to the grid.

This document describes how to set the feed-in limitation when using a single or 3-phase Fronius Smart Meter.

Setting the feed-in limitation

Requirements

Positioning and mounting the Fronius Smart Meter

The Fronius Smart Meter can be installed at two possible locations in the system: at the feed-in point and at the consumption point. The installation of a Fronius Smart Meter varies depending on the device type and is described in the "Installation" chapter of the Fronius Smart Meter Operating Instructions.

Wiring and configuring the Fronius Smart Meter

> ⚠ **WARNING!**
>
> **Electric shock**
> An electric shock can be fatal.
> ▶ Switch off the power supply before connecting the mains voltage inputs to the Fronius Smart Meter.

Carry out installation and configuration of the Fronius Smart Meter in accordance with the Operating Instructions. Observe the connection diagram shown.

Datamanager 2.0 user interface

Software requirements

To enable trouble-free operation, software version **3.16.x-x** or higher must be installed on the Fronius Datamanager 2.0. Current software versions can be downloaded from the download area of the Fronius website.

Connecting to the Fronius Datamanager

Access point:

1	Select the **"Setup"** menu on the inverter display.
2	Activate the **"Wi-Fi Access Point"**.
3	Establish the connection to the inverter in the network settings (the inverter is displayed with the name "Fronius_240.XXXXXX").
4	Enter the password **12345678**.
5	Acknowledge entries.
6	In the browser address bar, enter the IP address **http://192.168.250.181** and call it up.

The Fronius Datamanager 2.0 start page is displayed.

LAN:

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

The Fronius Datamanager 2.0 start page is displayed.

Activating the Fronius Smart Meter on the inverter

The individual activation steps are described in the Fronius Smart Meter Operating Instructions. To log in to the user interface, select the **"service"** user and enter the service password.

Setting the feed-in limitation

To set the feed-in limitation on the user interface, click on **"settings"** in the right menu bar. Then select the **"service"** user and enter the service password available to the authorised specialist. Proceed as follows to implement the setting:

Call up **"DNO-Editor"** in the menu bar.

Select the **"entire system"** option in the **"Dynamic power reduction"** menu item. This means that the feed-in limitation applies to the entire system, even if several inverters are present.

Alternatively, select **"weakest phase"** to set a phase-accurate feed-in limitation. Each individual phase is measured. If the permissible feed-in limit is exceeded on one phase, the total power of the inverter is reduced until the value on the affected phase is permissible again. This setting is only necessary if required by national standards and regulations. The value of the permissible power of feeding in per phase must be set.

The **DC system power** is set for setting the maximum power of feeding in to the public grid. The power is entered in watts or as a percentage of the system power, as a **"Soft Limit"** or **"Hard Limit Trip"**. At least one of these options must be enabled.
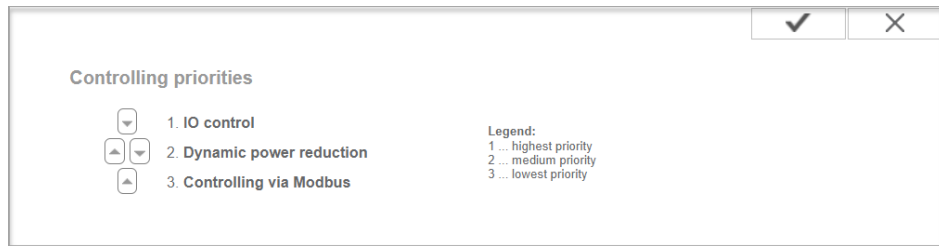
"Soft Limit"
If this value is exceeded, the inverter will regulate down to the set value within the time required by national standards and regulations.

"Hard Limit Trip"
If this value is exceeded, the inverter switches off within 5 seconds. This value must be higher than the value set for **"Soft Limit"**.

Confirm the changes and switch to the next menu item **"Control priorities"**.

Controlling priorities

1. IO control
2. Dynamic power reduction
3. Controlling via Modbus

Legend:
1 ... highest priority
2 ... medium priority
3 ... lowest priority

To prioritise the feed-in limitation, set **"Dynamic power reduction"** as **priority 1** and confirm the selection. Setting the feed-in limitation is complete.

⚠️ **IMPORTANT!**

If several inverters are connected, the feed-in limitation is divided between the devices depending on the available power.

Fronius GEN24 Web Interface

Activating the Fronius Smart Meter on the inverter

Activation is described in the Fronius Smart Meter Operating Instructions. To log in to the web interface, select the "Technician" user and enter the technician password.

Feed-in limitation

The settings for feed-in limitation on the web interface of the GEN 24 inverters are located in a submenu that is only enabled by the "Technician" user. Activation takes place during the course of inverter start-up by a qualified specialist.

After activation, the "Safety and grid regulations" menu can be selected. Here, there are various options for limiting the power of feeding in:
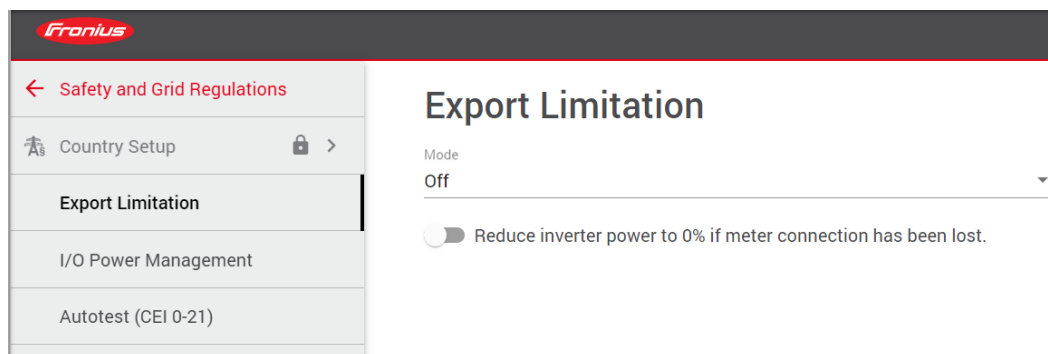
⚠️ **IMPORTANT!**

All changes to the following values and functions must be confirmed by "Save".

CANCEL	SAVE

"Off"
The inverter converts the entire available PV power and feeds it into the public grid.

"Limit for entire system"
The entire photovoltaic system is limited in accordance with a set feed-in limit.
The value of the permissible total feed-in power must be set.

"Limit per phase"
Each individual phase is measured. If the permissible feed-in limit is exceeded on one phase, the total power of the inverter is reduced until the value on the affected phase is permissible again (see example below). This setting is only necessary if required by national standards and regulations. The value of the permissible power of feeding in per phase must be set.

"Total DC system power"
Input field for the total DC system power in Wp.
This value is used if the maximum permitted feed-in power of the entire system is specified in %.

"Soft Limit"
If this value is exceeded, the inverter will regulate down to the set value within the time required by national standards and regulations.

"Hard Limit"
If this value is exceeded, the inverter switches off within max. 5 seconds. This value must be higher than the value set for **"Soft Limit"**.

"Maximum power of feeding in"
Input field for the maximum feed-in power, either in watts or % (setting range:

-10 to 100%).
If there is no meter in the system or if a meter has failed, the inverter limits the power of feeding in to the set value.

Example: "Limit per Phase" Fronius Symo GEN24 3.0 Plus (setting value: 500 W)				
	Phase 1	Phase 2	Phase 3	Total
Max. possible production [W]	1 000	1 000	1 000	3 000
Set value "Limit per phase" [W]	500			1 500
Load demand in the household network [W]	500	750	1 250	2 500
Load coverage in the household network via PV system [W]	500			1 500
Purchase from the public grid [W]	0	250	750	1 000

Example: Feed-in limitation Fronius Symo GEN24 5.0 Plus (without considering efficiency)	
PV system to Fronius inverter	5 000 W
Loads in the house	1 000 W
Maximum permitted feed-in power of the entire system	60% = 3 000 W
Case 1: The battery can be charged	
Power at grid feed-in point	1 000 W
Power at inverter output	2 000 W
Power into the battery	3 000 W
Case 2: The battery cannot be charged	
Power at grid feed-in point	3 000 W
Power at inverter output	4 000 W
Power into the battery	0 W
In this example, no more than 3 000 W may be fed into the public grid at the grid feed-in point. However, any loads that are located between the inverter and the grid feed-in point can be supplied by additional power from the inverter.	
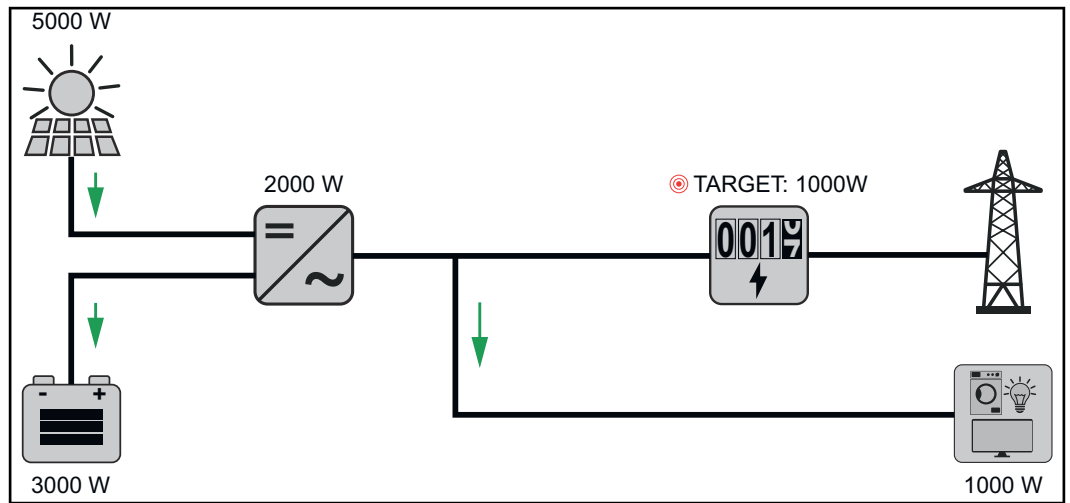
Schematic representation of case 1

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toring-digital-tools

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Fronius International GmbH
Froniusstraße 1
4643 Pettenbach
Austria
contact@fronius.com
www.fronius.com

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