FRONIUS SMART METER

The bidirectional meter for intelligent energy management

The Fronius Smart Meter 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 presents a clear overview of the power consumption. In combination with the Fronius storage solutions, the device ensures a perfectly coordination of various energy flows, which optimises the entire energy management. The Fronius Smart Meter 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

TECHNICAL DATA	FRONIUS SMART METER 63A-3	FRONIUS SMART METER 50KA-3 [1]	FRONIUS SMART METER 63A-1
Nominal voltage	400 - 415 V	400 - 415 V	230 - 240 V
Grid frequency range		50 to 60 Hz	
Maximum current	3 x 63 A	3 x 50,000 A	1 x 63 A
Input terminal capacity	1 - 16 mm²	0.05 - 4 mm²	1 - 16 mm²
Communication and neutral line terminal capacity		0.05 - 4 mm²	
Power consumption	1,5 W	2.5 W	1.5 W
Starting current		40 mA	
Accuracy class		1	
Active energy accuracy		Class B (EN50470)	
Reactive energy accuracy		Class 2 (EN/IEC 62053-23)	
Short-time overcurrent		30 x Imax / 0.5 s	
Mounting		Indoors (DIN rail)	
Housing	4 modules DIN 43880	4 modules DIN 43880	2 modules DIN 43880
Degree of protection		IP 51 (front frame), IP 20 (terminals)	
Specified operating range	-25 - +55°C	-5°C - +55°C	-25°C - +55°C
Dimensions (Height x Width x Depth)	89.0 x 71.2 x 65.6 mm	89.0 x 71.2 x 65.6 mm	89.0 x 35.0 x 65.6 mm
Interface to inverter		Modbus RTU (RS485)	
Display	8-digit LCD	8-digit LCD	6-digit LCD

[1] Delivered without current sensors. Further information about selecting suitable current sensors can be found at **www.fronius.com.**

THE ADVANTAGES AT A GLANCE

/ Fast and accurate dynamic feed-in control

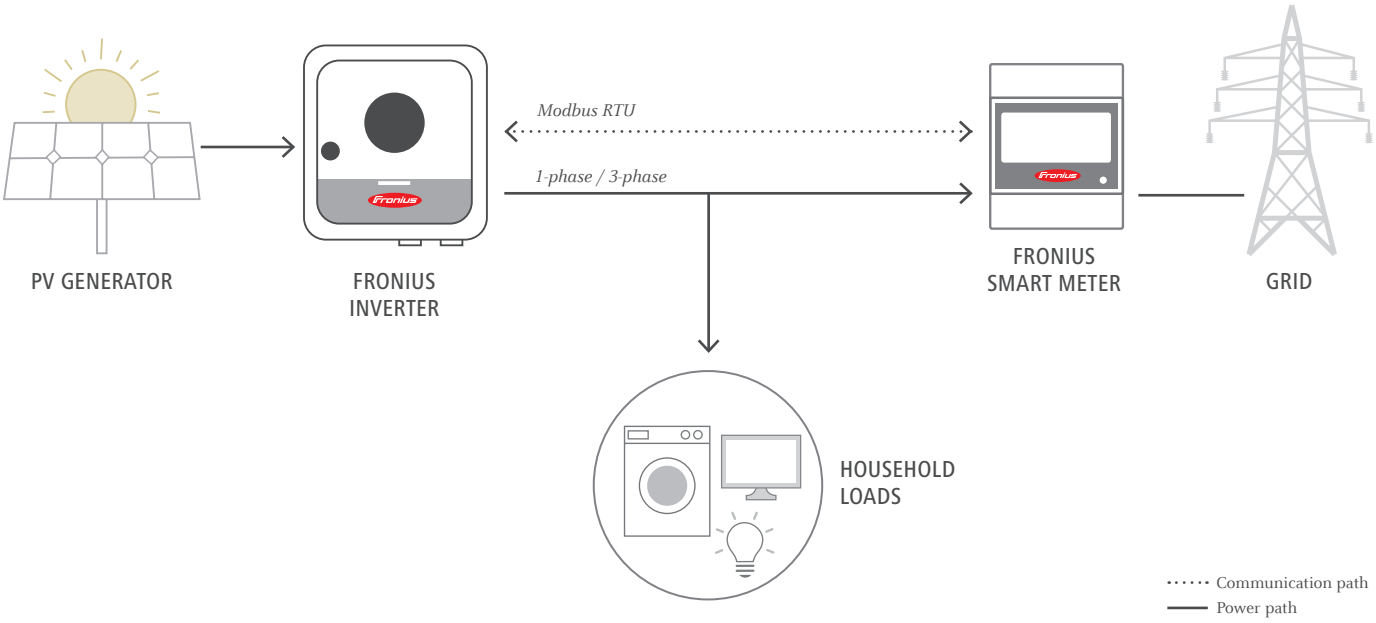
/ Clear overview of power consumption in Fronius Solar.web

/ Energy management with the Fronius storage solutions

/ Identifiying opportunities to optimize the pv system

/ Monitoring and analyzing heavy loads

CONFIGURATION DIAGRAM



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.

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

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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

M,06,0151,EN v16 Mar 2020 as17

EN

Wiring diagrams

DE

Anschluss-Schemata

IT

Schemi d'inserzione

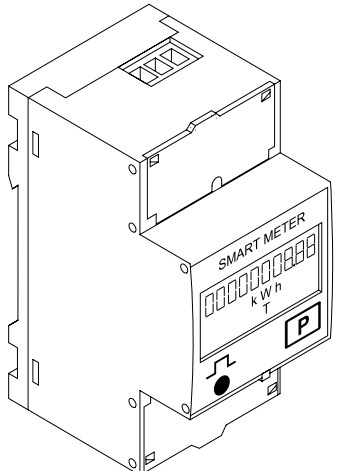
FR

Schemas de raccordement

/ Perfect Charging
/ Perfect Welding
/ Solar Energy

SHIFTING THE LIMITS

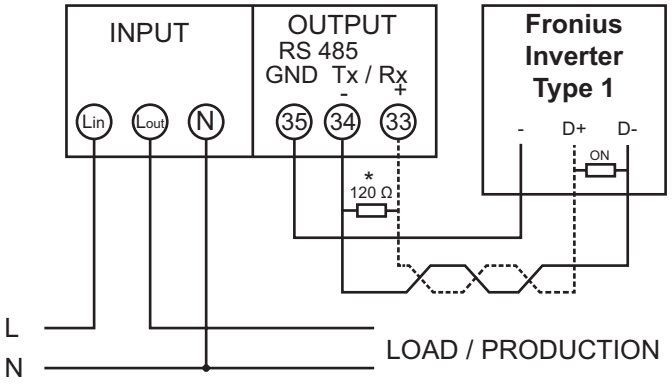
Fronius Smart Meter 63A-1

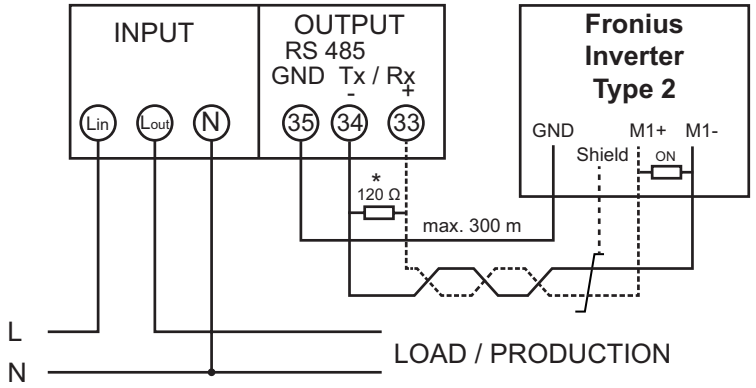


EN / DE / IT / FR

42,0410,2170 002/27082021

Fronius Smart Meter 63 A / 1 PH





* supplied with the device
liegt dem Gerät bei
incluso con l'apparecchio
joint á l'appareil

Modbus transmission
Transmission speed:
9600 baud
Address: 1
Parity bit: none

Modbus Übertragung
Übertragungsgeschwindigkeit:
9600 baud
Adresse: 1
Parity bit: keines

Transmissione Modbus
Velocità di trasmissione:
9600 baud
Indirizzo: 1
Bit di parità: nessuno

Transmission Modbus
Vitesse de transmission :
9600 baud
Adresse : 1
Bit de parité: none

Fronius Worldwide
www.fronius.com/addresses

Fronius International GmbH
4600 Wels, Froniusplatz 1, Austria
E-Mail: pv-sales@fronius.com
http://www.fronius.com

Under http://www.fronius.com/addresses you will find all addresses of our sales branches and partner firms!

1

Total Active Energy Consumed
Verbrauchte Gesamt-Wirkenergie
Energia Acctiva Totale consumata
Consommation Energie Active Totale

Total Active Energy Produced
Produzierte Gesamt-Wirkenergie
Energia Acctiva Totale prodotta
Produite Energie Active Totale

Total Reactive Energy
Gesamt-Blindenergie
Energia Reattiva Totale
Energie Rèactive Totale

Partial Reactive Energy
Teil-Blindenergie
Energia Reattiva Parziale
Energie Rèactive Partielle

Current
Strom
Corrente
Courant

Voltage
Spannung
Tensione
Tension

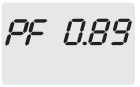
Active power
Wirkleistung
Potenza attiva
Puissance active

Reactive power
Blindleistung
Potenza reattiva
Puissance réactive

Apparent power
Scheinleistung
Potenza apparente
Puissance apparente

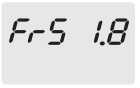
Frequency
Frequenz
Frequenza
Fréquence

Power factor
Leistungsfaktor
Fattore di potenza
Facteuer de puissance
L = IND C = CAP

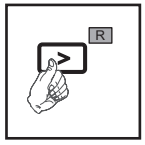


Working hours
Betriebsstunden
Ore funzionamento
Heures de fonctionnement

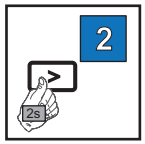
Label data intern
Interne Betriebsdaten
Dati di targa interni
Les Données d'exploitation interne



1



= For the Reset keep pressed the key for 2 seconds
Für die Rückstellung, die Taste für 2 Sekunden drücken
Tenere premuto per 2 secondi per l'azzeramento
Pour la Remise à zéro tenir appuyé la touche pour 2 seconds



= Keep pressed the key for 2 seconds
Die Taste für 2 Sekunden drücken
Tenere premuto per 2 secondi
Tenir appuyé la touche pour 2 secondes

2

Basic settings

This device has been preconfigured for use with Fronius inverters fitted with Fronius Datamanager 2.0 and Hybridmanager.
No further settings are required.

Grundeinstellungen

Dieses Gerät ist für den Betrieb mit Fronius Wechselrichtern mit Fronius Datamanager 2.0 und Hybridmanager vorkonfiguriert.
Daher sind keine zusätzlichen Einstellungen notwendig.

Impostazioi di base

Questo apparecchio è preconfigurato per l'utilizzo con inverter Fronius dotati di Fronius Datamanager 2.0e Hybridmanager.
Pertanto, non sono necessarie ulteriori impostazioni.

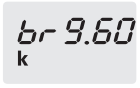
Configuration de base

Cet appareil est préconfiguré pour le fonctionnement avec des onduleurs Fronius équipés de Fronius Datamanager 2.0 et Hybridmanager. Aucun réglage supplémentaire n'est donc nécessaire.

Communication Protocol
Protokoll Kommunikation
Protocollo communicazione
Protocol communication
Mdb = Jbus / Modbus

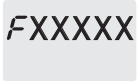
RS485 address
Adresse RS485
Indirizzo RS485
Adresse RS485

RS485 speed
RS485 Geschwindigkeit
Velocità RS485
Vitesse de RS485



Parity bit
Paritätsbit
Bit parità
Bit de parité

Version
Version
Versione
Version



Min. Softwareversion Min. Softwareversion Min. Softwareversion Version logiciel mini.	**Datamanager 3.3.6-16 / Energypackage ---**
Input terminal capacity Anschlussquerschnitt Strompfad Caratteristiche Terminali ingresso Section des câbles puissance	**1 - 16 mm² solid** **1 - 10 mm² flex**
Tightening torque Drehmoment Coppia di serraggio Couple de serrage	**Input terminal: 1,2 Nm / max. 1,4 Nm** **Communication terminal: 0,5 Nm / max. 0,8 Nm**
Communication terminal capacity Anschlussquerschnitt Kommunikation Caratteristiche Terminali Comunicazione Section des câbles communication	**0,05 - 4 mm² solid / 0,05 - 2,5 mm² flex**
Specified operating range Arbeitsbereich Campo di funzionamento Plage de fonctionnement	**- 25 °C .... + 55 °C**
Power consumption Eigenverbrauch Consumo di energia Puissance consommée	**1,5 W**
Current density! Stromdichte! Portata di corrente! Densité de courant !	**No restrictions** **Keine Einschränkungen** **Senza restrizioni** **Pas de restrictions**

Quick Guide:
How to install a Fronius Smart Meter 63A-1 and 63A-3

*for 63A-1, 63A-3 whole current Fronius Smart Meters only. For the 50kA Fronius Smart Meter, the 240V/480V Fronius Smart Meters UL or the Fronius Smart Meter TS refer to their respective guides.

Quick Guide

Version 4.0/2020

1. GENERAL

Fronius Smart Meters are Energy Meters which can be used to measure consumption data of a site or for export limitation of a PV system with the Fronius SnapINverter or GEN24 inverters.

The meter measures the energy flow to the loads or to the grid and feeds the information to the Fronius inverter via ModBus RTU/RS485. On the SnapINverter, this communication interface is the Datamanager 2.0 which is installed as standard in Fronius Galvo, Primo, Symo and Eco SnapINverter. Light versions are an exception. Datamanager 2.0 can also be retrofitted to all older Fronius inverters. In the GEN24 inverters, the necessary communication interface is always built in as standard (there is no light version).

This document describes how to install and set up only the 63A-1 single phase or 63A-3 3-phase Fronius Smart Meter range. Please use the below links if using a different model of Fronius Smart Meter.

Further information about the entire range of Fronius Smart Meters can be found in our Fronius Smart Meter Application Guide:
https://www.fronius.com/~/downloads/Solar%20Energy/Whitepaper/SE_WP_Fronius_Smart_Meter_Application_Guide_EN_AU.pdf

For installation and setup instructions of the 240V1-UL or 480V3-UL Fronius Smart Meters refer to the following document:
https://www.fronius.com/~/downloads/Solar%20Energy/Operating%20Instructions/42%2C0410%2C2289.pdf

For installation and setup instructions of the 50kA-3 Fronius Smart Meter refer to the following document:
https://www.fronius.com/~/downloads/Solar%20Energy/Technical%20Articles/SE_TEA_Quick_Guide_How_to_install_and_commission_a_Fronius_Smart_Meter_50kA-3_EN_AU.pdf

The document for setting export limitation with the Fronius Smart Meter can be found here:
https://www.fronius.com/~/downloads/Solar%20Energy/Technical%20Articles/SE_TEA_Quick_Guide_How_to_set_up_Export_Limiting_using_the_Fronius_Smart_Meter_EN_AU.pdf

Product information / Operating instructions Fronius Smart Meter TS 65A-3
https://manuals.fronius.com/html/4204260349

Product information / Operating instructions Fronius Smart Meter TS 100A-1
https://manuals.fronius.com/html/4204260350

Product information / Operating instructions Fronius Smart Meter TS 5kA-3
https://manuals.fronius.com/html/4204260348

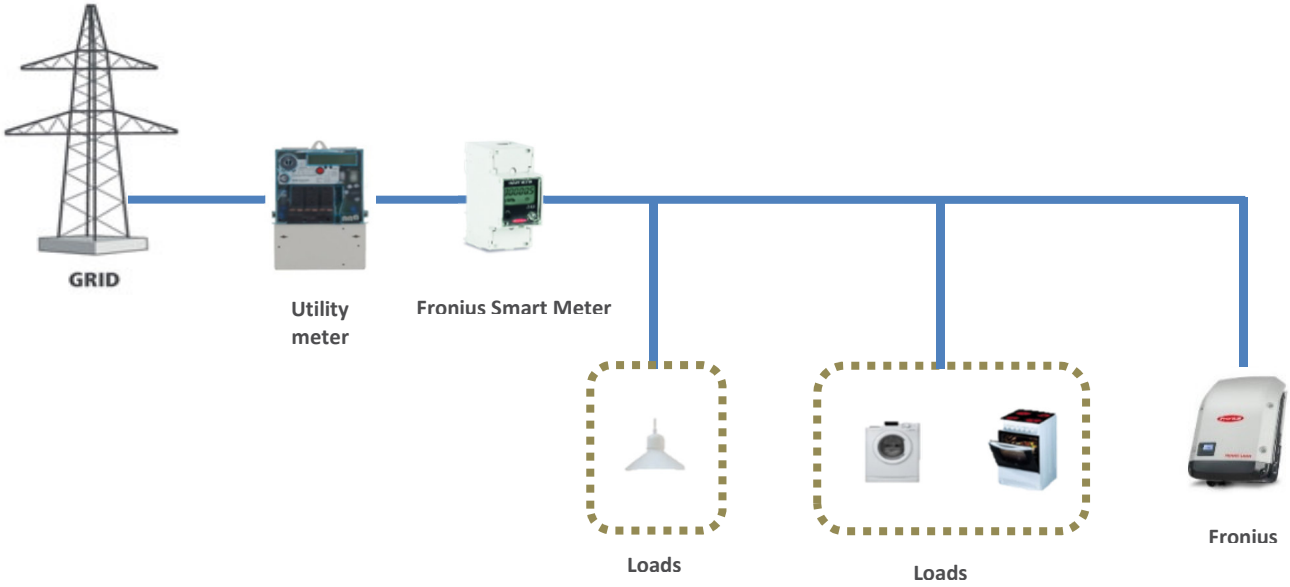
1.1 Location of the Fronius Smart Meter

With the Fronius Smart Meter there are 2 possible energy paths/ locations where it can be installed.

In almost all cases, the Fronius Smart Meter will be installed in the **feed-in path**. This is also the default setting in the Datamanager's METER section.

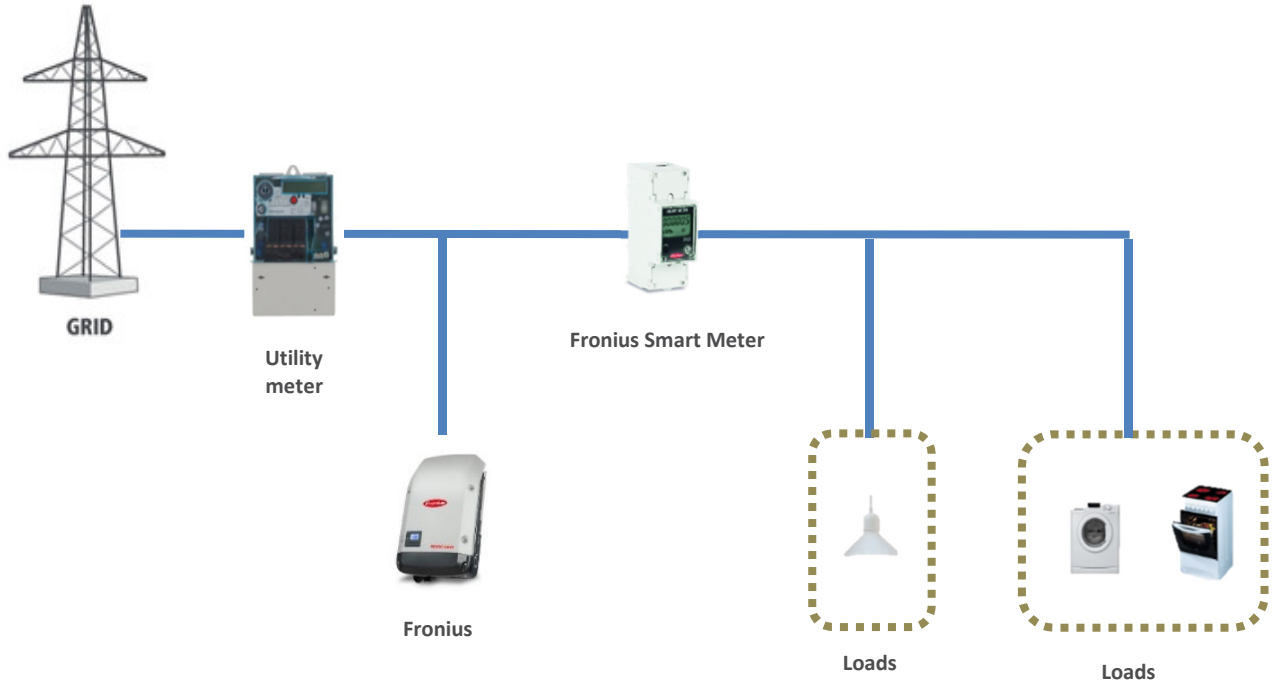
/ Feed-in point

In this position the Solar Supply Main Switch is on the load side of the Fronius Smart Meter



/ Consumption path

In this position the Solar Supply Main Switch is on the grid side of the Fronius Smart Meter



2. INSTALLING AND ACTIVATING A FRONIUS SMART METER

2.1 Schematics and Wiring Requirements

/ Wiring between Fronius Smart meter and inverter should use a CAT5 or CAT6 cable.

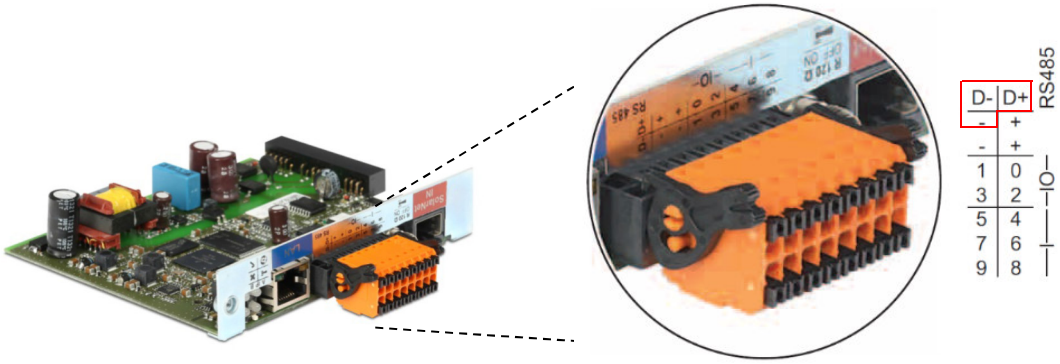
Important: To be compliant with the AS3000 standards, it is recommended to have the CAT5/CAT6 cable in a heat shrink tubing (probably 10mm) when it enters the switchboard part or alternatively use a 240V rated CAT5/CAT6 cable (e.g. Clipsal CBUS cable).

/ Connection is a data line for Modbus RTU / RS485 using screw terminals on the meter

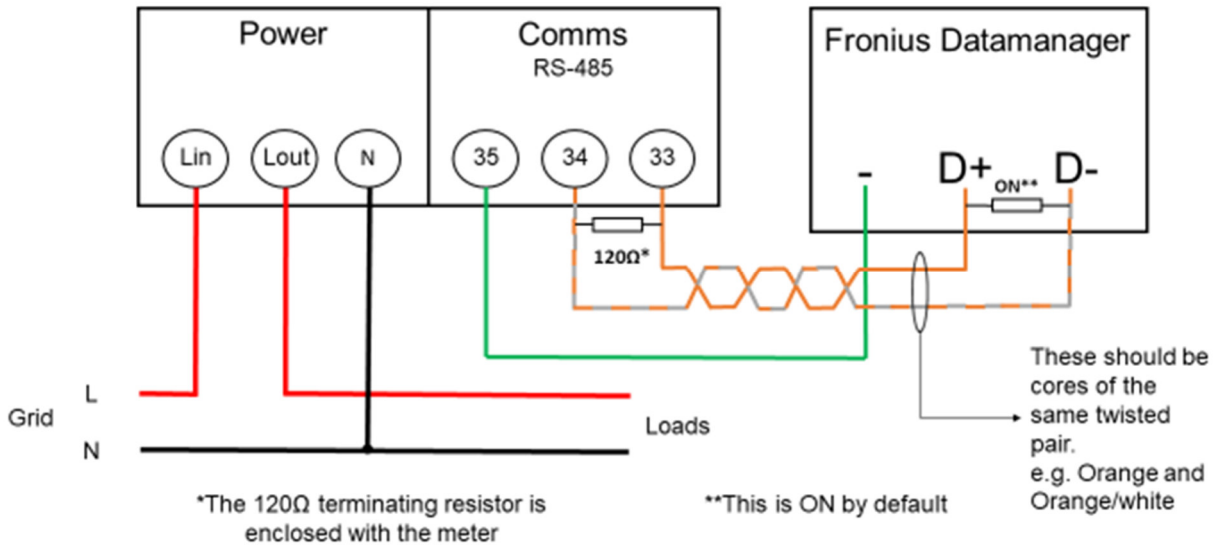
/ Maximum distance: 300 m (980 feet)

/ Use a single core per terminal connection between Fronius Smart Meter and the inverter. For D+ and D- use the single cores from the same colour (e.g. D+ is orange/white, D- is orange)

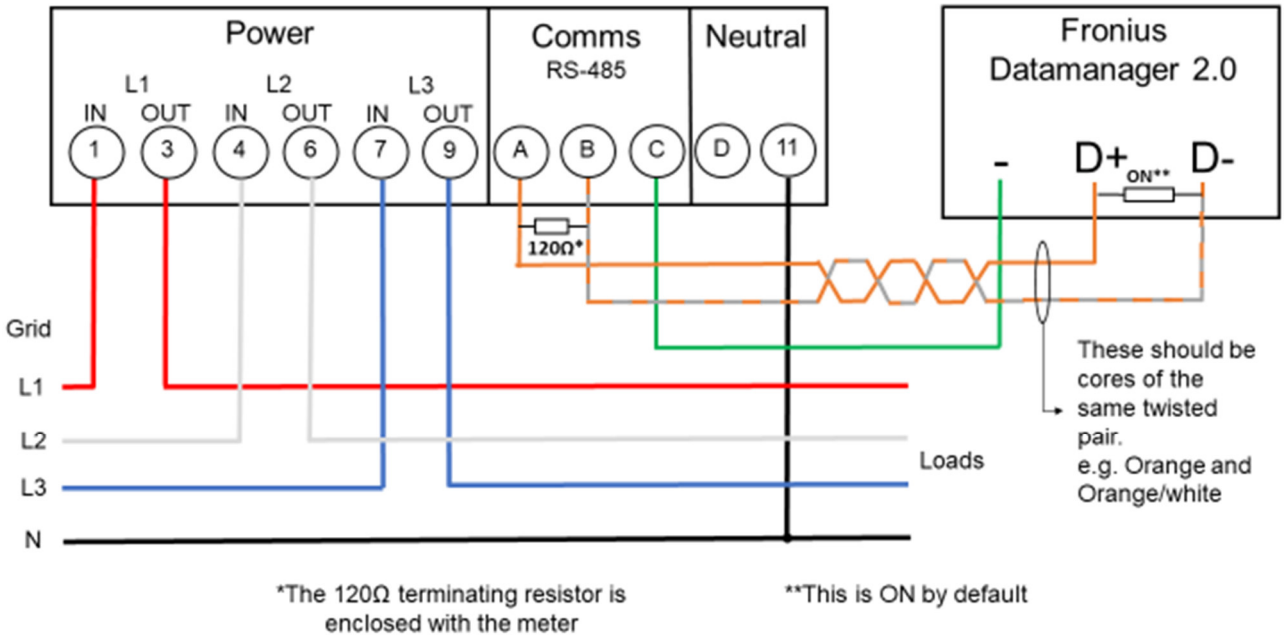
Meter connection on the Datamanager 2.0
The meter needs to be connected to the Datamanager's terminal block using terminals D+, D- and -.



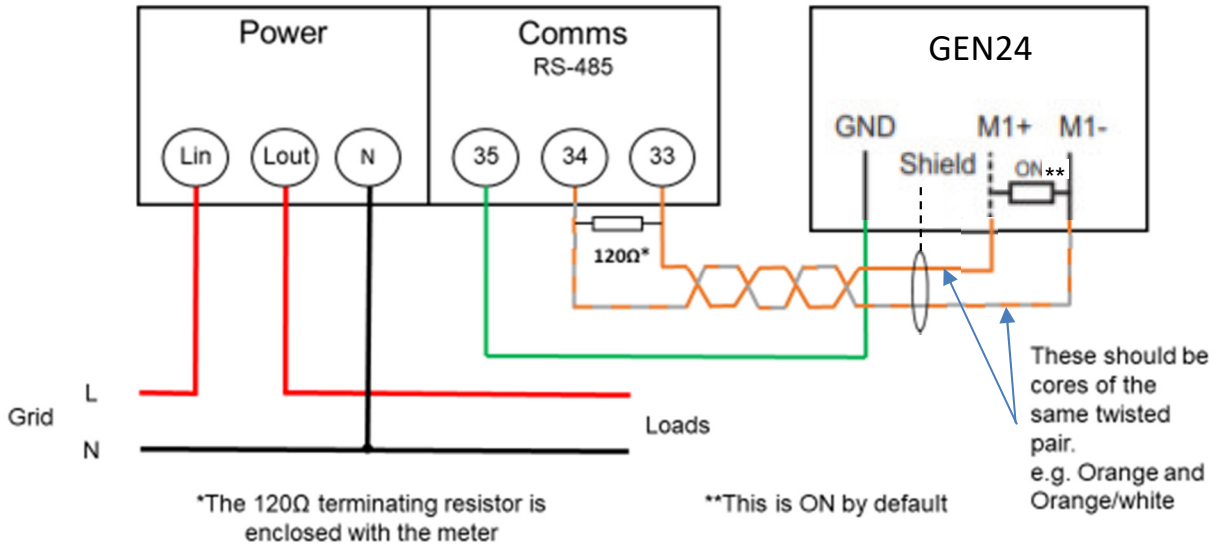
2.1.1 - Wiring detail for Single Phase Fronius Smart Meter 63A/1PH and Datamanager 2.0



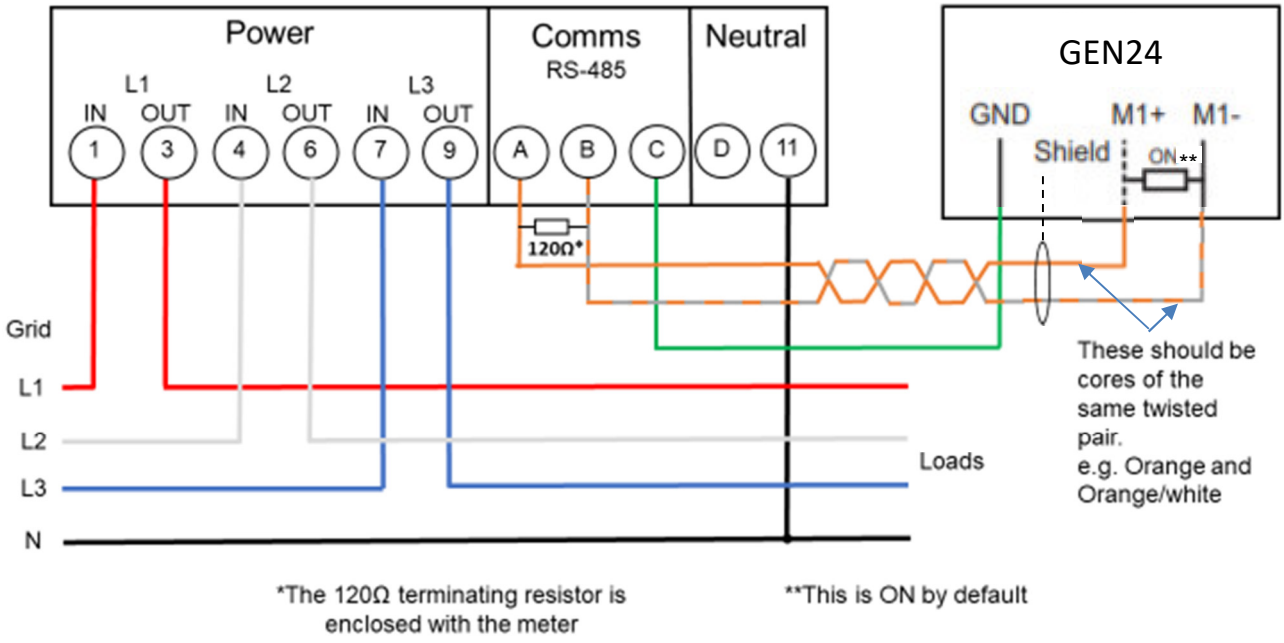
2.1.2 - Wiring detail for 3-Phase Fronius Smart Meter 63A/3PH and Datamanager 2.0



2.1.3 Wiring detail for Single Phase Fronius Smart Meter 63A/1PH and GEN24 inverter



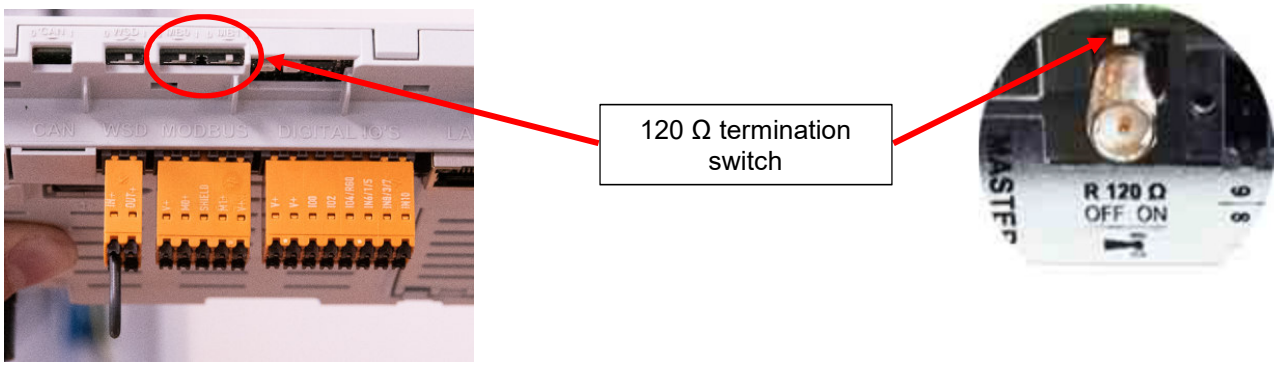
2.1.4 Wiring detail for 3-Phase Fronius Smart Meter 63A/3PH and GEN24 inverter



Modbus termination switch on the Datamanager 2.0 and the GEN24 inverter:

The internal bus termination 120-Ohm resistance (for Modbus RTU) needs to be switched to *ON*. **This switch is set to *ON* by default.**

Please Note:
The termination resistance must be activated for the first and last device in an RS485 bus.



2.2 Activating the Fronius Smart Meter on the SnapINverter

*It is recommended to complete the Solar.web Wizard first and get the system online. Once completed please go to **Section 2.2.1** for the Fronius Smart Meter activation.*

*If the system is not being set up for online monitoring the Fronius Smart Meter can be activated within the **Technician Wizard as per Section 2.2.2**.*

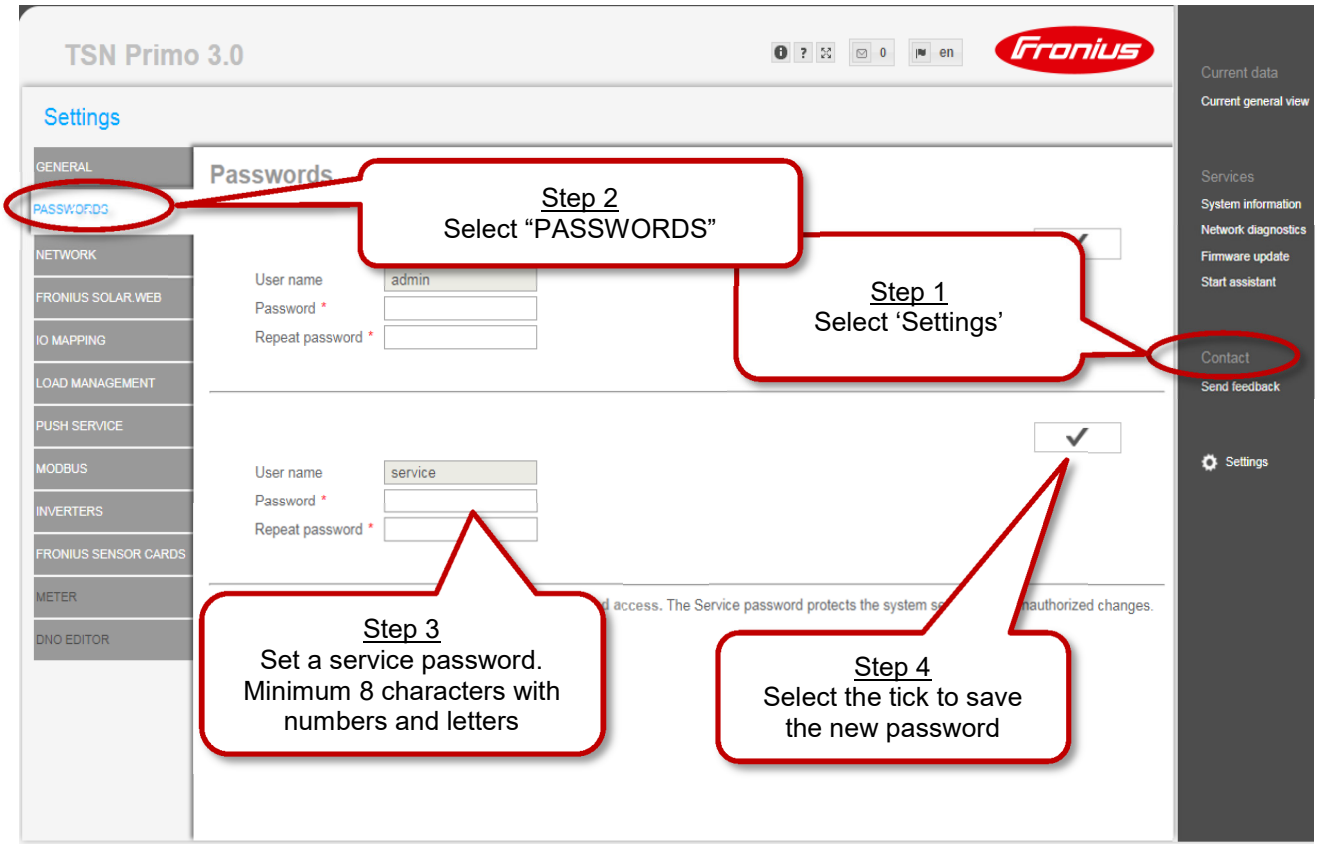
2.2.1 Activating the Fronius Smart Meter in the SnapINverter Web Interface

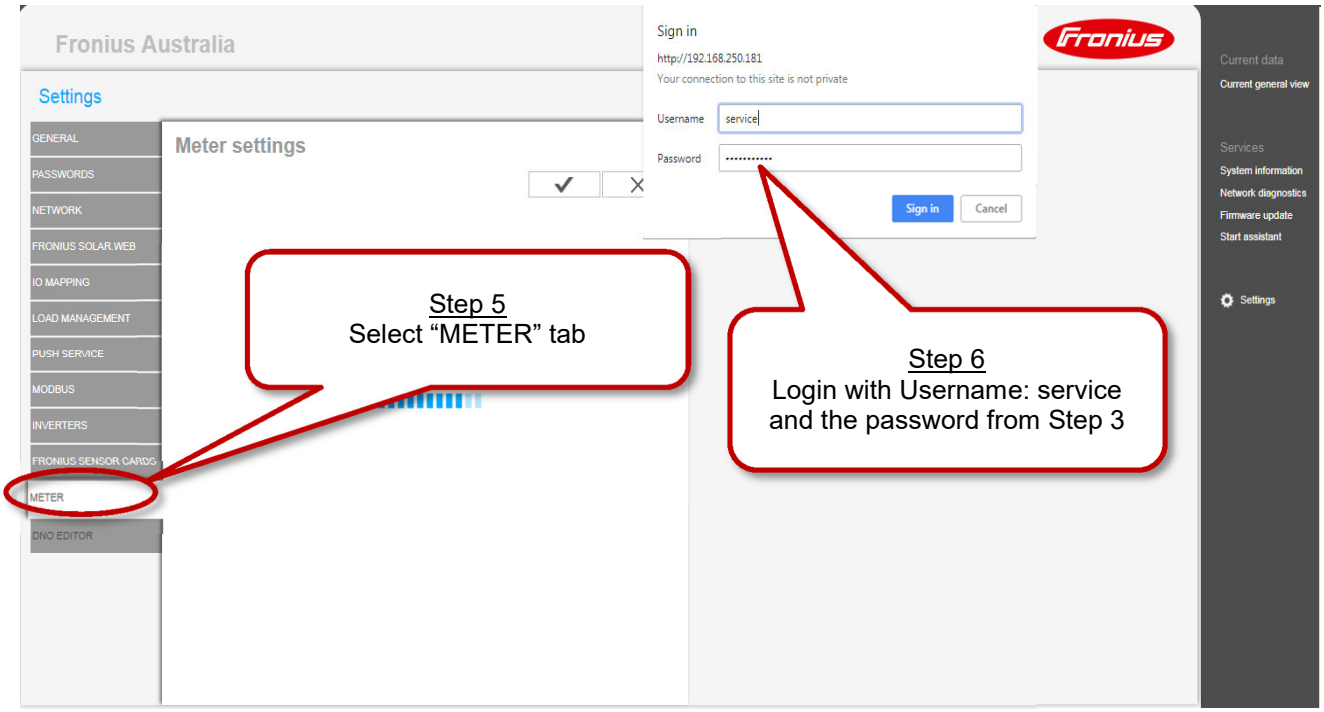
The PV Inverter homepage can be accessed in two ways:

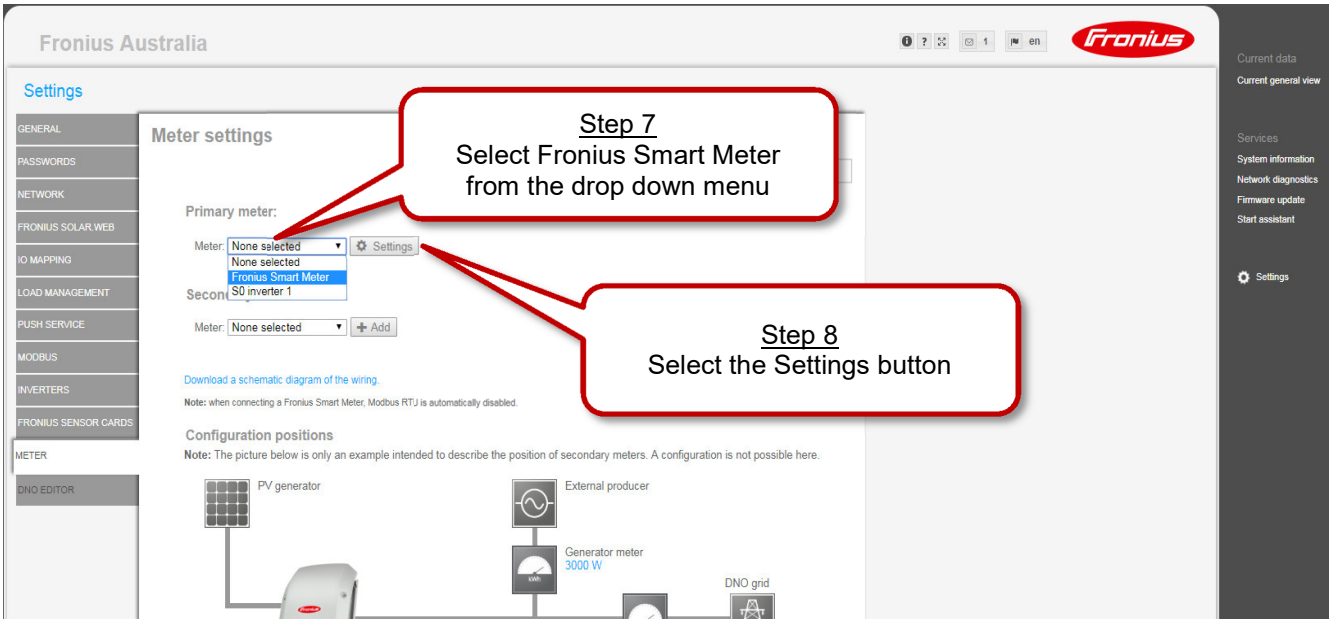
1. Via the Wi-Fi Access Point:
   - Activate the Wi-Fi Access Point on the Datamanager card (inverter screen under Setup) or Datamanager Box 2.0
   - Connect your computer/table/smart phone to the **Fronius_240.XXXXXX** network
   - Open a web browser and go to http://192.168.250.181.
     Alternatively you can use the Fronius SolarWeb App (Tablet/Smart Phone), open the Solar.web app and select Settings. Then select “PV Inverter Homepage” or “Your System Monitoring” depending on your device.

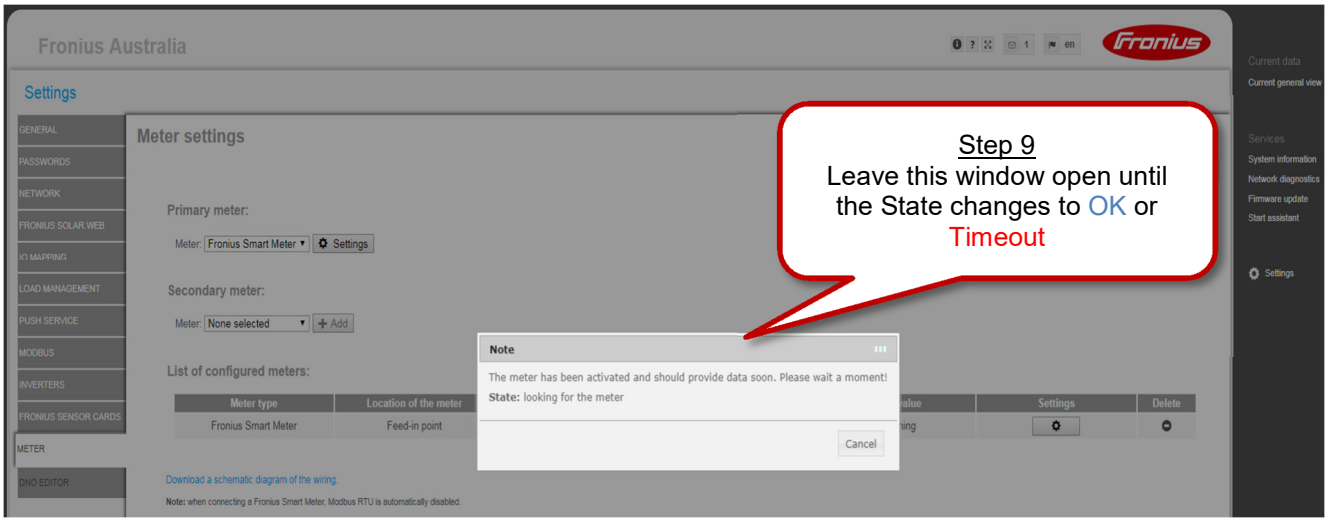
2. Via the LAN Port:
   - Connect your computer to the Datamanager via LAN cable
   - Switch the Datamanager IP Switch to Position ‘A’
   - Open a web browser and go to http://169.254.0.180

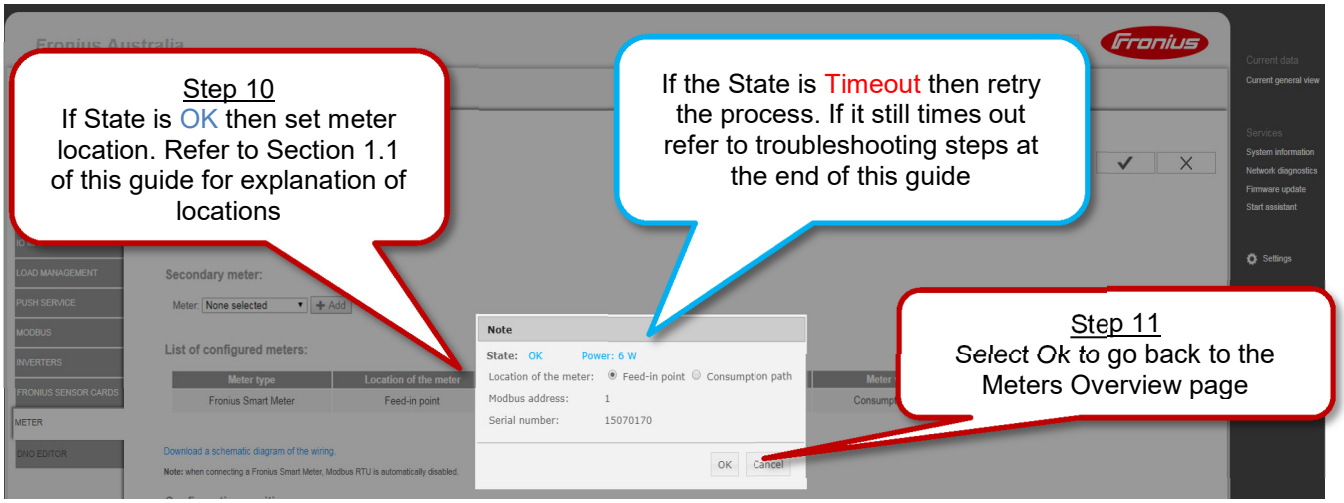
Once connected follow the below steps:

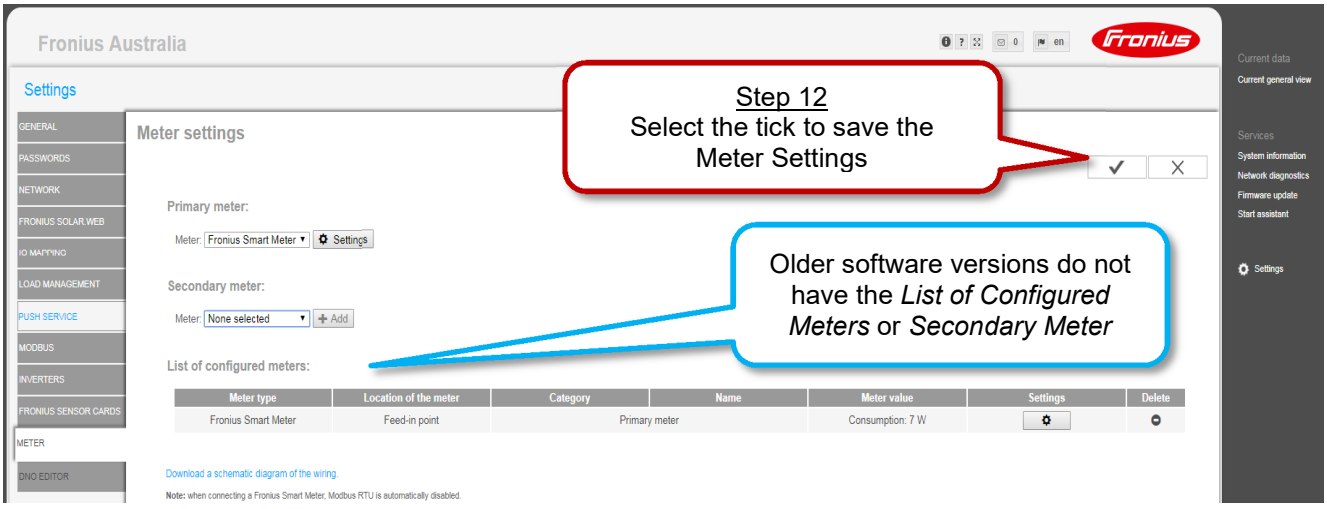


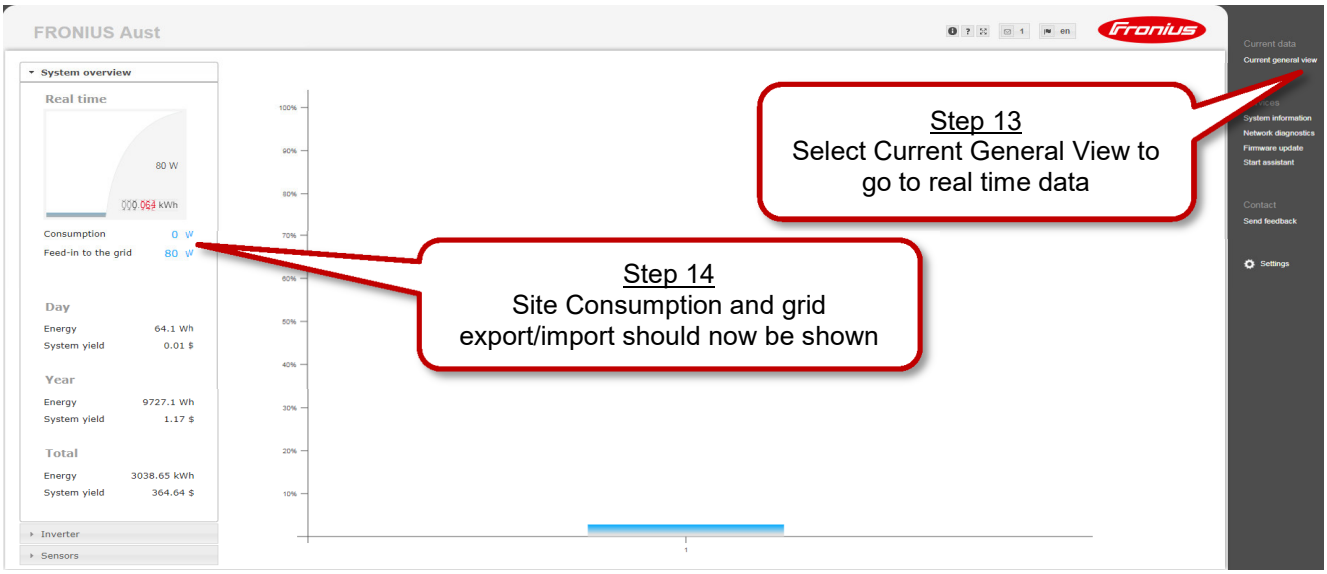












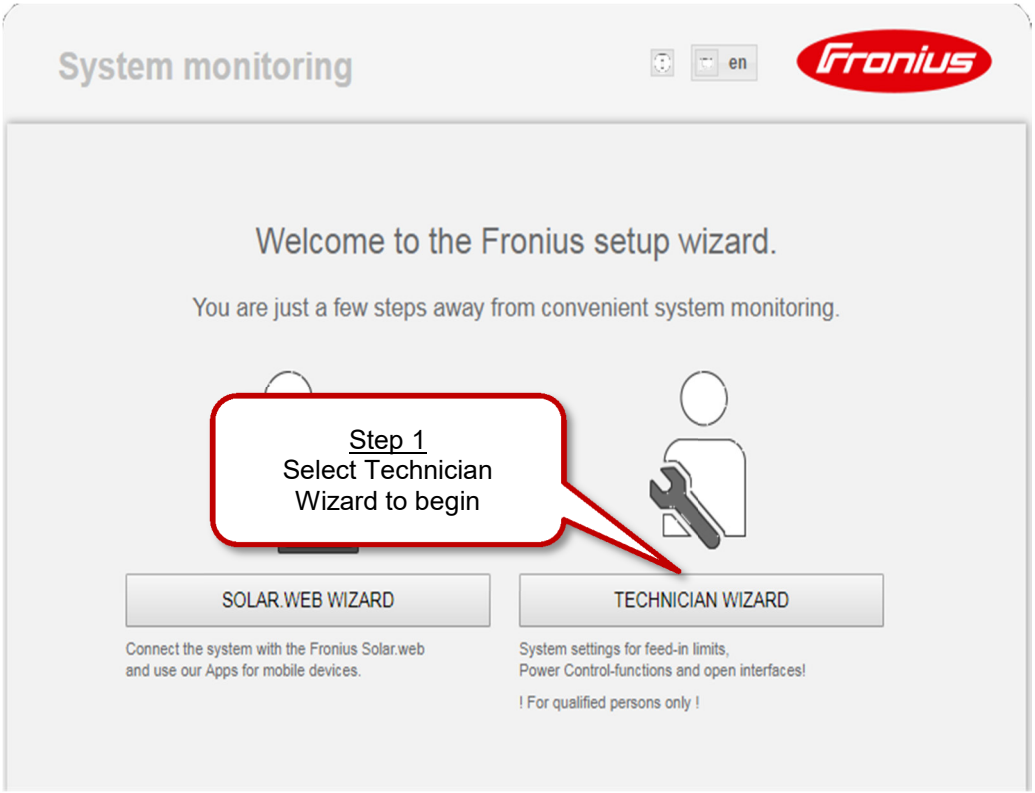
2.2.2 Activating the Fronius Smart Meter in the Technician Wizard

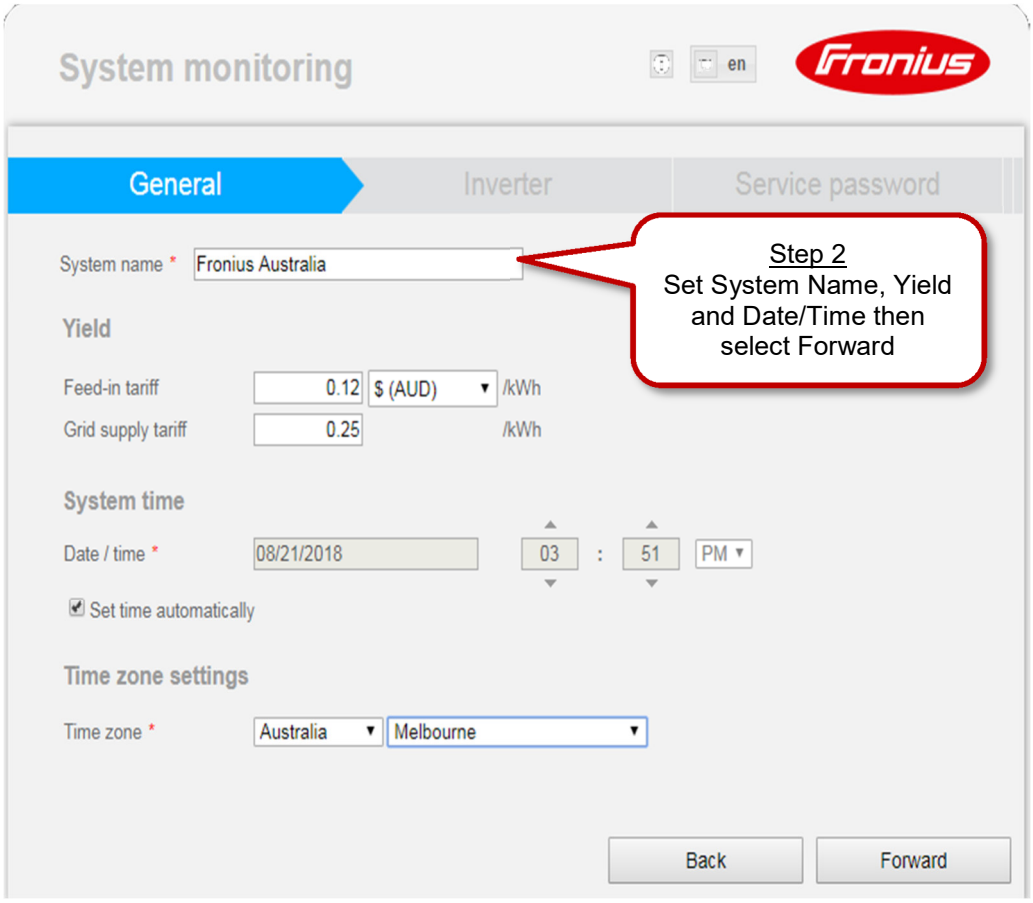
The Technician Wizard can be accessed in two ways:

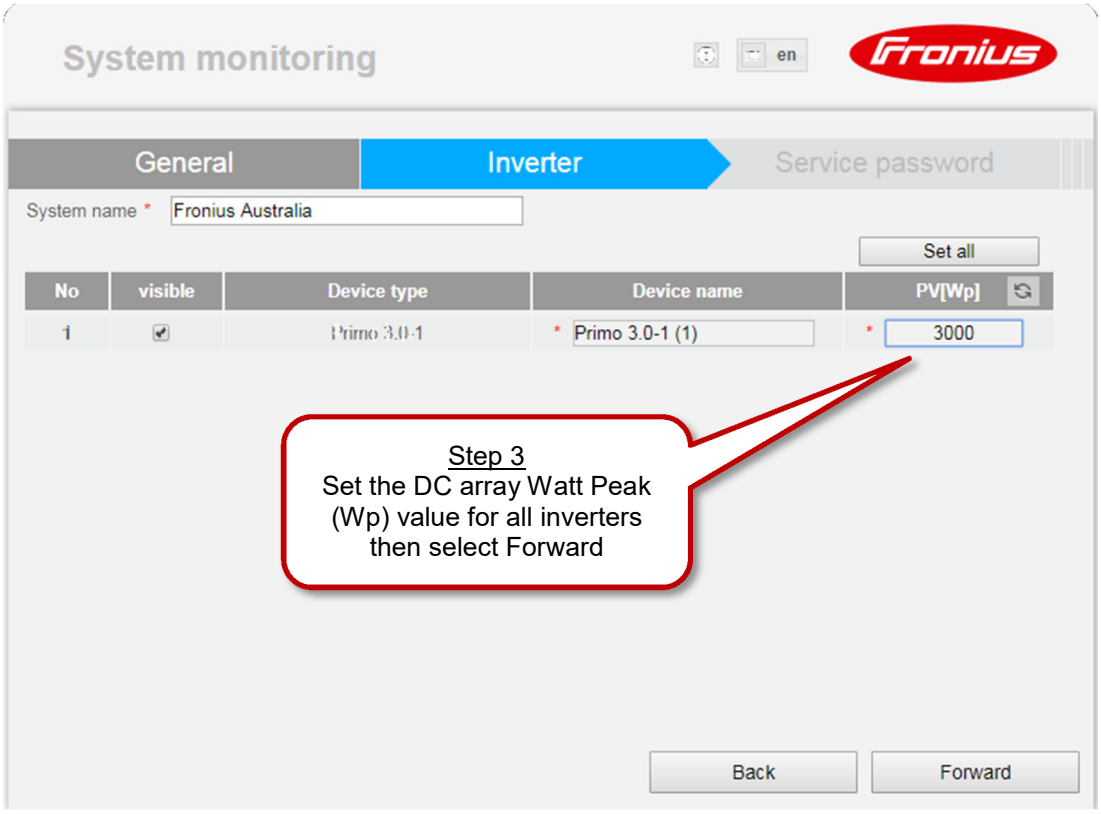
1. Via the Wi-Fi Access Point:
   - Activate the Wi-Fi Access Point on the Datamanager card (inverter screen under Setup) or Datamanager Box 2.0
   - Connect your computer/table/smart phone to the **Fronius_240.XXXXXX** network
   - Open a web browser and go to http://192.168.250.181.
   - Alternatively you can use the Fronius SolarWeb App (Tablet/Smart Phone), open the Solar.web app and select Settings. Then select “PV Inverter Homepage” or “Your System Monitoring” depending on your device.

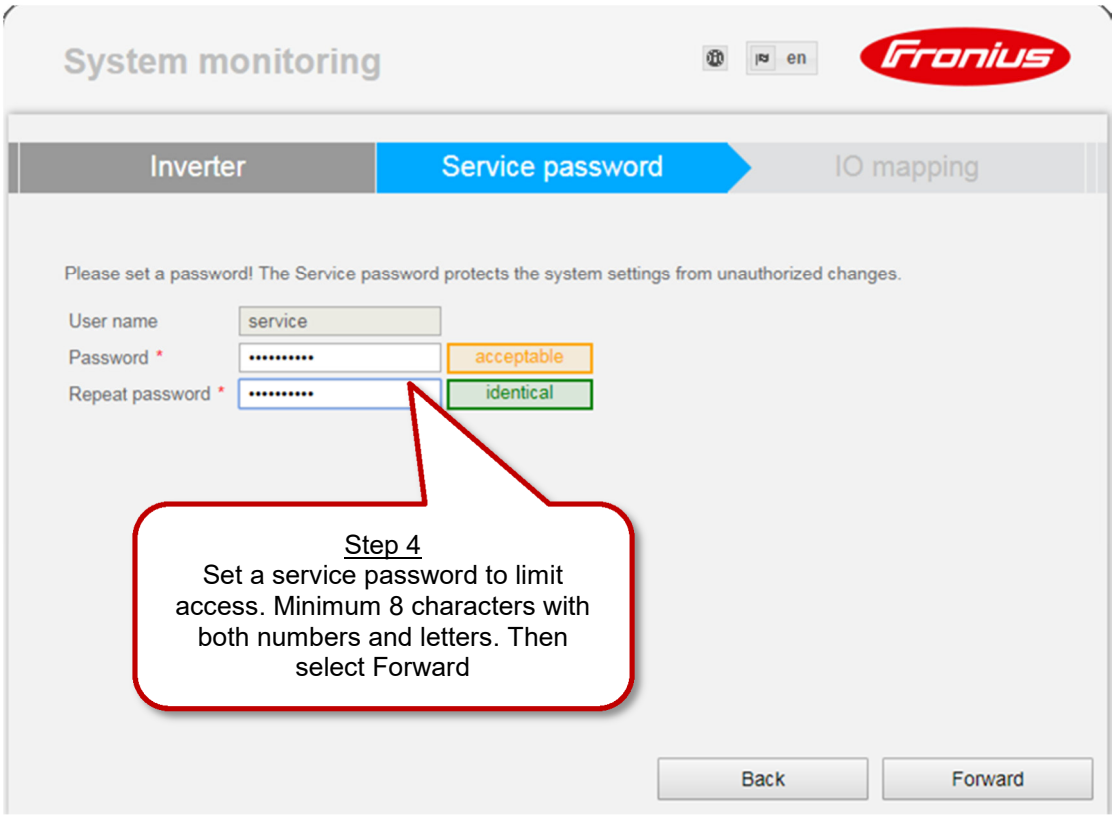
2. Via the LAN Port:
   - Connect your computer to the Datamanager via LAN cable
   - Switch the Datamanager IP Switch to Position ‘A’
   - Open a web browser and go to http://169.254.0.180

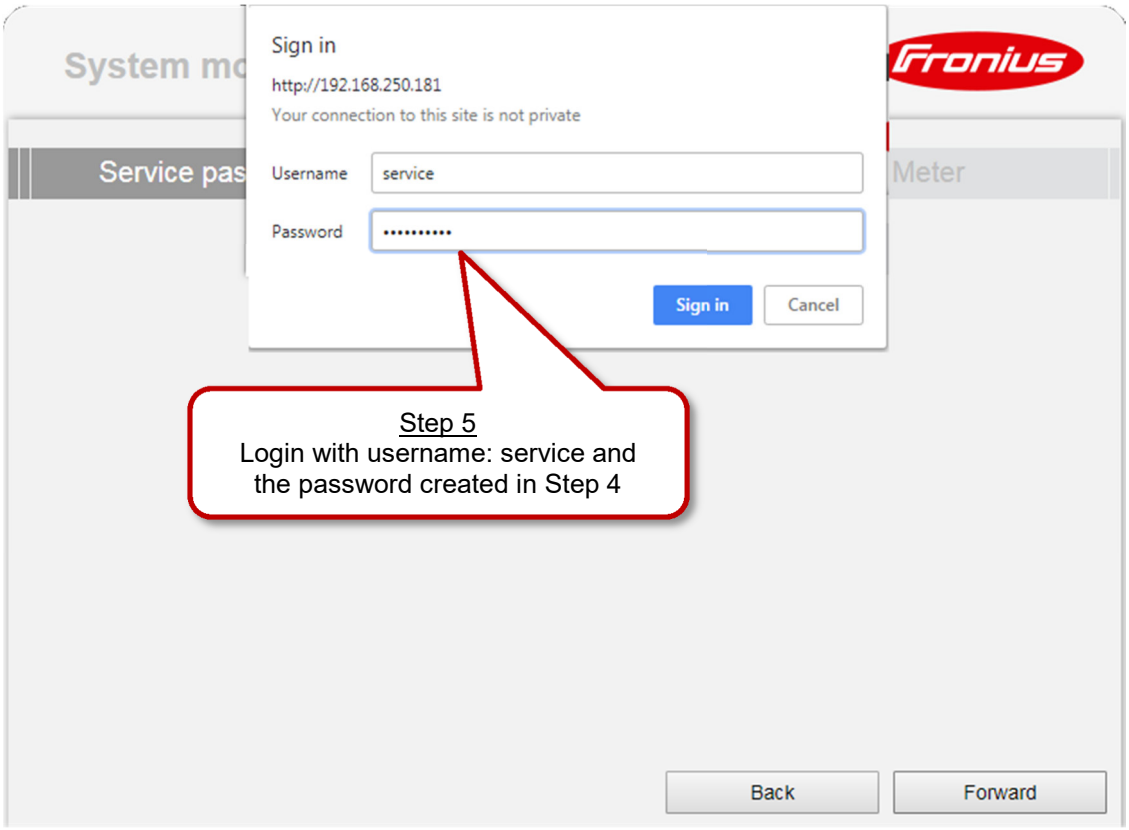
Once connected follow the below steps:

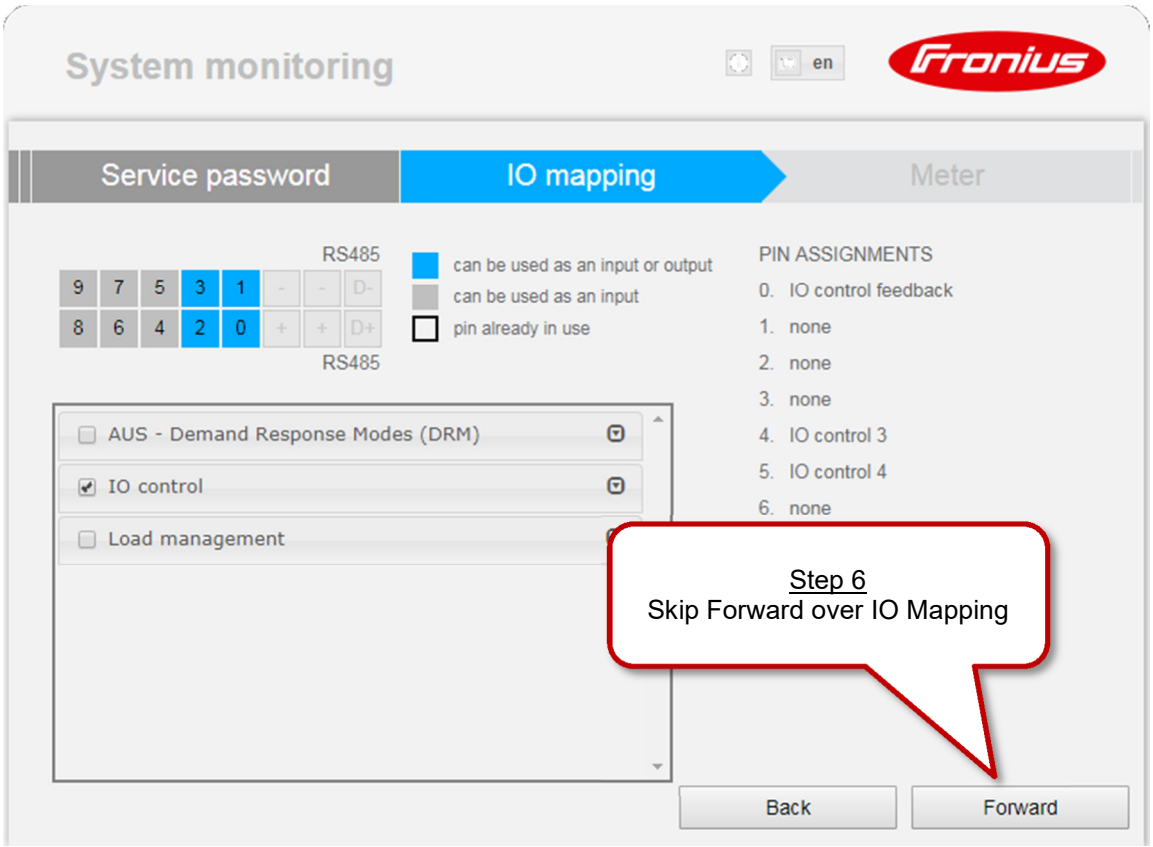


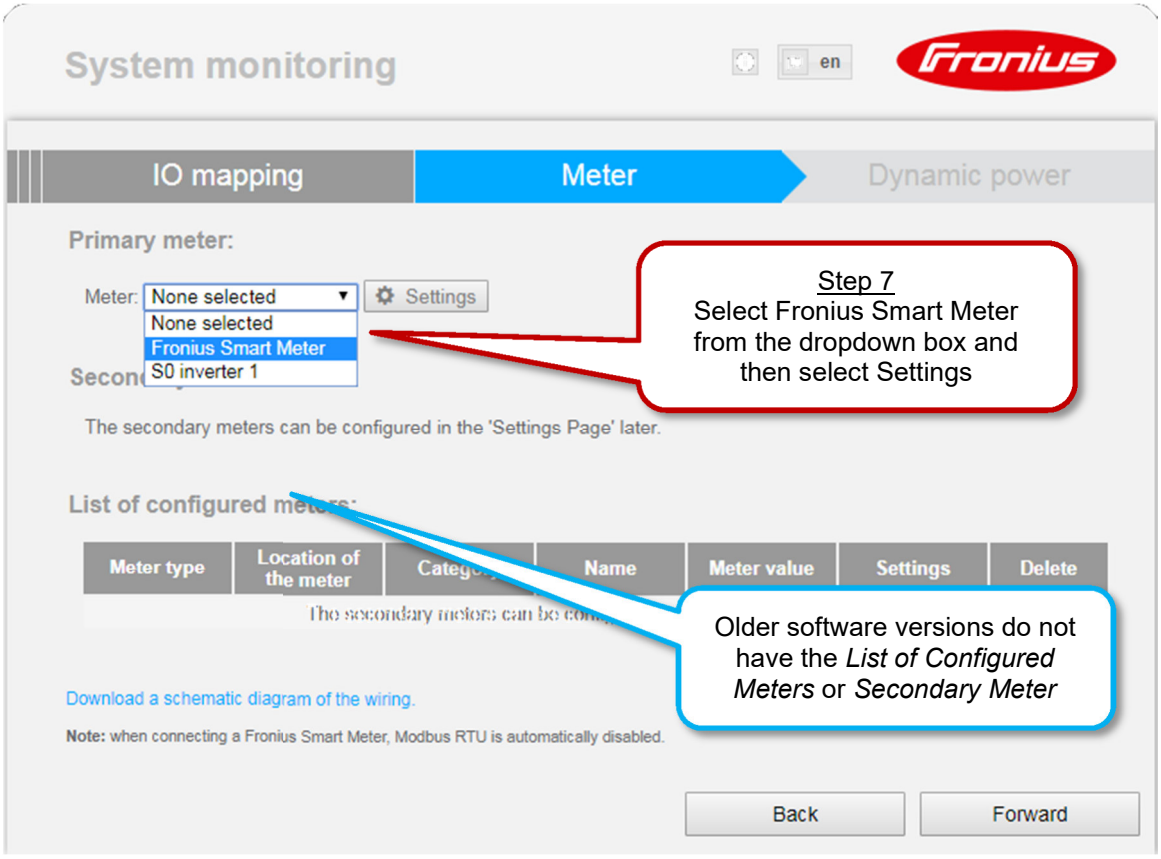


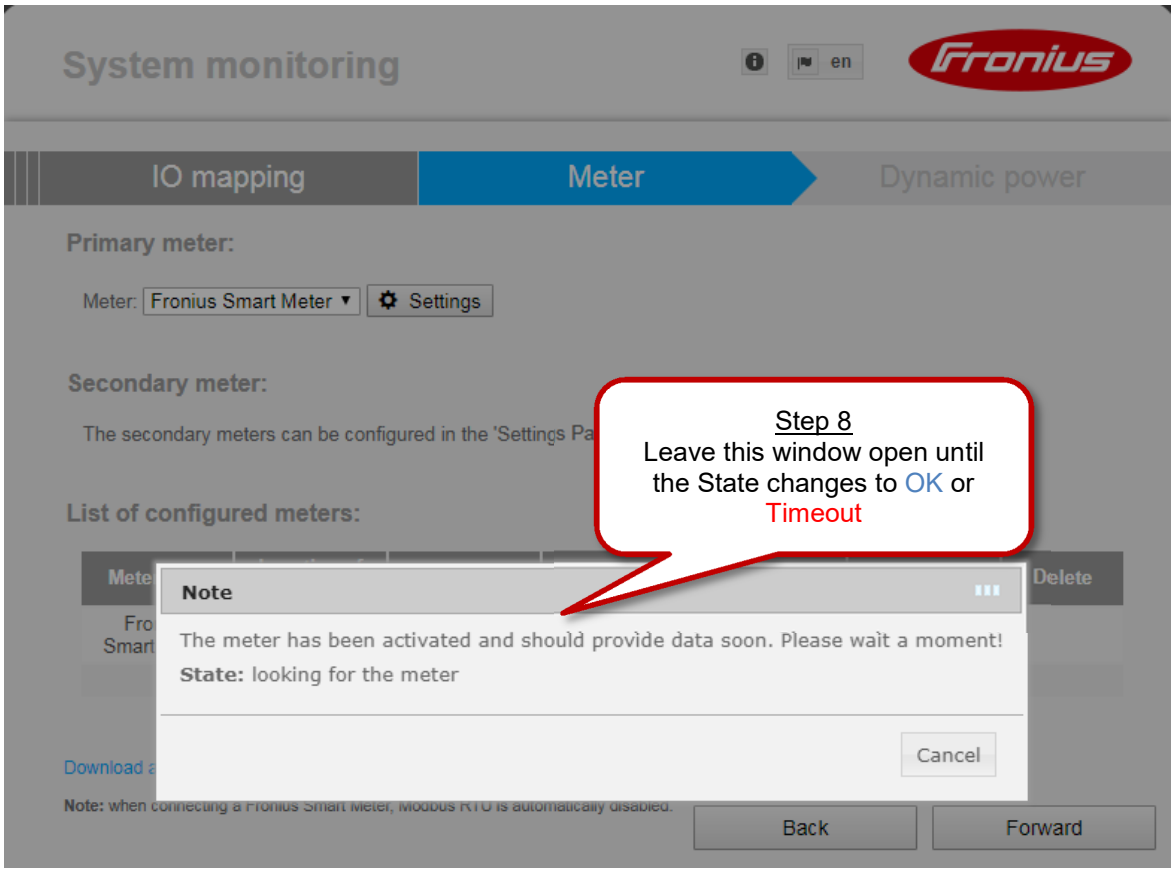


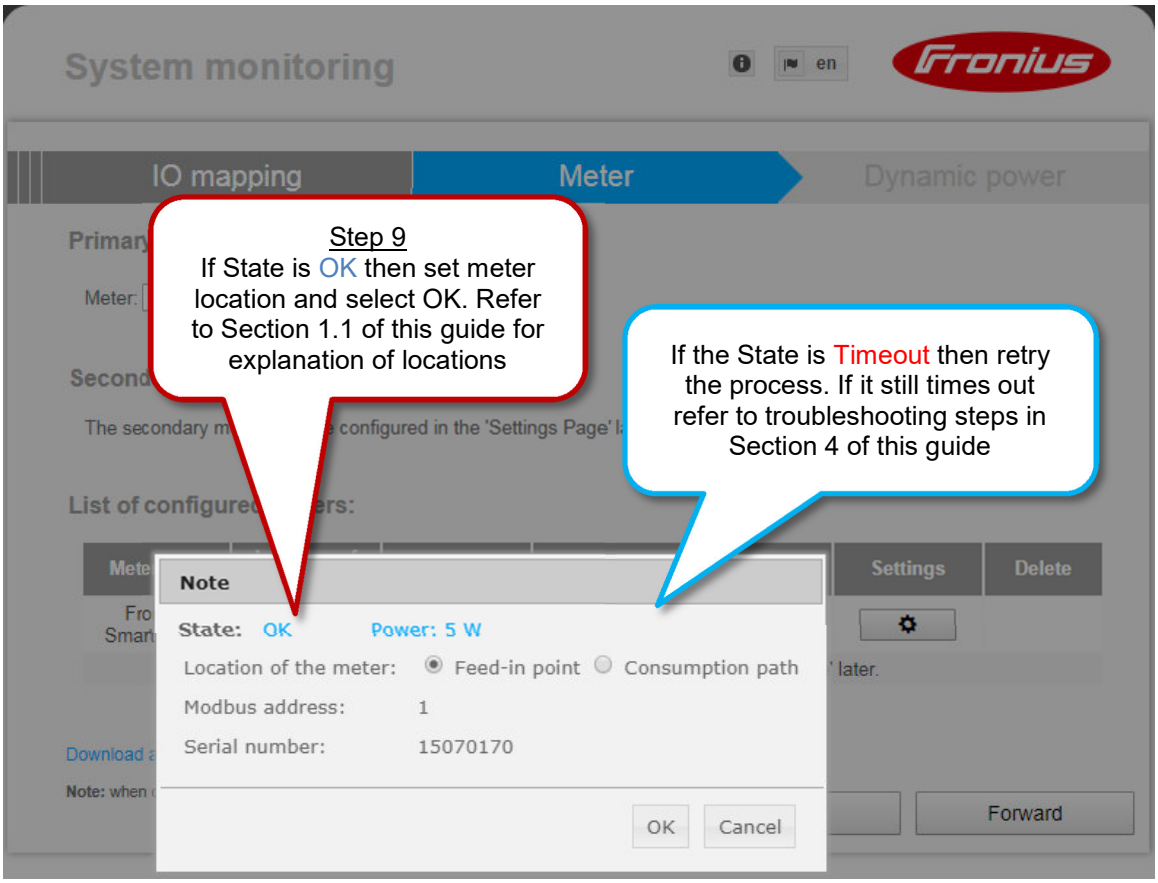


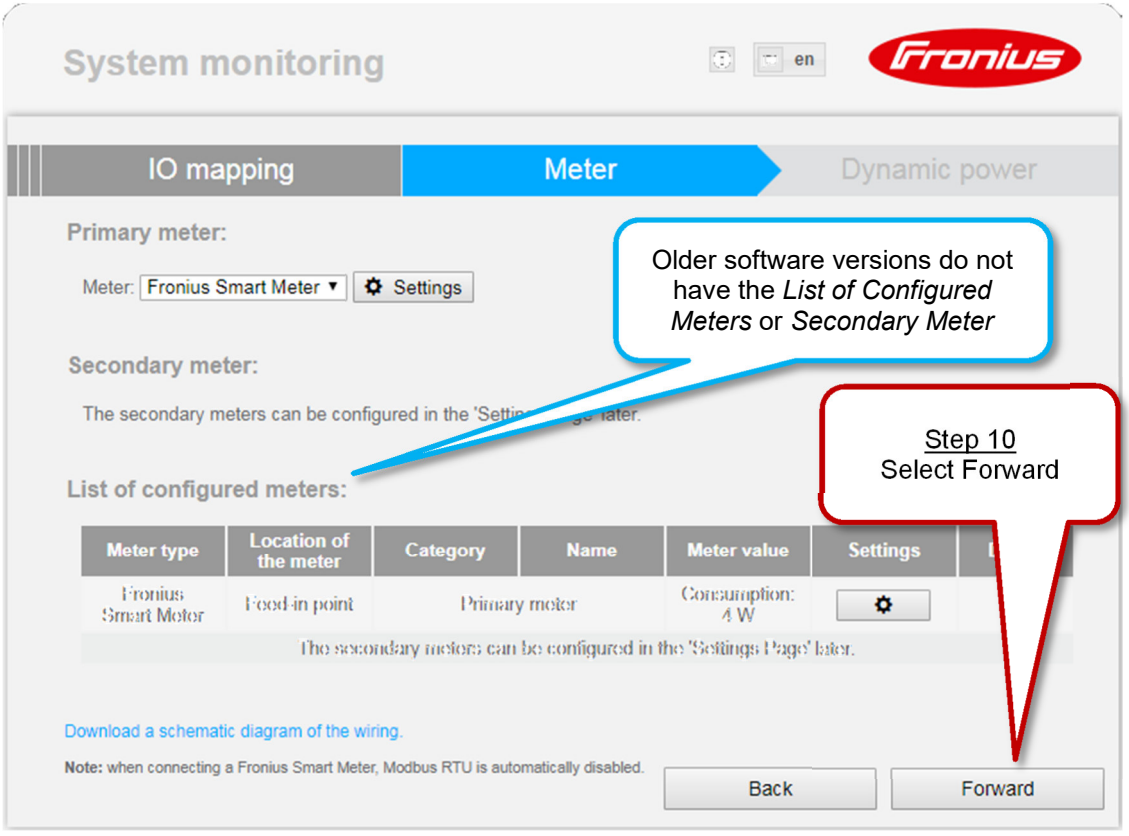


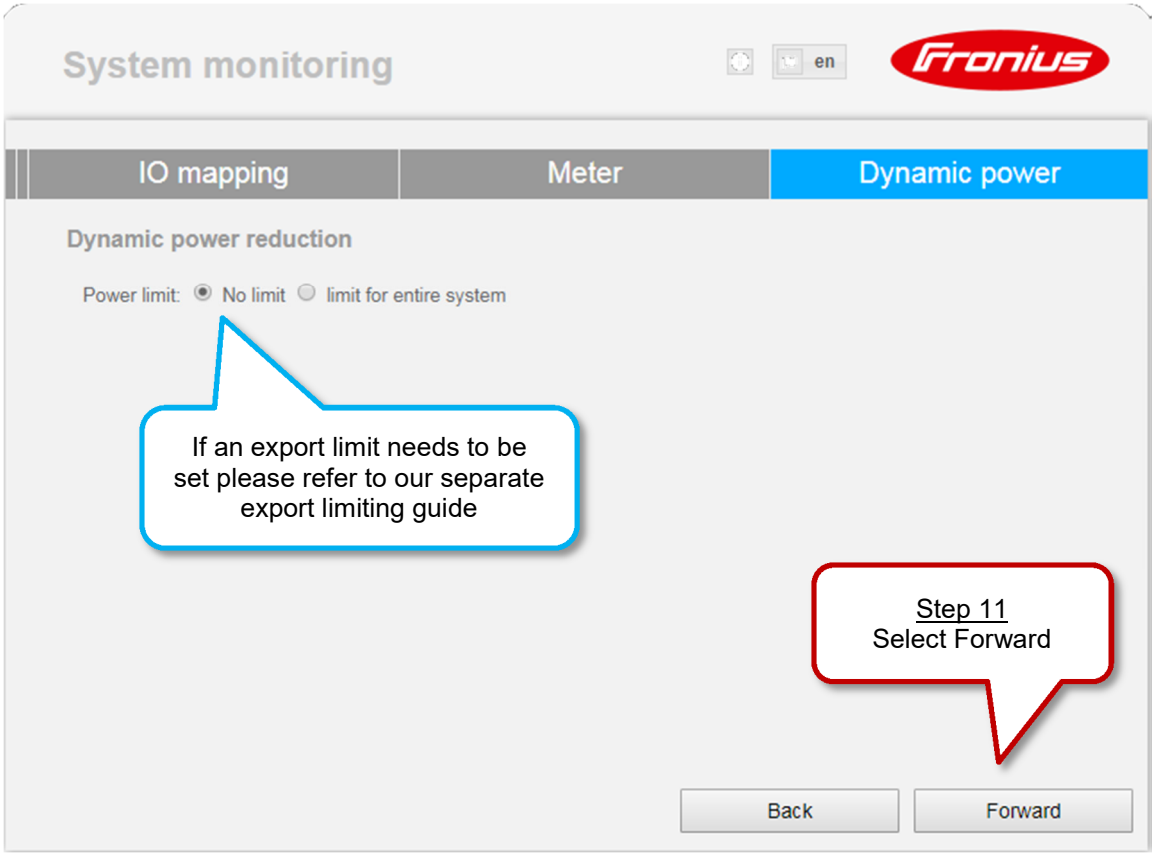


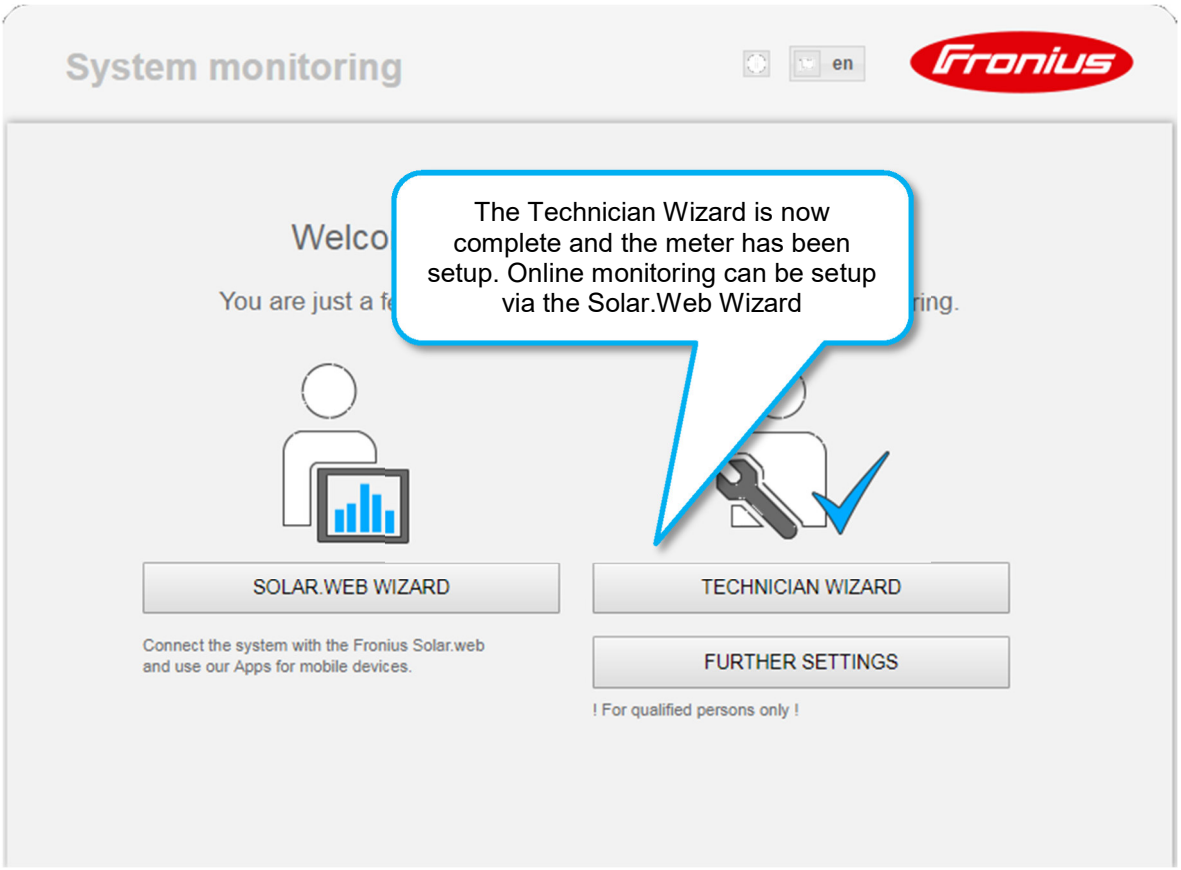












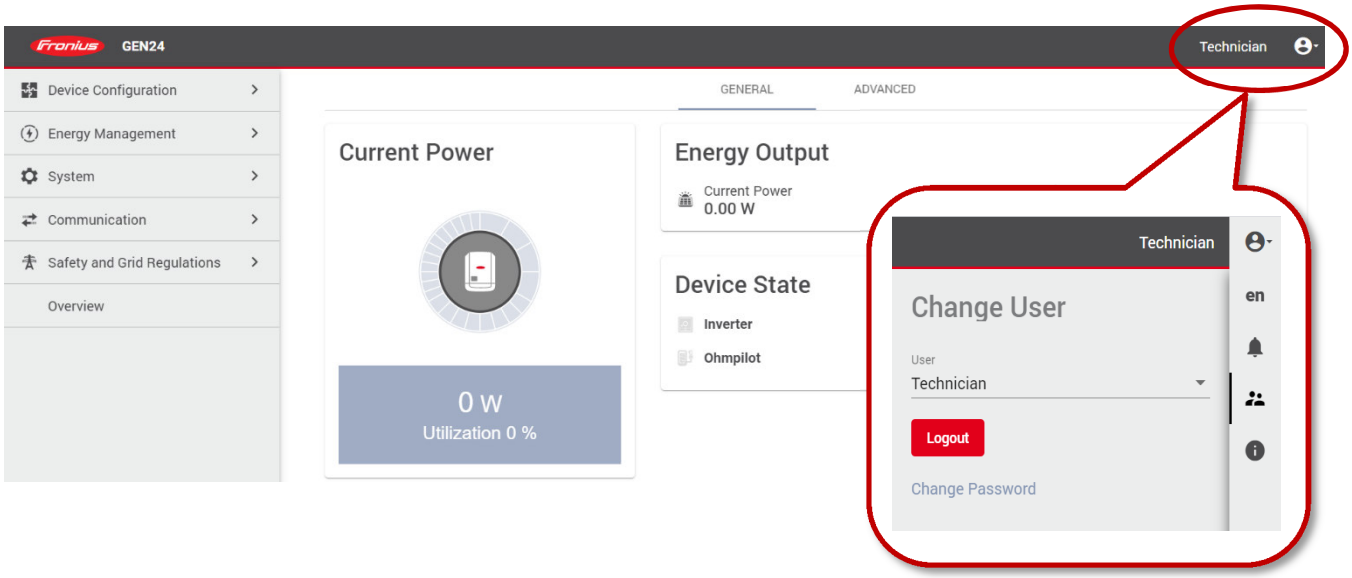
2.3 Activating the Fronius Smart Meter on the GEN24 inverter

The web interface of the GEN24 can be reached in two ways:

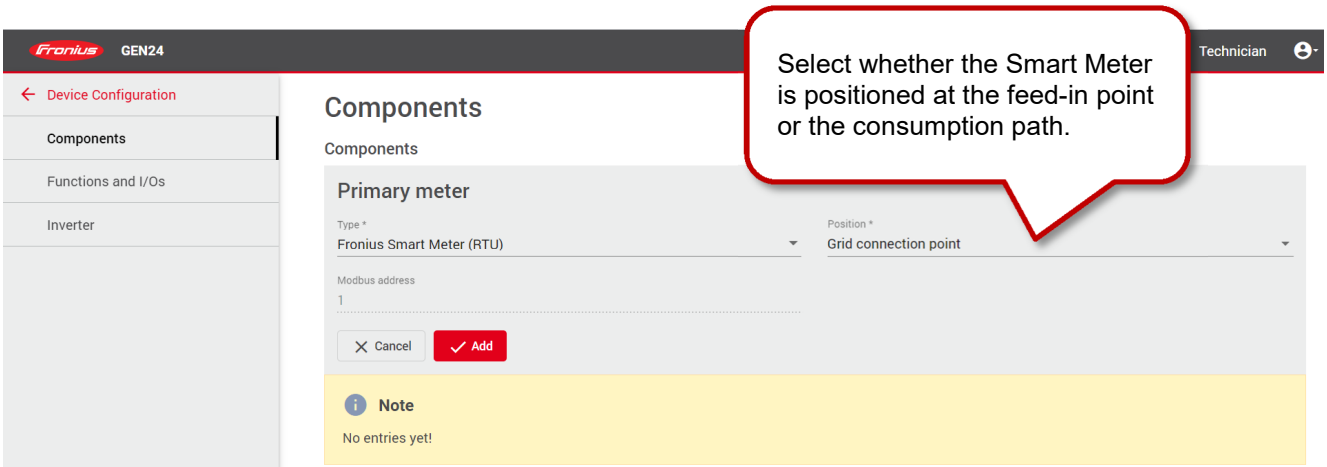
1. Via Wi-Fi Access Point:
   - Open the access point by pressing once on the sensor of the GEN24.
   - Connect to the inverter's network
     - Name: FRONIUS_Pilot Serial Number
     - Password: **12345678**
   - Enter IP address **192.168.250.181** in the browser.

2. Via LAN connection:
   - Connecting the computer to the inverter via LAN cable
     - Use the LAN 1 port on the GEN24
   - Open browser and enter IP address **169.254.0.180**

When you access the dashboard, you must unlock the submenus with the technician password if this has not already been done at start-up.



Open the "Configure Device" submenu and navigate to the "Components" menu. Here you can "add another component".



3. FRONIUS SMART METER TROUBLESHOOTING

4.1 – Timeout, meter not detected

If the Fronius Smart Meter is not being detected in the Technician wizard or PV Inverter Homepage try the following steps in order. After each step try to activate the meter again

1) Restart the inverter, shutdown both AC and DC to the inverter to switch it off and then power it back up. Reconnect to the wifi access point and attempt to activate the meter again.

2) Check that the 120 Ω resistor is installed correctly across the meter terminals as per the wiring diagrams in Section 2.1.

3) Confirm that the cable used between smart meter terminals and inverter terminal block are properly terminated.

4) Confirm that the RS485 wiring between meter terminals and inverter terminal block are correct as per the wiring diagrams in Section 2.2.

5) If cable is short enough complete a continuity test on the cores used to ensure no breaks in the cable

6) Update the GEN24 inverter/Datamanager 2.0 software. After software update restart the GEN24 inverter/Datamanager 2.0 as per Step 1 of this section. Refer to our update guide for more information: https://www.fronius.com/~/downloads/Solar%20Energy/Technical%20Articles/SE_TEA_Quick_guide_How_to_update_Fronius_Datamanager_firmware_EN_AU.pdf

4.2 – Data is not accurate in Solar.web

1) Meter is set in the incorrect path compared to actual installation. Refer to Section 1.1 of this guide and correct as per the above set up steps in 2.2.1 and 2.2.2.

2) Meter is installed in the wrong location in the switchboard. It must be installed after the Normal Supply Main switch and before the rest of the site loads including the Solar Supply Main Switch for feed in path. Refer to the single line diagrams in Section 1.1

3) If getting minimal load consumption values the meter may be in parallel with the Normal Supply Main Switch. Ensure they are in series or the meter will be mostly bypassed.

SHIFTING THE LIMITS

FRONIUS SMART METER – APPLICATION GUIDE

An overview on how to use the Fronius Smart Meter under various scenarios in the field

White Paper

Version 5.0/2019

INTRODUCTION

In this whitepaper, we will discuss how to use the Fronius Smart Meter according to the various scenarios in the field.

1. TYPES OF FRONIUS SMART METERS

The Fronius Smart Meter is a bidirectional meter that records the site's energy consumption. In combination with Fronius Solar.web, the Fronius Smart Meter presents a clear overview of energy consumption. The Fronius Smart Meter is ideally suited for use with the Fronius Symo, Fronius Symo Hybrid, Fronius Galvo, Fronius Primo, and Fronius Eco inverters, in conjunction with Fronius Datamanager 2.0 Card.

Note: All Fronius Smart Meters are compatible only with the Fronius Datamanager 2.0 Card

No	Type	Common area of application	CT requirement
1.	Fronius Smart Meter 63A-1	Single phase residential	No
2.	Fronius Smart Meter 63A-3	Three phase residential	No
3.	Fronius Smart Meter 50kA-3	Three phase commercial	Yes, CT's with 5A secondary current output
4.	Fronius Smart Meter 480 V-3 UL	SWER lines, two phase residential, and three phase commercial	Yes, CT's with 0.333 V secondary output

Table 1: Different types of Fronius Smart Meter

1.0.1 Installation tips on wiring for all the Fronius Smart Meters

- *Always follow AS3000 standard guidelines when installing the Fronius Smart Meter. Please ensure that the Fronius Smart Meter is protected by correct fusing.*
- Wiring between Fronius Smart Meter and inverter should use a CAT5 or CAT6 cable. **Important:** To be compliant with the AS3000 standards, it is recommended to have the CAT5/CAT6 cable in a heat shrink tubing (probably 10mm) when it enters the switchboard part. Alternatively, use a 240V rated CAT5/CAT6 cable – Clipsal CBUS cable.
- Communication line between the Fronius Smart Meter and the Fronius Datamanager 2.0 Card uses Modbus RTU / RS485 (3 wire connection)
- Maximum distance of the cable between the Fronius Smart Meter & the Fronius Datamanager Card: 300m (980 feet)

The Fronius **Datamanager 2.0** Card has an orange connector plug, where the communication cables from the Fronius Smart Meter have to be connected. The wiring schematics are discussed in detail for each type of the Fronius Smart Meter in the later sections of this whitepaper.

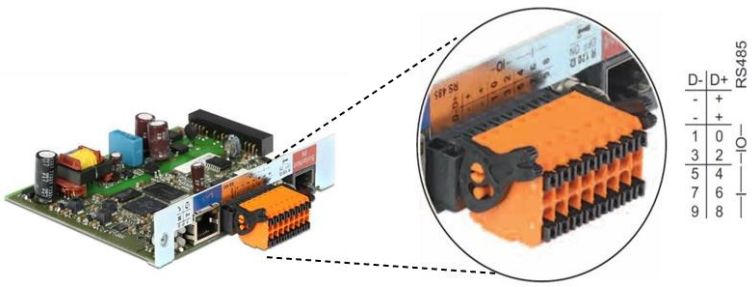


Figure 1: Fronius Datamanager 2.0 Card

1.1 Fronius Smart Meter 63A-1

1.1.1 Key points

- Area of application: Residential PV systems
- Voltage rating: 230V
- Maximum current rating: 63A
- Network: Single phase network
- Location: Main switch board, mounted on a DIN rail wired between the site's main AC switch and all site loads, including solar supply main switch → requires 2 poles
- CT requirement: No

Figure 2: Fronius Smart Meter 63A-1

1.1.2 Schematics

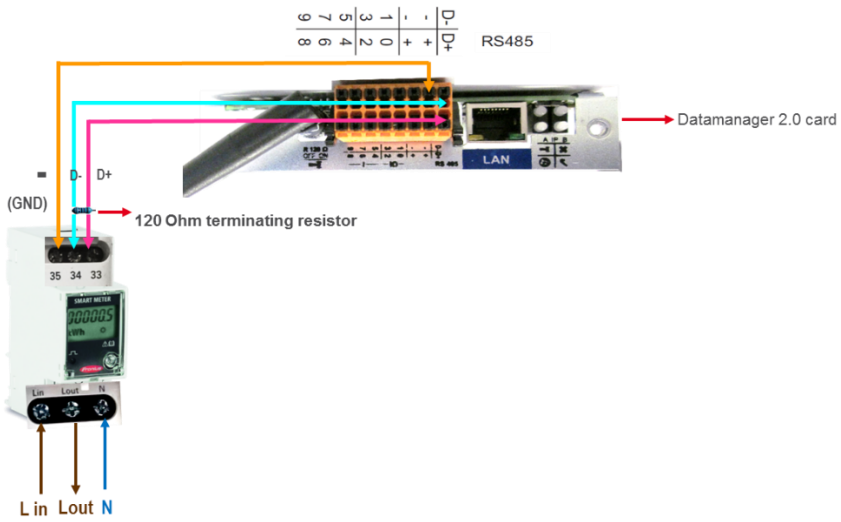


Figure 3: Wiring schematic - Fronius Smart Meter 63A-1

1.1.3 FAQ's

Can a single phase smart meter be used in a three phase network?
No, it can't be used because it will not be able to measure or visualise the power consumed in all the three phases. A three phase Fronius Smart Meter must be used in a three phase supply because the consumption will be measured across all the three phases.

Can a single phase smart meter be used in a single phase SWER connection?
Yes it can be used because the SWER is on the HV side of the transformer (11 – 22kV), so the secondary could be a split phase 480V or single phase 230V depending on the type of transformer. So, if it's a single phase SWER connection (230V) then a single phase smart meter can be used.

1.2 Fronius Smart Meter 63A-3

1.2.1 Key points

- Area of application: Residential
- Voltage rating: 400 – 415 V
- Maximum current rating: 63A per phase
- Network: Three phase network
- Location: Main Switch board, mounted on a DIN rail wired between the site's main AC switch and all site loads, including solar supply main switch → requires 4 poles
- CT requirement: No

Figure 4: Fronius Smart Meter 63A-3

1.2.2 Schematics

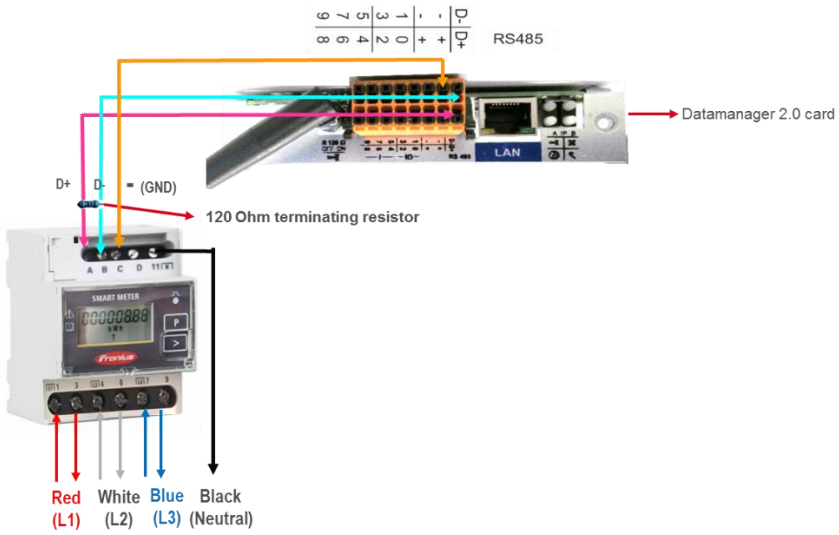


Figure 5: Wiring Schematic - Fronius Smart Meter 63A-3

1.2.3 FAQ's

Can a three phase smart meter be used in a two phase network?
Yes, it can be used if it is not a SWER connection.

1.3 Fronius Smart Meter 50 kA - 3

1.3.1 Key points

- Area of application: Commercial PV systems
- Voltage rating: 400 – 415 V
- Maximum current rating: 50 kA
- Network: Three phase network
- Location: Main Switch board mounted on a DIN rail, requires 4 poles
- CT requirement: Yes, CT's with 5A secondary current output
- Interface to set the CT ratio: On the Fronius Smart Meter

Figure 6: Fronius Smart Meter 50 kA – 3

1.3.2 Schematics

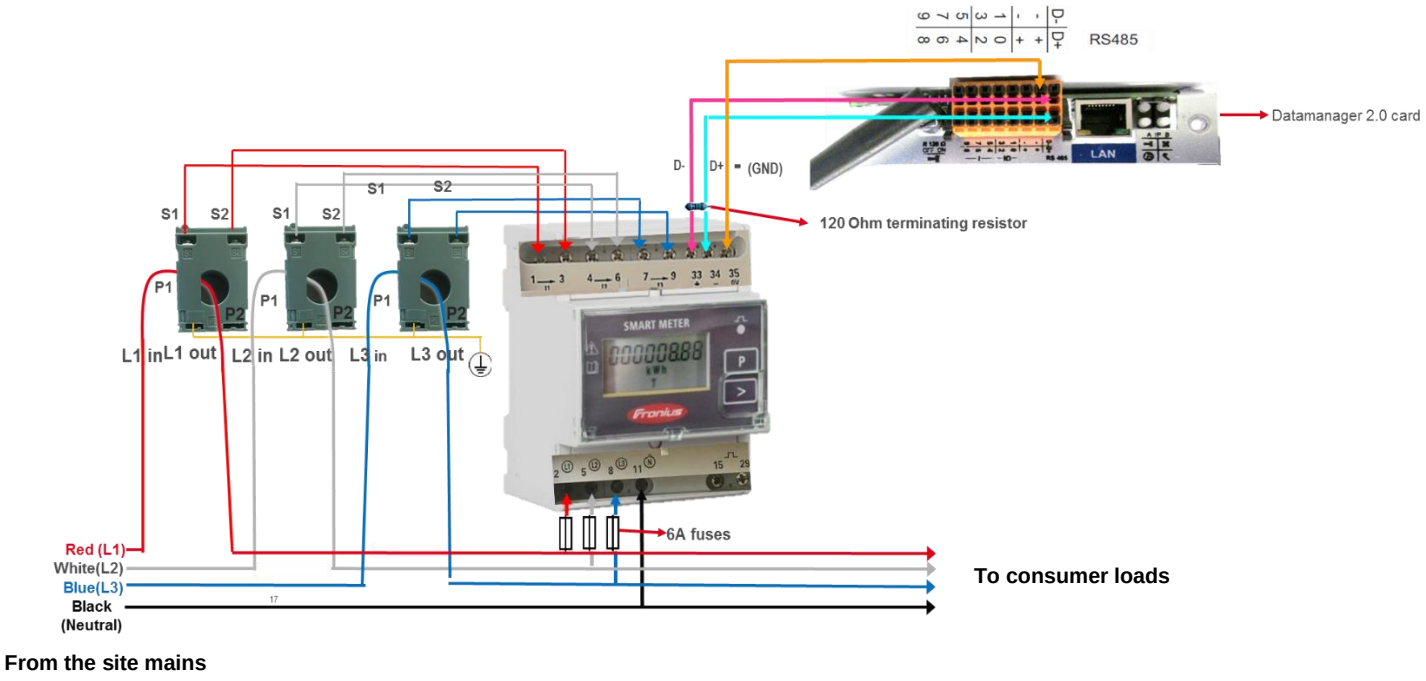


Figure 7: Wiring schematic - Fronius Smart Meter 50 kA - 3

1.3.3 Selection criteria for choosing the CT's:

/ **Primary current**
The CT's primary current should be equal to or greater than the maximum expected AC current from the grid, per phase. *Important: The closer the expected AC current is to the chosen primary current value, the more precise the measurement will need to be.*

/ **Secondary current**
5 A

/ **Power**
The Fronius Smart Meter needs 0.3 VA to carry out its measurements. Losses also occur on the outgoing and return leads. For example: Outgoing and return lead between Fronius Smart Meter and the CT's (together):

/ x 0.5 m = 1 m length with a copper cable cross-section of 1.5 mm² -> 1 x 0.6 VA
/ Fronius Smart Meter self-consumption = 0.3 VA
/ Sum total = 0.9 VA
/ *CT's with a rating of 1 VA, 1.5 VA, 5 VA or higher are suitable here*
/ Line resistances at different cross-sections (copper wires)

Secondary current	Cross-section	Line resistances at different lead lengths (outgoing and return lead)				
[A]	[mm²]	0.5 m	1.0 m	2.5 m	5 m	10 m
5	1.5	0.3 VA	0.6 VA	1.5 VA	2.9 VA	5.8 VA
5	2.5	0.2 VA	0.4 VA	0.9 VA	1.8 VA	3.6 VA
5	4.0	-	-	0.6 VA	1.1 VA	2.2 VA

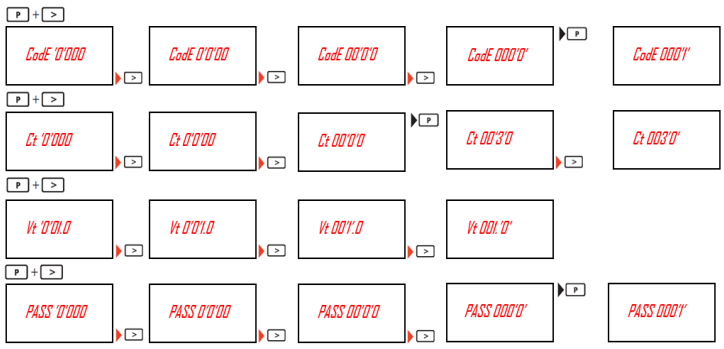
/ **Accuracy class**
Class 1 or better (Class 0.5, 0.2, etc.) is recommended. Class 1 is equivalent to a deviation of ± 1% of the secondary current at maximum power.

/ **Assembly**
There are two physical types of the CT's: solid core & split core

/ **Solid core CT's**
They form a permanently closed core. Installing a solid core CT requires disconnecting the cable to get it through the CT ring.

/ **Split core CT's**
They have a "split" in the core that allows the CTs to be placed around the conductor without having to disconnect the conductor or disrupt the wiring. This is advantageous if you cannot shut down the switch board or there are large busbars in the switchboard.

1.3.4 Programming of the CT ratio in the smart meter:



1. Press P and > and enter the password: 0001

2. Set the transmission ratio for the CT, which is given by Primary current: Secondary current. For example if the primary current is 150A and secondary current is 5A, then the CT ratio is 30

3. If you use voltage transducers then set the transmission ratio for the VT's

4. After setting the transmission ratios, save changes by exiting the menu.

1.3.5 FAQ's

Why is it important to set the CT ratio correctly?
If the CT ratio is set incorrectly then the power values will show unrealistic/wrong values in Fronius 63Solar.web

1.4 Fronius Smart Meter 480 V – UL

1.4.1 Key points

- Area of application: Commercial & residential PV systems
- Voltage rating: 384 V – 552 V
- Network: Two phase network, three phase network and SWER network
- Location: Main switch board
- CT requirement: Yes, CT's with 0.333V secondary voltage output
- Interface to set the CT ratio: On the Fronius Datamanager Card's web interface

Figure 8: Fronius Smart Meter 480 V UL

1.4.2 Schematics

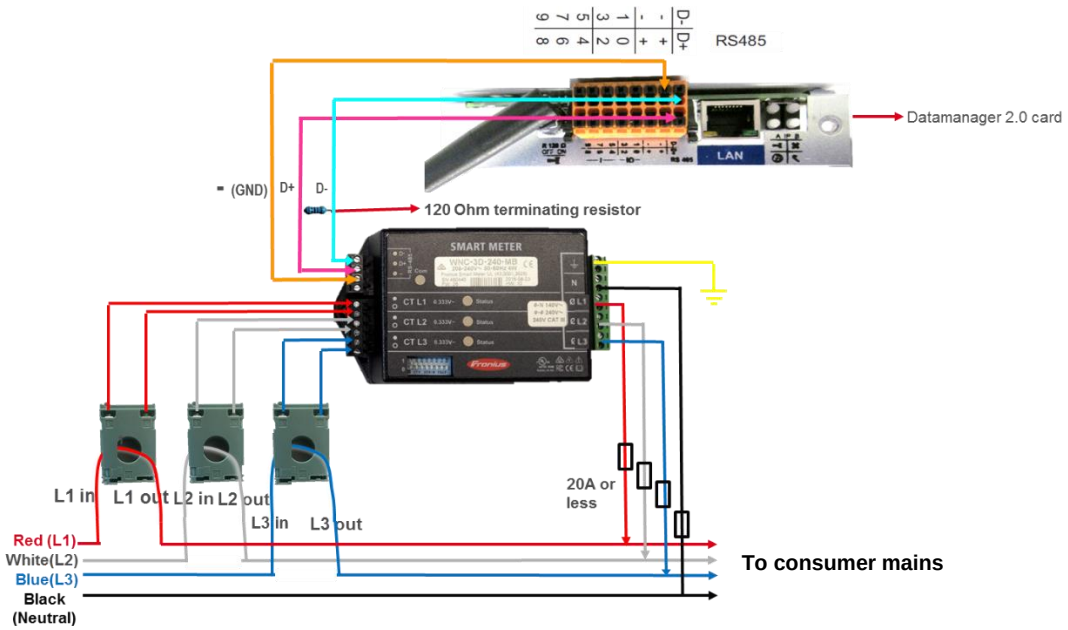


Figure 9: Wiring schematic - Fronius Smart Meter 480 V UL

1.4.3 Selection and connection of the CT's

- Only CT's with voltage output of 0.333 V may be used, which means that the secondary side must have a voltage output of 0.333 V. The CT's primary current should be equal to or greater than the maximum expected AC current from the grid, per phase. *Important: The closer the expected AC current is to the chosen primary current value, the more precise the measurement will need to be.*
- Make sure the CT L1 is measuring the current on the same phase being monitored by the L1 voltage input and the same for phases L2 and L3.
- Mount the current transformers (CTs) around the line conductors. Make sure the CTs face the correct direction. An arrow might indicate either the load or the mains (public grid).
- If you see strange readings on unused phases, jumper the unused CT inputs for each unused CT, and connect a short cable from the terminal marked with a white dot to the terminal marked with a black dot (refer figure 9).
- Verify that the LEDs indicate correct operation. This is to verify that the CT phases match the line voltage phases. LED state: green = consumption, red = feed-in. If not sure, turn off all energy sources (inverters). If you have loads on, all phases must be green (consumption)

1.4.4 FAQ's

What are the CT's that can be used for the 480UL smart meter?
For this smart meter only CT's with a secondary voltage output of **0.333 V can be used**. CT's with secondary current output, such as 1 Amp, 2 Amps and 5 Amps will damage the meter and must not be used.

2. FAQ's

I have a two phase site (not SWER) and I am installing a single phase inverter on one of the phases. What smart meter do I use in this scenario and can I do export limiting?
If export limit needs to be done on this site across all the phases then a three phase smart meter will need to be used. If the DNSP doesn't require export limitation on each of the individual phases then it's better to use a three phase smart meter because it will export limit once considering the total consumption across all the phases added together.

I am installing 2 x single phase inverters across 2 different phases and the DNSP requires export limitation per phase, what should be done?
If the DNSP requires export limit on each of the individual phases then a single phase smart meter will need to be used on each phase because the three phase smart meter will not do export limitation per phase. Under this scenario please note that you will not be able to set it up as a single system in Fronius Solar.web

Does a three phase Fronius Smart Meter manage export limitation per phase?
No, it doesn't manage export limitation per phase. It sums up the value across all the three phases and then adjusts to export limitation.

Is it possible to have two Fronius Smart Meters connected individually to two Fronius Datamanager Cards and have it as a single system in Fronius Solar.web?
No, this is not possible because having two smart meters under a single system will lead to an incorrect visualization of the consumption values in Fronius Solar.web. However this is possible when one smart meter is set to feed-in point and the other smart meter is set to consumption path. This configuration is possible only if a combination of Fronius Datamanager 2.0 box and Fronius Datamanager 2.0 card is used.

My customer has a 1.5kW system installed with a third party inverter brand. If he wants to upgrade the system with a Fronius Primo 5 kW inverter in addition to the existing system, where the DNSP requires 5kW export limit, can this be done by using a Fronius Smart Meter?
Yes, if your export limit is equal to or greater than the other inverter's output capacity this can be done. **Please note:** The Fronius Smart Meter will not control the power output of the third-party inverter. **For example**: If the third-party inverter is 1.5 kW and Fronius inverter is 5 kW and there is only 5 kW allowed to export, then the export limitation value that can be set on the Fronius inverter is 5 kW.

If there is a site where a Fronius Symo Hybrid is AC-coupled to a Fronius Symo inverter, how would you do export limitation?
Using a Fronius Smart Meter it is possible to export limit on the Fronius Symo Hybrid but not on the Fronius Symo inverter because the Fronius Smart Meter will be connected to the Fronius Symo Hybrid inverter, which in turn cannot be daisy chained with the Fronius Symo inverter.

If there is no sufficient space on the switch board to fit the CT's (in case of a 50 kA Fronius Smart Meter), what's the solution?
In case of space constraints in the switch board, rope CT's can be used. Please note that rope CT's are voltage reference CT's, which are smaller than current reference CT's and can only be used along with the 480VUL Fronius Smart Meter. So, if you have proposed a system with a 50 kA Fronius Smart Meter and you have space constraints in the main switchboard, then you can solve the situation by having a 480V UL Fronius smart meter with rope CT's.

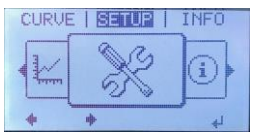
Is it possible to monitor the consumption of a site just by having a Fronius Smart Meter without installing an inverter?
Yes, you can use a Fronius Datamanager 2.0 box and connect the Fronius Smart Meter to it. This can then be added as a PV system in Fronius Solar.web to visualise the consumption values.

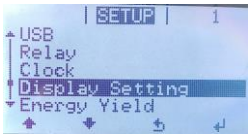
3. TROUBLESHOOTING

The Fronius smart meter is not getting detected in the Fronius Datamanager Card's interface and it displays 'timed out' when trying to activate it. What should be done to activate it?
If the software version on the Fronius Datamanager Card is outdated or if less than 3.5.2-1, then the Fronius Smart Meter might not be detected by the Datamanager Card. Please update the software on the Fronius Datamanager Card and once the update is complete, go to the meter settings to activate the meter.

Important: If the Fronius Smart Meter is not detected by the Fronius Datamanager Card even after updating the software on the Fronius Datamanager Card, restart the Fronius inverter and then try activating the Fronius Smart Meter.

A Fronius Smart Meter has been installed but I am unable to visualise the night-time consumption values in Fronius Solar.web. What should be done?
If the night mode on the Fronius inverter is disabled then you might not be able to visualise the consumption values during the night. To activate the night mode, please follow the steps below:





A Fronius 50 kA Smart Meter was installed and it is working but I am getting incorrect consumption values on Fronius Solar.web. What should be done to fix this?
Please check if the CT ratio has been set correctly on the smart meter. Check if the CT's are in the right direction, and if similar coloured wires are used for wiring the CT's please check if the connections/terminals have been swapped. To avoid this issue, it is best to use different colours for wiring the CT's, and also check the S1 & S2 connections for each phase.

A Fronius Smart Meter 480 V UL was installed but the status LED's flash red. What does it indicate?
Since the CT's are directional, if they are mounted backwards or the wiring on their terminals is swapped, then the status LED's flash red indicating that the measured power will be negative. If all the LED's are illuminated red for more than 3 seconds and if it happens repeatedly, please contact Fronius Technical Support.

A Fronius Smart Meter 480 V UL was installed but none of the status LED's are illuminated. What does it indicate?
If none of the LEDs are illuminated, check that the correct line voltages are applied to the meter and check the neutral connection to the Fronius Smart Meter. If the voltages are correct, please contact Fronius Technical support for further assistance.

A Fronius Smart Meter 480V UL was installed but it is not detected by the Fronius Datamanager Card. What should be done?
For the Fronius Smart Meter 480V UL to be recognised, the Fronius Smart Meter will need firmware version 3.7.3-2. If the firmware version on the Fronius Datamanager Card is below 3.7.3-2, then please update it.

SHIFTING THE LIMITS

How to set up Export Limiting
Using the Fronius Smart Meter*

*Single phase or 3-phase Energy Meter

Application Guide

Version 4.0/2020

1. GENERAL

So called “export limiting” is where the Utility or network operator restricts the amount of energy from PV system that goes into the grid. I.e. excess energy that is not consumed on the site. In order for the end user to gain the maximum amount of energy from the system without exceeding the export limit, the inverter output needs to be able to follow the site load.

With Fronius Datamanager 2.0 integrated SnapINverter and GEN24 inverter it is possible to limit the inverter output power dynamically and therefore to control and limit the amount of energy which is exported into the grid in accordance to the consumption of the loads.

The Datamanager Card 2.0 and the GEN24 inverter offer the following options to control the power output of the inverter:

- Modbus RTU
- Modbus TCP
- digital inputs
- Dynamic Power Reduction using the Fronius Smart Meter

Therefore there are two possible ways to achieve export limiting with Fronius Inverters:

- Using the Fronius Smart Meter to allow the inbuilt Dynamic Power Reduction.
- 3rd party controller issuing commands to the inverter.

The simplest and most cost effective way to achieve export control with Fronius inverters is to use the Fronius Smart Meter. The meter measures the amount of energy imported to or exported from the grid and the Datamanager 2.0/GEN24 uses these values to calculate the appropriate output power of the inverter to limit the export to the grid.

This document describes how to set up export control using the single phase or 3-phase Fronius Smart Meter.

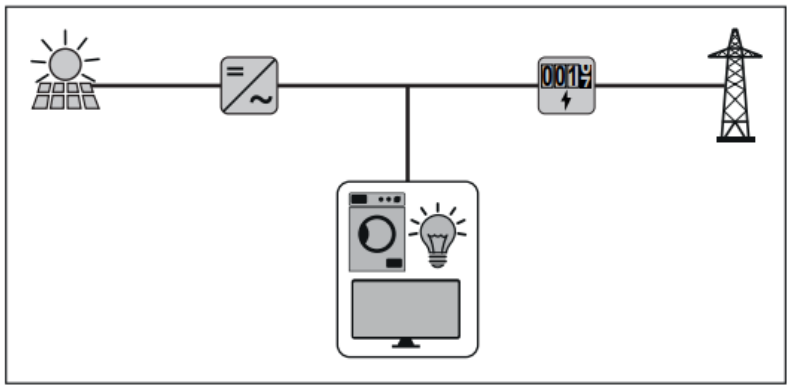
1.1 Location of the Fronius Smart Meter

With the Fronius Smart Meter there are 2 possible energy paths / locations where it can be installed.
The **feed-in point** or the **consumption path.**

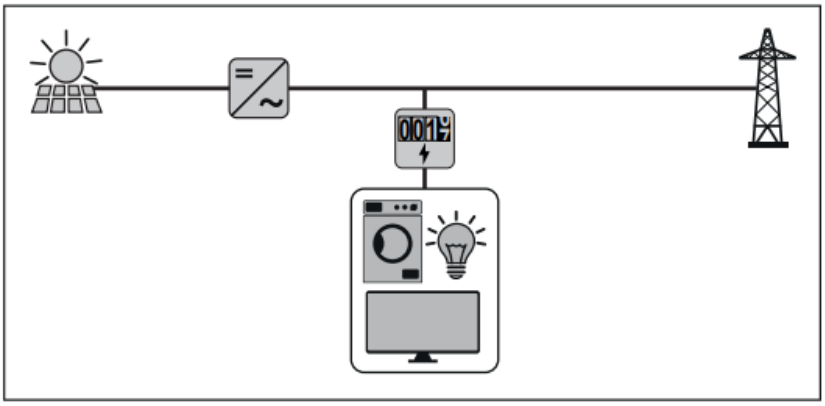
Feed-in point – bi-directional energy measurement possible. Feed-in of surplus energy/consumption from the grid is measured.
Consumption path – single direction energy measurement. Load is measured directly.

Due to NET metering and the common way installations are done in some countries, in almost all cases, the Fronius Smart Meter will be installed at the **feed-in point**. This is also the default setting on the inverter WebInterface.

/ Feed-in point
In this position the solar & the loads are in parallel. The solar is connected to the “load” side of the Fronius Smart Meter.



/ Consumption path
In this position the solar & the loads are separated by the meter. The solar is connected to the “grid” side of the Fronius Smart Meter.



1.2 Requirements

Important! The Fronius Datamanager 2.0 needs a software version of **3.16.x-x** or greater. It can be downloaded from the Fronius Website under *Solar Energy / Info center / installer support* or click here: https://www.fronius.com/en/photovoltaics/infocentre/tech-support?

Within the *Installer Support Area* on the Fronius Website you can also find a more detailed document/guide on how to update your Datamanager 2.0.

2. EXPORT CONTROL USING A FRONIUS SMART METER

2.1 Smart Meter type overview

Fronius Smart Meters or the Fronius Smart Meters TS (single phase or 3-phase) are energy meters with ModBus RTU / RS 485 communication. It is needed for measuring the load and energy fed into the grid.

The Smart Meter needs to be connected to the Fronius inverter. If a SnapINverter is used a Fronius Datamanager 2.0 is necessary. This communication card comes built-in in SnapINverters Galvo, Primo, Symo and Eco and can be retrofitted to all other Fronius inverters.

Fronius Smart Meter 63A-3

Fronius Smart Meter 63A-1

Fronius Smart Meter 50kA-3

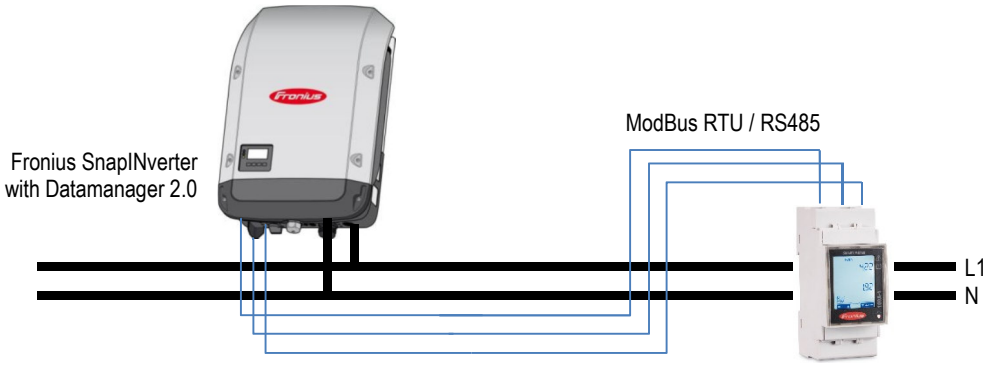
Fronius Smart Meter TS 65A-3

Fronius Smart Meter TS 100A-1

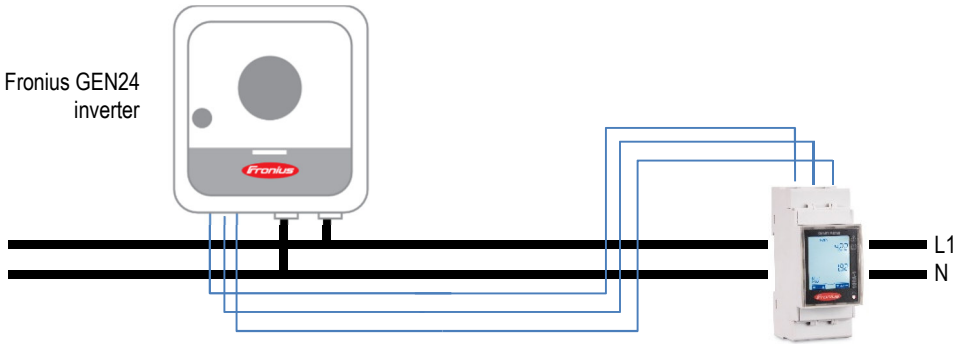
Fronius Smart Meter TS 5kA-3

2.2 Schematics and Wiring

The following schematics shows the system configuration



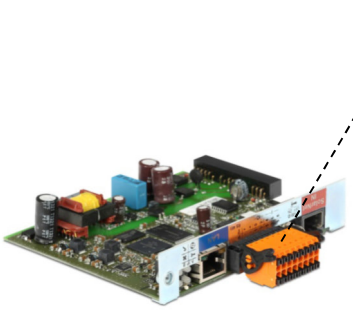
Fronius Smart Meter



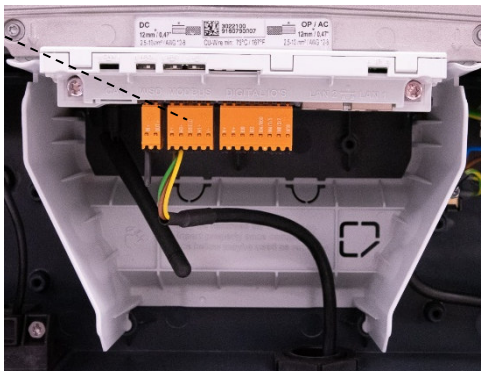
Fronius Smart Meter

Please note:
/ Cables of type CAT5 or a higher maybe used for data wiring between Meter and inverter.
/ Use a shielded twisted pair cable and connect the shield to ground on one side to avoid interference.
/ Use twisted cable pair for the data lines (D+ and D- or M1+ and M1-)
/ Maximum distance: 300 m (980 feet)

Meter connection on the inverter
The meter needs to be connected to the terminal block on the Datamanager 2.0/within the GEN24 inverter.

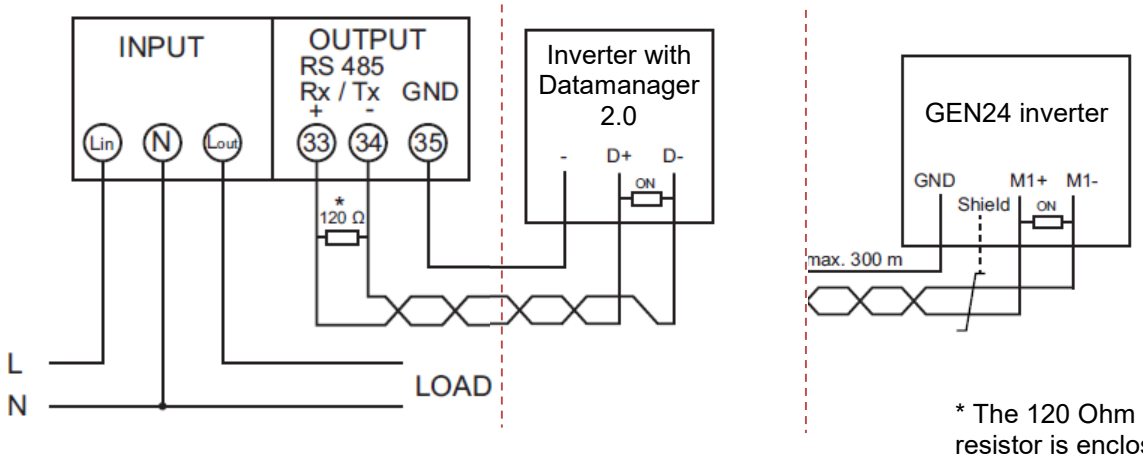


Datamanager 2.0



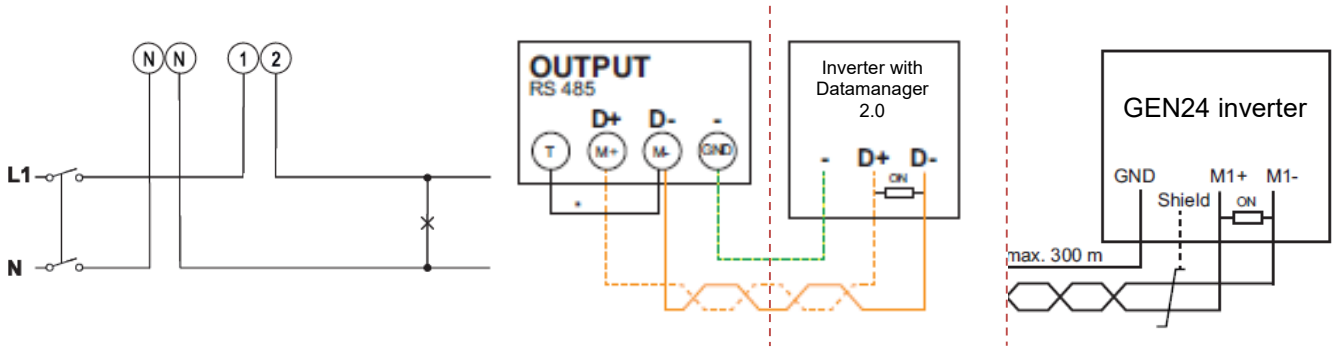
GEN24 – connection on the communication card

Wiring detail for Single Phase Fronius Smart Meter 63A-1



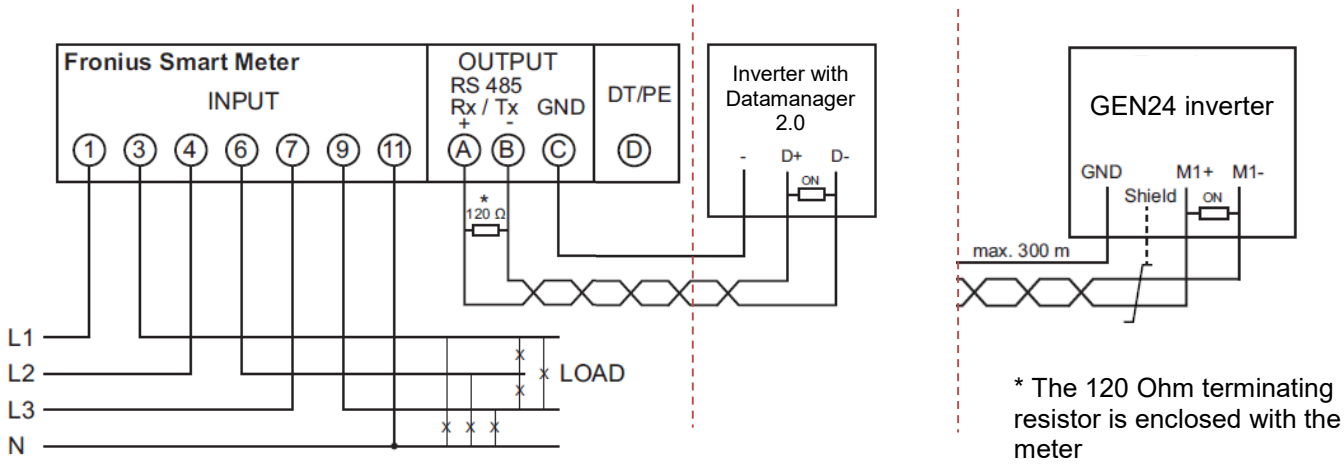
* The 120 Ohm terminating resistor is enclosed with the meter

Wiring detail for Single Phase Fronius Smart Meter TS 100A-1



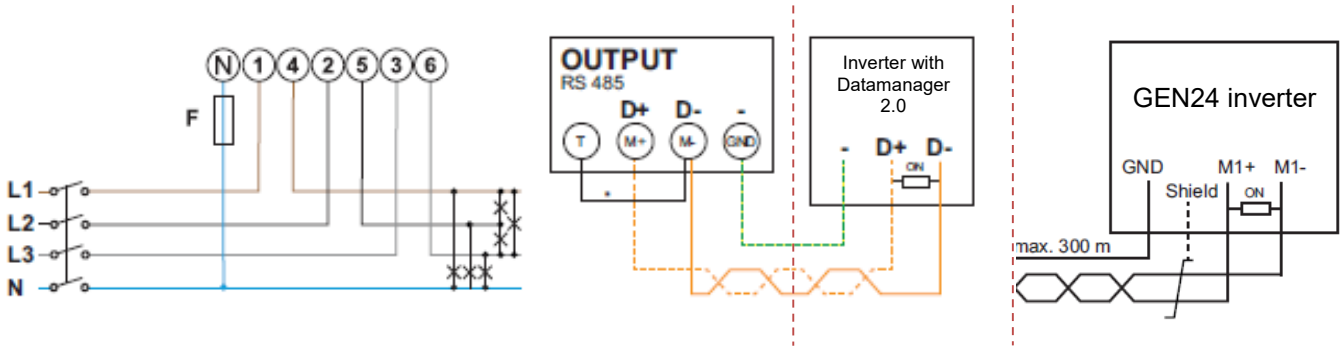
Contact “T”: 120 Ohm terminating resistor has to be bridged at the end of the Modbus line.

Wiring detail for 3-Phase Fronius Smart Meter 63A-3



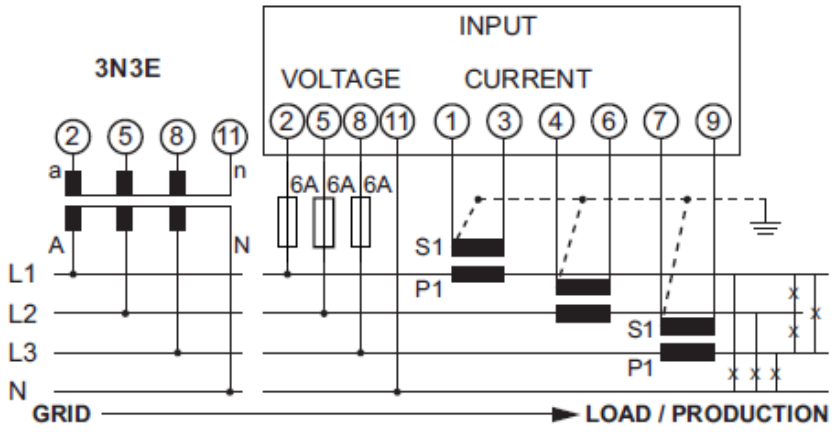
* The 120 Ohm terminating resistor is enclosed with the meter

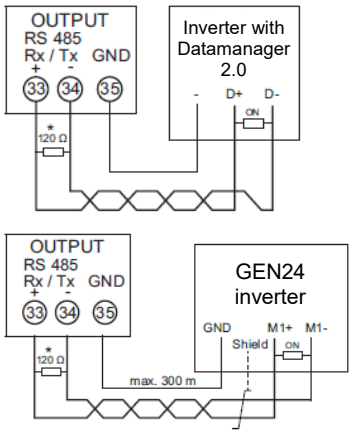
Wiring detail for 3-Phase Fronius Smart Meter TS 65A-3



Contact T: 120 Ohm terminating resistor has to be bridged at the end of the Modbus line.

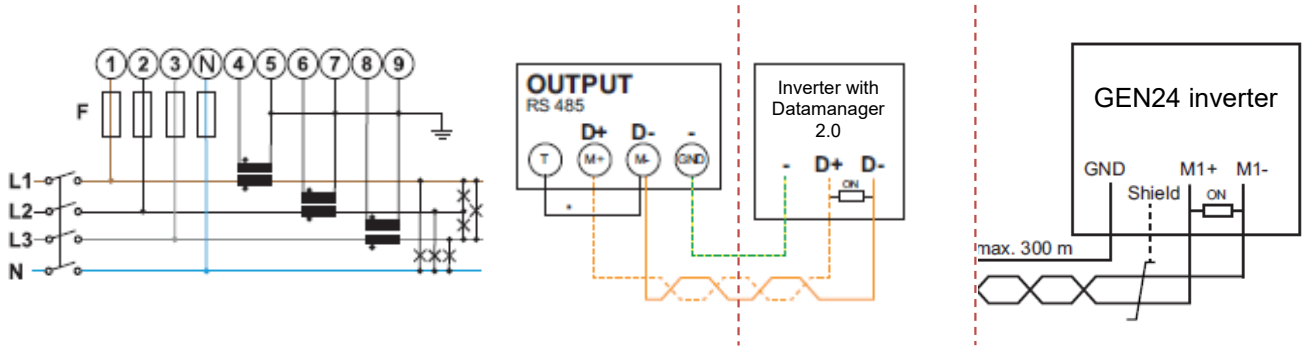
Wiring detail for 3-Phase Fronius Smart Meter 50kA-3





* The 120 Ohm terminating resistor is enclosed with the meter

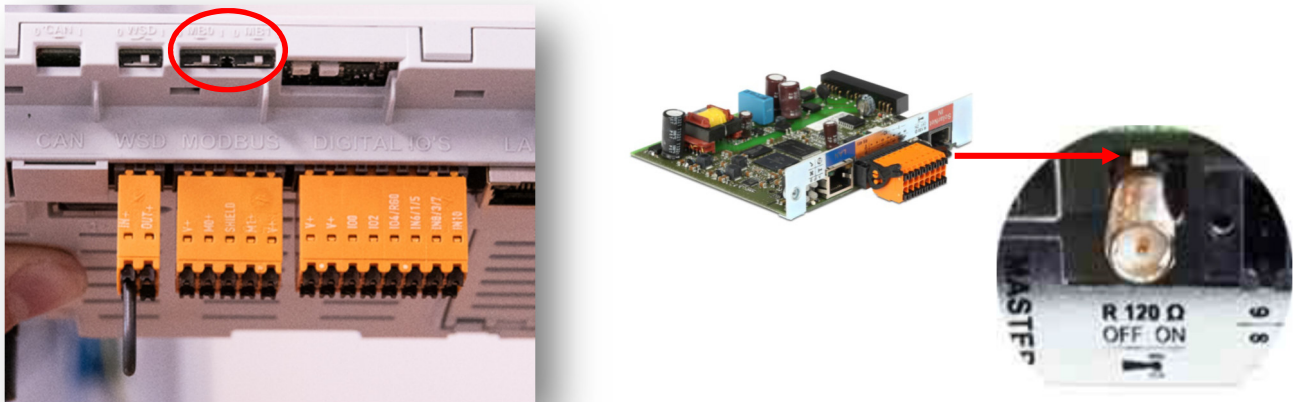
Wiring detail for 3-Phase Fronius Smart Meter TS 5kA-3



Contact T: 120 Ohm terminating resistor has to be bridged at the end of the Modbus line.

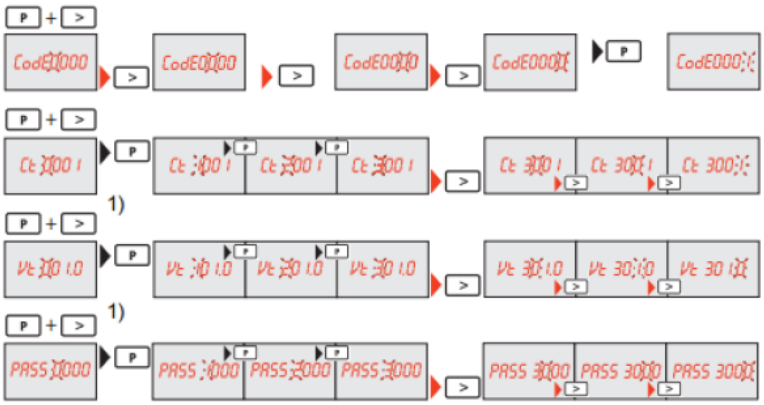
Modbus termination on the inverter

The internal bus termination 120-Ohm resistance (for Modbus RTU) must be switched *ON* at the first and last device in an RS-485 bus connection.



CT ratio programming on the Fronius Smart Meter 50kA-3

Only the transmission ratio has to be set!



Password / type in Code **0001**

transmission ratio of the current transducer *)

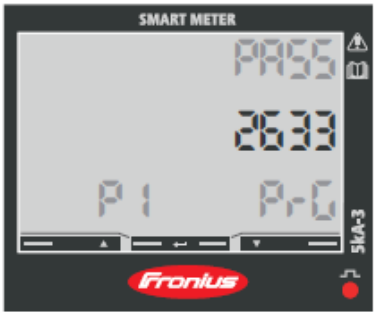
transmission ratio of the voltage transducer – not in use.

Change password – 0001
For future changes of the CT, please don't change the password, there is no possibility to read the set password

*) ratio **Primary nominal current** / **secondary nominal current**
Example:
Primary nominal current 100 A / secondary nominal current 5 A = Transmission ratio 20
Primary nominal current 200 A / secondary nominal current 5 A = Transmission ratio 40

E.g. If your CT ratio is 20 you need to set "Ct 0020"

CT ratio programming on the Fronius Smart Meter TS 5kA-3



(1) Press and hold "Enter" for 2 seconds long.
(2) Go to Page P1 with "Up" or "Down" buttons.
(3) Enter the password "2633" with "Up" and "Down" and confirm every single value with "Enter".
(4) Note the password.

Important! Password can not be reset.

(1) Go to Page P4 with "Up" or "Down" buttons.
(2) Press and hold "Enter" for 2 seconds long.
(3) Set the correct Ct ratio and confirm every single value with "Enter".
(4) Go to Page P18 with "Up". Press and hold "Enter" for 2 seconds long to save and leave the settings.

2.3 Activating the Fronius Smart Meter on the inverter

2.3.1 Meter activation on the Datamanager 2.0 Web interface

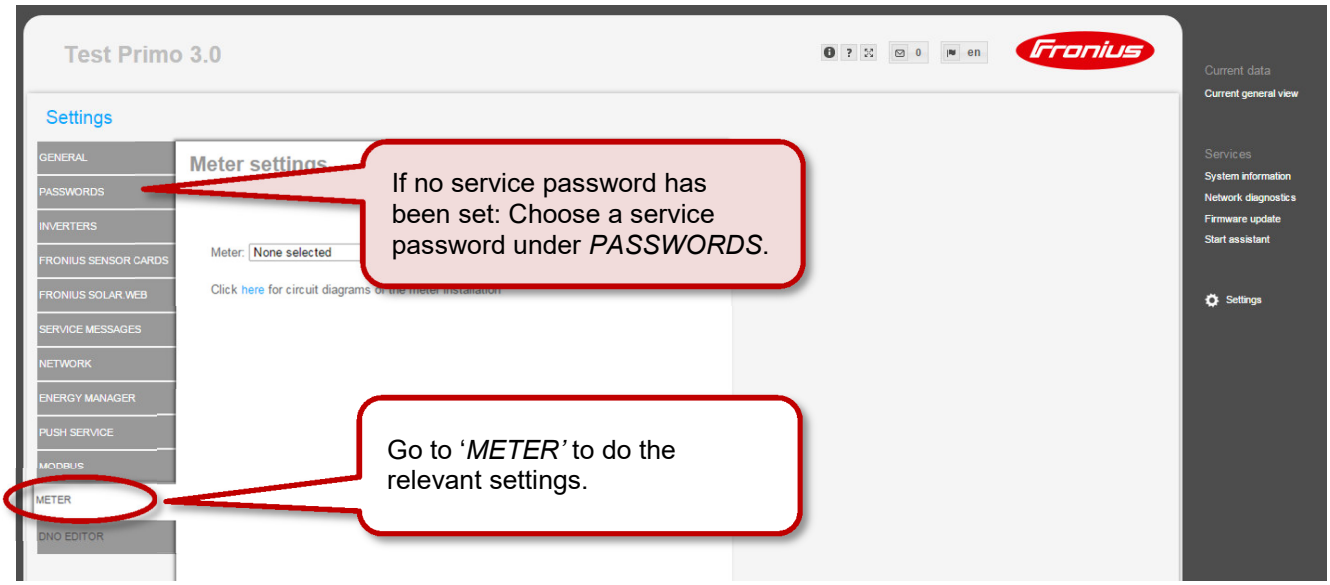
The Datamanager Web interface can be accessed in two ways:

1. Via the Wi-Fi Access Point:
   - Activate the Wi-Fi Access Point on the Datamanager card (inverter) or Datamanager Box 2.0
   - Connect your computer/table/smart phone to the ,,**Fronius_240.XXXXXX"** Wi-Fi network
   - Open a web browser and go to http://192.168.250.181.

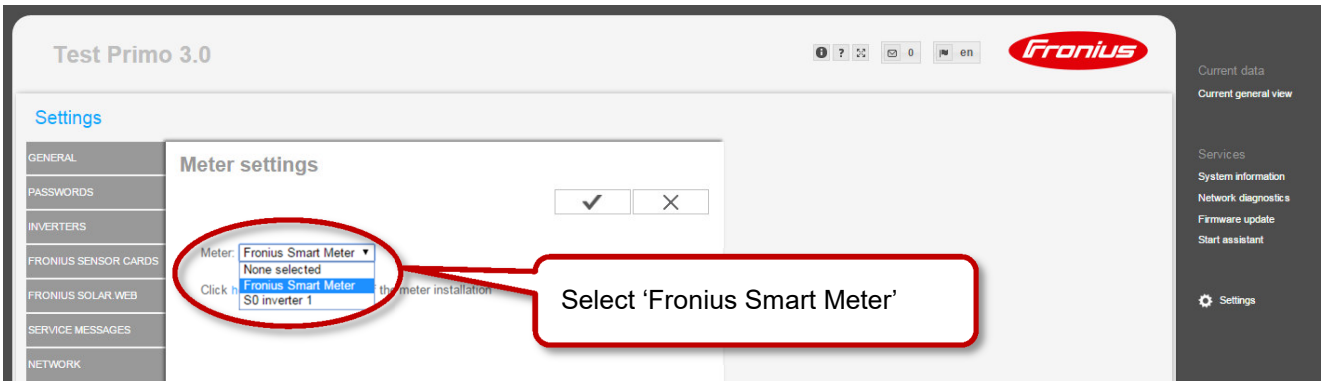
2. Via the LAN Port:
   - Connect your computer to the Datamanager via LAN cable
   - Switch the Datamanager IP Switch to Position 'A'
   - Open a web browser and go to http://169.254.0.180

For information of how to set up the Fronius Datamanager please see the manual of the Fronius inverter or the Fronius Datamanager (for Fronius Galvo/Symo/Primo/Eco):
http://www.fronius.com/cps/rde/xbcr/SID-791F3201-8338B17C/fronius_international/42_0426_0191_EA_388899_snapshot.pdf

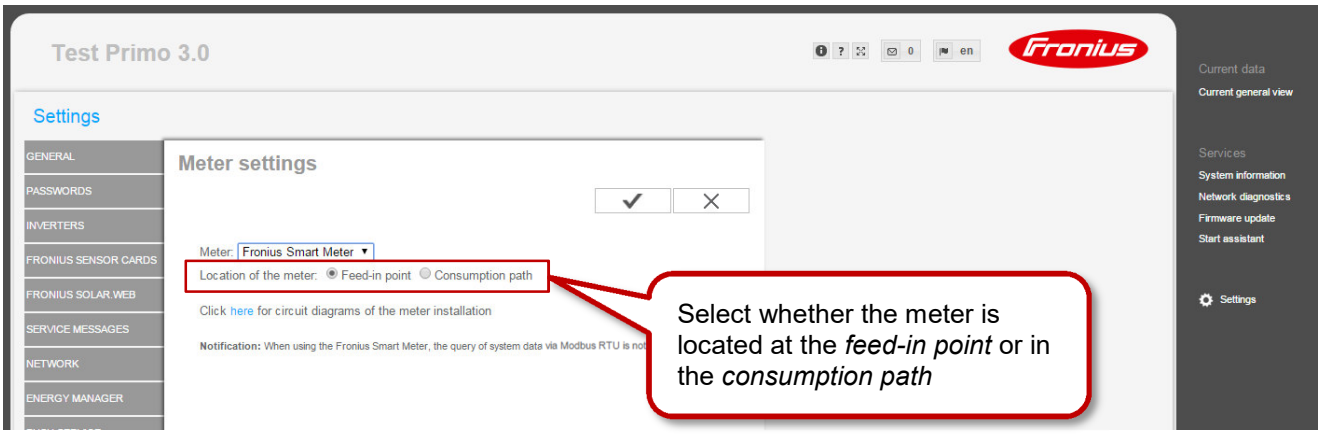
Before it is possible to enter the *METER* settings a service password is required. If no service password has been set, it needs to be created first!



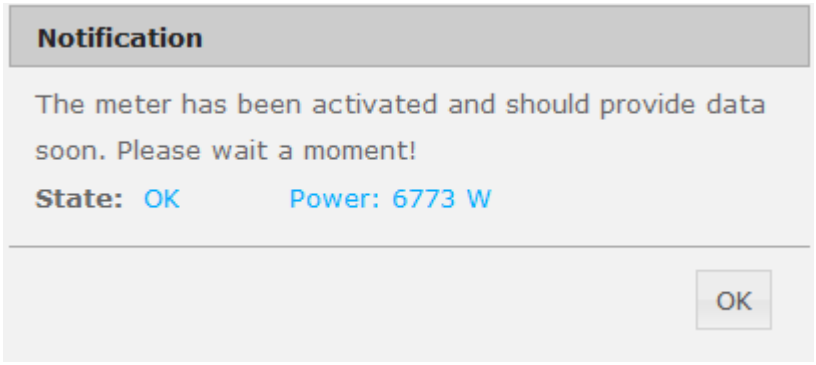
Choose the type of meter.



Choose location.
For further explanations on feed-in point and consumption path see chapter *1.1 Location of the energy meter*



The meter is activated once you get the following message.



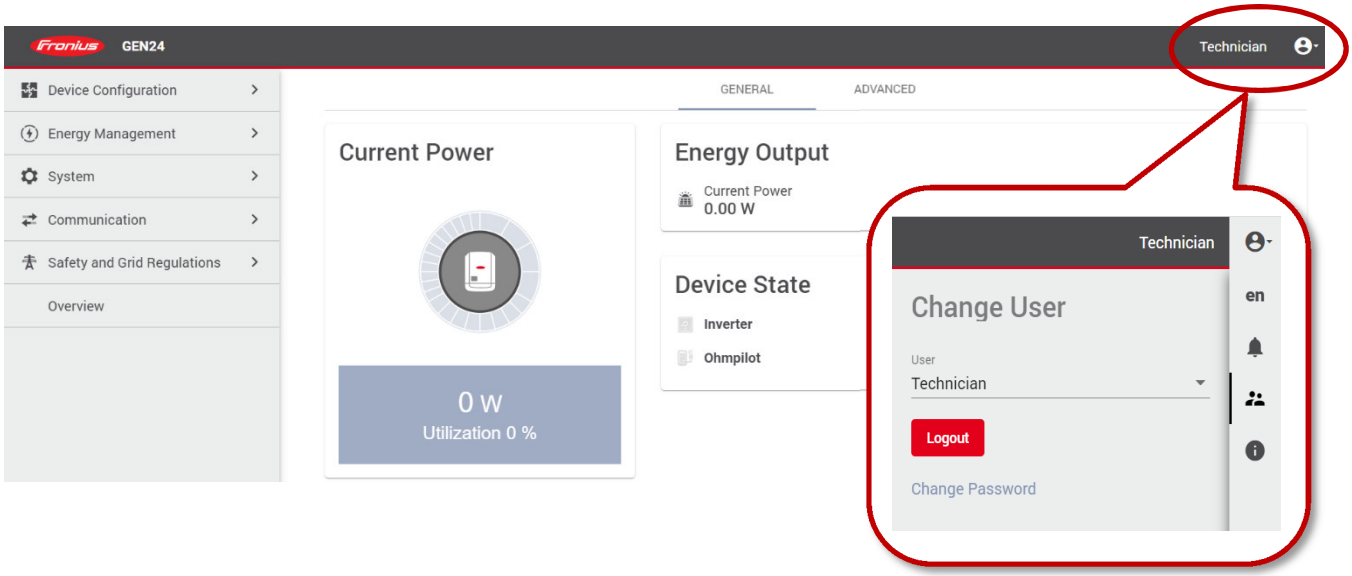
2.3.2 Activation on the GEN24 Web interface

The Web interface of GEN24 inverters can be accessed in two ways:

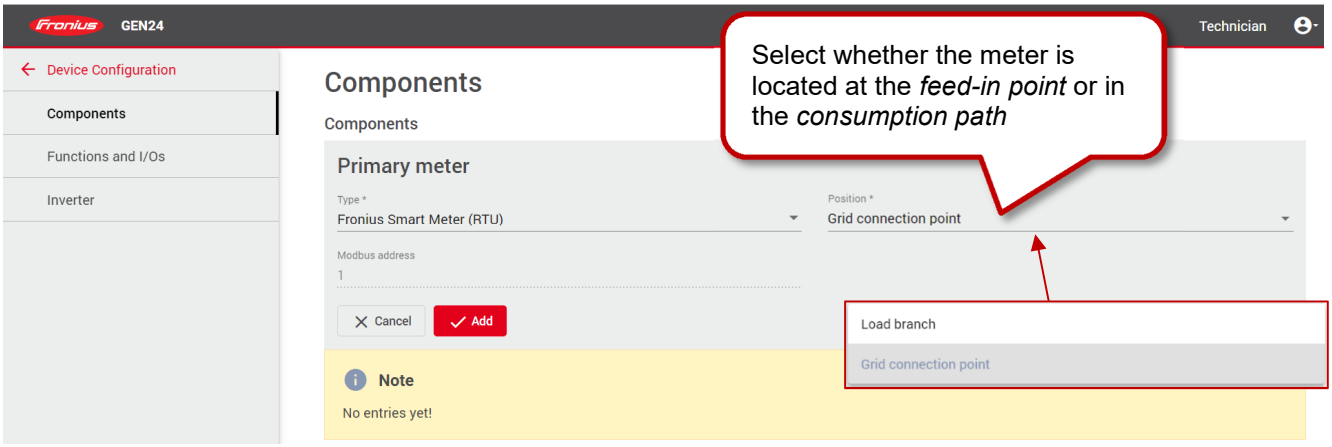
1. Via the Wi-Fi Access Point:
   - Open access point with one quick push on the inverter
   - Connect to the inverter network
     - Name: FRONIUS_Pilot serial number
     - Password: **12345678**
   - Enter IP-adress **192.168.250.181** into the address bar of your browser

2. Via the LAN Port:
   - Connect to inverter via network cable
     - Use LAN 1 - interface on the pilot
   - Enter IP-adress **169.254.0.180** into the address bar of your browser

Entering the Dashboard you have to unlock the submenus with the Technician password if you haven't done this in the commissioning yet.



Enter the Submenu "Device Configuration" and go to "Components". There you are able to "add a component".

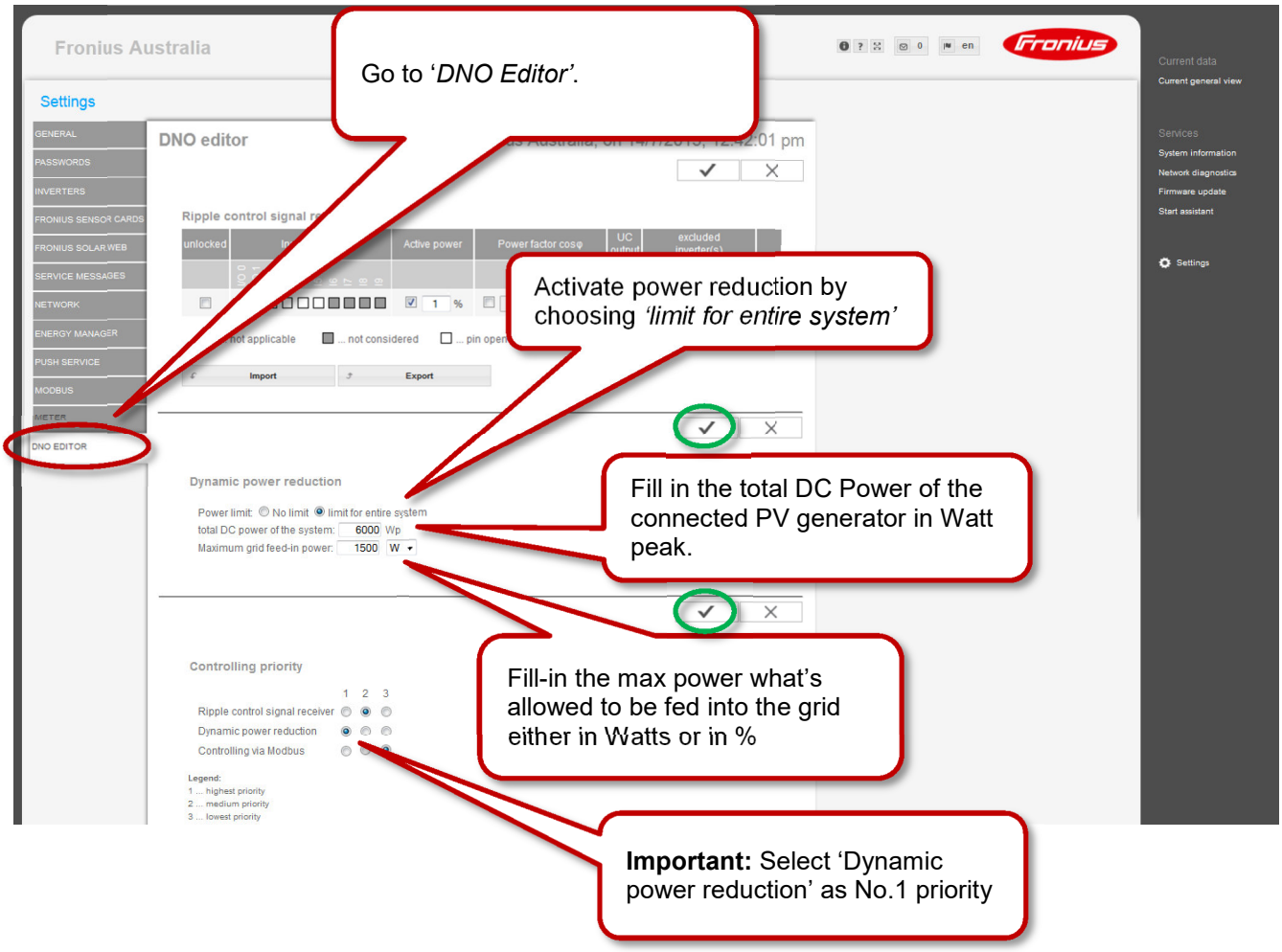


2.4 Set up Limit Export on the inverter

2.4.1 Set up Limit Export on Datamanager 2.0

Dynamic power reduction has the capability to control the inverter's output power according to the site's load and the export limitation. The export limit can be set on the web interface of the Fronius Datamanager as shown in the following picture.

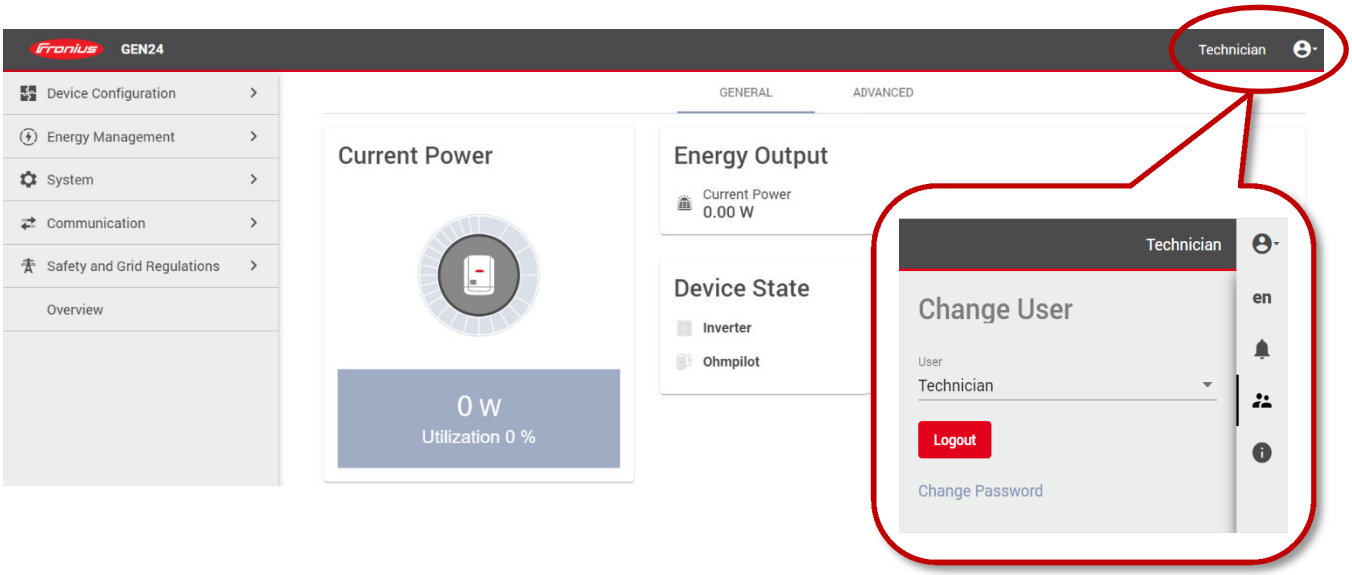
Go to the tab '*DNO EDITOR'* under the Datamanager's settings.



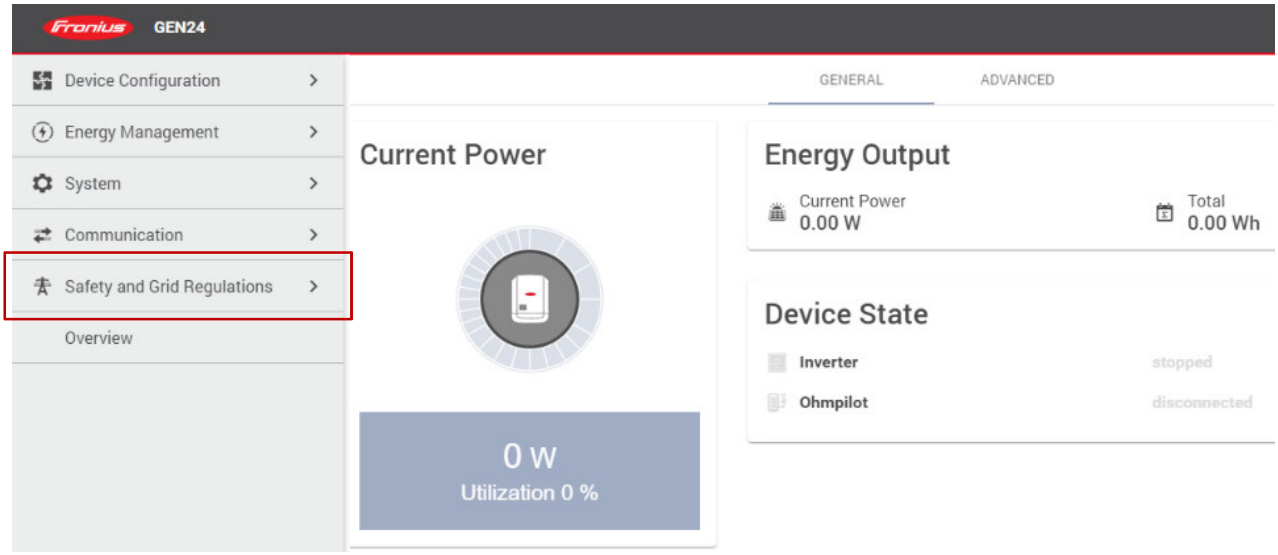
Once you **saved** your settings by selecting the ✓ in the Dynamic power reduction field, the set-up of the export limit is completed.
If the system comprises multiple inverters, all inverters which are connected in the SolarNet ring to the Datamanager will be equally power limited to achieve the set output limit.

2.4.2 Set up Limit Export on GEN24 inverter

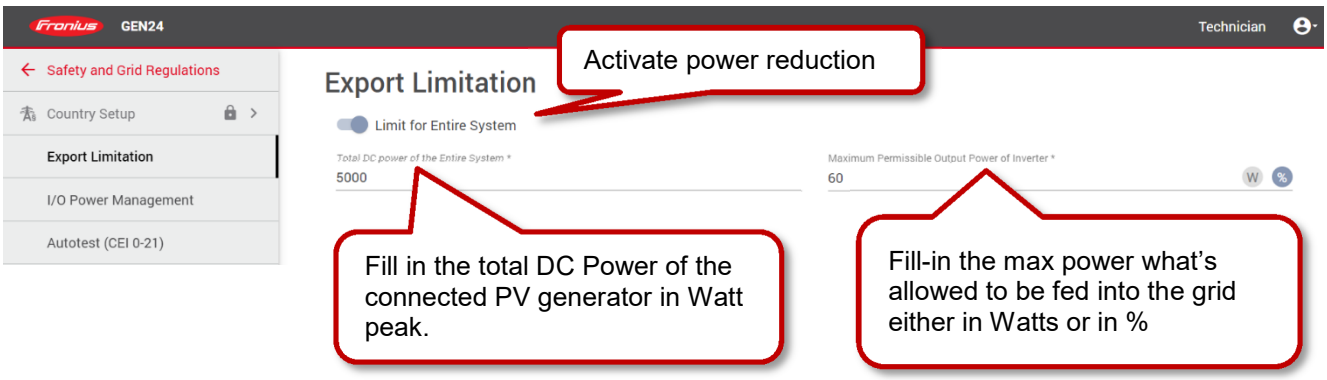
Entering the Dashboard you have to unlock the submenus with the Technician password if you haven't done this in the commissioning yet.



Enter the submenu "Safety and Grid Regulations"



Enter "Export Limitation" and set the parameters "Total DC power of the entire system" and "maximum allowed feed-in power of the inverter" in % or Watt.



WARRANTY CONDITIONS FOR PRODUCTS OF THE FRONIUS SOLAR ENERGY BUSINESS UNIT
FRONIUS WARRANTY AND FRONIUS WARRANTY PLUS

(Valid from: 01.01.2022)

1. General remarks

1.1. Fronius International GmbH (hereinafter FRONIUS) grants a voluntary manufacturer's warranty (Fronius Warranty or Fronius Warranty Plus) for the products it manufactures listed in section 2.1 (hereinafter "covered products") for the product warranty period specified and applicable below (hereinafter "warranty period"). The content and scope of the warranty statement issued by FRONIUS are defined exclusively by the following warranty conditions.
1.2. FRONIUS is entitled to amend these warranty conditions at any time with effect for the future. The warranty conditions are always those applicable at the time of product purchase.
1.3. **This warranty is in addition to and does not limit any legal or contractual claims or rights of the warranty holder.**

2. Scope

2.1. Covered products: The warranty applies to products purchased directly from FRONIUS, from an authorised FRONIUS distributor or professional installation company as new equipment and put into operation by a professional installer in accordance with the Operating and Installation Instructions. It refers exclusively to the device notified to FRONIUS with its serial number as part of the commissioning process and is limited to devices in the following product groups:

Fronius Inverter,
Fronius Datamanager,
Fronius Smart Meter,
Fronius Ohmpilot.

The following are excluded:

- Components of covered products that are subject to regular wear and tear. These include DC isolators, fuses, bayonet connectors, varistors, surge arresters, string fuses and mechanical screw connections if they are not properly tightened to the correct torque during installation.
- Devices provided by FRONIUS to customers as prototypes for test purposes.
- All parts or components not originally sold or marketed by FRONIUS are excluded from this warranty. This applies, for example, to all other components of the photovoltaic system, system expansions and components for system monitoring and data communication.

2.2. Warrantor: The warrantor is Fronius International GmbH, Froniusstrasse 1, A-4643 Pettenbach, Austria.
2.3. Warranty holder: The warranty holder is a person who has acquired the covered product pursuant to point 2.1 and is operating it for the first time in accordance with its intended use (first operator). Distributors and other resellers who do not operate the product for their own purposes are not entitled to the warranty. The warranty may be transferred by a first operator to another person together with the covered product and maintained, provided that (1) the covered product is not removed from the place of first use and (2) no modifications are made to the covered product. No new warranty agreement is entered into with the legal successor, who merely takes over the warranty of the first operator to the extent that it existed in relation to the first operator at the time of transfer. A legal successor who fulfils the applicable requirements is free to take out warranty extensions; see Section 9.
2.4 The warranty applies only to covered products started for the first time in Australia and New Zealand.

3. Warranty claim

3.1. A warranty claim exists if

- the covered product has a material or manufacturing defect for which FRONIUS is responsible,
- such a defect affects the operation of the covered product,
- the defect occurs during normal use of the covered product,
- and the warranty holder's claim is not excluded on the basis of Section 5 (warranty exclusions).

3.2. Defects that do not affect the proper functioning of the product (visual defects, blemishes) are not covered by this warranty.

4. Software updates

4.1. For the GEN24 product series and product series first placed on the market after 1 September 2020, the following applies:
4.2 If the warranty holder has **consented** to online access by FRONIUS, updates may be carried out automatically by FRONIUS. Prerequisites for online access by FRONIUS are (1) the establishment of a network connection with the covered product, (2) full commissioning including connection to FRONIUS Solar.web and (3) cost-free provision and maintenance of an Internet connection by the warranty holder.
Online access allows FRONIUS to detect technical malfunctions. As soon as a malfunction is diagnosed that requires intervention by FRONIUS to prevent a defect, it can be rectified by remote maintenance. As a result, further technical problems and damage to the product can be avoided and initial countermeasures can be taken depending on the detected malfunction.
4.3. If the warranty holder has **not consented** to online access by FRONIUS, software updates may alternatively be installed by the warranty holder through a system partner authorised by FRONIUS. In this case, FRONIUS provides only the

software update free of charge. FRONIUS will not bear additional costs of updating by the service partner (travel costs, labour, etc.) and such costs shall be borne by the warranty holder himself.
4.4. FRONIUS will always announce software updates at www.fronius.com/solar/softwareupdates. It is the warranty holder's responsibility to view announcements on a regular basis (at least every 3 months) and ensure that the necessary software updates are installed. Software updates include not only security and function-relevant adjustments, but also improvements to interfaces, known bug fixes and successive new features. Timely installation of software updates guarantees the best possible performance and serviceability of the covered product. It is the warranty holder's responsibility to ensure that the Internet connection is maintained during the warranty period. See Section 5 of the warranty conditions.
4.5. The warranty holder is also obliged to follow the Operating Instructions in the event of malfunctions or errors during operation.

5. Warranty exclusions

5.1. Warranty claims are excluded if the claimed defect was partly caused by:

- Failure to comply with the Installation or Operating Instructions during installation, commissioning and operation, and installation, commissioning or repair other than in compliance with relevant technical and professional standards
- Improper transport, storage or packaging
- Use of the covered product in a manner not corresponding to normal use
- Non-compliance with safety regulations for proper use
- Inadequate ventilation of the covered product
- Operation of the covered product in emergency power mode for more than the number of operating hours specified in the Operating Instructions
- Lack of maintenance or improper maintenance according to the Operating Instructions
- Non-installation or late installation of necessary software updates, unless the warranty holder has consented to online access by FRONIUS for the covered product according to 4.2
- Unauthorised intervention or intervention by third parties not authorised by FRONIUS in the covered product, in the form of openings, modifications, repairs, conversions and use of accessories not authorised by FRONIUS.
- Events that are due to circumstances for which FRONIUS is not responsible or that are not attributable to normal operating conditions, such as power fluctuations, overvoltage, lightning, fire, flooding, tampering or damage caused by the warranty holder or third parties, impact of foreign objects
- Force majeure.
- No claims for energy that has not been fed into the grid or energy that has not been used for self-consumption, etc.

6. Warranty services

6.1. In the event of a warranty claim, FRONIUS may choose from the following options:

- the defective unit is repaired on site or in a Repair Center operated or appointed by FRONIUS,
- the defective unit is exchanged for an equivalent unit of the same age, type and condition, or
- a credit note is issued for the market value applicable at the time of the service notification, which can be used to purchase a new FRONIUS product.

6.2 In case of repair on site:
If FRONIUS decides that the defective unit should be repaired on site, the repair must be carried out by FRONIUS or a professional installer authorised by FRONIUS. The costs to be borne by FRONIUS depend on the applicable warranty model; see Section 7. The warranty holder shall provide unobstructed access to the covered products and provide any apparatus required by applicable occupational safety regulations free of charge.
6.3 In case of repair in a Repair Center operated or appointed by FRONIUS: If FRONIUS decides that the defective unit is to be repaired in a Repair Center operated by FRONIUS, the warranty holder shall ensure proper dismantling and transport to the Repair Center notified by FRONIUS. FRONIUS will arrange for the return of the repaired unit.
6.4 If FRONIUS decides that the defective unit is to be replaced, the Warranty holder undertakes to ensure proper dismantling and transport of the defective unit to the address notified by FRONIUS. FRONIUS may, at its discretion, arrange for a replacement unit to be sent before the defective unit is returned. In this case, FRONIUS is entitled to demand financial security in the amount of the value of the replacement unit, including transport costs. FRONIUS retains ownership of the supplied replacement unit until the defective unit has been received.

7. Warranty models

7.1. FRONIUS will only bear the costs arising in connection with warranty services to the extent of the respective warranty model declared applicable to the covered product in accordance with Table 1 ("Fronius Warranty" or "Fronius Warranty Plus").

7.2. "Fronius Warranty" model:
FRONIUS provides the following service under the "Fronius Warranty":

- The required spare part or the equivalent replacement unit is provided or the market value is refunded.

The following are not refunded:

- Costs of repair on site or at FRONIUS incurred in connection with the repair or provision of a replacement unit (travel costs and travel expenses, removal and installation costs relating to the defective component or unit, hours worked, repairs to the defective component or unit, installation of the replacement component, assembly of the replacement unit, etc.).
- Costs of shipping and transport to FRONIUS or to a FRONIUS Repair Center (including customs duties, export certificates, etc.) for the defective components or the defective unit and return of the replacement components or replacement unit to the warranty holder.

7.3. “Fronius Warranty Plus” model:
FRONIUS provides the following services under the “Fronius Warranty Plus”:

- The required spare part or the equivalent replacement unit is provided or the market value is refunded.
- FRONIUS bears the repair costs directly related to the removal and replacement of the component or the replacement unit if these services are carried out by FRONIUS or a professional installer appointed by FRONIUS.
- FRONIUS bears domestic shipping and transport costs of the FRONIUS components and of the defective unit to the nearest FRONIUS Repair Centre and of the replacement components or replacement unit.

The following are not refunded:

- Travel expenses, export certificates or customs duties are not covered by FRONIUS.
- Costs of work on other equipment of the warranty holder are not covered (necessary modifications to the existing photovoltaic system, the house installation or other equipment).
- However, due to technological progress, it is possible that a provided spare part or replacement unit is not compatible with the system monitoring or other components installed on site. Resulting costs and expenses are not part of this warranty and are not covered by FRONIUS.
- Costs of express deliveries are not covered.

7.4. Cost acceptance: If costs are incurred in providing warranty services for which FRONIUS is not liable under the applicable warranty model, these costs shall be borne by the warranty holder. FRONIUS may also check at any time whether the claim for warranty services is justified. If FRONIUS concludes that no warranty claim exists, the warranty holder must also bear the costs of materials, repair or replacement normally covered by the warranty (see either section 7.2. or 7.3.). FRONIUS is not obliged to provide services if the warranty holder or their authorised representative does not agree to bear the costs.

8. Warranty period

8.1 The warranty begins on the date of delivery of the covered product ex works FRONIUS. The warranty holder can find out the date by visiting www.solarweb.com and entering the serial number. The relevant warranty period is shown in Table 1.
8.2 If the unit is registered at www.solarweb.com within 30 months of delivery ex works FRONIUS, the warranty will commence on the date of commissioning rather than the date of delivery. The date of using for the first time must be entered during product registration.
8.3 If the covered product is replaced or repaired, the warranty period for the replaced or repaired product or component will not start afresh and no new warranty certificate will be issued. In this case too, the warranty ends on the date when the warranty for the originally delivered product covered by the warranty ends.

9. Warranty extensions

9.1 FRONIUS provides various options (free of charge or against payment) to extend the warranty for covered products; see Table 1. Warranty extensions are subject to the warranty conditions applicable at the time the original warranty agreement was concluded.
9.2 Warranty extensions can only be applied for within the specified period and in the manner indicated in Table 1. The warranty extension starts at the end of the original warranty period and is extended by the period of time stated in Table 1 and requested by the warranty holder.
9.3 A warranty extension always applies only to the product uniquely identified by the serial number.
9.4 If the warranty holder is given the option of extending the warranty against payment, the following also applies: The warranty extension only becomes effective upon payment in full. As long as the warranty holder is in default of payment, FRONIUS is not obliged to provide warranty services.

Table 1 – Covered product, warranty model, warranty period, warranty extension option:

	Inverter	**Datamanager**	**Fronius Smart Meter**	**Fronius Ohmpilot**
Warranty services from dispatch from Fronius factory	Fronius Warranty Plus	Fronius Warranty Plus	Fronius Warranty Plus	Fronius Warranty Plus
Warranty period from dispatch from Fronius factory	5 years	5 years	2 years	2 years
Free warranty extension	⁄ Possible ⁄ Extension period and warranty model: - to 10 years for Fronius Warranty ⁄ Conditions of eligibility: - Registration via www.solarweb.com - within 30 months of delivery	Automatically takes over the warranty period of the inverter in which the Datamanager has been installed.	⁄ Free warranty extension to a total of 5 years Fronius Warranty Plus ⁄ valid for all Smart Meter's installed between 01.04.2021 and 31.12.2022	No warranty extension possible
Paid warranty extension	⁄ Possible ⁄ Extension period and warranty model: - to 10, 15, 20 years for Fronius Warranty or Fronius Warranty Plus - annual extension up to max. 15 years ⁄ Conditions of eligibility: - Registration via www.solarweb.com - within 30 months of delivery	Automatically takes over the warranty period of the inverter in which the Datamanager has been installed.	No warranty extension possible	No warranty extension possible

10. Claiming services under warranty

10.1. The warranty holder must notify FRONIUS of any warranty claim for the covered product within the warranty period. To ensure efficient processing, the warranty holder should first contact their competent professional installer and instruct the installer to contact FRONIUS and deal with the service case. The following are required in order for FRONIUS to process warranty claims: (1) the commissioning report (including date of acceptance, date of commissioning, report of the energy company), (2) the invoice (including serial number), (3) a photo with fully legible type plate (4), proof of payment of the warranty extension fee if applicable, (5) full payment of the covered product or warranty extension.
10.2 While the claim is being processed, the warranty holder or their authorised representative must also provide FRONIUS with all further information in order to be able to carry out a proper fault diagnosis.
10.3. As long as the warranty holder or their authorised representative fails to meet the obligations according to Sections 10.1. and 10.2., FRONIUS shall not be obliged to provide services under this warranty. The warranty services must be agreed in advance with FRONIUS.

11. Data privacy statement

11.1. If warranty extensions are claimed via www.solarweb.com, FRONIUS will process personal data of the warranty holder.
11.2. If the warranty holder registers the product online, data will be processed by FRONIUS for the purpose of providing services. For detailed information, please refer to the data privacy statement at www.fronius.com.

12. Applicable law, jurisdiction

12.1. Claims arising from or in connection with this warranty are subject to Austrian law, to the exclusion of the UN Sales Convention. The place of performance for obligations under this warranty is Wels, Austria. If the warranty holder is a consumer according to Art. 6 of Regulation (EC) No. 593/2008, the choice of Austrian law shall not result in the consumer being deprived of the protection granted to them by the law of the country where they have their habitual residence and which cannot be derogated from by agreement.
12.2. If the warranty holder is not a consumer, the exclusive place of jurisdiction is Wels, Austria.

13. Other legal information

In Australia, this warranty is given by, and all Australian warranty claims should be directed to: Fronius Australia Pty Ltd, 90-92 Lambeck Drive, Tullamarine, VIC 3043, Telephone 03 8340 2900, Email pv-supportaustralia@fronius.com The benefits to the consumer given by this manufacturer's warranty are in addition to other rights and remedies of the consumer that are stipulated by law, and which are not affected by this manufacturer's warranty. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. The general delivery and payment terms and conditions located on our website (www.fronius.com.au) under "Terms and conditions" are in effect unless these warranty conditions allow more favorable provisions. Previously valid warranty conditions are replaced by these conditions.