Fronius Datamanager 2.0
Fronius Datamanager Box 2.0

EN-US

Operating Instructions

System monitoring

Dear reader,

Introduction

Thank you for the trust you have placed in our company and congratulations on buying this high-quality Fronius product. These instructions will help you familiarize yourself with the product. Reading the instructions carefully will enable you to learn about the many different features your Fronius product has to offer. This will allow you to make full use of its advantages.

Please also note the safety rules to ensure greater safety when using the product. Careful handling of the product will repay you with years of safe and reliable operation. These are essential prerequisites for excellent results.

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General Information

General

General

The Fronius Datamanager 2.0 is a network-compatible datalogger which combines the functionality of the Fronius Com Card, the Fronius Datalogger Web, the Fronius Power Control Card, and the Fronius Modbus Card on one plug-in card.
The Fronius Datamanager 2.0 website provides a quick overview of the photovoltaic system.
The website can be accessed with a web browser via a direct connection or on the internet, if properly configured.

When connected to Fronius Solar.web, the real-time and archived data of a photovoltaic system can be easily accessed via the internet or the Fronius Solar.web app. No difficult configuration is required. Data is sent automatically from the Fronius Datamanager 2.0 to Fronius Solar.web. Fronius Solar.web is equipped with an easy-to-configure system monitoring feature with an automatic alarm. The alarm can be signaled via SMS or e-mail.

Available Versions of Fronius Datamanager 2.0

Fronius Datamanager 2.0 is available in the following versions:

-   without Fronius Com Card function
    (for Fronius Galvo Fronius Symo, and Fronius Primo inverters)

-   with Fronius Com Card function
    (for Fronius IG, Fronius IG Plus, Fronius IG Plus V,
    Fronius IG Plus A, Fronius CL, Fronius CL USA, Fronius IG 300–500 inverters)

-   in external housing with Fronius Solar Net IN and Fronius Solar Net OUT connection sockets
    (Fronius Datamanager Box 2.0, e.g. for inverters without plug-in card slots or for photovoltaic systems with a separate Fronius Datamanager 2.0)

Provided that the inverter is not fitted as standard with Fronius Datamanager 2.0, existing inverters can be upgraded with the Fronius Datamanager 2.0 plug-in card.

Applicable DAT-COM Components

The Fronius Datamanager 2.0 plug-in card installed in the inverter or the separate Fronius Datamanager Box 2.0 can be operated with the following DATCOM components:

- up to 100	x	Fronius inverters (incl. the inverter in which Fronius Datamanager 2.0 is installed)
- up to 10	x	Fronius Sensor Card or Fronius Sensor Box
- up to 10	x	Fronius Public Display Card or Fronius Public Display Box
- up to 1	x	Fronius Interface Card or Fronius Interface Box
- up to 200	x	Fronius String Control

Prerequisites for Operation

In order to ensure flawless data exchange online, it is essential to use an appropriate internet connection:
-   For cabled internet solutions, Fronius recommends a download speed of at least 512 kbit/s and an upload speed of
    at least 256 kbit/s.
-   For solutions with mobile internet services, Fronius recommends a minimum transmission standard of 3G with reliable signal strength.

These specifications do not provide an absolute guarantee of flawless operation.
High error rates in transmission, fluctuating reception or dropouts can have an adverse effect on the online operation of Fronius Datamanager 2.0.
Fronius recommends on-site testing to ensure that the connections meet the minimum requirements.

For operation with an antenna extension. If you want to connect your inverter to the Internet using WLAN, we recommend the following approach:
- Test your signal strength in the exact position where the inverter is to be installed and make sure the Datamanager 2.0 card is activated.
- Connect to the WLAN network using a smartphone, laptop or tablet and test the connection. The free website "www.speedtest.net" can be used to check whether the connection meets our recommended download speed of at least 512 kbit/s and an upload speed of 256 kbit/s.

Since Fronius Datamanager 2.0 acts as a data logger, no other data logger may be present in the Fronius Solar Net ring.
Only have one Fronius Datamanager 2.0 for each Fronius Solar Net ring.
Fronius Datamanager 2.0 must be in slave mode if existing in inverters Fronius Galvo and Fronius Symo.

The following DATCOM components may not be operated together with Fronius Datamanager 2.0 in a Fronius Solar Net ring:
- Fronius Power Control Card/Box
- Fronius Modbus Card
- Fronius Datalogger Web
- Fronius Personal Display DL Box
- Fronius Datalogger easy/pro
- Fronius Datamanager
- Fronius Datamanager 2.0 Box

To use Fronius Datamanager 2.0
- the plug-in card must be installed in an inverter,
  or
- there must be a Fronius Datamanager Box 2.0 in the Fronius Solar Net ring.

The Fronius Datamanager 2.0 plug-in card and the Fronius Com Card may not be used together in one inverter.

Inverter software required

Fronius Datamanager 2.0 requires the following inverter software versions for its operation:

Inverter	required software version according to display (MainControl)
Fronius IG 15–60	V2.9.4 or higher
Fronius IG 2000–5100	starting from series no 19153444
Fronius IG 300–500	V3.6.4.0 or higher
Fronius IG Plus 35–150	V4.22.00 or higher
Fronius IG TL *	-
Fronius CL	V4.22.00 or higher
Fronius Agilo *	-
Fronius Agilo Outdoor *	-
Fronius Agilo TL *	-
Fronius Galvo	-
Fronius Symo	-
Fronius Symo Hybrid	-
Fronius Primo	-
Fronius Eco	-

*   Only in conjunction with Fronius Datamanager Box 2.0

The relevant inverter software version can be downloaded for free from our homepage (http://www.fronius.com).

If you have any questions, please contact pv-support@fronius.com.

Notes regarding radio certification

The Fronius Datamanager 2.0 plug-in card and Fronius Datamanager Box 2.0 are equipped with a wireless module.

Wireless modules in the USA require FCC certification:

FCC

This device conforms to the limit values for a Class B digital device, pursuant to Part 15 of the FCC regulations. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates and uses high frequency energy and, if not used in accordance with the instructions, may interfere with radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the device and the receiver.
- Connect the device to a different circuit than the receiver.
- Consult the dealer or an experienced radio/TV technician for help.

FCC ID: PV7-WIBEAR11N-DF1

Industry Canada RSS

This device complies with Industry Canada license-exempt RSS standards. Operation is subject to the following two conditions:
(1) this device is not permitted to cause harmful interference, and
(2) this device must accept any interference, including interference that may cause undesired operation of the device.

IC ID: 7738A-WB11NDF1

Unless otherwise expressly permitted by the manufacturer, changes or modifications to the wireless module are not allowed and lead to a loss of the right of use of the device by the user.

Scope of Supply

Fronius Datamanager 2.0 plug-in card

- 1 x Fronius Datamanager 2.0 plug-in card
- 1 x Fronius Solar Net termination plug
- 1 x 16-pin plug
- 1 x FCC sticker label, three parts

Additional equipment depending on the inverter:

- 1 x antenna	Fronius Galvo
- 1 x Fronius Solar Net termination plug	Fronius Symo
	Fronius Primo
- 1 x antenna	Fronius IG
- 1 x 1 m RG58 antenna cable	Fronius IG Plus
- 1 x mounting bracket	Fronius IG Plus V
- 1 x double-sided adhesive tape	

- 1 x antenna	Fronius IG 300 - 500
- 1 x 3 m RG58 antenna cable	Fronius CL
- 1 x mounting bracket	Fronius CL - USA
- 1 x double-sided adhesive tape	

- 1 x antenna	Fronius IG 2000 - 5100 - USA
- 1 x 0.4 m RG58 antenna cable	Fronius IG Plus - USA
- 1 x 3/4 in. screw joint	Fronius IG Plus V - USA
- 1 x 3/4 in. hex nut	
- 1 x 3/4 in. seal	

Fronius Datamanager Box 2.0

- 1 x Fronius Datamanager Box 2.0 with wall bracket
- 2 x Fronius Solar Net termination plugs
- 1 x 16-pin plug
- 1 x antenna
- 1 x 3 m RG58 antenna cable
- 1 x mounting bracket
- 1 x double-sided adhesive tape
- 2 x installation anchors + screws
- 1 x "DATCOM Cabling" leaflet

Using the Sticker Labels

IMPORTANT! If the three-part sticker label included in the scope of supply for the Datamanager 2.0 has not already been affixed to the inverter at the factory, this must be done now.

Position of the sticker label on the inverter:

Fronius IG Plus
Fronius IG Plus V
Fronius IG Plus A

Fronius IG

Fronius Galvo
Fronius Symo
Fronius Primo
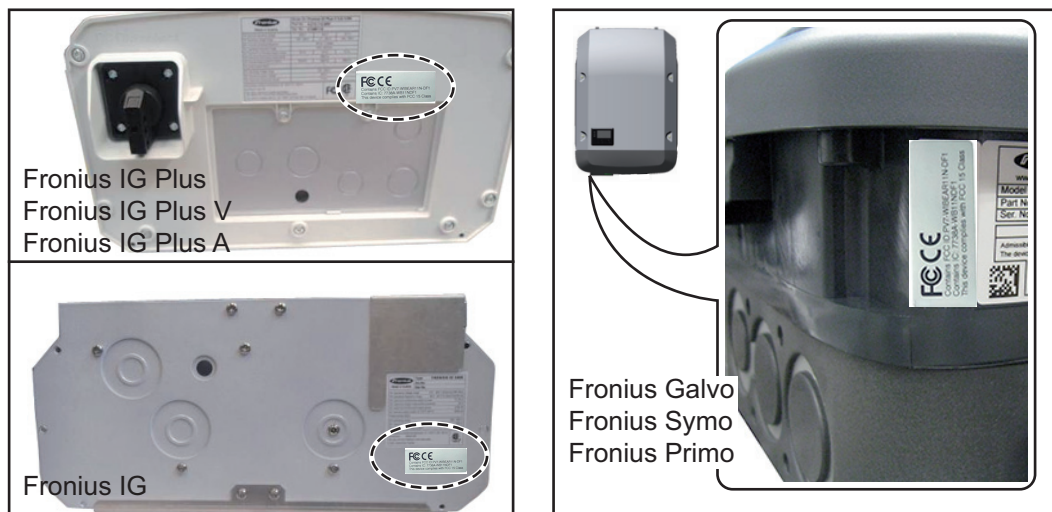
For Fronius Galvo, Fronius Symo, and Fronius Primo inverters, the sticker label information is located on the rating plate.

Using the sticker labels:

(1) On the cardboard packaging of the inverter or the Fronius Datamanager 2.0
(2) On the Fronius Datamanager 2.0 plug-in card
(3) On the inverter

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Linking Inverters with a Fronius Datamanager 2.0 Plug-in Card to a PC:
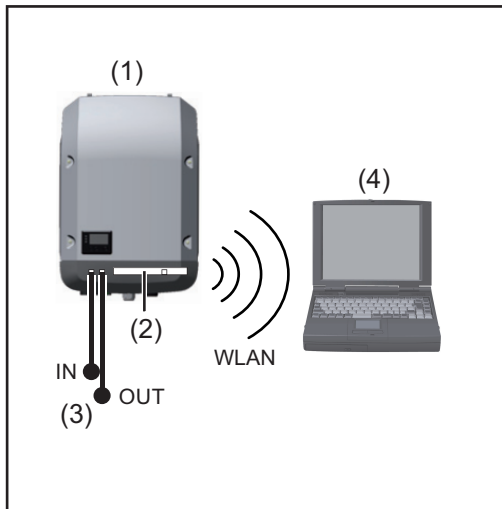
(1)	Inverter
(2)	Fronius Datamanager 2.0
(3)	Fronius Solar Net termination plug
(4)	PC/laptop

NOTE! When linking an inverter with Fronius Datamanager 2.0 to a PC, one Fronius Solar Net termination plug must be connected at each free IN or OUT connection.

Linking Inverters with a Fronius Datamanager 2.0 Plug-in Card to Other Inverters, a Fronius Sensor Box, and a PC:
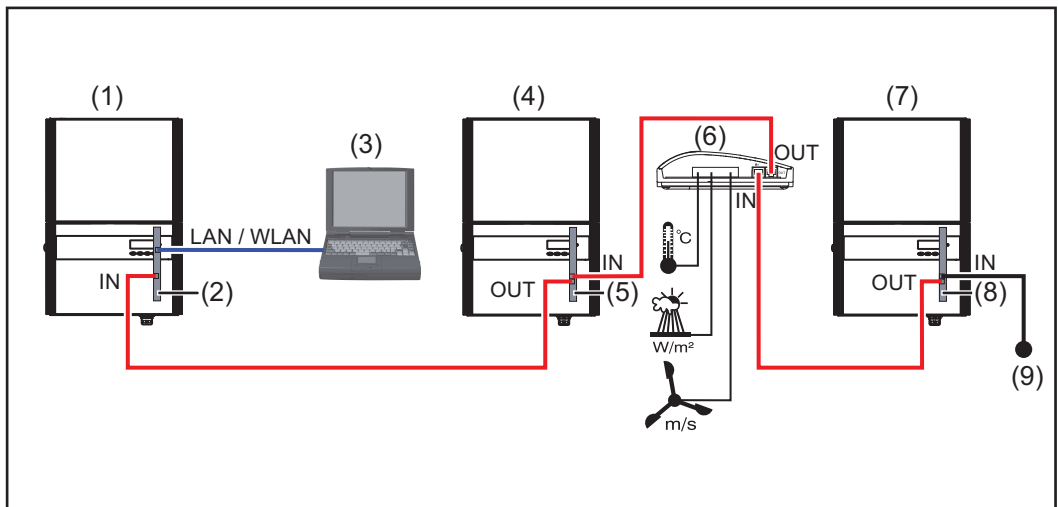
(1)	Inverter with	(6)	Fronius Sensor Box
(2)	Fronius Datamanager 2.0	(7)	Inverter
(3)	PC/laptop	(8)	Fronius Com Card
(4)	Inverter with	(9)	Fronius Solar Net termination plug
(5)	Fronius Com Card		

NOTE! When linking several DATCOM components to Fronius Datamanager 2.0: Use the data cable to connect the IN connection socket of Fronius Datamanager 2.0 with the OUT connection socket of the next DATCOM component. A Fronius Solar Net termination plug must be inserted into the empty IN connection socket of the last DATCOM component.
With the following inverters, the inverter with Fronius Datamanager 2.0 must always be connected either at the start or end of the data chain:
Fronius IG, Fronius IG Plus, Fronius IG Plus V, Fronius IG Plus A, Fronius CL, Fronius CL USA and Fronius IG 300–500.

Linking Two Inverters with Fronius Com Card or Com Card Function to a Fronius Datamanager Box 2.0 and a Smartphone:
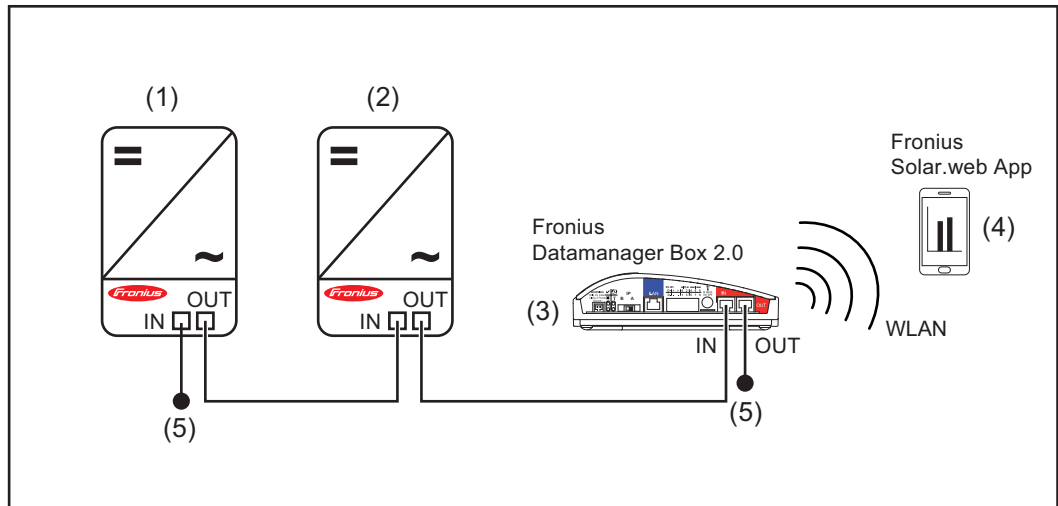
(1)	Inverter with Fronius Com Card or Com Card function	(4)	Smartphone with Fronius Solar.web App
(2)	Inverter with Fronius Com Card or Com Card function	(5)	Fronius Solar Net termination plug
(3)	Fronius Datamanager Box 2.0		

NOTE! When linking several DATCOM components with a Fronius Datamanager Box 2.0, each of the DATCOM components must be cabled from the IN connection socket to the OUT connection socket of the next DATCOM component. Fronius Solar Net termination plugs must be inserted into empty IN or OUT connection sockets of the last DATCOM components.

Calculating the data volume

General

When operating Fronius Datamanager 2.0, data is generated and needs to be transmitted online.
In order to select a suitable internet connection it is necessary to calculate the data volume.

The following data volume calculation provides an overview of the amount of data generated when operating Fronius Datamanager 2.0.

Firmware Versions for Calculating the Data Volume

The data volume calculation is based on Fronius Datamanager 2.0 firmware versions V 3.3.x-x and lower.

Higher firmware versions can cause a higher data volume due to their increased functional range.

Calculating Data Volumes

The data volume calculation depends on which Fronius Datamanager 2.0 functions are activated.

Function	Data volume	
Make real-time data available in Fronius Solar.web	Once [1]	150 bytes 32 KB/h
View real-time data in Fronius Solar.web	Current Total View per sensor card/sensor box	42 KB/h + 300 KB/h
	Current Comparison View per inverter	13 KB/h + 4 KB/h
	Home	0 KB/h
	System Comparison View	0 KB/h
Send archived data/logging data to Fronius Solar.web	(Memory sectors per day [2] x 4 KB) + 8 KB	
	Transmission time [3]	600 bytes/min
Send service messages or errors	For daily sending per service message or error	1 KB/day + 300 bytes
	For immediate sending per service message or error	1 KB

[1]   Only after a restart or if the internet connection has been disconnected
[2]   Calculation of memory sectors per day according to Chapter "Calculating Memory Capacity" on page 68
[3]   Depending on the quality of the internet connection

IMPORTANT: Since the values listed in the table are "rough data" for Fronius Datamanager 2.0 and the provider's bill may show discrepancies as a result of the various ways of calculating the transfer volume, the total values should be increased by 10–20%.

If the functions have been deactivated, no data volume is generated.

A certain data volume is also required to update the Fronius Datamanager 2.0 firmware. This data volume depends on the size of the relevant update package and cannot therefore be taken into account for any advance calculation of the data volume.

IMPORTANT: Fronius recommends a flat rate in order to avoid unforeseeable data volumes.

Calculation Examples	**Example 1 - Home System**

1 inverter;	+ 0.15 KB
No Fronius Sensor Card/Box;	
Fronius Datamanager 2.0 has a 24-hour internet connection	+ 32 KB/h x 24 h = 768 KB
Archived data is sent to Fronius Solar.web;	
30 minutes transfer time;	+ 0.6 KB/min x 30 min = 18 KB
Inverters operate 14 h/day;	
15 minutes storage interval;	+ (1 memory sector/day x 4 KB) + 8 KB = 12 KB
(This results in 1 memory sector per day in accordance with Section "Calculating Memory Capacity")	
Real-time data is viewed over a 15-minute period every day	+ 42 KB/h x 0.25 h = 10.5 KB
1 service message sent each day to confirm average error rate	+ 1 service message x 1 KB = 1 KB
Subtotal without safety	0.15 KB
	768.00 KB
	18.00 KB
	12.00 KB
	10.50 KB
	1.00 KB
	809.65 KB
A 10% safety factor is added to the calculation	809.65 KB + 10%
Final result	**890.615 KB/day**

Example 2 - Large System

100 inverters;	+ 0.15 KB
10 Fronius Sensor Cards/Boxes;	
Fronius Datamanager 2.0 has a	+ 32 KB/h x 24 h = 768 KB
24-hour internet connection	

Archived data is sent to Fronius Solar.web;	
120 minutes transfer time;	+ 0.6 KB/min x 120 min = 72 KB
Inverters operate 14 h/day;	
5 minutes storage interval;	+ (173 memory sectors/day x 4 KB)
(This results in 173 memory sectors per	+ 8 KB
day in accordance with Section "Calculat-	= 700 KB
ing Memory Capacity")	

The current Total View and the current	+ 42 KB/h x 2 h
Comparison View are viewed over a two-	+ 300 KB/h x 10 x 2 h
hour period every day	+ (13 KB/h + 100 x 4 KB/h) x 2 h
	= 6910 KB

50 service messages sent each day to confirm average error rate	+ 50 service messages x 1 KB = 50 KB

Subtotal without safety	0.15 KB
	768.00 KB
	72.00 KB
	700.00 KB
	6910.00 KB
	50.00 KB
	8,500.15 KB

A 10% safety factor is added to the calculation	8,500.15 KB + 10%

Final result	9,350.165 KB/day
	(approx. 9.35 MB/day)

General information for the network administrator

Requirements

☞ **NOTE!** Configuring a network for Fronius Datamanager 2.0 requires knowledge of network technology.

If Fronius Datamanager 2.0 is being integrated into an existing network, the Fronius Datamanager 2.0 address must be adapted to the network.

Example: network address range = 192.168.1.x, subnet mask = 255.255.255.0

- An IP address between 192.168.1.1 and 192.168.1.254 must be assigned to Fronius Datamanager 2.0.
- The IP address selected may not be already assigned in the network.
- The subnet mask must correspond to the existing network (e.g., 255.255.255.0).

If Fronius Datamanager 2.0 will be sending service messages and/or data to Fronius Solar.web, then a gateway address and a DNS server address must also be entered. Fronius Datamanager 2.0 uses the gateway address to access the internet. The IP address of the DSL router can be used as a gateway address, for example.

IMPORTANT!
- Fronius Datamanager 2.0 may not have the same IP address as the PC/laptop!
- Fronius Datamanager 2.0 cannot connect itself to the internet. A router must be used for a DSL connection to the internet.

General Firewall Settings

The firewall must be configured as follows in order to use the different Fronius Datamanager 2.0 functions:

	49049/UDP output	15015/TCP input	80/TCP input
Sending service messages	x	-	-
Connecting to Fronius Datamanager 2.0 via Fronius Solar.web	x	-	-
Connecting to Fronius Datamanager 2.0 via Fronius Solar.access or Fronius Solar.service	-	x	x
Accessing the Fronius Datamanager 2.0 website	-	-	x

Service messages are sent via Fronius Solar.web.

Configure the firewall so that the IP address of Fronius Datamanager 2.0 can send data to port 49049/UDP from fdmp.solarweb.com.

DSL routers mostly enable you to send data to the internet and, therefore, do not normally have to be configured.

To access the Fronius Datamanager 2.0 web interface outside of the LAN:
- Configure the network router so that requests are forwarded to port 80/TCP on Fronius Datamanager 2.0

Sending Service Messages via a DSL Internet Connection

Normally, no additional router configuration is required for a regular DSL internet connection to access Fronius Solar.web and/or send service messages, because connections from the LAN to the internet are open.

Using Fronius Solar.web and Sending Service Messages

However, an internet connection is required to use Fronius Solar.web and send service messages.

Fronius Datamanager 2.0 cannot connect itself to the internet. A router must be used for a DSL connection to the internet.

Controls, connections and indicators

Safety

⚠ **WARNING!** Operating the device incorrectly can cause serious injury and damage. Do not use the functions described until you have thoroughly read and understood the following documents:
- these operating instructions
- all operating instructions for system components, especially the safety rules

Controls, Connections and Indicators

Fronius Galvo
Fronius Symo
Fronius Primo

Fronius IG
Fronius IG Plus
Fronius IG Plus V
Fronius IG Plus A
Fronius CL
Fronius CL USA
Fronius IG 300 - 500

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No.	Function
(1)	**IP Switch**

For changing the IP address:

A   Specified IP address and opening the WLAN Access Point

Fronius Datamanager 2.0 uses fixed IP address 169.254.0.180 for a direct connection to a PC via LAN.

If the IP switch is set to position A, an Access Point for a direct WLAN connection to the Fronius Datamanager 2.0 is also opened.

Access data for this Access Point:
Network name: FRONIUS_240.XXXXXX
Key: 12345678

The Fronius Datamanager 2.0 can be accessed:
- via DNS name "http://datamanager"
- via IP address 169.254.0.180 for the LAN interface
- via IP address 192.168.250.181 for the WLAN Access Point

B   Assigned IP address:

The Fronius Datamanager 2.0 works with an assigned IP address dynamic host configuration protocol (DHCP)

The IP address can be set on the Fronius Datamanager 2.0 website.

In the case of the Fronius Datamanager 2.0 plug-in cards, the IP switch is located underneath the LEDs and is separate in the case of the Fronius Datamanager Box 2.0.

| **(2)** | **WLAN LED**   ⊤ |

- Flashes green: The Fronius Datamanager 2.0 is in service mode
  (IP switch on the Fronius Datamanager 2.0 plug-in card is set to position A or service mode was activated via the inverter display, the WLAN Access Point is opened)
- Lights up green: There is an existing WLAN connection
- Alternately flashes green/red: The length of time for which the WLAN Access Point is open after activation (1 hour) has been exceeded
- Lights up red: There is no existing WLAN connection
- Flashes red: Faulty WLAN connection
- Does not light up: The Fronius Datamanager 2.0 is in slave mode

| **(3)** | **Solar.web Connection LED** |

- Lights up green: There is an existing connection to Fronius Solar.web
- Lights up red: There is no existing connection to Fronius Solar.web, but one is required
- Does not light up: No connection to Fronius Solar.web is required

| **(4)** | **Supply LED**   ✔ |

- Lights up green: Sufficient power supply from Fronius Solar Net; the Fronius Datamanager 2.0 is operational.
- Does not light up: No power or insufficient power supply from Fronius Solar Net—an external power supply is required
  or the
  Fronius Datamanager 2.0 is in slave mode
- Flashes red: During an update process

  IMPORTANT! Do not interrupt the power supply during an update process.
- Lights up red: Update process failed

No.	Function
(5)	**Connection LED** ✕
	- Lights up green: There is an active connection within Fronius Solar Net
	- Lights up red: There is an interrupted connection within Fronius Solar Net
	- Does not light up: The Fronius Datamanager 2.0 is in slave mode
(6)	**LAN Connection**
	Ethernet interface colored blue for connecting the Ethernet cable
(7)	**I/Os**
	Digital inputs and outputs
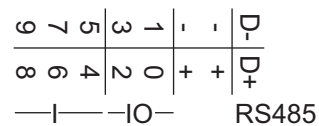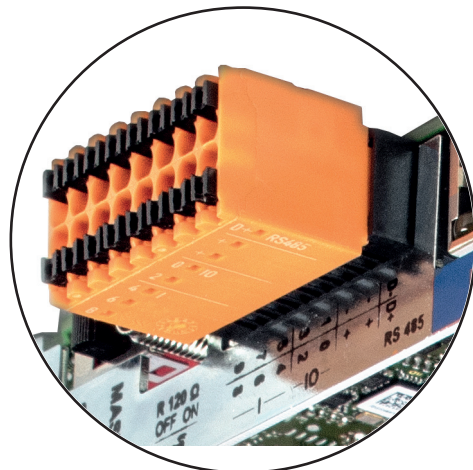
Modbus RTU 2-wire (RS485):

D-   Modbus data -

D+   Modbus data +

Int./Ext. Power Supply

-       GND

+ U_{int}/U_{ext}
        Output for internal voltage 10.8 V/12.8 V
        or
        Input for an external supply voltage
        >12.8–24 V DC (+ 20%)

        10.8 V:
        Fronius IG, Fronius IG Plus, Fronius IG Plus V,
        Fronius IG Plus A, Fronius CL, Fronius CL USA,
        Fronius IG 300–500

        12.8 V:
        Fronius Galvo, Fronius Symo

Digital inputs: 0–3, 4–9
Voltage level: low = min. 0 V – max. 1.8 V; high = min. 3 V – max. 24 V DC
(+ 20%)
Input currents: dependent on input voltage; input resistance = 46 kOhm

No.	Function
	Digital outputs: 0–3 Switching capacity when supplied by the Fronius Datamanager 2.0 plug-in card: 3.2 W, 10.8/12.8 V in total for all four digital outputs 10.8 V: Fronius IG, Fronius IG Plus, Fronius IG Plus V, Fronius IG Plus A, Fronius CL, Fronius CL USA, Fronius IG 300–500 12.8 V: Fronius Galvo, Fronius Symo Switching capacity when supplied by an external power supply with min. 12.8 – max. 24 V DC (+ 20%), connected to Uint/Uext and GND: 1 A, 12.8–24 V DC (depending on the external power supply) per digital output The connection to the I/Os is made via the supplied mating connector.
(8)	**Antenna Plug** For screwing on the WLAN antenna or WLAN antenna extension cable, depending on the inverter
(9)	**Modbus Termination Switch (for Modbus RTU)** Internal bus termination with 120 ohm resistance (yes/no) Switch in "on" position: Termination resistance of 120 Ohm active Switch in "off" position: No termination resistance active **IMPORTANT!** The termination resistance must be active for the first and last device in an RS485 bus.
(10)	**Fronius Solar Net Master/Slave Switch** For switching between master and slave mode within a Fronius Solar Net ring **IMPORTANT!** All LEDs on the Fronius Datamanager 2.0 plug-in card are off in slave mode.
(11)	**Fronius Solar Net IN Connection Socket** Fronius Solar Net input colored red for connecting to other DATCOM components (e.g., inverters, sensor cards) For Fronius Datamanager 2.0 with Fronius Com Card function only! (for Fronius IG, Fronius IG Plus, Fronius IG Plus V, Fronius IG Plus A, Fronius CL, Fronius CL USA, Fronius IG 300–500 inverters)

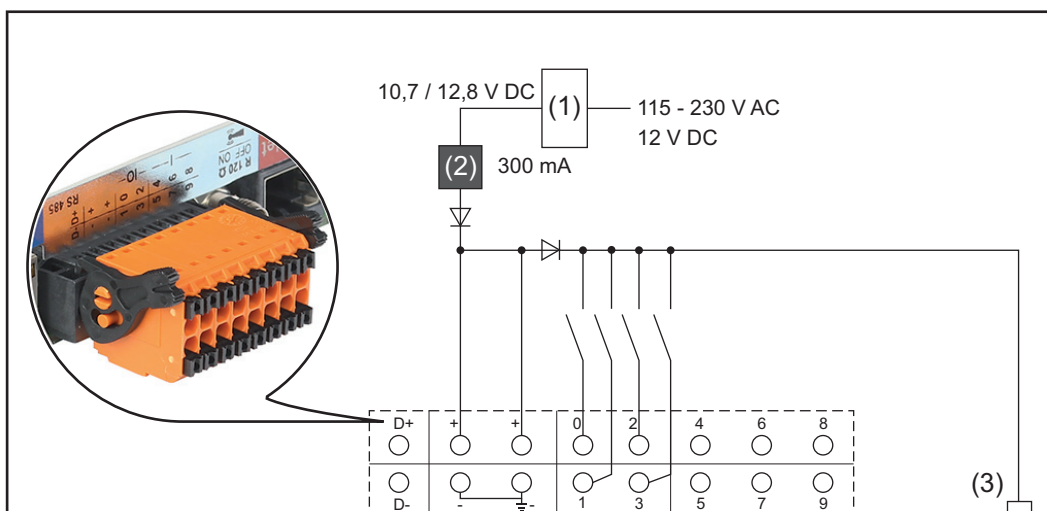| No.	Function
(12)	**Fronius Solar Net OUT Connection socket** Fronius Solar Net output colored red for connecting other DATCOM components (e.g., inverters, sensor cards) For the Fronius Datamanager Box 2.0 only!
(13)	**External Power Supply Connection** For connecting an external power supply when the power supply within Fronius Solar Net is insufficient (e.g., when too many DATCOM components are installed in Fronius Solar Net). **IMPORTANT!** The external power supply unit for the Fronius Datamanager Box 2.0 must be securely disconnected from components supplying grid voltage (SELV or Class 2 for USA/Canada). The output power of the power supply unit may not exceed a max. of 15 VA/ 1.25 A. If the power supply is sufficient, the Supply LED (4) lights up green. For an external power supply, use only the Fronius power supply unit! For the Fronius Datamanager Box 2.0 only!

Schematic Connection of I/Os

Supply via the Fronius Datamanager 2.0 plug-in card:

(1)   Power supply
        (for Fronius Datamanager 2.0 with Fronius Com Card function only)

(2)   Current limit

(3)   Fronius Solar Net IN connection socket
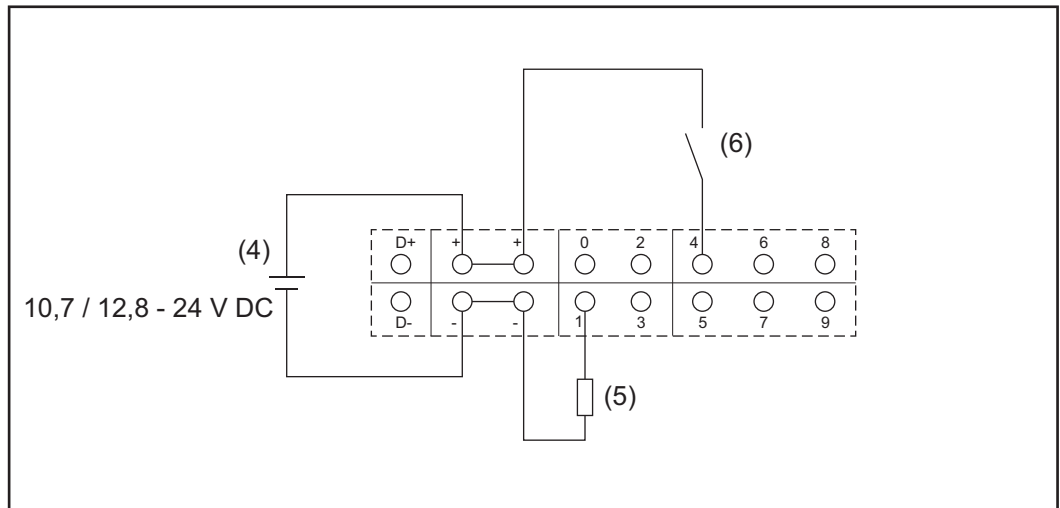
115–230 V AC:
Fronius IG, Fronius IG Plus, Fronius IG Plus V, Fronius IG Plus A, Fronius CL, Fronius CL USA, Fronius IG 300–500

12.8 V DC:
Fronius Galvo, Fronius Symo, Fronius Primo

Supply via external power supply:

(4) External power supply

(5) Load

(6) Switch

NOTE! When the supply is via an external power supply, the external power supply must be galvanically isolated.

10.7 V DC:
Fronius IG, Fronius IG Plus, Fronius IG Plus V, Fronius IG Plus A, Fronius CL, Fronius CL USA, Fronius IG 300–500

12.8 V DC:
Fronius Galvo, Fronius Symo, Fronius Primo

Technical Data

Technical Data

Memory capacity	up to 4096 days
Supply voltage with Fronius Com Card function without Fronius Com Card function	 115–230 V AC 12 V DC
Energy consumption	< 2 W
Dimensions	
Plug-in card	132 x 103 x 22 mm 5.2 x 4.1 x 0.9 in.
Box	190 x 114 x 53 mm 4.69 x 4.49 x 2.09 in.
Degree of protection (box)	IP 20
External power supply connection (box)	12 V DC, max. 1 A, Class 2
Cable cross section for external power supply connection (box)	0.13–1.5 mm² AWG 16–24 (USA/Canada)
Ethernet (LAN)	RJ 45, 100 Mbit
WLAN	IEEE 802.11b/g/n client
RS 422 (Fronius Solar Net)	RJ 45
Ambient temperature	
Plug-in card	-20–+65°C -4–+149°F
Box	0–50°C 32–122°F
Fronius Solar Net power	approx. 3 W max. 3 DATCOM components *
I/O connection specifications	
Voltage level of digital inputs	low = min. 0 V–max. 1.8 V high = min. 3 V–max. 24 V (+ 20%)
Input currents of digital inputs	depending on the input voltage; input resistance = 46 kOhm
Switching capacity of digital outputs when supplied by the Datamanager plug-in card	3.2 W
Fronius IG, Fronius IG Plus, Fronius IG Plus V, Fronius IG Plus A, Fronius CL, Fronius CL USA, Fronius IG 300–500	10.8 V
Fronius Galvo, Fronius Symo, Fronius Primo	12.8 V in total for all four digital outputs (minus other Fronius Solar Net participants)

Switching capacity of digital outputs when supplied by an external power supply with min. 10.7–max. 24 V DC	1 A, 10.7–24 V DC (depending on the external power supply) per digital output
Max. switchable inductive loads on the digital outputs	76 mJ (per output)
Modbus RTU	RS-485 2-wire
Factory setting of RS-485 interface: Speed Data frame	9600 baud 1 start bit 8 data bits no parity 1 stop bit

*   Given sufficient power supply from Fronius Solar Net, the green LED lights up on every DATCOM component.
If the green LED does not light up, the power supply unit available from Fronius should be inserted into the 12 V power supply connection socket of an external DATCOM component.
Check the cable and plug connections if necessary.

Examples of external DATCOM components: Fronius String Control, Fronius Sensor Box etc.

Installing Fronius Datamanager 2.0

Inserting Fronius Datamanager 2.0 into an Inverter

General

Please see the Operating Instructions for the respective inverter for information regarding plug-in card installation. Please note the safety and warning information in your inverter's Operating Instructions.

Safety

> ⚠️ **WARNING!** An electric shock can be fatal. Danger from grid voltage and DC voltage from solar modules.
> - The connection area should only be opened by a licensed electrician.
> - The separate power stage set area should only be disconnected from the connection area after first being disconnected from the grid power.
> - The separate power stage set area should only be opened by Fronius-trained service personnel.
>
> Before making any connections, make sure that the AC and DC sides are disconnected from the inverter, e.g.:
> - Switch off the AC automatic circuit breaker for the inverter
> - Cover solar modules
>
> Please observe the 5 safety rules.

> ⚠️ **WARNING!** An electric shock can be fatal. Danger from residual voltage from capacitors.
> You must wait until the capacitors have discharged.

> ☞ **NOTE!** Follow general ESD precautions when handling plug-in cards.

Fronius Datamanager 2.0 Plug-in Positions

The Fronius Datamanager 2.0 plug-in position is specified for each inverter type:

Inverter	Plug-in position
Fronius IG 15 - 60	ENS slot $^{*)}$
Fronius IG 300 - 500	ENS slot $^{*)}$
Fronius IG Plus, Fronius IG Plus V	on the far right, unless a ML-MON plug-in card is present
Fronius CL	on the far right, unless a ML-MON plug-in card is present
Fronius Galvo	does not matter
Fronius Symo	does not matter
Fronius Primo	does not matter

*)   If an ENS plug-in card is inserted in the ENS slot: Insert Fronius Datamanager 2.0 in the next slot to the right of the ENS slot.

IMPORTANT!
The next slot must be kept free.
Never remove an existing ENS plug-in card.
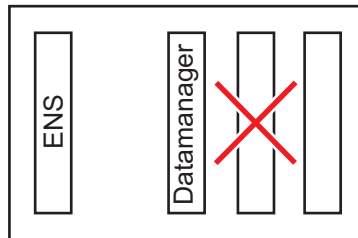
Installing and connecting WLAN antennas

General

Depending on the inverter the WLAN antenna must be either installed in the inverter or mounted to the outside of the inverter.

IMPORTANT! Always follow the relevant operating instructions when opening an inverter! Observe the safety rules!

Fronius IG, Fronius IG Plus, Fronius IG Plus V, Fronius CL: Installing and Connecting Antennas


0,9 Nm
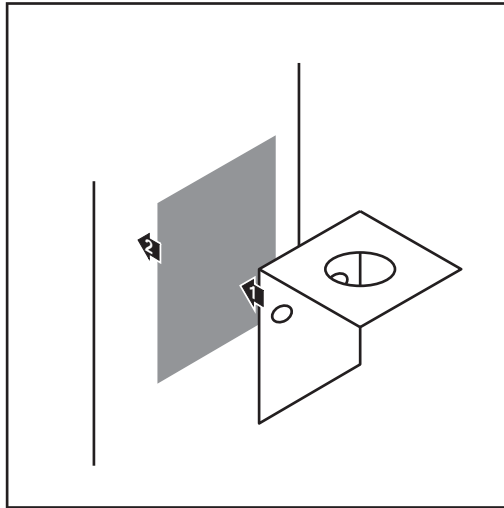
1. Use the double-sided adhesive tape to fasten the mounting bracket to the outside of the inverter housing or, if suitable for the antenna cable, secure it in a position near the inverter

   IMPORTANT! The double-sided adhesive tape only reaches its maximum bond strength after 24 hours.

   IMPORTANT! The mounting bracket may not be screwed to the inverter housing.
   It may however be fitted in a nearby position. The relevant screws are not included in the scope of delivery and must be selected by the installer.
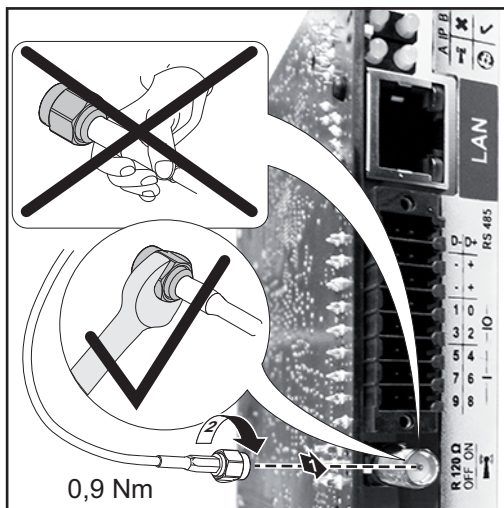
2. Connect the antenna cable to the antenna socket on the Fronius Datamanager 2.0 plug-in card

3. Run the antenna cable out through the DATCOM opening on the inverter

4. If possible, secure the cable with a strain relief device

5. Close or seal the DATCOM opening in accordance with the inverter operating instructions
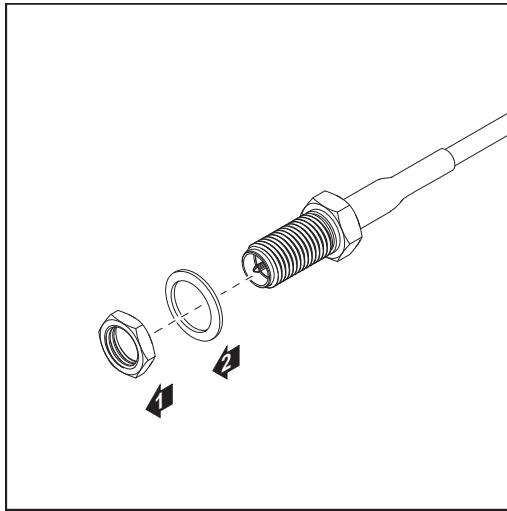
6 Remove the hex nut and washer from the outside thread of the antenna cable
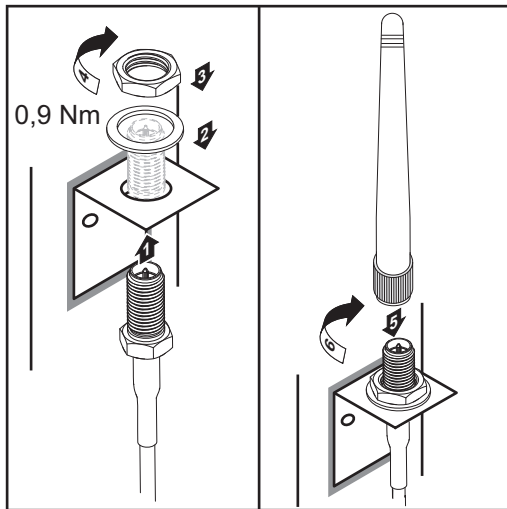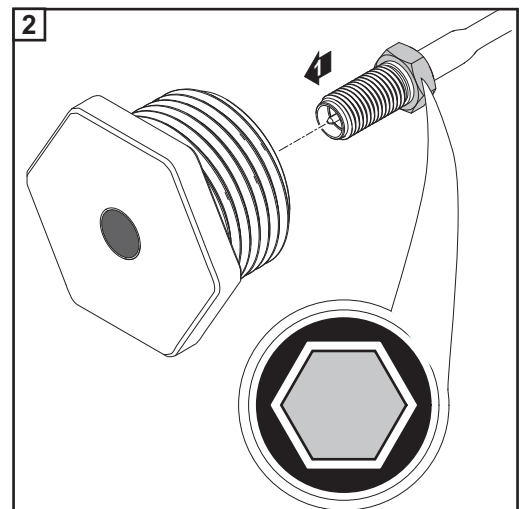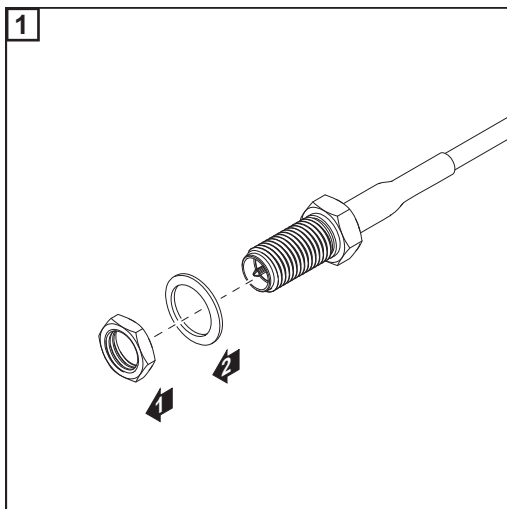

7 Run the antenna cable through the drill hole on the mounting bracket

**8** Attach the lock washer and screw on the hex nut

9 Screw on the antenna

0,9 Nm

Fronius IG USA, Fronius IG Plus USA, Fronius IG Plus V USA: Installing and Connecting Antenna

1

2

CAUTION! Danger of short circuit caused by loose metal parts from knockouts. Loose metal parts in the inverter may cause short circuits when the inverter is powered up. When removing knockouts, make sure that
- no loose metal parts fall into the inverter,
- any metal pieces that do fall into the inverter should be removed immediately.

3

0.6 Nm
0.74 ft. lb.

4

19 mm
3/4 in.
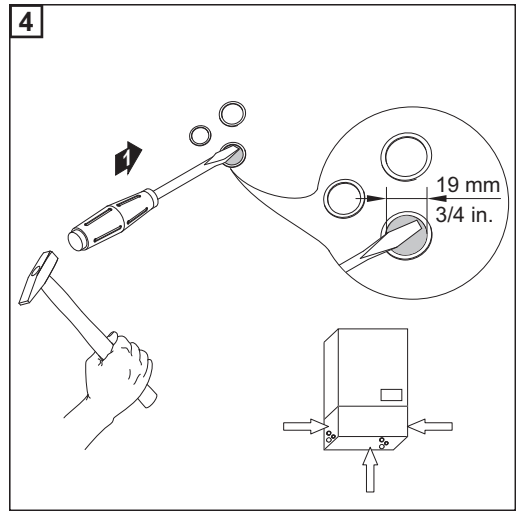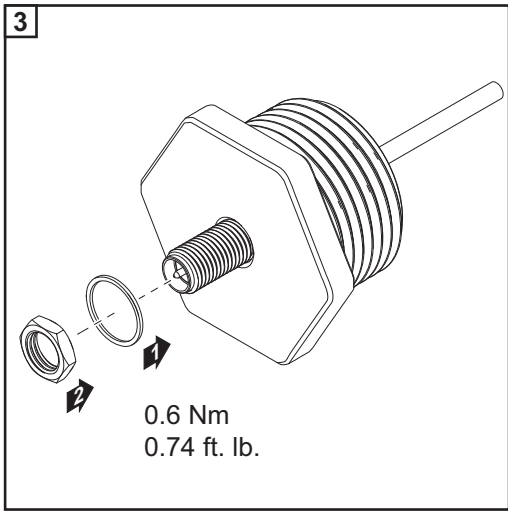
NOTE! In order to ensure leak-tightness, the sealing ring must be fitted to the antenna screw joint before inserting the antenna screw joint into the inverter housing.

5

6

7

8 Nm
5.90 ft. lb.

8
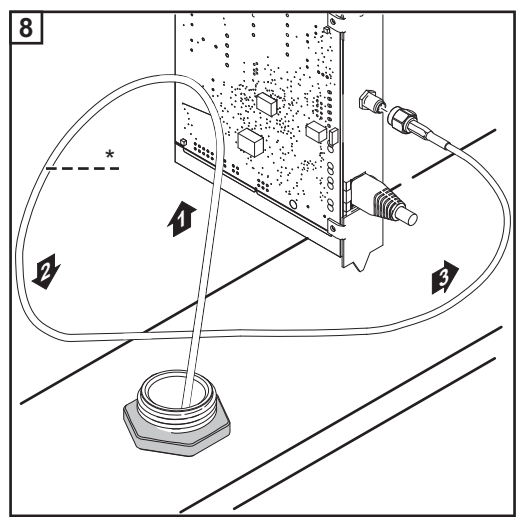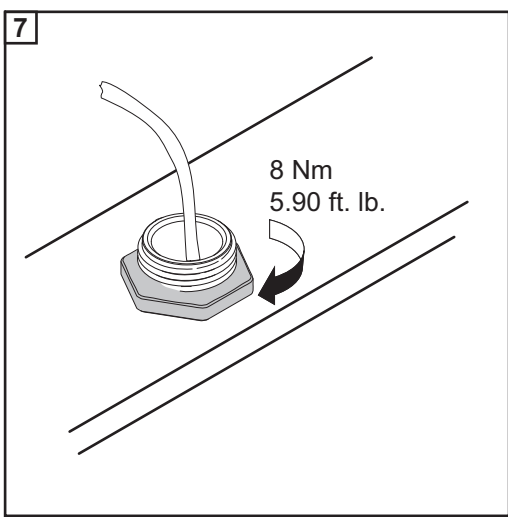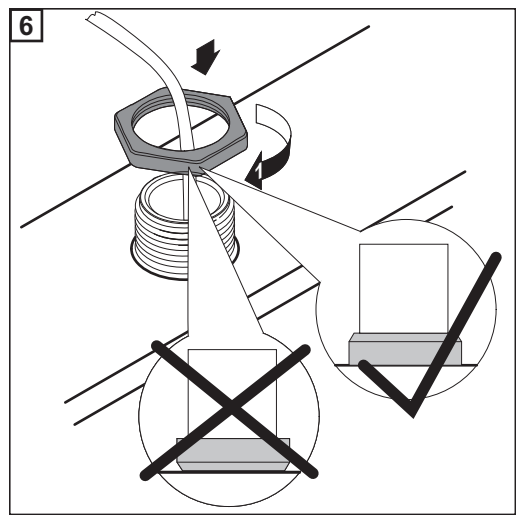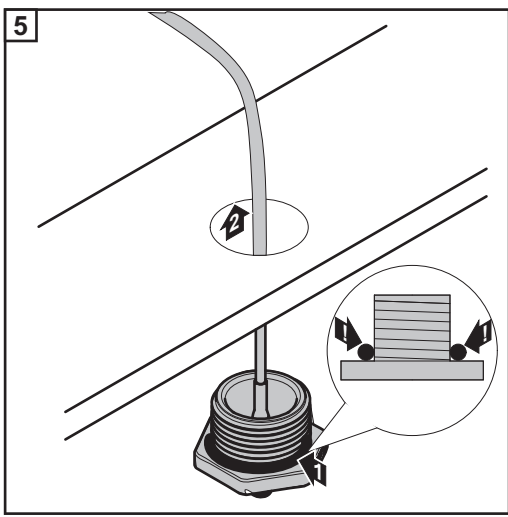
Bending radius of the antenna cable: at least 25.4 mm/1 in.

37

9

0.9 Nm
8 in-lb

10
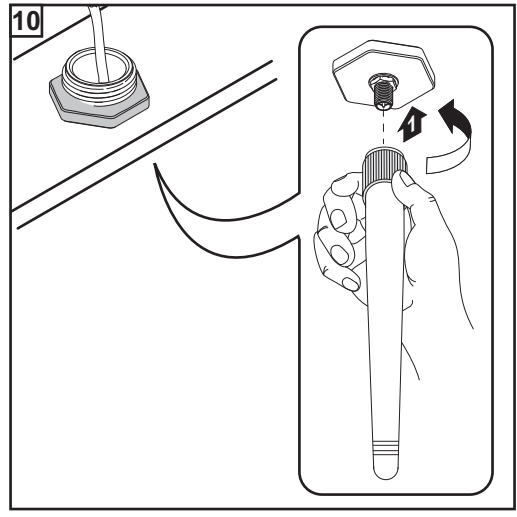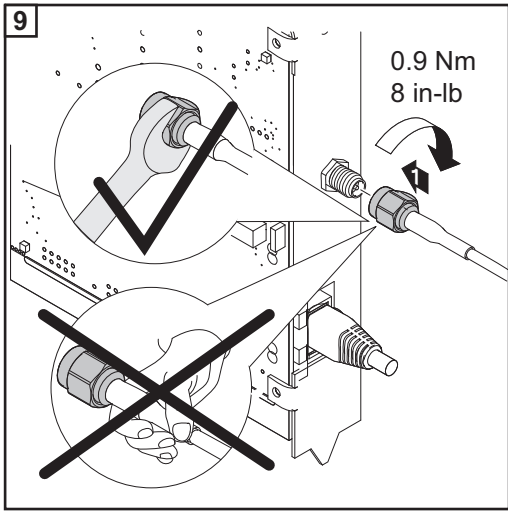
Installing Fronius Datamanager 2.0 in Fronius Solar Net

Safety

⚠️ **CAUTION!** DATCOM components and/or the PC/laptop may be seriously damaged if the Ethernet or Fronius Solar Net cables are connected incorrectly to the Fronius Datamanager 2.0.
- The Ethernet cable should only be inserted into the LAN connection socket (colored blue).
- The Fronius Solar Net cable should only be inserted into the Fronius Solar Net IN connection socket (colored red).

Installing Inverters with Fronius Datamanager 2.0 in Fronius Solar Net

Fronius IG, Fronius IG Plus, Fronius IG Plus V, Fronius IG Plus A, Fronius CL, Fronius CL USA, Fronius IG 300–500:
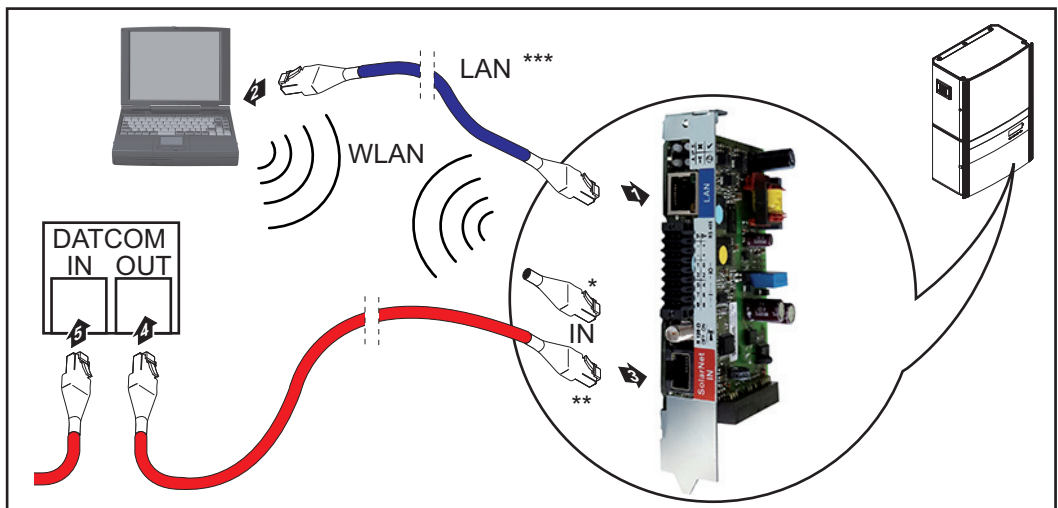
Fronius Galvo, Fronius Symo, Fronius Primo:
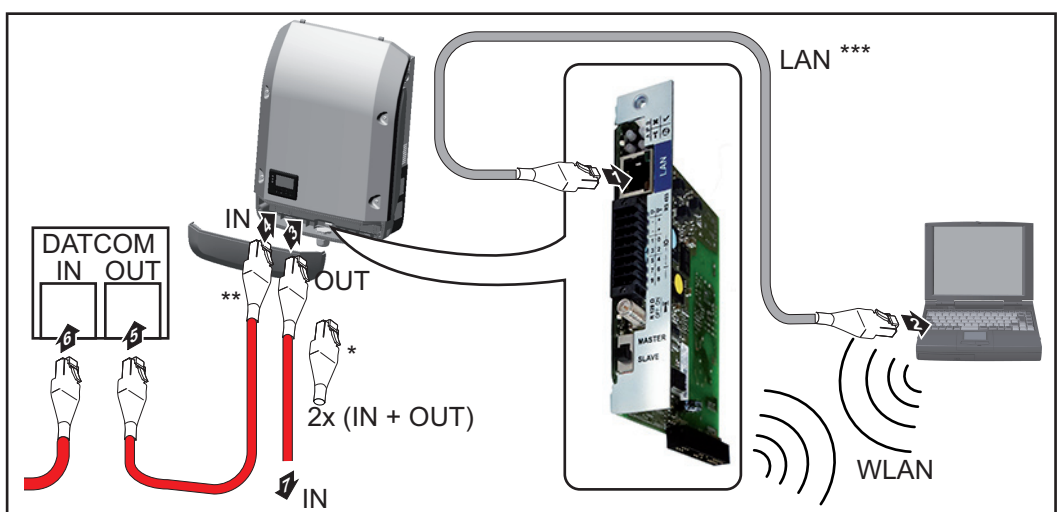
*   Fronius Solar Net termination plug, if only one inverter with Fronius Datamanager 2.0 is linked to a PC

**   Fronius Solar Net cable, if an inverter with Fronius Datamanager 2.0 is linked to a PC and other DATCOM components

39

Connection between Fronius Datamanager 2.0 and PC via LAN or WLAN

1   Insert and lay the Ethernet cable in the inverter like a data communication cable in accordance with the operating instructions for the inverter

2   Insert the Ethernet cable into the LAN connection socket

3   Insert the Ethernet cable into the PC/laptop or into a suitable network connection socket

4   If only one inverter with Fronius Datamanager 2.0 is linked to a PC:

Fronius IG, Fronius IG Plus, Fronius IG Plus V, Fronius IG Plus A, Fronius CL, Fronius CL USA, Fronius IG 300 - 500:
Insert the Fronius Solar Net termination plug into the Fronius Solar Net IN connection socket

Fronius Galvo, Fronius Symo, Fronius Primo:
Insert a Fronius Solar Net termination plug into the Solar Net IN connection socket and the Solar Net OUT connection socket

If other DATCOM components are connected to the network, besides the inverter with Fronius Datamanager 2.0:
Insert the Fronius Solar Net cable into the Fronius Solar Net IN connection socket of the Fronius Datamanager 2.0

5   Connect the other DATCOM components

IMPORTANT! A Fronius Solar Net termination plug must be inserted into the empty IN connection socket of the last DATCOM component.

Installing Fronius Datamanager Box 2.0 in Fronius Solar Net
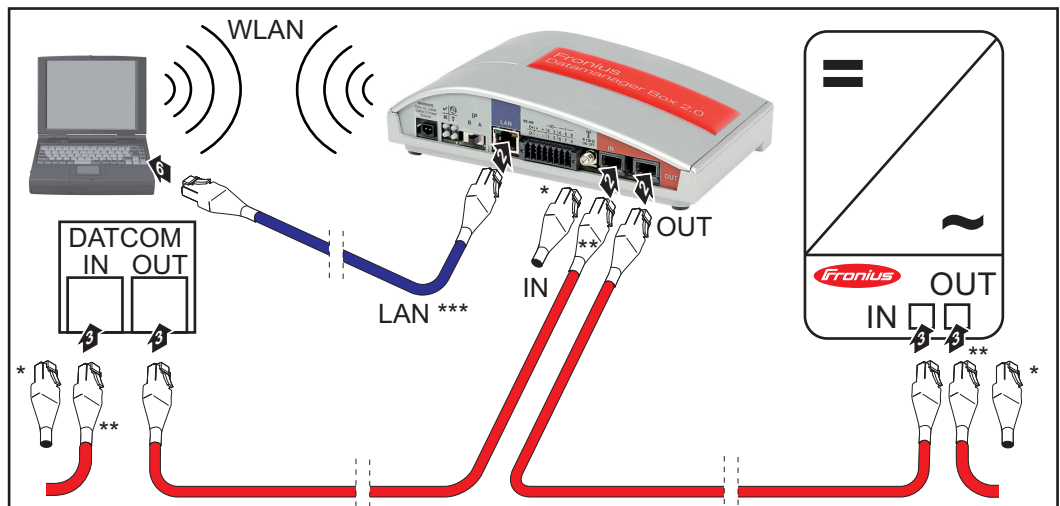
*   Fronius Solar Net termination plug for the last DATCOM component

**   Fronius Solar Net cable, if a Fronius Datamanager Box 2.0 is linked to a PC and other DATCOM components

***   Ethernet cable is not included in the scope of supply for the Fronius Datamanager 2.0/Fronius Datamanager Box 2.0

Connection between Fronius Datamanager 2.0 and PC via LAN or WLAN

1   Insert the Ethernet cable into the LAN connection socket

2 Insert the Ethernet cable into the PC/laptop or into a suitable network connection socket

3 Insert the Fronius Solar Net cable into the Fronius Solar Net OUT connection socket of the Fronius Datamanager Box 2.0

4 Insert the Fronius Solar Net cable into the Fronius Solar Net IN connection socket of the inverter as per the inverter operating instructions

5 Connect the other DATCOM components

IMPORTANT! A Fronius Solar Net termination plug must be inserted into each empty IN or OUT connection socket of the last DATCOM components.

Fronius Solar Net Cabling

Fronius Solar Net clients	Inverters with Fronius Datamanager, Fronius Hybridmanager or Fronius Com Card, DAT-COM components with external housing or other DATCOM components will hereinafter be referred to as Fronius Solar Net clients.

Fronius Solar Net Client Cabling	The data connection for the Fronius Solar Net client is a 1:1 connection using 8-pin data cables and RJ-45 plugs. The overall line length in a Fronius Solar Net ring must not exceed 1000 m.

Requirements for the Solar Net Data Cables	Shielded CAT5 (new) and CAT5e (old) cables compliant with ISO 11801 and EN 50173 must be used for the Fronius Solar Net client cabling. Other cables are not permitted. **IMPORTANT!** Do not use ISO/IEC-11801 U/UTP cables!

Permitted cables:

-	S/STP	-	F/FTP	-	F/UTP
-	F/STP	-	SF/FTP	-	U/FTP
-	S/FTP	-	S/UTP	-	U/STP

The shield must be crimped onto a CAT5-compatible shielded plug.

Due to the fact that the wires in Ethernet cables are twisted, you must make sure the twisted pairs of wires are assigned correctly for cabling in accordance with TIA/EIA-568B:

Fronius Solar Net contact		Pair no.	Color	
1	+12 V	3		white/orange line
2	GND	3		orange/white line or orange
3	TX+ IN, RX+ OUT	2		white/green line
4	RX+ IN, TX+ OUT	1		blue/white line or blue
5	RX- IN, TX- OUT	1		white/blue line
6	TX- IN, RX- OUT	2		green/white line or green
7	GND	4		white/brown line
8	+12 V	4		brown/white line or brown

Cabling compliant with TIA/EIA-568B

- Make sure that the wires are assigned correctly.
- When setting up an independent ground connection (e.g., in patch panels), make sure that the shield is grounded on one side of the cable only.

The following structured cabling standards must generally be observed:
-   EN 50173-1 for Europe
-   ISO/IEC 11801:2002 internationally
-   TIA/EIA 568 for North America

Rules for use of copper cables apply.

Preassembled data cables

The following preassembled data cables are available from Fronius:
-   CAT5 cable 1 m ... 43,0004,2435
-   CAT5 cable 20 m ... 43,0004,2434
-   CAT5 cable 60 m ... 43,0004,2436

The cables listed above are 8-pin, 1:1 LAN network cables, shielded and twisted, including RJ 45 plugs.

IMPORTANT! Data cables are not UV resistant. They should be protected from sunlight when laid outdoors.

Installing Fronius Datamanager 2.0 – Overview

Safety

> ⚠️ **WARNING!** Operating the device incorrectly can cause serious injury and damage. Do not use the functions described until you have thoroughly read and understood the following documents:
> - these operating instructions
> - all operating instructions for system components, especially the safety rules

👉 **NOTE!** Installing Fronius Datamanager 2.0 requires knowledge of network technology.

Starting for the First Time via the Fronius Solar.web App

👉 **NOTE!** The Fronius Solar.web App makes commissioning Fronius Datamanager 2.0 significantly easier. The Fronius Solar.web App is available in the relevant app store.

GET IT ON Google play   Download on the App Store

To start Fronius Datamanager 2.0 for the first time,
- the Fronius Datamanager 2.0 plug-in card must be installed in the inverter,
  or
- there must be a Fronius Datamanager Box 2.0 in the Fronius Solar Net ring.

IMPORTANT! To establish a connection to Fronius Datamanager 2.0, the end device in question (e.g., laptop, tablet) must be configured as follows:
- "Obtain an IP address automatically (DHCP)" must be activated

1 Connect the inverters with Fronius Datamanager 2.0 or Fronius Datamanager Box 2.0 in Fronius Solar Net

IMPORTANT! Inverters Fronius IG, Fronius IG Plus, Fronius IG Plus V, Fronius IG Plus A, Fronius CL, Fronius CL USA, and Fronius IG 300–500 must always be located at the beginning or end of the Fronius Solar Net ring.

2 For Fronius Galvo/Fronius Symo/Fronius Primo only and when linking multiple inverters in Fronius Solar Net:
Set the Fronius Solar Net master/slave switch on the Fronius Datamanager 2.0 plug-in card as required
- One inverter with Fronius Datamanager 2.0 = master
- All other inverters with Fronius Datamanager 2.0 = slave (the LEDs on the Fronius Datamanager 2.0 plug-in cards are off)

3 Switch the device to service mode

Inverter with Fronius Datamanager 2.0 plug-in card:
- Switch the IP switch on the Fronius Datamanager 2.0 plug-in card to position A

- OR -

- Activate the WIFI Access Point via the Setup menu of the inverter
  (the performance of this function depends on the inverter software)

```
 _\_        | SETUP |     1
 ↑ Stand by
 | WiFi Access Point
 | DATCOM
 ↓ USB
 ↓ Clock
   ✦        ✦        ⌐        ↵
```

Fronius Datamanager Box 2.0:
- Switch the IP switch on the Fronius Datamanager Box 2.0 to position A

The inverter/Fronius Datamanager Box 2.0 establishes the WLAN Access Point. The WLAN Access Point stays open for one hour.

4 Download Fronius Solar.web App

5 Run Fronius Solar.web App

The start page of the Commissioning Wizard appears.
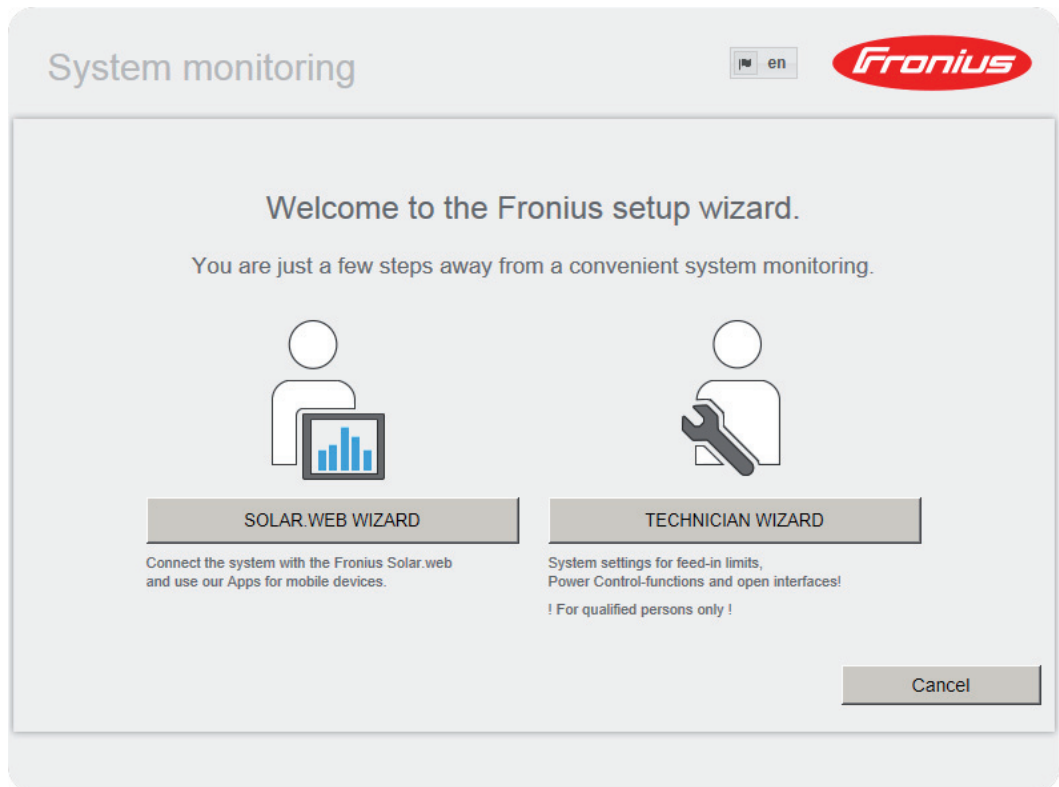
The Technician Wizard is designed for the installer and includes standard-specific settings. **Running the Technician Wizard is optional.**
If the Technician Wizard is run, it is essential to note down the assigned service password. This service password is required to configure the UC Editor and Counter menu items.
If the Technician Wizard is not run, no specifications for power reduction are set.

The Solar Web Wizard must be run.

6   If necessary, run the Technician Wizard and follow the instructions

7   Run the Solar Web Wizard and follow the instructions

The Fronius Solar.web start page appears.
or
The Fronius Datamanager 2.0 website opens.

Starting for the First Time via Web Browser

☞ **NOTE!** The Fronius Solar.web App makes starting Fronius Datamanager 2.0 for the first time significantly easier.
The Fronius Solar.web App is available in the relevant app store.

To start Fronius Datamanager 2.0 for the first time,
-    the Fronius Datamanager 2.0 plug-in card must be installed in the inverter,
     or
-    there must be a Fronius Datamanager Box 2.0 in the Fronius Solar Net ring.

IMPORTANT! To establish a connection to Fronius Datamanager 2.0, the end device in question (e.g., laptop, tablet) must be configured as follows:
-    "Obtain an IP address automatically (DHCP)" must be activated

> ⚠️ **WARNING!** An electric shock can be fatal. Danger from grid voltage and DC voltage from solar modules.
> Before opening the inverter:
> - You must wait until the capacitors have discharged.
> - Follow the operating instructions when opening the inverter.
> - Observe the safety rules and safety instructions contained in the inverter's operating instructions.

1 Connect the inverters with Fronius Datamanager 2.0 or Fronius Datamanager Box 2.0 in Fronius Solar Net

IMPORTANT! Inverters Fronius IG, Fronius IG Plus, Fronius IG Plus V, Fronius IG Plus A, Fronius CL, Fronius CL USA, and Fronius IG 300–500 must always be located at the beginning or end of the Fronius Solar Net ring.

2 For Fronius Galvo/Fronius Symo/Fronius Primo only and when linking multiple inverters in Fronius Solar Net:
Set the Fronius Solar Net master/slave switch on the Fronius Datamanager 2.0 plug-in card as required
- One inverter with Fronius Datamanager 2.0 = master
- All other inverters with Fronius Datamanager 2.0 = slave (the LEDs on the Fronius Datamanager 2.0 plug-in cards are off)

3 Switch the device to service mode

Inverter with Fronius Datamanager 2.0 plug-in card:
- Switch the IP switch on the Fronius Datamanager 2.0 plug-in card to position A

or
- Activate the WIFI Access Point via the Setup menu of the inverter
(the performance of this function depends on the inverter software)

Fronius Datamanager Box 2.0:
- Switch the IP switch on the Fronius Datamanager Box 2.0 to position A
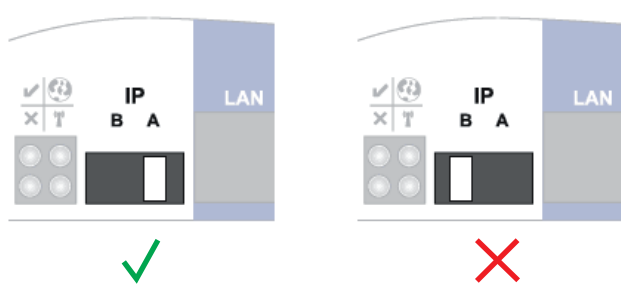
The inverter/Fronius Datamanager Box 2.0 establishes the WLAN Access Point. The WLAN Access Point stays open for one hour.

4 Connect the end device to the WLAN Access Point

SSID = FRONIUS_240.xxxxx (5–8 digits)

- Search for a network with the name "FRONIUS_240.xxxxx"
- Establish a connection to this network
- Enter password 12345678

(or connect end device and inverter via Ethernet cable)

5 Enter in the browser:
http://datamanager
or
192.168.250.181 (IP address for WLAN connection)
or
169.254.0.180 (IP address for LAN connection)

The start page of the Commissioning Wizard appears.
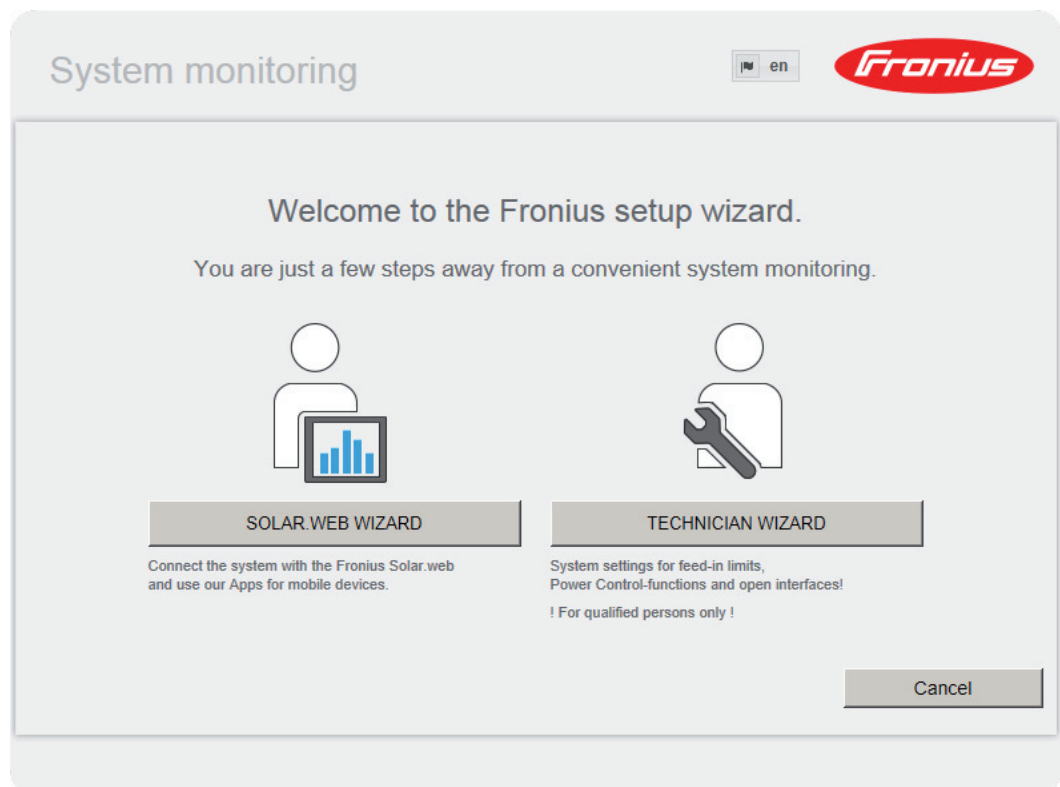
The Technician Wizard is designed for the installer and includes standard-specific settings. If the Technician Wizard is run, it is essential to note down the assigned service password. This service password is required to configure the UC Editor and Counter menu items. If the Technician Wizard is not run, no specifications for power reduction are set.

The Solar Web Wizard must be run.

6 If necessary, run the Technician Wizard and follow the instructions

7 Run the Solar Web Wizard and follow the instructions

The Fronius Solar.web start page appears.
or
The Fronius Datamanager 2.0 website opens.

Establishing a Connection to Fronius Datamanager 2.0

Connecting to Fronius Datamanager 2.0 via a Web Browser

General

The connection to Fronius Datamanager 2.0 via a web browser is suitable for accessing current values with several PC users in a LAN (e.g., company networks, schools).

For example, total and daily yields can be accessed and/or inverter comparisons can be made on the Fronius Datamanager 2.0 website.

Requirements

- At least a LAN or WLAN connection
- Web browser (e.g., Microsoft Internet Explorer IE ≥ 9.0, Firefox 4, Google Chrome 27.0)
- PC/laptop in the same network segment as Fronius Datamanager 2.0

Establishing a Connection to Fronius Datamanager 2.0 via a Web Browser

1 Open the web browser

2 Enter the IP address or the host name and the domain name for Fronius Datamanager 2.0 in the address field

The Fronius Datamanager 2.0 website opens.
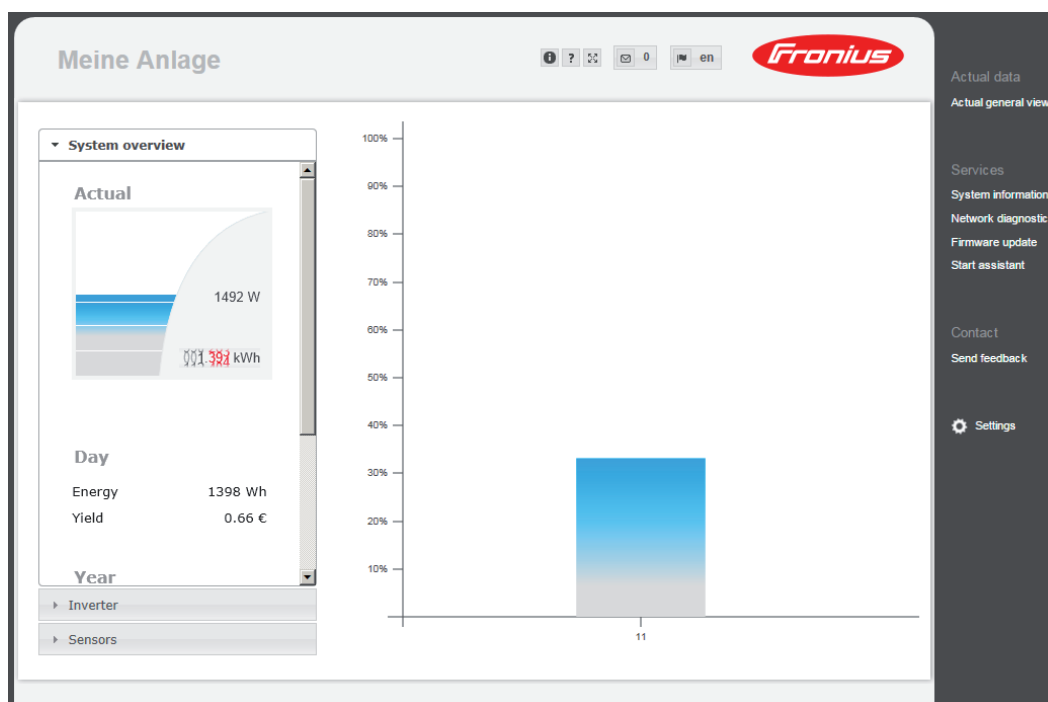
Connecting to Fronius Datamanager 2.0 via the Internet and Fronius Solar.web

General

By connecting to Fronius Datamanager 2.0 via the internet and Fronius Solar.web, you can access archived data and up-to-date photovoltaic system data online from anywhere in the world with internet access.
You can also provide other users with guest access so that they can view your photovoltaic system, or you can make a comparison of several systems.

Function Overview

Fronius Datamanager 2.0 is connected to the internet (e.g., via a DSL router). Fronius Datamanager 2.0 regularly logs on to Fronius Solar.web and sends its saved data every day.
Fronius Solar.web can actively contact Fronius Datamanager 2.0, e.g., to display real-time data.

Requirements

- Internet access
- Web browser

IMPORTANT! Fronius Datamanager 2.0 cannot connect itself to the internet. A router must be used for a DSL connection to the internet.

- Registration of photovoltaic system with Fronius Solar.web.

- In order to access real-time data in Fronius Solar.web, the "Yes" selection option must be activated under "Send actual data to Fronius Solar.web" in Fronius Datamanager 2.0 in the settings under Solar.web.

- In order to access archived data in Fronius Solar.web, the "Daily at" or "Hourly" selection option must be activated under "Send archive data to Fronius Solar.web" in Fronius Datamanager 2.0.

Accessing Data from Fronius Datamanager 2.0 via the Internet and Fronius Solar.web

To access real-time and archived data from Fronius Datamanager 2.0 using Fronius Solar.web:

1 Start Fronius Solar.web: http://www.solarweb.com

For more information about Fronius Solar.web, see the online help.

Current Data, Services, and Settings on Fronius Datamanager 2.0

The Fronius Datamanager 2.0 Website

Fronius Dataman-ager 2.0 Website – Overview

The following data is displayed on the Fronius Datamanager 2.0 website:

(1) Current comparison view of all inverters in the Fronius Solar Net ring

(2) System overview: Current/Day/Year/Total

(3) Inverter

(4) Sensors

(5) Services
System information, Network diagnostics, Firmware update

(6) Contact
Send feedback

(7) Settings menu

(8) Other setting options
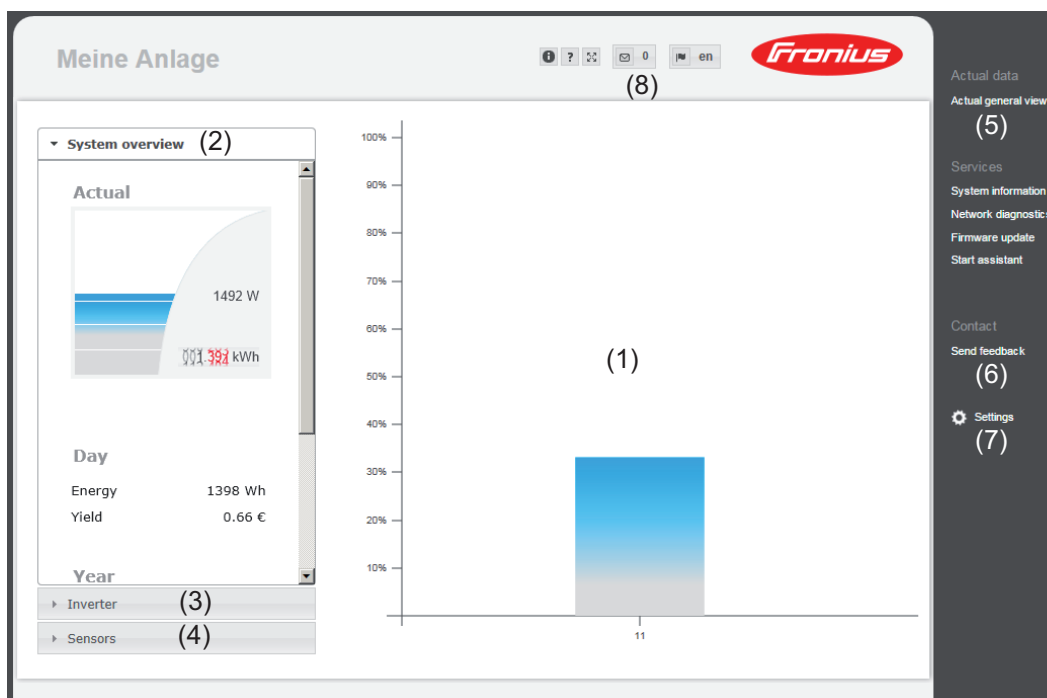
The Settings Menu

After clicking on "Settings," the Settings menu is opened on the Fronius Datamanager 2.0 website.
Fronius Datamanager 2.0 is configured in the Settings menu.

General Adjustment and Viewing of Menu Items

GENERAL *
PASSWORDS
NETWORK
FRONIUS SOLAR.WEB
SERVICE MESSAGES
IO MAPPING
LOAD MANAGEMENT
PUSH SERVICE
MODBUS
INVERTER
FRONIUS SENSOR CARDS
METER **
DNO EDITOR **

Menu items in Settings menu

1 Establish a connection to Fronius Datamanager 2.0

2 Click on "Settings"

3 Click on the desired menu item

   The desired menu item is opened.

4 View menu item or edit accordingly.

5 If there is one, click on the relevant button (e.g, Save, Synchronize)
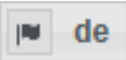
   The changed data is accepted

* Selected menu item

** The Counter and UC Editor menu items are protected by the service password.

Other Setting Options

Other setting options are shown in the top right corner of the Fronius Datamanager 2.0 website:
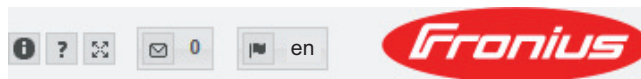
🛈	System information: Data logger ID, software version, hardware version, Solar Net connection, Solar.web connection
?	Help: - Software operating instructions - Fronius Solar Channel
⤢	Expand contents: The "Real-time Data/Settings" menu area is hidden
✉ 0	Display notifications
de	Language: Set the language

The Fronius Datamanager 2.0 website will appear in the language set for the browser itself or in the last selected language.

Current Data in Fronius Datamanager 2.0

Current Comparison View

Several inverters in the same photovoltaic system can be compared in the current Comparison View.

The real-time inverter AC power is displayed as a percentage of the power from the solar module connected to the respective inverter (shown in a bar diagram). A bar is displayed for each inverter. The bar color indicates the power range of the inverter:

Blue:	The inverter power corresponds to the average power of all inverters.
Yellow:	The inverter power deviates slightly from the average power of all inverters (50–90% from the average).
Red:	The inverter power deviates significantly from the average power of all inverters or an error has occurred in the inverter (< 50% from the average).

System Overview

The system overview contains:
- the real-time power data of a photovoltaic system
- the active devices
- the energy generated per day, per year, and in total
- the yield per day, per year, and in total

The values for consumption and energy fed into the grid are only displayed when a meter is configured on the inverter and the meter sends valid data.

Inverter/Sensor View

Inverter View
The Inverter View displays all the inverters present in the system.
Clicking on an inverter or the corresponding bar in the Comparison View displays the inverter's real-time data.

Sensor View
The Sensor View displays all the sensor cards/boxes present in the system.

Services – System Information

System Informa-
tion

The System Information page contains various information about the system.

The following buttons are also available:
- "**Datalogger restart**" button
  Used to restart the datamanager/system monitoring
- "**Reset to factory settings**" button with the following selection options:
  - "**All settings except for the network**"
    Used to reset the Datamanager (system monitoring) to factory settings.
    The network settings and all items protected by the service user (UC Editor, meter settings, and the service password) are retained
  - "**All settings**"
    Used to reset the Datamanager (system monitoring) and the network settings to factory settings.
    All items protected by the service user (UC Editor, meter settings, and the service password) are retained

IMPORTANT! When the Datamanager (system monitoring) is reset to factory settings, the time and date settings must be checked.

Services – Network Diagnostics

Network Diagnostics

The Services / Network diagnostics option contains functions that are useful for diagnosing and correcting network problems. Ping and traceroute commands can be executed.

Ping command
Used to determine whether or not a host is available and how much time a data transfer will take.

Send ping command:

1   Enter a host name or IP address in the Host field

2   Click on the ping button
- Ping command is sent
- The resulting data is displayed

Traceroute command
Used to determine via which intermediate stations the data reaches the host.

Send traceroute command:

1   Enter a host name or IP address in the Host field

2   Click on the "traceroute" button
- Traceroute command is sent
- The resulting data is displayed

Services – Firmware Update

General	You can update the Datamanager firmware under Services/Firmware Update. A firmware update can be performed via LAN or web.

Automatic Update Search	**IMPORTANT!** An internet connection is required for the automatic update search.
	When the "**Automatic update search**" option is activated, the Datamanager will automatically search for updates once a day. If new updates are available, a message is displayed under the other setting options for the website.

Manual Update Search	When the "**Automatic update search**" option is deactivated, there will be no automatic search for updates.
	1 To search manually for updates, use the "**Check now**" button

Firmware Update via Web	**1** Open the Datamanager website via a web browser
	2 Open "Firmware update" under "Services"
	3 Select "**Update via Web**"
	4 Click on the "**Run update**" button
	The confirmation prompt for the update appears
	5 Click on the "**Yes**" button
	The update starts and the progress is displayed as a bar and a percentage.
	6 Once the update has been carried out successfully, click on the "**Apply/Save**" ✓ button
	If the connection to the server fails:
	- Deactivate the firewall for the duration of the update
	- Retry the update
	IMPORTANT! If a proxy server is used to connect to the internet:
	- The "Use proxy server for Web update" option must be activated
	- The required data must be entered

Firmware Update via LAN	**1** Establish LAN connection between PC/laptop and Datamanager
	2 Download the current firmware from the Fronius homepage
	3 Run the downloaded update file on the PC/laptop
	This will start a web server from which the Datamanager will download the required files.
	4 Open the Datamanager website via a web browser
	5 Open "Firmware update" under "Services"
	6 Select "**Update via LAN**"
	7 Enter the IP address of the PC/laptop
	8 Click on the "**Run update**" button
	The confirmation prompt for the update appears.

9   Click on the "**Yes**" button

     The update starts and the progress is displayed as a bar and a percentage.

10   Once the update has been carried out successfully, click on the "**Apply/Save** ✓ " button

The update is complete when the "Supply LED" lights up green again.

If the connection to the server fails:
-   Deactivate the firewall for the duration of the update
-   Retry the update

Services – Opening Wizards

Opening Wizards   Under "**Open Wizards**," it is possible to re-open the Solar.web Wizard and the Technician Wizard and run these again.

Settings – General

General

You can enter the charge rate per kWh, the currency, and the expenses per kWh to calculate the yield under "Feed-in payment." The yield is shown in the current Total View.

The date, hour, and minutes can be entered under "System time."
Click on the "**Synchronize**" button to adapt the time displayed in the entry fields of the Datamanager website to the time set on the operating system.
Click on the "**Apply/Save**" button to apply the [✓] time.

The region and location for the time zone can be set under "Time zone settings."

Fields marked with * are mandatory fields.

Settings – Passwords

General

Access to Fronius Datamanager 2.0 is regulated by assigning passwords.
Three different password types are available:
- the administrator password
- the service password
- the user password

Passwords

Administrator Password
User name = admin

The administrator password set during commissioning assigns the user read and write (configuration) access. The user can then open the "Settings" menu item and define any settings as desired, with the exception of the UC Editor and Meter.

When an administrator password is set, the user must enter the user name and password to open the "Settings" menu item.

Service Password
User name = service

The service password is usually assigned in the Commissioning Wizard by the service technician or system installer and provides access to system-specific parameters. The service password is required to adjust meter settings and settings in the UC Editor. If no service password has been assigned, the Meter and UC Editor menu items cannot be accessed.

User Password
After activating the "**Save local site page**" selection field, the user password is displayed; user name = user.

An assigned user password gives the user read access only. The user cannot open the "Settings" menu item.

When assigning a user password, users must enter their username and password every time they connect.

Settings – Network

Internet via WLAN

The networks found are displayed.

Clicking on the Refresh button will   conduct a new search for available WLAN networks.

Hidden networks can be added via the "**Add WLAN**" menu.

"Setup" button – used to save a selected WLAN network.
Clicking on this option opens the "WLAN connection" window.

"Remove" button – used to delete a saved WLAN network.

"Configure WLAN IP" button – clicking on this option opens the "Configure IP" window, with the same setting options as for a LAN connection.

Internet via LAN

Setting options:
- "**Obtain addressstatically**"
  The user has to enter a fixed IP address for the Datamanager (system monitoring), the subnet mask, gateway address, and DNS server address (from the provider).
- "**Obtain addressdynamically**"
  The Datamanager (system monitoring) obtains its IP address from a DHCP server (DHCP = dynamic host configuration protocol).
  The DHCP server must be configured so that the Datamanager is always assigned the same IP address. You will then always know the IP address at which the Datamanager (system monitoring) can be found.
  If the DHCP server supports the "DNS dynamic updates" function, a name can be entered for the Datamanager (system monitoring) in the "Host name" field. The connection to the Datamanager (system monitoring) can then be established using the name instead of the IP address.
  For example: Host name = sample_system, Domain name = fronius.com.
  The Datamanager (system monitoring) can be reached via the address "sample_system.fronius.com".

Local Network via Access Point

The Datamanager (system monitoring) is used as the access point. The PC or smart device connects directly to the Datamanager (system monitoring). Connecting to the internet is not possible.

Settings – Fronius Solar.web

Solar.web

The "**Fronius Solar.web**" menu item can be used to make a direct connection to Fronius Solar.web.

Selecting the storage interval for the fields "**Inverter Query Cycle**" and "**Fronius Sensor Cards Query Cycle**" affects the required storage capacity.

"**Register Solar.web**" button – clicking on this button opens the Fronius Solar.web start page; data relevant for Fronius Solar.web is automatically sent as well.

Memory capacity

The Fronius Datamanager has a memory capacity of up to 5 years and 7 months for a PV system with one inverter and a save interval of 15 minutes.
However, the memory capacity is reduced accordingly depending on the number of inverters and/or Fronius sensor cards/boxes that are integrated into the system.

Calculating memory capacity

1 Determine logging points for inverters and Fronius sensor cards/boxes

$$\text{Logging points per day} = \frac{\text{Logging duration [min]}}{\text{Save interval [min]}}$$

Logging duration [min]
- For inverter: e.g., 14 hours = 840 minutes
- For Fronius Sensor Card/Fronius Sensor Box: 24 hours = 1440 minutes

2 Calculate the total logging points

Total logging points =
= (number of inverters x logging points per day) + (number of Fronius Sensor Cards/ Boxes x logging points per day)

3 Determine memory sectors per day

$$\text{Memory sectors per day} = \frac{\text{Total logging points}}{114}$$

4 Round to whole numbers
5 Determine memory capacity

$$\text{Memory capacity [days]} = \frac{2048}{\text{Memory sectors per day}}$$

Calculation example

2 inverters, logging duration = 14 hours (840 minutes)
1 Fronius Sensor Card, logging duration = 24 hours (1440 minutes)

Save interval = 15 minutes

1. Logging points per day:

    Inverter logging points = $\dfrac{840 \text{ min}}{15 \text{ min}}$ = 56

    Sensor Card logging points = $\dfrac{1440 \text{ min}}{15 \text{ min}}$ = 96

2. Total logging points:

    Total logging points = (2 x 56) + (1 x 96) = 208

    (2 x 56) ... 2 inverters, (1 x 96) ... 1 Sensor Card

3. Memory sectors per day:

    Memory sectors = $\dfrac{208}{114}$ = 1,825

4. Rounded:

    1,825 $\implies$ 2

5. Memory capacity [days]:

    Memory capacity = $\dfrac{2048}{2}$ = 1024 days (= 2 years, 9 months, 18 days)

    Memory capacity [days] = $\dfrac{2048}{\text{Memory sectors per day}}$

Settings - IO Mapping

General

The characteristics of the inverter's individual inputs and outputs (I/O) can be configured in this menu item. Only the settings possible with the respective system can be selected, depending on the range of functions and system configuration.

Any activated output that has not been assigned ("free") will remain active until the inverter is restarted. The status of an output will only change if new specifications are entered for assigned services.

AUS - Demand Response Modes (DRM)

Demand Response Modes for Australia

The pins for control via DRM can be set here:

IMPORTANT! To control the inverter via DRM, a Fronius DRM interface (item number 4,240,005) is required in the inverter.
Installation is described in the installation instructions for the Fronius DRM interface. The installation instructions for the Fronius DRM interface are available at the following link on the Fronius homepage:

   http://www.fronius.com/QR-link/4204102292

Mode	Description	Information	Default pin
DRM0	Inverter disconnects itself from the grid	Open grid relay	
	REF GEN	closed	FDI
	COM LOAD	closed	FDI
		or	
		combinations of invalid DRM1 - DRM8	
DRM1	$-P_{nom} \leq 0\%$ without disconnection from the grid	limits effective power input	6
DRM2	$-P_{nom} \leq 50\%$	limits effective power input	7
DRM3	$-P_{nom} \leq 75\ \% \ \& \ +Q_{rel}{}^* \geq 0\ \%$	limits effective power input	8
		and	
		sets the reactive power	
DRM4	$-P_{nom} \leq 100\ \%$	limits effective power output	9
DRM5	$+P_{nom} \leq 0\%$ without disconnection from the grid	begrenzt die Wirkleistungs-Abgabe	6
DRM6	$+P_{nom} \leq 50\ \%$	limits effective power output	7

Mode	Description	Information	Default pin
DRM7	$+P_{nom} \leq 75\ \%$ & $-Q_{rel}^* \geq 0\ \%$	limits effective power output and sets the reactive power	8
DRM8	$+P_{nom} \leq 100\ \%$	Normal operation without limitation	9

FDI	on the Fronius DRM interface
*	The values for Q_{rel} can be set in the PSC Editor menu item.

The remote control capability of the inverter always relates to the nominal device output.

NOTE! If there is no DRM control (DRED) connected to the Datamanager and the "AUS - Demand Response Mode (DRM)" function is activated, the inverter changes into the standby mode.

IO control

The pins for the IO control can be set here. Additional settings can be adjusted in the "PSC editor - IO control" menu.

IO control	Default pin	IO control	Default pin
IO control 1 (optional)	2	IO control 6 (optional)	7
IO control 2 (optional)	3	IO control 7 (optional)	8
IO control 3 (optional)	4	IO control 8 (optional)	9
IO control 4 (optional)	5	IO control feedback (optional)	0
IO control 5 (optional)	6		

Load management

The pin for load management can be selected here. Additional load management settings are available in the "Load management" menu item.
Default pin: 1

Settings - load management

General

The output I/O 1 can be used to control an actuator (e.g., relay, contactor) via the "Load Management" function.
A load connected to I/O 1 can thus be controlled by assigning a power feed-dependent switch-on or switch-off point.

Load manage-ment

Control
"**deactivated**": Control via Energy Management is deactivated.
"**by the power generated**": Control via Energy Management takes place through the power generated
"**by excess power (given feed limits)**": Control via Energy Management is effected by excess power (given feed limits).
This option can only be selected if a meter has been connected. Control via Energy Management is effected using the actual power of feeding in with respect to the grid.

Thresholds
"**on**": For entering an effective power limit at which the I/O 1 output is activated
"**off**": For entering an effective power limit at which the I/O 1 output is deactivated.
If "**by excess power**" is selected under "**Control**," additional selection fields for "**Feed**" and "**Reference**" are displayed under "Thresholds."

Runtimes
"**Minimum runtime for each switch-on process**": Field for entering a minimum time for which the I/O 1 output is to be activated for each switch-on process.
"**Maximum runtime per day**": Field for entering a maximum time for which the I/O 1 output is to be activated in total per day (several switch-on processes are included).

Target runtime
"**per day**": Field for entering a minimum time for which the I/O 1 output is to be activated for each switch-on process.
"**achieved by**": Field for selecting the time, if the target runtime is to be achieved by a certain time

Status
If the mouse pointer is moved over the status, the reason for the current status is displayed.

Settings – Push Service

Push Service   This function can be used to export current and log data in different formats or with different protocols to an external server.

Further information about the push service function can be found in the following Operating Instructions:

http://www.fronius.com/QR-link/4204102152

42,0410,2152
Fronius Push Service

Modbus Settings

General

From your web browser, you can use the Fronius Datamanager 2.0 website to apply the Modbus connection settings which cannot be accessed via the Modbus protocol.
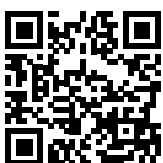
Additional Information on the Modbus Function

For additional information on the Modbus function, please see the following Operating Instructions:

http://www.fronius.com/QR-link/4204102049
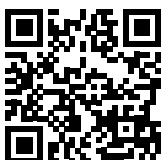
42,0410,2049
Fronius Datamanager Modbus connection

http://www.fronius.com/QR-link/4204102108

42,0410,2108
Fronius Datamanager Modbus RTU Quickstart Guide

Data Output via Modbus

"Data output via Modbus" "off"
If the data output via Modbus is deactivated, control commands sent to the inverter via Modbus are reset, e.g., no power reduction or no reactive power specification.

"Data output via Modbus" "tcp"
If the data output via Modbus is deactivated, control commands sent to the inverter via Modbus are reset, e.g., no power reduction or no reactive power specification.

"Modbus port" field – number of the TCP port which must be used for Modbus communication. Presetting: 502. Port 80 cannot be used for this purpose.

"String Control address offset" field – offset value for addressing Fronius String Controls via Modbus.

"Sunspec Model Type" – used to select the data type of data models for inverters and energy meters.
"float" – display as floating-point numbers.
SunSpec Inverter model I111, I112, or I113
SunSpec Meter model M211, M212, or M213
"int+SF" – display as integers with scaling factors
SunSpec Inverter model I101, I102, or I103
SunSpec Meter model M201, M202, or M203

IMPORTANT! Since the different models have different numbers of registers, the register addresses of all the subsequent models also change when the data type is changed.

"Demo mode" – the demo mode is used to implement or validate a Modbus master. It enables you to read inverter, energy meter, and Fronius String Control data without actually having to connect or activate a device. The same data is always sent back for all the registers.

"**Inverter control via Modbus**"
If this option is activated, the inverters can be controlled via Modbus. The "Limit Control" selection field is displayed. Inverter control includes the following functions:
- On/off
- Power reduction
- Setting a constant power factor (cos phi)
- Setting a constant reactive power

"**Data output via Modbus**" set to "**RTU**"

NOTE! If there is a Modbus energy meter (e.g., Fronius Smart Meter) configured under Settings/Meter on the system, it will not be possible to use the "RTU" setting.
In this case, data output via Modbus will be deactivated automatically upon selection of "RTU." This change will only be visible once the website has been reloaded.
Any energy meter connected via RS-485 can also be read by Modbus TCP via the corresponding SunSpec models. The Modbus ID for the meter is 240.

"**Interface**" field – Modbus interface 0 (rtu0 | default) or Modbus interface 1 (rtu1) can be selected here.

"**String Control address offset**" field – offset value for addressing Fronius String Controls via Modbus. For further details, see "Modbus Device ID for Fronius String Controls" section.

"**Sunspec Model Type**" – used to select the data model data type for inverters
"**float**" – display as floating-point numbers
SunSpec Inverter model I111, I112, or I113
"**int+SF**" – display as integers with scaling factors
SunSpec Inverter model I101, I102, or I103

IMPORTANT! Since the different models have different numbers of registers, the register addresses of all the subsequent models also change when the data type is changed.

"**Demo mode**" – the demo mode is used to implement or validate a Modbus master. It enables you to read inverter, energy meter, and Fronius String Control data without actually having to connect or activate a device. The same data is always sent back for all the registers.

"**Inverter control via Modbus**"
If this option is activated, the inverters can be controlled via Modbus. Inverter control includes the following functions:
- On/off
- Power reduction
- Setting a constant power factor (cos phi)
- Setting a constant reactive power

"**Control priorities**"
Used to specify which service is given priority by the inverter control unit.
1 = highest priority, 3 = lowest priority
The control priorities can only be changed under the "**UC EDITOR**" menu item.

Limit Control
The "Limit Control" option is only available for the TCP transmission protocols.
It is used to block inverter control commands from unauthorized users by only permitting control for specific devices.

"**IP address**" field

To limit inverter control to one or more devices, enter the IP addresses of the devices which are permitted to send commands to Fronius Datamanager in this field. Multiple entries are separated by commas.

Examples:
- one IP address: ***98.7.65.4*** – control only permitted by IP address *98.7.65.4*
- several IP addresses: ***98.7.65.4,222.44.33.1*** – control only permitted by IP addresses *98.7.65.4 and 222.44.33.1*
- IP address range, e.g., from 98.7.65.1 to 98.7.65.254 (CIDR notation): ***98.7.65.0/24*** – control only permitted by IP addresses *98.7.65.1 to 98.7.65.254*

Save or Reject Changes

| ✓ | Saves the changes and displays a message confirming this. If you exit the "Modbus" section without saving your changes, all the changes you have made will be rejected. |

| ✕ | Prompts you to confirm whether or not you wish to reject the changes you have made and then reinstates the most recently saved values. |

Settings – Inverter

Inverter   The data for the Comparison View is defined in the **"Inverter"** menu.
If the **"visible"** selection field is selected, the inverter is displayed in the Comparison View.

Settings – Fronius Sensor Cards

Sensor Cards   A specific channel name can be assigned to each sensor value of a Fronius Sensor Card/ Box under "Sensor Cards" (e.g., Wind Speed).

Settings – Counter

General   **IMPORTANT!** Settings in the "Counter" menu item may only be entered by staff trained to do so!

The service password must be entered for the "Counter" menu item.

Three-phase or one-phase Fronius Smart Meters may be used. In both cases, selection is made via the "Fronius Smart Meter" item. The Fronius Datamanager automatically detects the counter type.

A primary meter or, optionally, multiple secondary meters can be chosen. The primary meter must be configured before a secondary meter can be chosen.

Fronius Smart Meter   When the Fronius Smart Meter is chosen as a counter the field **"Settings"** must be used to set the counter position.

"**Meter position**" at "**Feed-in point**" (1a)
The power of feeding in and energy are measured. The consumption is determined using these values and the system data.

"**Meter position**" in "**Consumption branch**" (1b)
The consumed power and energy are measured directly. The power of feeding in and energy are determined using these values and the system data.
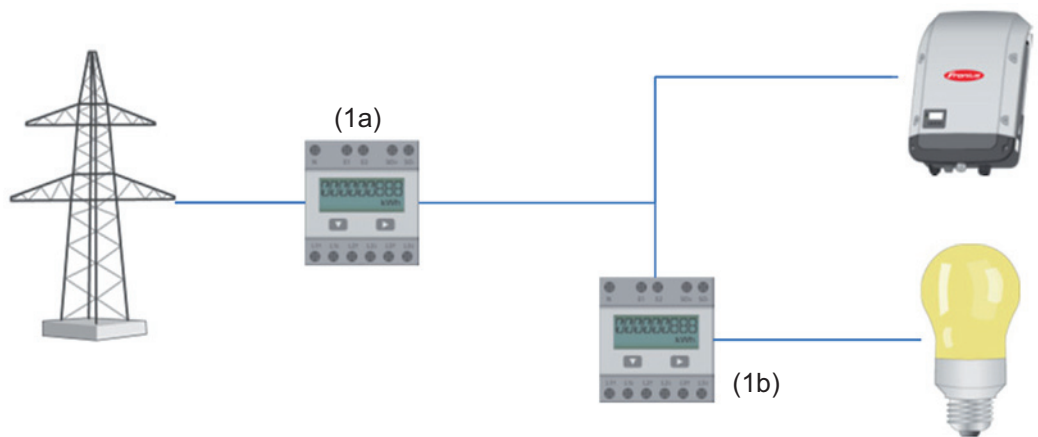
Secondary meter
If a Fronius Smart Meter was chosen as a secondary meter, a window will open to enter the **"Description"** (freely selectable) as well as a "**Modbus address**" field. A value is suggested automatically in the "Modbus address" field (next free address in the address range). The modbus address must not be assigned twice. Click on "**Scan**" after entering.

Connecting the Fronius Smart Meter to the Fronius Datamanager 2.0
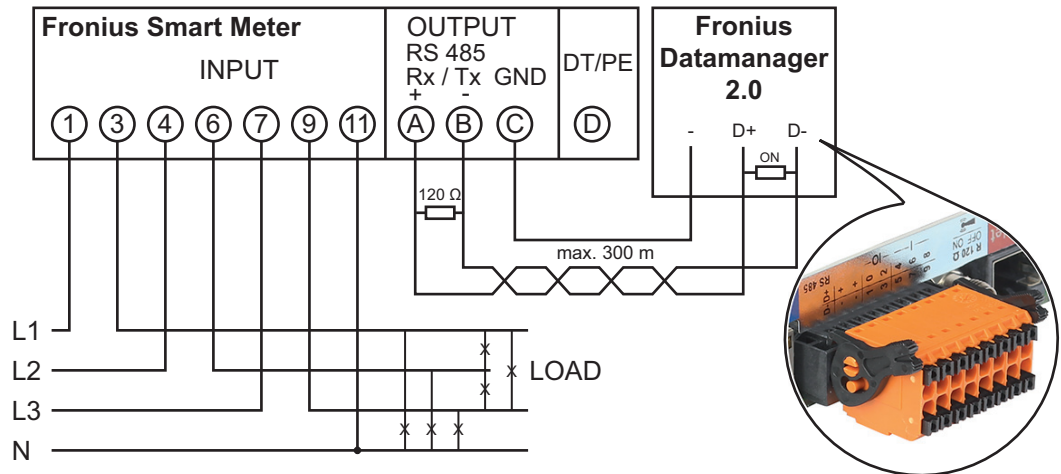
S0 Inverter

"**Meter position**" at "**Feed-in point**" (1a)
The power of feeding in and energy are measured. The consumption is determined using these values and the system data.
An S0 meter must be configured at this position in order to count the fed-in energy.

IMPORTANT! If you are using an S0 meter at the feed-in point, the meter data will not be displayed on Fronius Solar.web. This option is only provided for dynamic power reduction. The consumption values can be detected to a limited extent when feeding into the grid.

"**Meter position**" in "**Consumption branch**" (1b)
The consumed power and energy are measured directly. The power of feeding in and energy are determined using these values and the system data.
An S0 meter must be configured at this position in order to count the energy consumed.
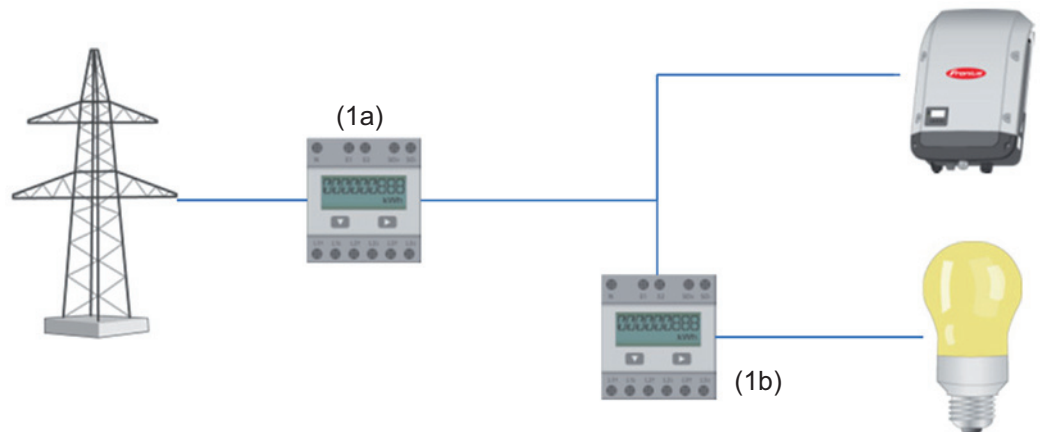
A meter for recording self-consumption per S0 can be connected directly to the inverter.

IMPORTANT! An S0 meter is connected to the switchable multifunctional current interface of the inverter. Connecting an S0 meter to the inverter may require an inverter firmware update.
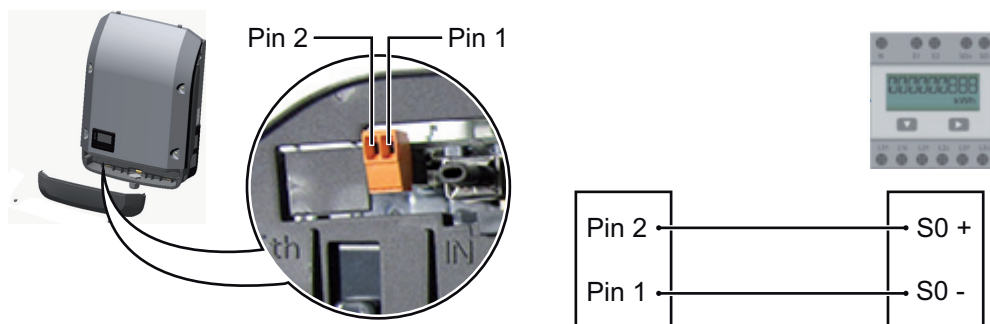
Requirements for the S0 meter:
- Must meet standard IEC 62053-31 Class B
- Max. voltage: 15 V DC
- Max. current when ON: 15 mA
- Min. current when ON: 2 mA
- Max. current when OFF: 0.15 mA

Recommended max. impulse rate of S0 meter:

PV power kWp [kW]	Max. impulse rate per kWp
30	1000
20	2000
10	5000
≤ 5.5	10,000

Settings – UC Editor

General

In the "UC Editor" menu item, settings relevant to a utility company are made.
An effective power limit in % and/or a power factor limit can be set.

IMPORTANT! Settings in the "UC Editor" menu item may only be made by staff trained to do so!

The service password must be entered for the "UC Editor" menu item.

UC Editor – IO Control

"**Input pattern**" (assignment of individual I/Os)
1 click = white
2 clicks = blue
3 clicks = gray

The virtual IO assignment is displayed as described in the "Settings – IO Assignment" section (see page 70).
The display may be different in older versions of the software.

"**Power factor cos phi**"
"**ind**" = inductive
"**cap**" = capacitive

"**UC output**" (feedback output)
When the rule is activated, the I/O 0 output will be activated (e.g., for operating a signal device)

"**Excluded inverters**"
Enter the numbers of inverters here that are to be excluded from control. Separate multiple inverters with commas.

Delete/Add a Rule
+ = add a new rule
- = delete the selected rule

"**Import**" button – click to import rules in *.fpc format
The function of the "Import" button depends on the browser used, e.g., Firefox and Google Chrome support the function.

"**Export**" button – click to save the rules separately in *.fpc format.

Connection Example
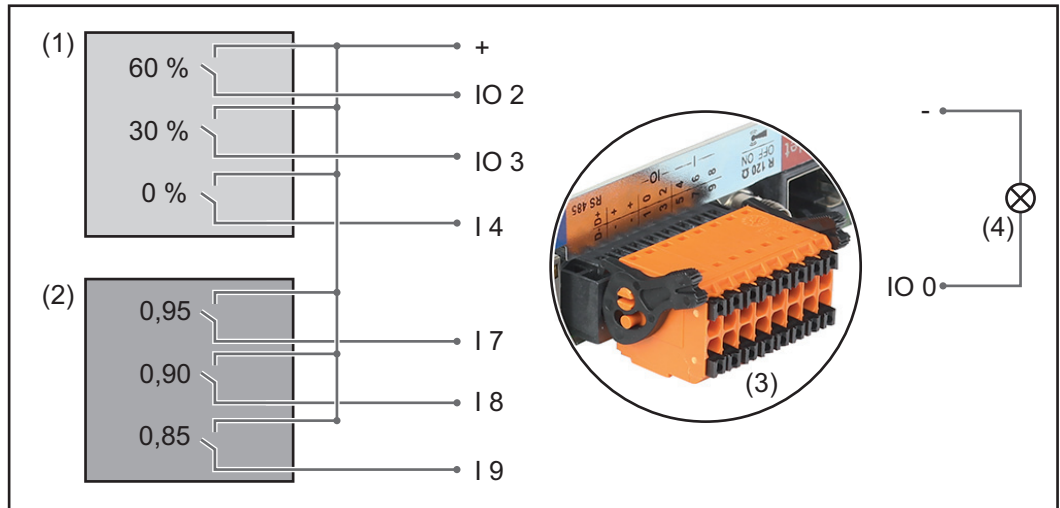
Two ripple control signal receivers, connected to the Fronius Datamanager 2.0 IOs

(1)	Ripple control signal receiver with three relays for effective power limitation
(2)	Ripple control signal receiver with three relays for power factor limitation
(3)	I/Os on the Fronius Datamanager 2.0
(4)	Loads (e.g., signal light, signal relay)

The ripple control signal receiver and the Fronius Datamanager 2.0 plug are connected to one another using a 4-pin cable in accordance with the connection diagram.
For distances of greater than 10 m between the Fronius Datamanager 2.0 and the ripple control signal receiver, a shielded cable is recommended.

Six pins must be defined under IO Control under the IO Assignment menu item for this application.

Settings on the UC Editor:

Released	Input pattern (*I1 I2 I3 I4 I5 I6 I7 I8)	Effective power	Power factor cos φ;	UC output	Excluded inverters	
(1) ✔	■ closed, open, open, gray, gray, gray, black, black	✔ 60 %	☐ 1 — ind ● cap	✔		⊖
(1) ✔	open, closed, open, gray, gray, gray, black, black	✔ 30 %	☐ 1 — ind ● cap	✔		⊖
✔	open, open, closed, gray, gray, gray, black, black	✔ 0 %	☐ 1 — ind ● cap	✔		⊖
(2) ✔	gray, gray, gray, closed, open, open, black, black	☐ 100 %	✔ 0,95 — ind ● cap	✔		⊖
(2) ✔	gray, gray, gray, open, closed, open, black, black	☐ 100 %	✔ 0,90 — ind ● cap	✔		⊖
✔	gray, gray, gray, open, open, closed, black, black	☐ 100 %	✔ 0,85 — ind ● cap	✔		⊖
☐	gray, gray, gray, gray, gray, gray, black, black	☐ %	☐ — ind cap	✔		⊕

■ ... cannot be used   ▨ ... not taken into consideration   ☐ ... contact open   ▮ .. contact closed

Example settings on the UC editor for two ripple control signal receiver: (1) Effective power limitation,
(2) Power factor limitation

| **UC Editor – AUS – Demand Response Modes (DRM)** | **IMPORTANT!** To control an inverter via DRM the inverter has to have a Fronius DRM Interface (item number 4,240,005). |

Assembly and installation are described in the Installation Instructions of the Fronius DRM. The Installation Instructions for the Fronius DRM Interface is available on the Fronius homepage on:

http://www.fronius.com/QR-link/4204102292

"Reactive power output"– to enter the reactive power output (= $+Q_{rel}$) for DRM 3 in %

"Reactive power input"– to enter the reactive power input (= $+Q_{rel}$) for DRM 7 in %

UC Editor – Dynamic Power Reduction

UCs or utility companies can prescribe feed-in limits for an inverter (e.g., max. 70% of the kWp or max. 5 kW).
Dynamic power reduction takes into account self-consumption in the household before the power of an inverter is reduced:
- An individual limit can be set.
- A meter for determining self-consumption per S0 can be connected directly to the inverter.
- A Fronius Smart Meter can be connected to the Datamanager at the D-/D+ connections for Modbus data.

"**No limit**" – the photovoltaic system converts all available PV energy and feeds it into the grid.

"**Limit for the entire system**" – the entire photovoltaic system is limited to a fixed power limit.

Field for entering the total DC system power in Wp
This value is used as a control reference and also in case of errors (e.g., meter failure).

Field for entering the max. power in W or %
If no meter has been selected under the "Meter" menu item:
max. power generated for the entire system
If Fronius Smart Meter or S0 inverter has been selected under the "Meter" menu item: max. energy fed into the grid

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UC Editor – Control Priorities

Used to set control priorities for the ripple control signal receiver, the dynamic power reduction, and the control via Modbus

1 = highest priority, 3 = lowest priority

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