



SHIFTING THE LIMITS

Fronius Datamanager Galvo - Symo - Primo - Eco

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 it 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

Fronius Datamanager is a network-compatible datalogger which combines the functionality of the Fronius Com Card and Fronius Datalogger Web on a plug-in card.

The Fronius Datamanager web interface provides a quick overview of the photovoltaic system.

The web interface can be accessed via a direct connection from the Intranet or, if properly configured, via the Internet.

Fronius Datamanager is equipped with an easy-to-configure system monitoring feature with an automatic alarm. The alarm can be signaled via SMS, e-mail, or fax.

When connected to Fronius Solar.access, real-time photovoltaic system data as well as archived data can be saved to a PC and analyzed. You can also make settings to all devices in Fronius Solar Net.

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 Fronius Datamanager to Fronius Solar.web.

Available Versions of Fronius Datamanager

The following versions of Fronius Datamanager are available for the Fronius Galvo, Fronius Symo, Fronius Primo, and Fronius Eco inverters:

- Without Fronius Com Card function
- Without Fronius Com Card function and with WLAN

Provided that the inverter is not fitted as standard with Fronius Datamanager, existing inverters can be upgraded with Fronius Datamanager.

Applicable DAT-COM Components

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

- | | | |
|-------------|---|---|
| - up to 100 | x | Fronius inverters
(incl. the inverter in which the Fronius Datamanager 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 the transmission, fluctuating receptions or misfires can have an adverse effect on Fronius Datamanager's online operation.

Fronius recommends on-site testing to ensure that the connections meet the minimum requirements.

Since Fronius Datamanager acts as a data logger, no other data logger may be present in the Fronius Solar Net ring.

Only have one Fronius Datamanager for each Fronius Solar Net ring.

The following DATCOM components may not be operated together with the Fronius Datamanager 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 2.0
- Fronius Datamanager Box 2.0

To use Fronius Datamanager, the plug-in card must be installed in one inverter.

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

Notes regarding Radio Certification

Fronius Datamanager plug-in cards with WLAN are equipped with a wireless module.

Wireless modules in the USA require FCC certification:



FCC

This device conforms to the limits 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

Basic equipment:

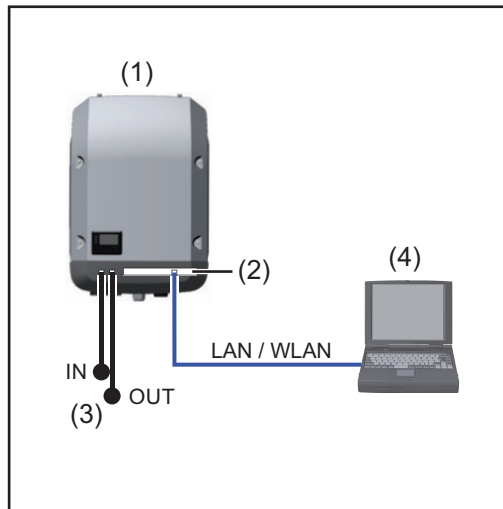
- 1 x Fronius Datamanager plug-in card
- 1 x Ethernet cable 5 m, blue
- 2 x Terminating plugs
- 1 x 12-pin plug

In addition for Fronius Datamanager with WLAN:

- 1 x WLAN antenna

Configuration Examples

Linking Inverters with Fronius Datamanager to a PC:

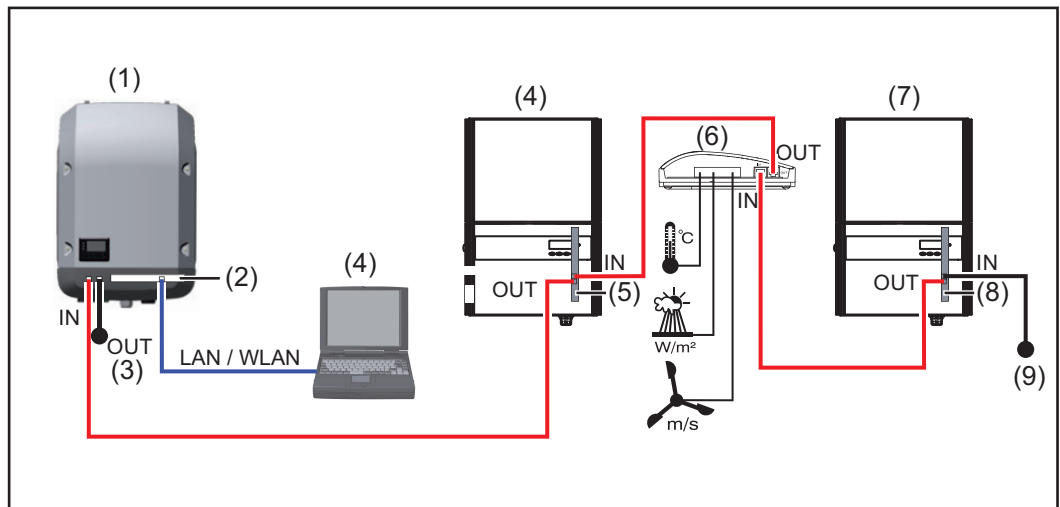


- (1) Inverter +
- (2) Fronius Datamanager
- (3) Terminating plug (2x)
- (4) PC/laptop



NOTE! When linking an inverter with Fronius Datamanager to a PC, a terminating plug must be inserted into both of the Fronius Solar Net IN and Fronius Solar Net OUT connection sockets of the inverter.

Linking inverters (Fronius Galvo, Fronius Symo, Fronius Primo, and Fronius Eco) with Fronius Datamanager to additional inverters (Fronius IG Plus V), a Fronius Sensor Box and a PC:



- | | |
|--|--|
| (1) Inverter (e.g: Fronius Galvo, Fronius Symo, Fronius Primo, or Fronius Eco) + | (6) Fronius Sensor Box |
| (2) Fronius Datamanager | (7) Inverter (e.g., Fronius IG Plus V) + |
| (3) PC/laptop | (8) Fronius Com Card |
| (4) Inverter (e.g., Fronius IG Plus V) + | (9) Terminating plug |
| (5) Fronius Com Card | |



NOTE! When linking several DATCOM components in connection with an inverter with Fronius Datamanager:

Connect the Fronius Solar Net IN connection socket of the inverter, for example, and the OUT connection socket of the next DATCOM component to the data cable. A terminating plug must be inserted into empty Fronius Solar Net connection sockets of the last DATCOM component.

Calculating the data volume

General

When operating the Fronius Datamanager, 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.

Firmware versions for calculating the data volume

The data volume calculation is based on Fronius Datamanager Firmware versions V 2.3.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 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 54

3) Depending on the quality of the internet connection

IMPORTANT: Since the values listed in the table are "rough data" for Fronius Datamanager 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 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 has a	+ 32 KB/h x 24 h = 768 KB
24-hour internet connection;	
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 the 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 <hr/> 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 sensor cards/sensor boxes;	
Fronius Datamanager has a	+ 32 KB/h x 24 h = 768 KB
24-hour internet connection;	

Archived data is sent to Fronius So-	
lar.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 the section "Calcu-	= 700 KB
lating 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	+ 50 service messages x 1 KB = 50 KB
confirm average error rate	

Subtotal without safety	0.15 KB
	768.00 KB
	72.00 KB
	700.00 KB
	6910.00 KB
	50.00 KB
	<hr/>
	8,500.15 KB

A 10% safety factor is added to the calcu-	8,500.15 KB + 10%
lation	

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 requires knowledge of network technology.

If Fronius Datamanager is being integrated into an existing network, the Fronius Datamanager 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.
- 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 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 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 may not have the same IP address as the PC/laptop!
- Fronius Datamanager cannot connect to the Internet spontaneously. A router must be used for a DSL connection to the Internet.

If you are using the WLAN network connection, the Fronius Datamanager must be equipped with a WLAN function and a WLAN antenna suitable for the inverter.

General Firewall Settings

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

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

Service messages are sent via Fronius Solar.web.

Configure the firewall so that the IP address of Fronius Datamanager 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 web interface outside of the LAN:

- Configure the network router so that requests are forwarded to port 80/TCP on Fronius Datamanager

Sending service messages via a DSL Internet connection

Normally, no additional router configuration is required for a regular DSL Internet connection for accessing 'Fronius Solar.web' and/or sending 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 cannot connect to the Internet spontaneously. A router must be used for a DSL connection to the Internet.

Controls, connections and indicators

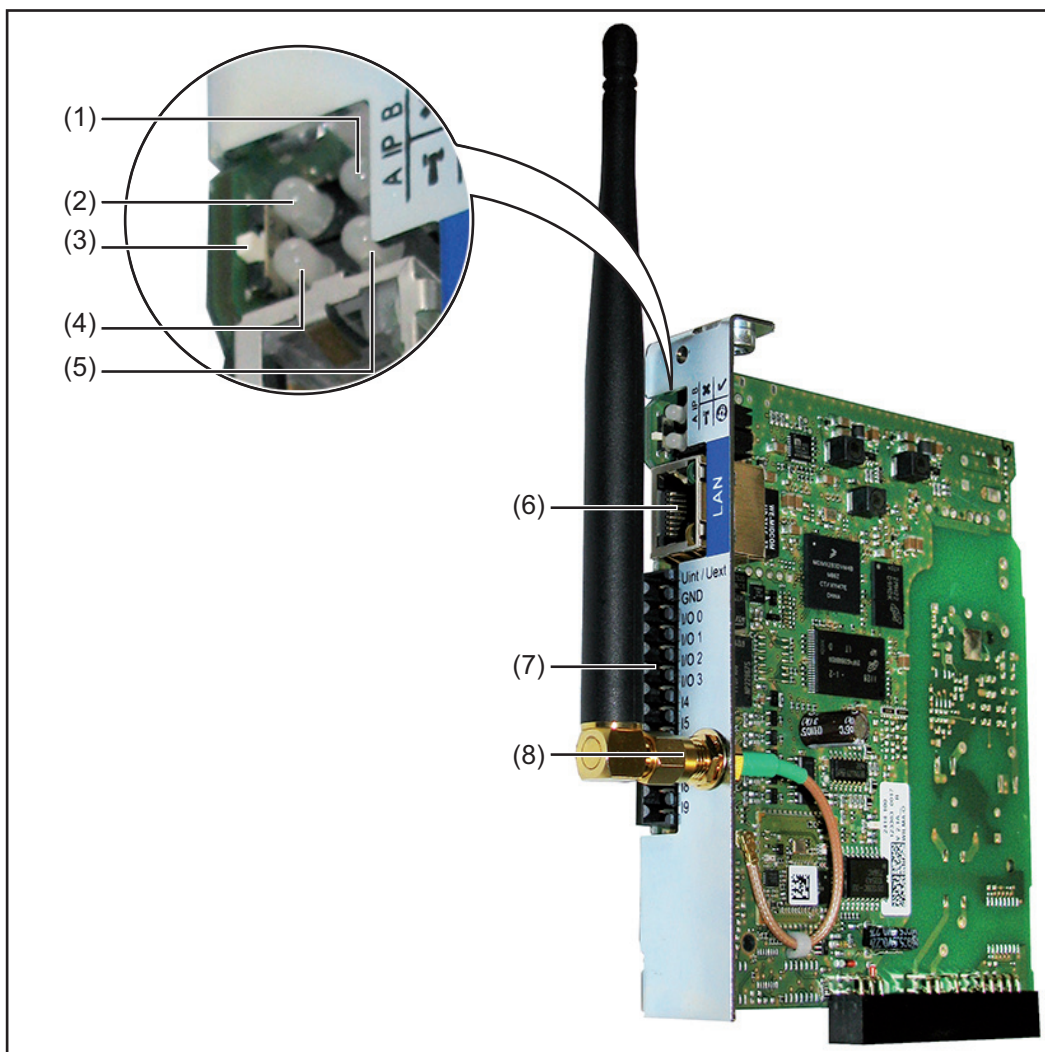
Safety



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



No.	Function	
(1)	Supply LED	✓
	<ul style="list-style-type: none"> - Lights up green: When sufficient power is coming from Fronius Solar Net; Fronius Datamanager is operational - Does not light up: When no power or not enough power is coming from Fronius Solar Net; an external power supply is required - Flashes red: During an update process <p>IMPORTANT! Do not interrupt the power supply during an update process.</p> <ul style="list-style-type: none"> - Lights up red: the update process failed 	
(2)	Connection LED	✗
	<ul style="list-style-type: none"> - lights up green: When there is an active connection within Fronius Solar Net - Lights up red: When there is an interrupted connection within Fronius Solar Net 	
(3)	IP switch for changing the IP address:	
	<p>A Default IP address "169.254.0.180" Fronius Datamanager uses the fixed IP address 169.254.0.180; the fixed IP address is used for a direct connection to a PC via LAN without first having to pre-configure the PC</p> <p>B Assigned IP address Fronius Datamanager operates using an assigned IP address (factory setting 192.168.1.180); The IP address can be set on the Fronius Datamanager web interface.</p>	
(4)	WLAN LED	ⓘ
	<ul style="list-style-type: none"> - Flashes green: Fronius Datamanager is in service mode (IP switch on the Fronius Datamanager plug-in card is in position A) - Lights up green: When there is an existing network connection - Lights up red: When there is no existing network connection - Does not light up: Plug-in card without WLAN 	
(5)	Solar Web LED connection	🌐
	<ul style="list-style-type: none"> - Lights up green: When there is an existing connection to Fronius Solar.web - Lights up red: When there is no connection to Fronius Solar.web, but one is required - Does not light up: When no connection to Fronius Solar.web is required 	
(6)	LAN connection socket Ethernet interface colored blue for connecting the Ethernet cable	

No.	Function
-----	----------

(7)	I/Os
-----	-------------

digital inputs and outputs

Digital inputs: I/O 0 – I/O 3, I 4 – I 9

voltage level: low = min. 0 V – max. 1.8 V; high = min. 3 V – max. 30 V

input currents: dependent on input voltage; input resistance = 46 kOhm

Digital outputs: I/O 0 – I/O 3

Switching capacity when supplied by the Datamanager plug-in card: 3.2 W, 10.7 V in total for all 4 digital outputs

Switching capacity when supplied by an external power supply with min. 10.7 – max. 24 V DC, connected to U_{int} / U_{ext} and GND: 1 A, 10.7 – 24 V DC (depending on the external power supply) per digital output

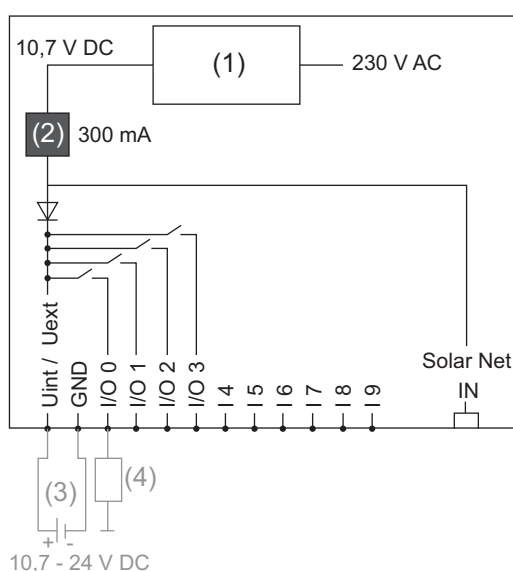
The connection to the I/Os is made via the supplied mating connector.

(8)	WLAN Antenna Socket with WLAN antenna
-----	--

(only for versions with WLAN)

for connecting the WLAN antenna

Schematic Connection of I/Os



Supply via Datamanager plug-in card:

- (1) Power supply
- (2) Current limit

Supply via external power supply:

- (3) External power supply
- (4) Load



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

Installing Fronius Datamanager

Inserting Fronius Datamanager into an inverter

General

Provided the Fronius Datamanager plug-in card is not fitted as standard in the inverter, the plug-in card must be inserted into the inverter in accordance with the operating or installation instructions of the inverter in question. Please note the safety and warning information in your inverter's operating instructions.

IMPORTANT! Before inserting the Fronius Datamanager plug-in card, remove any existing Fronius Power Control Card, or Fronius Modbus Card!

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.

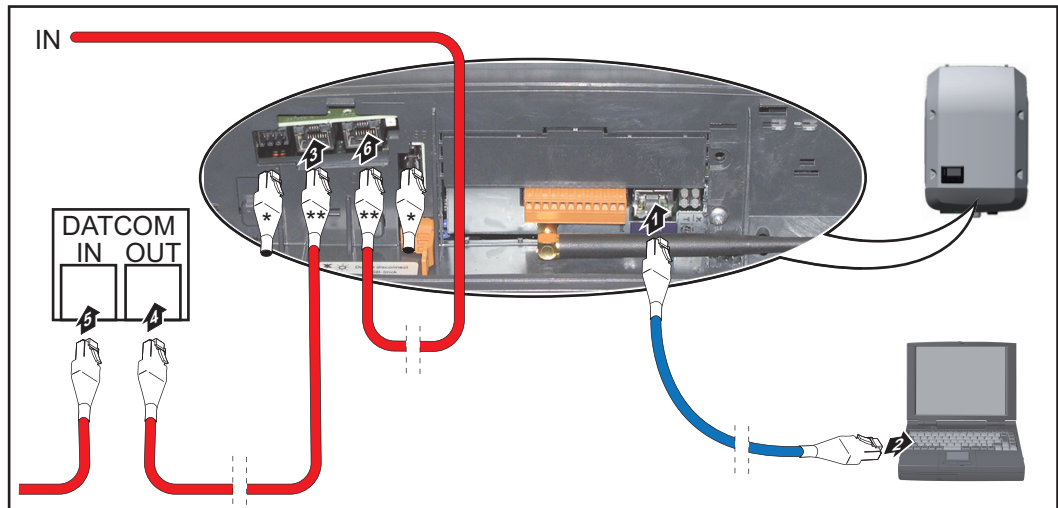
Installing Fronius Datamanager in Fronius Solar Net

Installing Inverters with Fronius Datamanager in Fronius Solar Net



CAUTION! DATCOM components and/or the PC/laptop may be seriously damaged if the Ethernet or Solar Net cables are connected incorrectly to the Fronius Datamanager.

- The Ethernet cable should only be inserted into the LAN connection socket (colored blue).
- The Solar Net cable should only be inserted into the inverter Solar Net IN or Solar Net OUT connection sockets.



- * Terminating plug, if only one inverter with Fronius Datamanager is linked to a PC or if there is no further Solar Net subscriber on the Solar Net connection socket.
- ** Solar Net Cable, if an inverter with Fronius Datamanager is linked to a PC and other DATCOM components

- 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 is being linked to a PC:
Insert a terminating 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:

Insert the Solar Net cable into the Solar Net IN connection socket and the Solar Net OUT connection socket.

- 5 Connect the other DATCOM components.

IMPORTANT! A terminating plug must be inserted into every empty Solar Net connection socket of the last DATCOM component.

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 – 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 requires knowledge of network technology.

Starting Up for the First Time

- 1 Insert Fronius Datamanager into the inverter



See section "Inserting Fronius Datamanager into an inverter"

- 2 Insert blue Ethernet cable into Fronius Datamanager (LAN connection socket)
- 3 Insert terminating plug into Fronius Datamanager (Solar Net IN connection socket)
- 4 Insert blue Ethernet cable into the PC/laptop



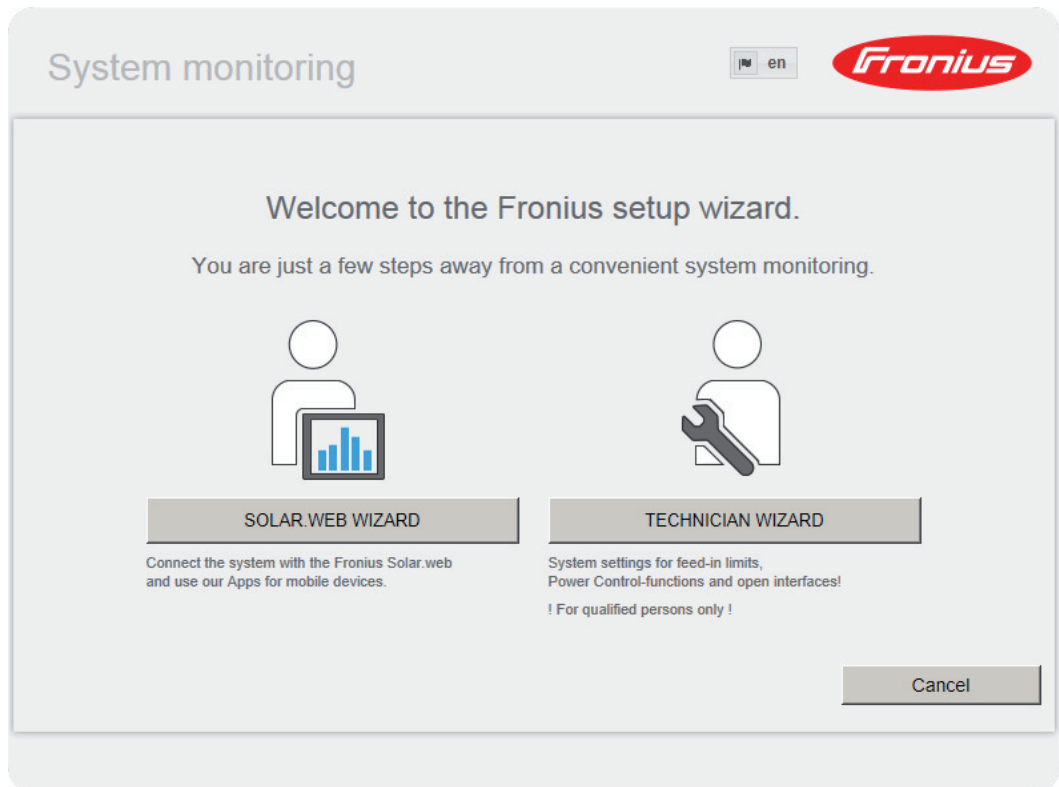
See section "Installing Fronius Datamanager in Fronius Solar Net"

- 5 Turn off WLAN on PC/laptop (to avoid network conflicts)
- 6 Adjust network settings for Fronius Datamanager on PC/laptop: "Obtain an IP address automatically (DHCP)" must be activated
- 7 Switch IP switch on Fronius Datamanager to position - A -



- 8 Close the inverter and switch it on
- 9 After about 1 minute, open the browser on the PC/laptop and enter the following address (web server works with Internet Explorer 9 or higher, Chrome or Firefox):
<http://169.254.0.180>

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 website opens.

IMPORTANT: To establish a connection to Fronius Datamanager, the end device in question (e.g., laptop, tablet) must be configured as follows:

- "Obtain an IP address automatically (DHCP)" must be activated

Connect to Fronius Datamanager

Connecting to Fronius Datamanager via a Web Browser

General

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

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

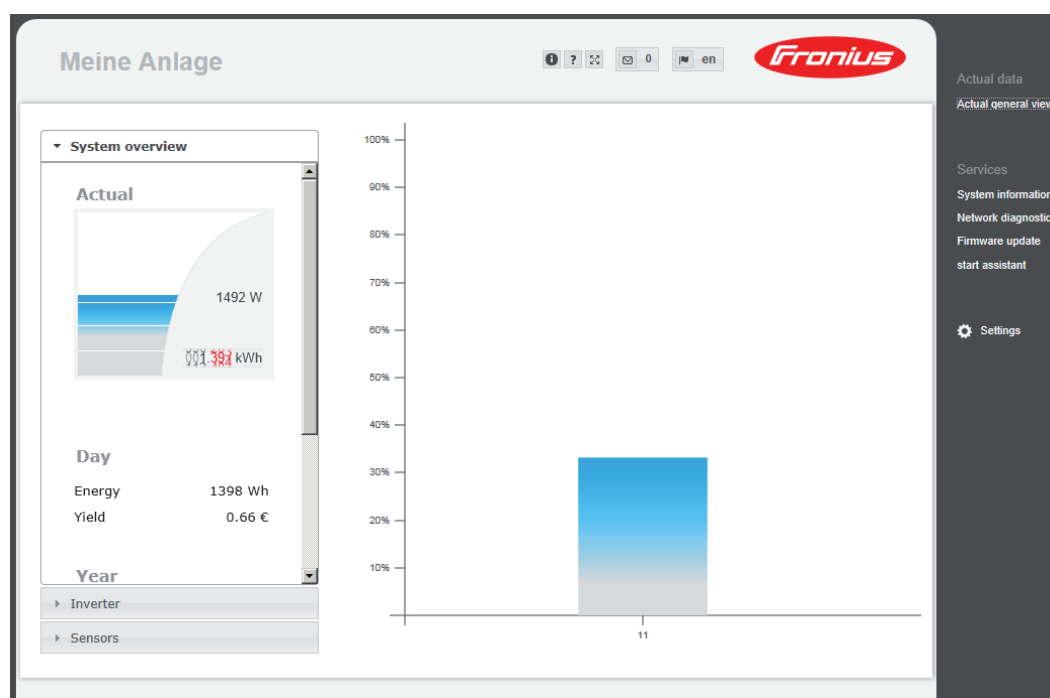
Requirements

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

Establishing a Connection to Fronius Datamanager 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 in the address field

The Fronius Datamanager web page appears.



Connecting to Fronius Datamanager via the Internet and Fronius Solar.web

General

By connecting to Fronius Datamanager via the Internet and Fronius Solar.web, you can access archived data and real-time photovoltaic system data online from anywhere in the world.

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

Requirements

- Internet access
- Web browser

IMPORTANT! Fronius Datamanager 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" option must be activated under "Send real-time data to Solar.web" in Fronius Datamanager.
 - In order to access archived data in Fronius Solar.web, the "Daily" or "Hourly" option must be activated under "Send archived data to Solar.web" in Fronius Datamanager.
-

Accessing data from Fronius Datamanager via the Internet and Fronius Solar.web

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

- 1 Start Fronius Solar.web: <http://www.solarweb.com>
For more information about Fronius Solar.web, see the online help.

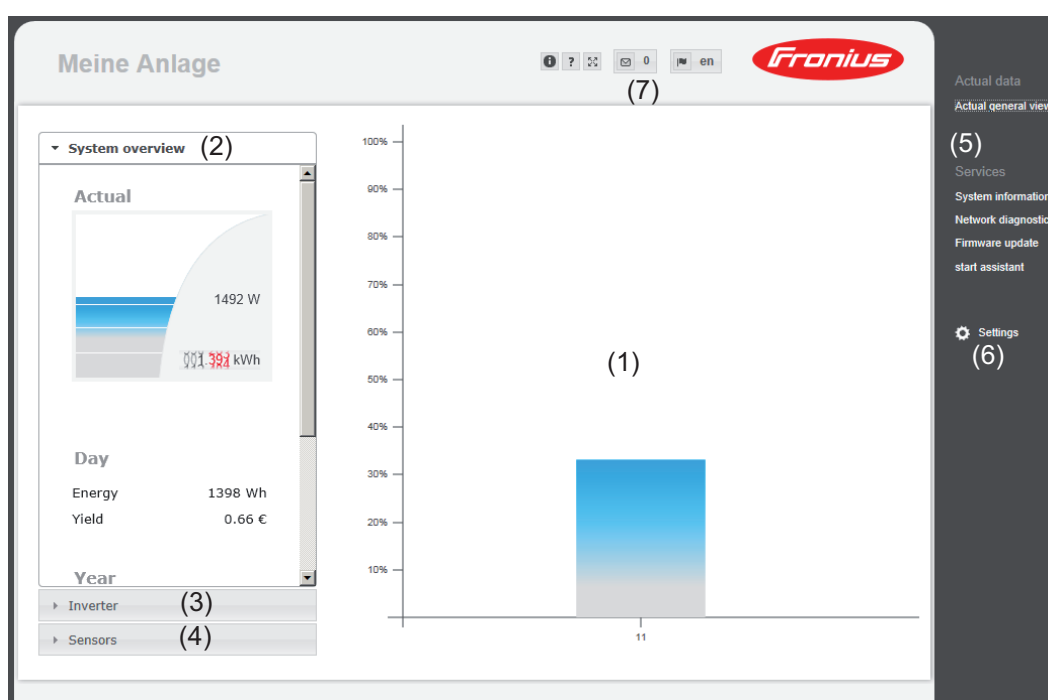
Current Data, Services, and Settings on Fronius Datamanager

The Fronius Datamanager Website

Fronius Datamanager Website – Overview

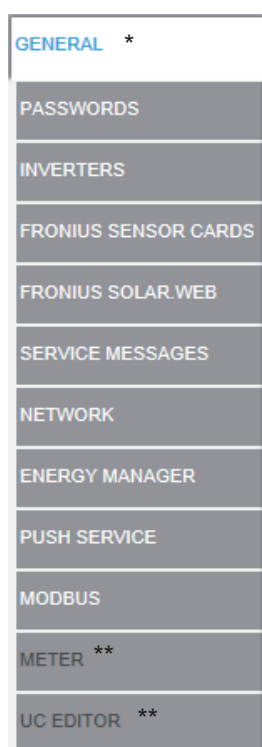
The following data is displayed on the Fronius Datamanager website:

- (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) The Settings Menu
- (7) Other Setting Options



The Settings Menu

After clicking on "Settings," the Settings menu is opened on the Fronius Datamanager web page.
Fronius Datamanager is configured in the Settings menu.



Menu items in Settings menu

General Adjustment and Viewing of Menu Items

- 1 Connect to Fronius Datamanager
- 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 amended data is accepted.

* Selected menu item

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

Other setting options

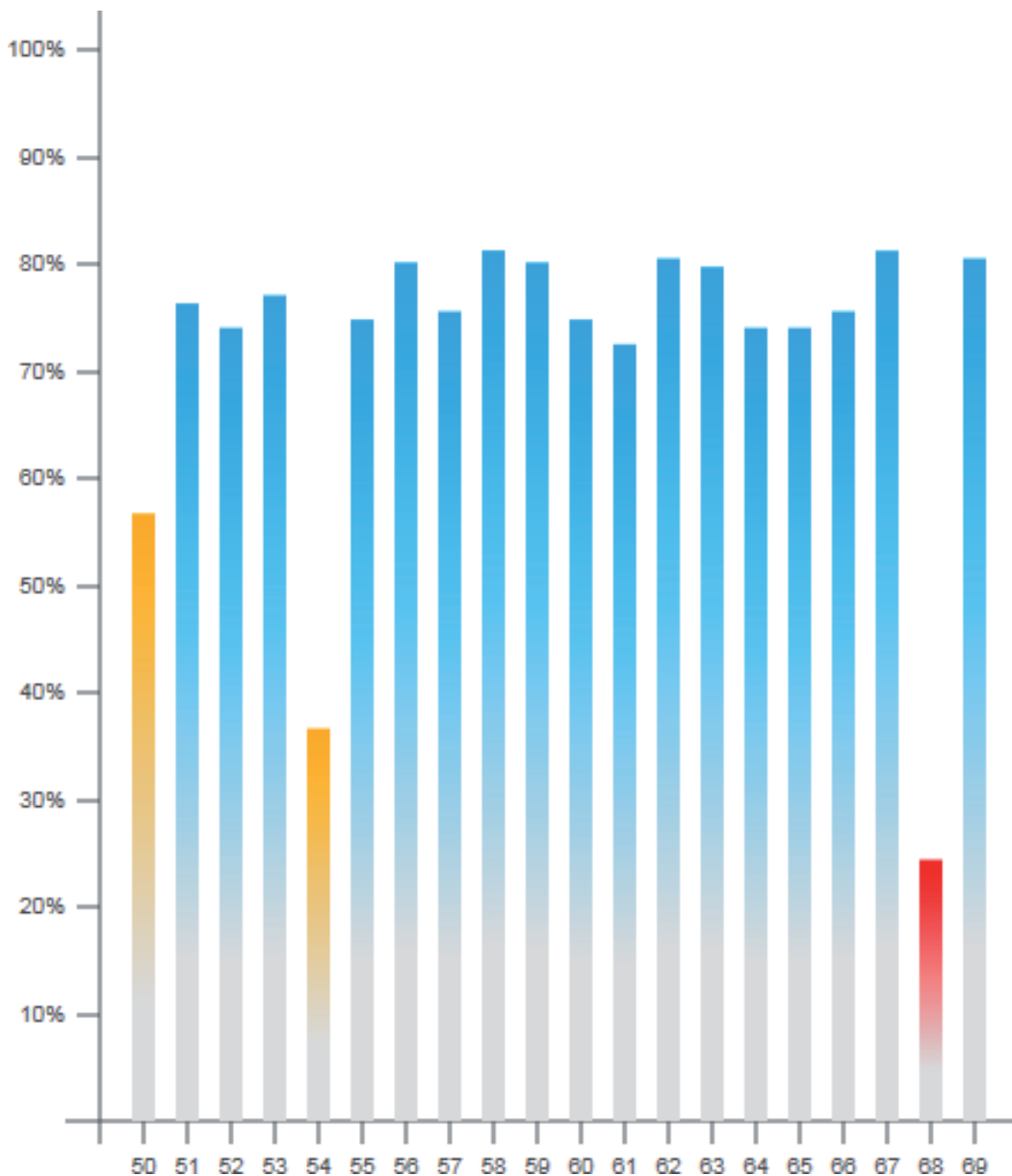
Other settings options are shown in the top right corner of the Fronius Datamanager web interface:



	Display notifications
	System information: Datalogger ID, software version, hardware version, Solar Net connection, Solar.web connection
	Help: Fronius Datamanager operating instructions, available in both English and German
	Language: For setting the language (English or German) The Fronius Datamanager web interface will appear in the language set in the browser or in the last language selected.
	Expand contents: The Real-time Data/Settings menu is hidden

Current Data in Fronius Datamanager

Current Comparison View

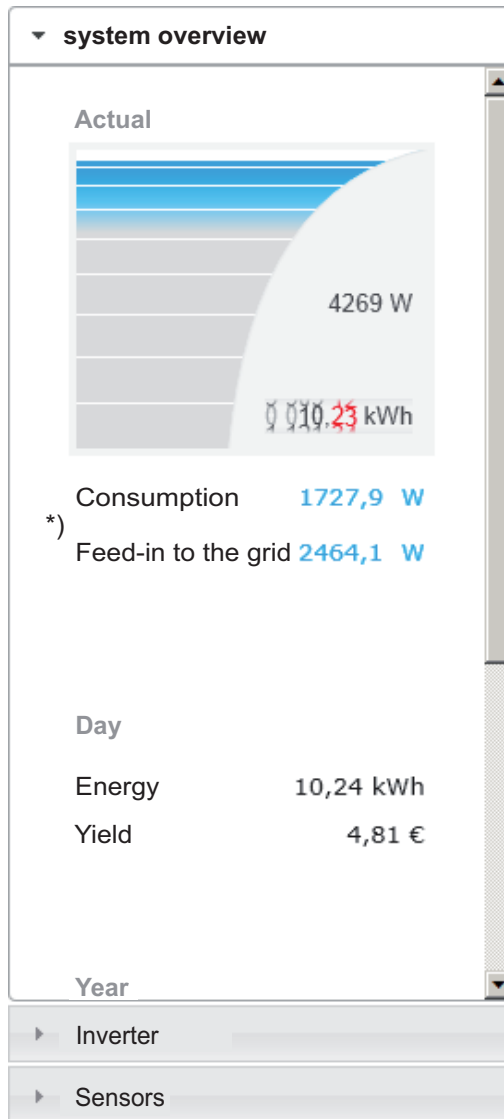


Several inverters in the same photovoltaic system can be compared in the current Comparison View.

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 counter is configured on the inverter and the counter sends valid data.

Inverter/Sensors View

Inverter View



The Inverter View displays all the inverters present in the system.

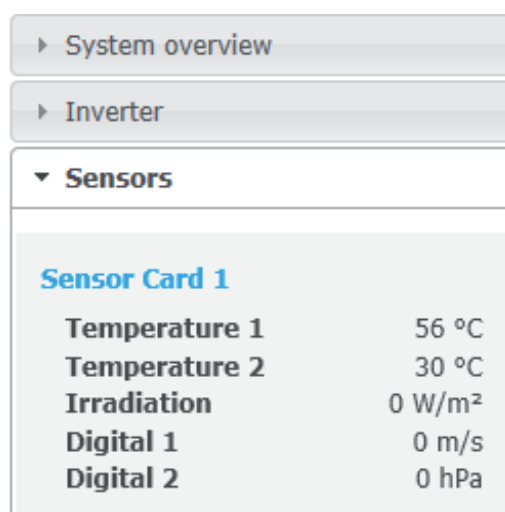
*) Clicking on an inverter or the corresponding bar in the Comparison View displays the inverter's real-time data:

Inverter 53

Fronius IG Plus 150 V-3

Operational status	Running
Power	8413 W
Daily energy	80 kWh
Annual energy	12 MWh
Total energy	36 MWh

Sensor View







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

Services – System Information

System Information

System information

Datalogger ID	240.42435
Circuit board version	2.4A
Software version	3.3.5-22
System time	Oct 21 2014, 12:06:29 CEST
Uptime	3 d, 23 h, 48 min, 34 sec.
User agent	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT 6.1; WOW64; Trident/5.0; SLCC2; .NET CLR 2.0.50727; .NET CLR 3.5.30729; .NET CLR 3.0.30729; Media Center PC 6.0; .NET4.0C; .NET4.0E)
Gateway	
DNS server	
LED states	   
LAN interface	
IP address	
Subnet mask	255.255.255.0
MAC address	00:03:AC:01:BF:49
WLAN interface	
IP address	
Subnet mask	
MAC address	00:06:C6:41:27:D3
GPIO	
IO-Name	I/O0 I/O1 I/O2 I/O3 I4 I5 I6 I7 I8 I9
IO-Direction	OUT OUT IN IN IN IN IN IN IN IN
IO-State	off off off off off off off off off off

Note: This device contains open source software.

For detailed information about the software being used and the requirements of the corresponding source code, please contact Fronius Tech Support.

Datalogger restart (1)

Reset to factory settings (2)

☒ All settings except for the network
☐ All settings

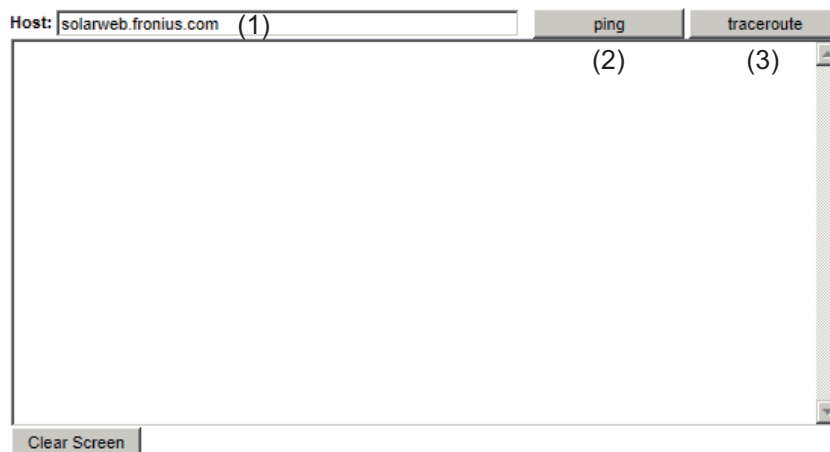
- (1) "Datalogger restart" button
used to restart Fronius Datamanager
- (2) "Reset to factory settings" button
- (3) Option "All settings except for the network"
is used to reset Fronius Datamanager to factory settings.
The network settings and all items protected by the service user (UC Editor, counter settings, and the service password) are retained.
- (4) Option "Settings"
is used to reset Fronius Datamanager and the network settings to factory settings.
All items protected by the service user (UC Editor, counter settings, and the service password) are retained.

IMPORTANT: When Fronius Datamanager 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.



The **ping** command

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

Sending a ping command:

- 1 Enter a host name or IP address in the "Host:" field (1)
- 2 Click on "ping" (2)
 - Ping command is sent
 - The resulting data is displayed

A **traceroute** command

is used to determine the intermediate stations via which the data reaches the host.

Sending a traceroute command:

- 1 Enter a host name or IP address in the "Host:" field (1)
- 2 Click on "traceroute" (3)
 - Traceroute command is sent
 - The resulting data is displayed

Services – Firmware Update

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

Firmware Update



Configuration

- (1) ☒ Automatic update search (2)
- (3) ☐ Use proxy server for Web update

Update

- (4) ☒ Update via Web ☐ Update via LAN
- (6)

- (1) Automatic update search
- (2) "Check now" button (to search for updates manually)
- (3) Use proxy server for Web update

(3) ☒ Use proxy server for Web update

(3a) Proxy server:

(3b) Port:

(3c) User:

(3d) Password:

- (3a) Field to enter the proxy server
- (3b) Field to enter the port
- (3c) Field to enter the user
- (3d) Field to enter the password
- (4) Carry out update via web
- (5) Carry out update via LAN

- ☐ Update via Web ☒ Update via LAN
- (5)

(5a) . . .

- (5a) Field to enter the IP address
- (6) "Run update" button to launch update process
- (7) "Apply/Save" button
- (8) "Cancel/Discard entries" button

Automatic Update Search

IMPORTANT: An internet connection is required for the automatic update search.

When the "Automatic update search" option (1) is activated, Fronius 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 Fronius Datamanager website.

Firmware Update



Configuration

(1) ☒ Automatic update search

Manual Update Search

When the "Automatic update search" function is deactivated, there will be no automatic search for updates.

1 To search manually for updates, use the "check now" button (2)

Firmware Update



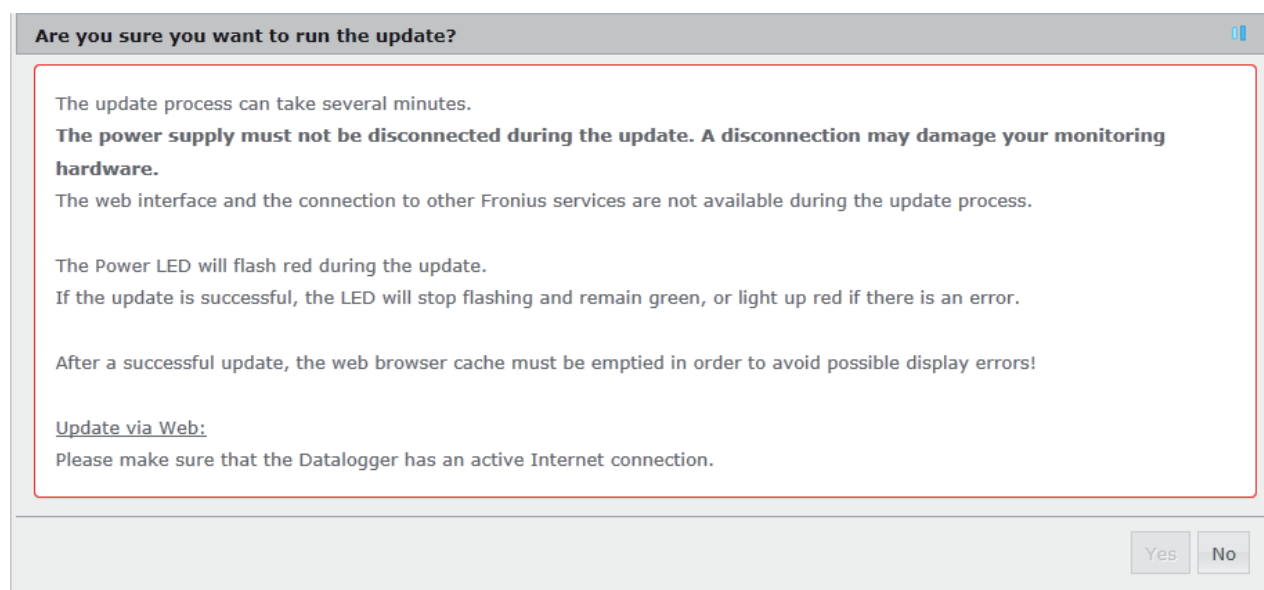
Configuration

☐ Automatic update search (2)

Firmware update via web

- 1** Open the Fronius Datamanager web page via a web browser
- 2** Open "Firmware update" under "Service"
- 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. The update 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 Fronius 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 Fronius Datamanager will download the required files.

4 Open the Fronius Datamanager web page via a web browser

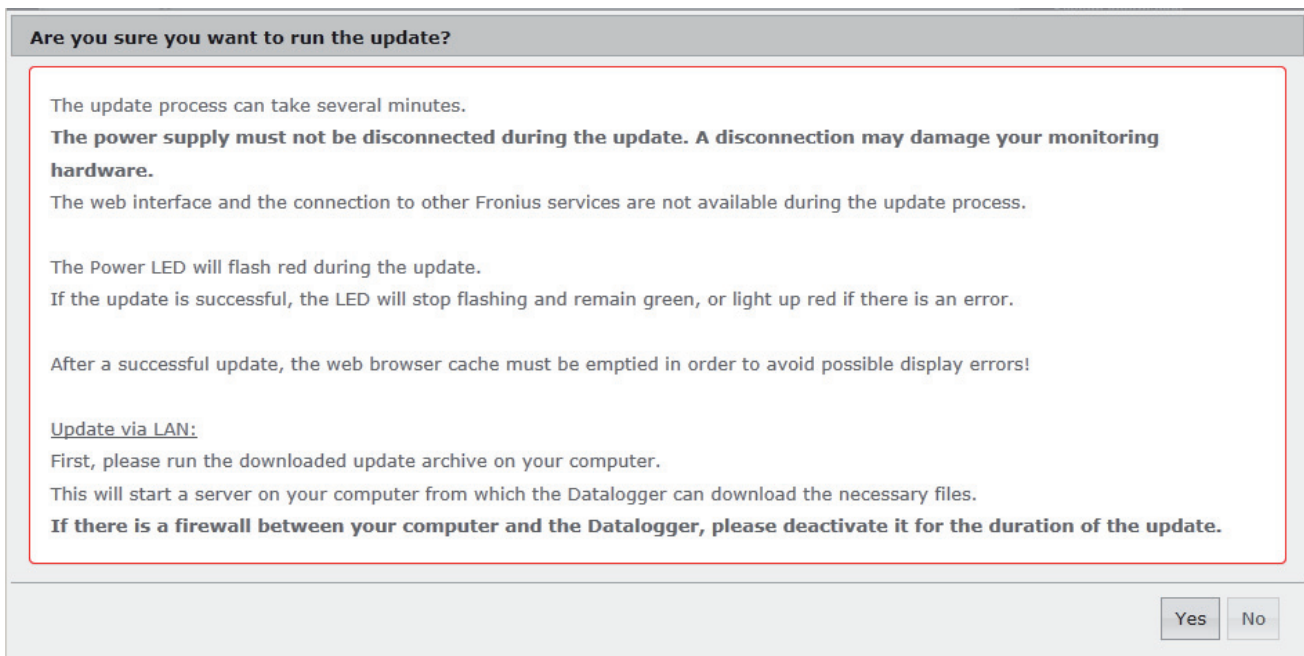
5 Open settings/firmware update

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

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

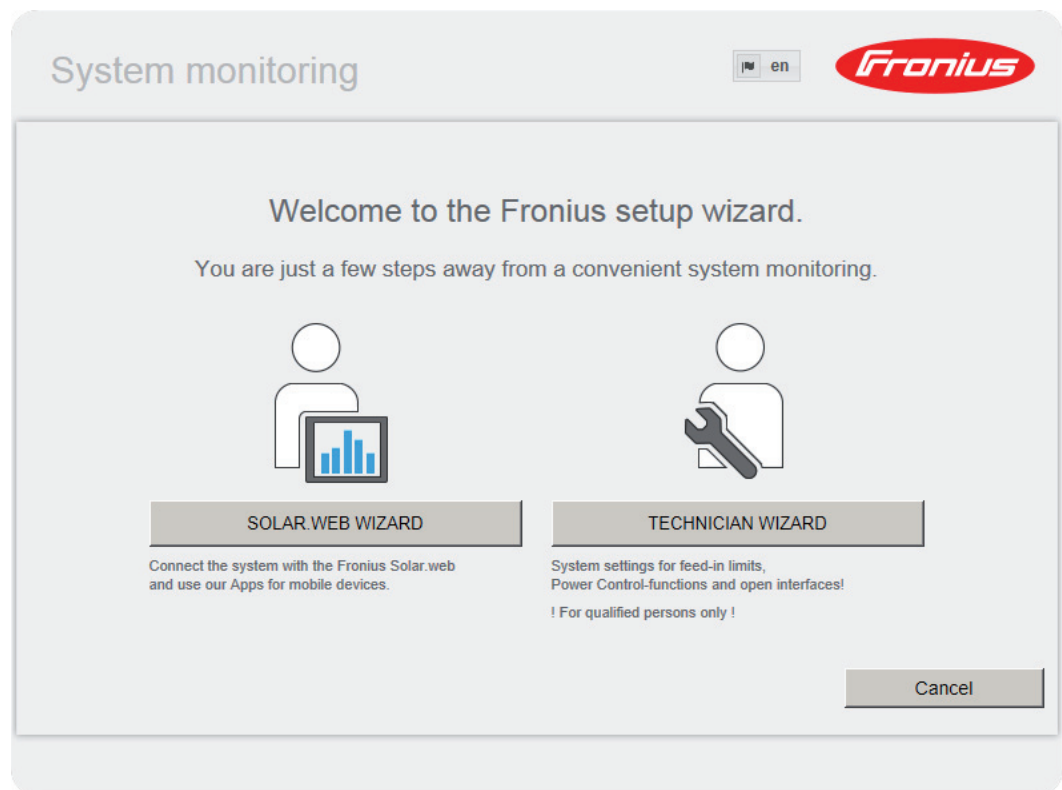
The update is complete when the "Supply LED" lights up green.

If the connection to the server fails:

- Deactivate the firewall for the duration of the update
- Retry the update

Services – Opening Wizards

Opening Wizards The Commissioning Wizard can be opened again and run under "Open Wizards."



Settings – General

General

General

(10) (11)

Yield

Feed-in payment (1) (2) /kWh

Delivery costs (3) /kWh

System time

Date / time * (4) (5) : (6)

(7)

Time zone settings

Time zone * (8) (9)

You can enter the charge rate per kWh (1), the currency (2) and the expenses per kWh (3) to calculate the yield under "Feed-in payment." The yield is shown in the current Total View.

The date (4), hour (5), and minutes (6) can be entered under "System time." Click "Synchronize" (7) to adapt the displayed time in the entry fields of the Fronius Data-manager web page to the time set on the computer operating system. Click the "Apply/Save" button (10) to apply the time.

The region (8) and location (9) for the time zone can be set under "Time zone settings."

- (10) "Apply/Save" button
- (11) "Cancel/Discard entries" button

* Fields marked with * are mandatory fields.

Settings – Passwords

General

Access to Fronius Datamanager is regulated by assigning passwords.

3 different password types are available:

- the administrator password
- the service password
- the user password

Passwords

Passwords

User name

admin

(1)

Old password *

Password *

Repeat password *

✓

(4)

User name

service

(2)

Old password *

Password *

Repeat password *

✓

(4)

(3)

☐ Protect your system monitoring from unauthorized read access.

- (1) Administrator password, user name = admin

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

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

- (2) 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 define counter settings and settings in the UC Editor. If no service password has been assigned, the Counter and UC Editor menu items cannot be accessed.

- (3) After activating the selection field, the user password is displayed, user name = user.

☒ Protect your system monitoring from unauthorized read access.

(3)



(4)

User name	<input type="text" value="user"/>
Password *	<input type="password"/>
Repeat password *	<input type="password"/>

An assigned user password only gives the user read access to Fronius Dataman-ager. The user cannot open the "Settings" menu item.

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

(4) "Apply/Save" button

Settings – Inverter

Views – Inverter

Inverters

✓

✕

(7)

(8)

System name *

No	visible	Device type	Device name	PV[Wp]	
11	<input checked="" type="checkbox"/>	Symo 4.5-3-M	* <input type="text" value="Symo left side"/>	* <input type="text" value="5000"/>	

(2)

(3)

(4)

(5)

(6)

The data for the Comparison View is defined in "Inverter."

- (1) Field for assigning a system name *
- (2) Number of the inverter in Fronius Solar Net
- (3) If the selection field is chosen, the inverter is displayed in the Comparison View
- (4) Display of device type
- (5) Field for assigning a device name *
- (6) Field for entering the solar module power in W *
- (7) "Apply/Save" button
- (8) "Cancel/Discard entries" button

* Fields marked with * are mandatory fields.

Settings – Fronius Sensor Cards

Sensor Cards

Fronius Sensor Cards

Fronius Sensor Card 1 (1)

(2) Measurement channel	(3) Channel name
Temperature 1	<input type="text" value="Temperature 1"/>
Temperature 2	<input type="text" value="Temperature 2"/>
Irradiation	<input type="text" value="Irradiation"/>
Digital 1	<input type="text" value="Digital 1"/>
Digital 2	<input type="text" value="Digital 2"/>
Current	<input type="text" value="Current"/>

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

- (1) Sensor Card selection
- (2) Displayed measuring channel
- (3) Fields for assigning the channel name
- (4) "Apply/Save" button
- (5) "Cancel/Discard entries" button

Settings – Fronius Solar.web

Solar.web

The Solar.web menu item can be used to make a direct connection between Fronius Data-manager and Fronius Solar.web.

Fronius Solar.web

☒

☐

(9) (10)

Datalogging settings

Query cycle inverter5 Minutes (1)

Query cycle Fronius Sensor Cards5 Minutes (2)

logged delete logged data ... (3)

Send actual data to Fronius Solar.web

☐ No ☒ Yes (4)

Send archive data to Fronius Solar.web

☒ never ☐ daily ☐ hourly (5) (6) (7)

register at Solar.web ... (8)

Datalogging settings

- (1) Selection of query cycle for the inverter:
Data queries every 5/10/15/20/30 minutes
- (2) Selection of query cycle for Fronius Sensor Cards:
Data queries every 5/10/15/20/30 minutes
- (3) "Delete log data" button
After clicking the "Delete log data" link, a security prompt appears to confirm the deletion of the log data.

- (4) Selection of whether current data is sent to Fronius Solar.web

Send archived data to Fronius Solar.web

- (5) Never
- (6) Daily
After the selection field is activated the setting options are displayed:

☐ never ☒ daily ☐ hourly

(6)

at 07:00 (6a)

on ☒ Monday ☒ Tuesday ☒ Wednesday ☒ Thursday ☒ Friday ☒ Saturday ☒ Sunday

(6b)

- (6a) Field for entering the time (hour)
- (6b) Fields for selecting the weekdays
- (7) Hourly
After the selection field is activated the setting options are displayed:

☐ never ☐ daily ☒ hourly

(7)

<input type="checkbox"/> 00:00	<input type="checkbox"/> 01:00	<input type="checkbox"/> 02:00	<input type="checkbox"/> 03:00	<input type="checkbox"/> 04:00	<input type="checkbox"/> 05:00	<input checked="" type="checkbox"/> 06:00	<input checked="" type="checkbox"/> 07:00
<input checked="" type="checkbox"/> 08:00	<input checked="" type="checkbox"/> 09:00	<input checked="" type="checkbox"/> 10:00	<input checked="" type="checkbox"/> 11:00	<input checked="" type="checkbox"/> 12:00	<input checked="" type="checkbox"/> 13:00	<input checked="" type="checkbox"/> 14:00	<input checked="" type="checkbox"/> 15:00
<input checked="" type="checkbox"/> 16:00	<input checked="" type="checkbox"/> 17:00	<input checked="" type="checkbox"/> 18:00	<input checked="" type="checkbox"/> 19:00	<input checked="" type="checkbox"/> 20:00	<input checked="" type="checkbox"/> 21:00	<input type="checkbox"/> 22:00	<input type="checkbox"/> 23:00

- (7a) Fields for selecting the time (hour)
- (8) "Register Solar.web" button
Clicking this link opens the Fronius Solar.web start page; data relevant for Fronius Solar.web is automatically sent as well.
- (9) "Apply/Save" button
- (10) "Cancel/Discard entries" button

Calculating memory capacity

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:

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

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

2. Total logging points:

$$\text{Total logging points} = (2 \times 56) + (1 \times 96) = 208$$

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

3. Memory sectors per day:

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

4. Rounded:

$$1,825 \quad \Rightarrow \quad 2$$

5. Memory capacity [days]:

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

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

Settings – Service Messages

General

Service messages, inverter errors, the Fronius String Control, etc., are sent to Fronius Datamanager and saved. The "Service messages" selection option is used to define how service messages are communicated. They can be communicated via:

- E-mail
- SMS

Service messages can be analyzed further using Fronius Solar.web.

Service Messages

Service messages

☒ (13)

☐ (14)

Message on

(1) ☒ E-Mail receiver:

(2)

(3)

immediately
daily at

(4)

(5) ☐ SMS receiver:

(6)

(7)

(8)

(9)

daily at

(10)

(11)

Language (12)

(1)

Message to e-mail recipient
Activate to send service messages to one or more e-mail addresses

(2)

Field for up to a max. of 10 e-mail addresses
Separate e-mail addresses with ","

(3)

Selection field to determine whether the service message will be sent immediately via e-mail or at a specific time
If "daily" is selected, the selection options for the time (hour) are also displayed.

(4)

"Send test e-mail" button
Sending a test e-mail may take several minutes.

(5)

Message to SMS recipient
Activate to send service messages as an SMS to a telephone number

(6)

Field to enter the country code
e.g.: +43 = country code for Austria

(7)

Field to enter area code

(8)

Field to enter the telephone number

(9)

Field for sending daily

(10)

Selection field for the time (hour) at which a service message is to be sent via SMS

- (11) "Send test SMS" button
Sending a test SMS may take several minutes.
- (12) Selection field for the language in which the service message will be sent
- (13) "Apply/Save" button
- (14) "Cancel/Discard entries" button

Settings – Network

General The "Network" menu item is used to determine the type of internet connection (LAN or WLAN).

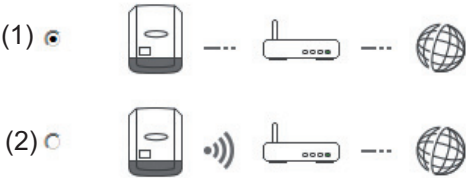
IMPORTANT! If the IP address is obtained statically, a gateway and a DNS server must be entered for the selected network interface.

Network

Network interfaces



Internet connection



LAN

(3) (4)

Get address ☐ static ☒ dynamic

Host name (5)

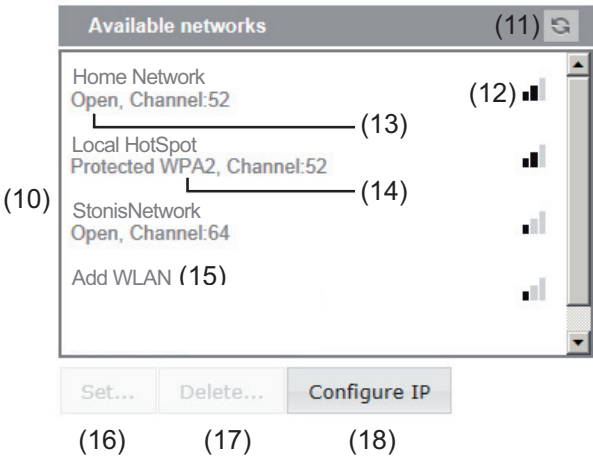
IP-Address (6)

Subnet-mask (7)

Gateway (8)

DNS-Server (9)

WLAN



- (1) Internet connection via LAN
- (2) Internet connection via WLAN

LAN

- (3) Obtain IP address statically
The user enters a fixed IP address for Fronius Datamanager and also manually sets the subnet mask, gateway address, and DNS server address (from the provider).
- (4) Obtain IP address dynamically
Fronius Datamanager obtains its IP address from a DHCP server (DHCP = dynamic host configuration protocol).
The DHCP server must be configured so that Fronius Datamanager is always assigned the same IP address. You will then always know the IP address at which Fronius Datamanager can be found.
If the DHCP server supports the "DNS dynamic updates" function, a name can be entered for Fronius Datamanager in the "Host name" field. The connection to Fronius Datamanager can then be established using the name instead of the IP address.
For example: Host name = sample_system, Domain name = froni.us.com.
The Fronius Datamanager can be reached via the address "sample_system.froni.us.com".
- (5) Field for entering a host name for dynamically obtained IP address
- (6) Field for entering the IP address for static IP address
- (7) Field for entering the subnet mask for static IP address
- (8) Field for entering the gateway for static IP address
- (9) Field for entering the DNS server for static IP address

WLAN

- (10) Display of detected WLAN networks
- (11) "Refresh" button
Used to search again for available WLAN networks
- (12) Display of signal quality
One bar = low signal strength
Three bars = high signal strength
- (13) Network status
Open/secured/saved (after pressing the "Setup" button (16))
- (14) Display of encryption
WPA / WPA2 / WEP
- (15) Add WLAN
Used to display hidden networks
Clicking this option opens the "WLAN connection" window

WLAN Connection

Network: (15a)

Security: (15b)

Enter password: (15c)

Show password: ☐ (15d)

(15e) (15f)

- (15a) Name of hidden WLAN network
 - (15b) Selection field for encrypting the hidden WLAN network
 - (15c) Field for entering the password for the hidden WLAN network
 - (15d) Selection field for whether the password is displayed
 - (15e) "Save" button
 - (15f) "Cancel" button
- (16) "Setup" button
Used to save a selected WLAN network;
Clicking this option opens the "WLAN connection" window

WLAN Connection

Network: Home Network (16a)

Signal quality: good (16b)

Security: WPA2 (16c)

Enter password: (16d)

Show password: ☐ (16e)

(16f) (16g)

- (16a) Name of selected WLAN network
 - (16b) Signal strength of selected WLAN network
 - (16c) Encryption of selected WLAN network
 - (16d) Field for entering the password for the WLAN network
 - (16e) Selection field for whether the password is displayed
 - (16f) "Save" button
 - (16 g) "Cancel" button
- (17) "Remove" button
Used to delete a saved WLAN network
- (18) "Configure IP" button
Clicking this option opens the "Configure IP" window

The image shows a 'Configure IP' dialog box with the following elements and callouts:

- Configure IP** (Title bar)
- (3)** points to the **static** radio button.
- (4)** points to the **dynamic** radio button.
- Get address** (Label)
- Host name** (Label) with text **meineanlage** in the input field.
- (5)** points to the **Host name** input field.
- IP-Address** (Label) with an empty input field.
- (6)** points to the **IP-Address** input field.
- Subnet-mask** (Label) with text **255.255.255.0** in the input field.
- (7)** points to the **Subnet-mask** input field.
- Gateway** (Label) with an empty input field.
- (8)** points to the **Gateway** input field.
- DNS-Server** (Label) with an empty input field.
- (9)** points to the **DNS-Server** input field.
- (19)** points to the **OK** button.
- (20)** points to the **Cancel** button.

- (19) "OK" button
- (20) "Cancel" button
- (21) "Apply/Save" button
- (22) "Cancel/Discard entries" button

Settings – Energy Manager

General

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

Energy Manager

Energy Manager

✓ (14) ✗ (15)

▼ Output IO-1State: on (16)

Controlling

(1) ☐ deactivated

(2) ☒ by power production

(3) ☐ by power surplus (in case of feed-in limits)

Thresholds

on: (4) W

off: (5) W

Duration

(6) ☒ Minimum duration per on-signal: minutes (7)

(8) ☒ Maximum duration per day: minutes (9)

☒ **Desired duration**

(10) per day: (11) minutes

is to finish until: (12) : (13)

Control

- (1) Control via Energy Manager is deactivated.
- (2) Control via Energy Manager is effected by the power generated.
- (3) Control via Energy Manager is effected by excess power (given feed limits).
This option can only be selected if a counter has been connected. Control via Energy Manager is effected using the actual power of feeding in with respect to the grid.

Thresholds

- (4) On:
For entering an effective power limit, at which the I/O 1 output is activated.
- (5) Off:
For entering an effective power limit, at which the I/O 1 output is deactivated.

Runtimes

- (6) Field for activating the minimum runtime for each switch-on process

- (7) Field for entering a minimum time for which the output I/O 1 is to be activated for each switch-on process
- (8) Field for activating the maximum runtime per day
- (9) Field for entering a maximum time for which the output I/O 1 is to be activated in total per day (several switch-on processes are included).

Target runtime

- (10) Field for activating a target runtime
- (11) Field for entering a minimum time for which the output I/O 1 is to be activated in total per day (several switch-on processes are included)
- (12) Field for selecting the hour, if the target runtime is to be achieved by a certain time
- (13) Field for selecting the minute, if the target runtime is to be achieved by a certain time
- (14) "Apply/Save" button
- (15) "Cancel/Discard entries" button
- (16) Status display
If the mouse pointer is moved over the status, the reason for the current status is displayed.

If "by excess power" is selected under "Control", additional selection fields for Feed (3a) and Reference (3b) are displayed under "Thresholds":

(3) ☒ by power surplus (in case of feed-in limits)

Thresholds

on:	(3a)	Feed in	1000	w (4)
off:	(3b)	Consumption	500	w (5)

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.

Push Service

✓

 (1)

✕

 (2)

+ Add

 (3)

▼ New FTP Service 0

 (5)

State: ---

 (4)

Name:

New FTP Service 0

Data format:

Demo Content

 by

FTP upload

 (6)

Interval:

10 sec

activated

☒

Server:Port:

MyServer:21

Upload file name:

/anypath/anyfile{DATE}-{TIME}.any

 (7)

☐ Login:

☒ Proxy

Server:Port:

http://anyserver:8080

 (8)

User:

anyuser

Password:

.....

🗑 Delete

 (9)

- (1) "Apply/Save" button
- (2) "Cancel/Discard entries" button
- (3) "Add" button
Clicking this button adds a new push service job. The new job is saved by clicking the "Apply/Save" button (1).
- (4) Status
Displays the current status of the push service job in question
- (5) Displayed name of push service job
- (6) Area for entering general data:
Name (name of push service job)
File format
Protocol type (FTP upload/HTTP POST)
Interval
Activation status
- (7) Area for entering the target data:
Server port
Upload file name
Login (user/password)

- (8) Area for entering the proxy data:
Server port
User
Password
- (9) "Delete" button
Clicking this button deletes the selected push service job

Further Information about the Push Service Function

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

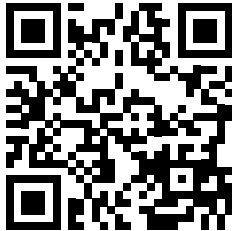
Modbus Settings

General

From your web browser, you can use the Fronius Datamanager web page 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

Data Output via Modbus

Modbus

(1) (2)

Data export via Modbus ☒ off ☐ tcp

(4) (5)

Control priorities overview

1 2 3

Ripple control signal receiver ☒ ☐ ☐

Dynamic power reduction ☐ ☒ ☐ (3)

Controlling via Modbus ☐ ☐ ☒

Data Output via Modbus

Activation of the Modbus service and selection of the transmission protocol.
If the Modbus service is activated, additional entry fields are available.

(1) **off**
No data output via Modbus

(2) **tcp**
Data output via Modbus TCP

(2)

Data export via Modbus ☐ off ☒ tcp

Modbus port (2a)

String control address offset (2b)

Sunspec Model Type (2c) ☒ float ☐ int + SF

Demo mode ☐ (2e)

Inverter control via Modbus ☒ (2f)

(2a) **Modbus port**
Number of the TCP port which must be used for Modbus communication.

(2b) String Control address offset

Offset value used to assign addresses to Fronius String Controls via Modbus. For further details, see the section entitled "Modbus Device ID for Fronius String Controls."

Sunspec model type

Used to select the data type of data models for inverters.

(2c) float

Display as floating-point numbers

SunSpec Inverter model I111, I112 or I113

(2d) int+SF

Display as integers with scaling factors

SunSpec Inverter model I101, I102 or I103

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

(2e) Demo mode

The demo mode is used to implement or validate a Modbus master. It enables you to read inverter and String Control data without actually connecting or activating a device. The same data is always sent back for all the registers.

(2f) Inverter control via Modbus

If this option is activated, the inverter 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

(3) 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 in the **UC EDITOR** menu item.

(4) "Apply/Save" button**(5) "Cancel/Discard entries" button****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.

Inverter control via Modbus ☒

Restrict the control ☒

(1)

IP adress

10.5.34.1 | x

(2)

(1) **Limit Control**

If this option is activated, only certain devices will be able to send control commands.

(2) **IP address**

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 through 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 – 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. Fronius Datamanager automatically detects the counter type.

Counter

Meter settings

Meter: None selected (1)

Click [here](#) for circuit diagrams of the meter installation (2)

(3) (4)

- (1) Field for selecting a counter:
 - None selected
 - S0 inverter (for Fronius Galvo, Fronius Symo, Fronius Primo, and Fronius Eco inverters only)
- (2) Link to counter circuit diagrams
- (3) "Apply/Save" button
- (4) "Cancel/Discard entries" button

S0 Inverter

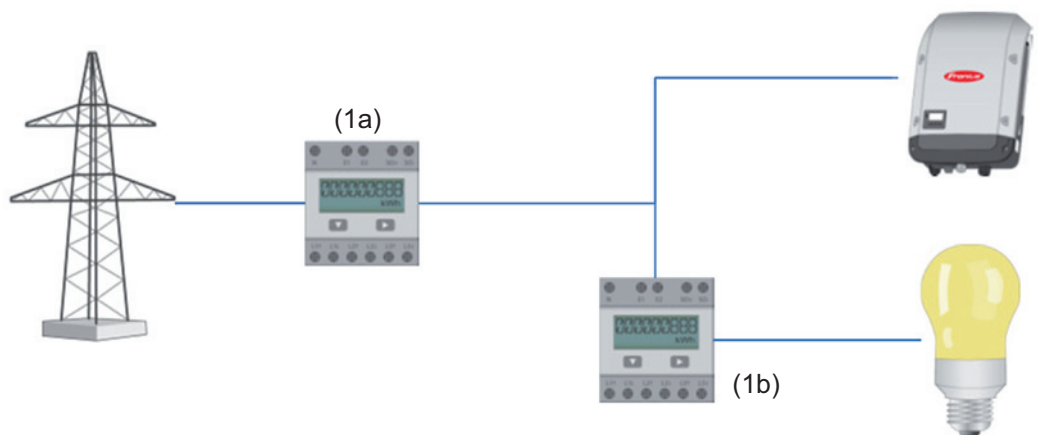
(1)

Meter: S0 inverter 1 Impulses/kWh: 10000 (1c)

Location of the meter: ☒ Feed-in point (1a) ☐ Consumption path (1b)

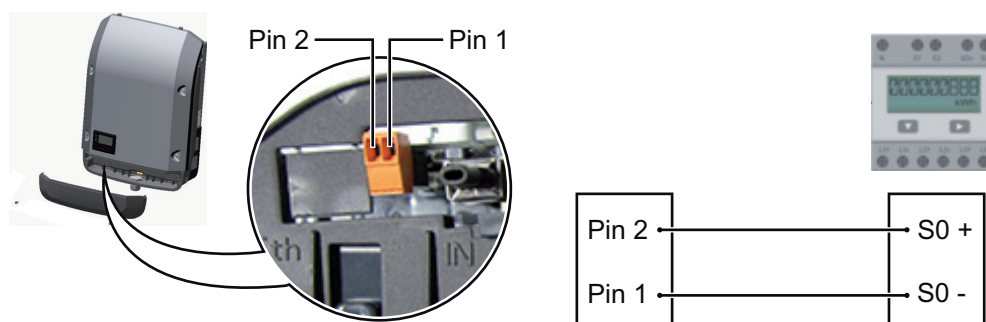
Click [here](#) for circuit diagrams of the meter installation (2)

- (1a) Counter position at feed-in point
The power of feeding in and energy are measured. The consumption is determined using these values and the system data.
An S0 counter must be configured at this position in order to count the fed-in energy.
- IMPORTANT!** If you are using an S0 counter at the feed-in point, the counter 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.
- (1b) Counter position in consumption branch
The power consumed and energy are measured directly. The power of feeding in and energy are determined using these values and the system data.
An S0 counter must be configured at this position in order to count the energy consumed.
- (1c) Field for entering the impulses per kWh



A counter for recording self-consumption per S0 can be connected directly to the inverter (for Fronius Galvo, Fronius Symo, Fronius Primo, and Fronius Eco only).

IMPORTANT! An S0 counter is connected to the switchable multifunctional current interface of the inverter. Connecting an S0 counter to the inverter may require an inverter firmware update.



Requirements for the S0 counter:

- 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 counter:

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 – Ripple Control Signal Receiver

UC editor

My System, at Mittwoch, 26. März 2014, 08:47:45

(11) ✓ (12) ✕

(1)	(2)	(3)	(4)	(5)	(6)	(7)
unlocked	Ripple control signal receiver Input pattern	Active power	Power factor cosφ	UC output	excluded inverter(s)	
	I/O 0 I/O 1 I/O 2 I/O 3 4 5 6 7 8 9			I/O 0		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> 100 %	<input type="checkbox"/> 1 <input type="radio"/> ind <input type="radio"/> cap	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="button" value="−"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> 60 %	<input type="checkbox"/> 1 <input type="radio"/> ind <input type="radio"/> cap	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="button" value="−"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> 30 %	<input type="checkbox"/> 1 <input type="radio"/> ind <input type="radio"/> cap	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="button" value="−"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> 0 %	<input type="checkbox"/> 1 <input type="radio"/> ind <input type="radio"/> cap	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="button" value="−"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> %	<input type="checkbox"/> <input type="radio"/> ind <input type="radio"/> cap	<input type="checkbox"/>	<input type="text"/>	<input type="button" value="+"/>

☒ ... not applicable
 ☐ ... not considered
 ☐ ... pin open
 ☒ ... pin closed

UC Editor – Factory setting with 100%, 60%, 30%, and 0% effective power.
The settings can be changed at any time.

- (1) Activating the rule
- (2) Input pattern (assignment of individual I/Os)
1 click = white
2 clicks = blue
3 clicks = gray
- (3) First activate effective power,
then enter the desired effective power as a %

- (4) First activate power factor $\cos \phi$,
then enter the desired power factor and select "ind" or "cap"

ind = inductive
cap = capacitive
- (5) UC Output (feedback output)
When the rule is activated, the I/O 0 output will be activated (e.g., for operating a signal device)
- (6) Excluded inverters
Enter the numbers of inverters here that are to be excluded from control. Separate multiple inverters with commas.
- (7) Delete/Add a Rule
+ = add a new rule
- = delete selected rule
- (8) Legend for use of colors
- (9) Click "Import" button
to import rules in *.fpc format

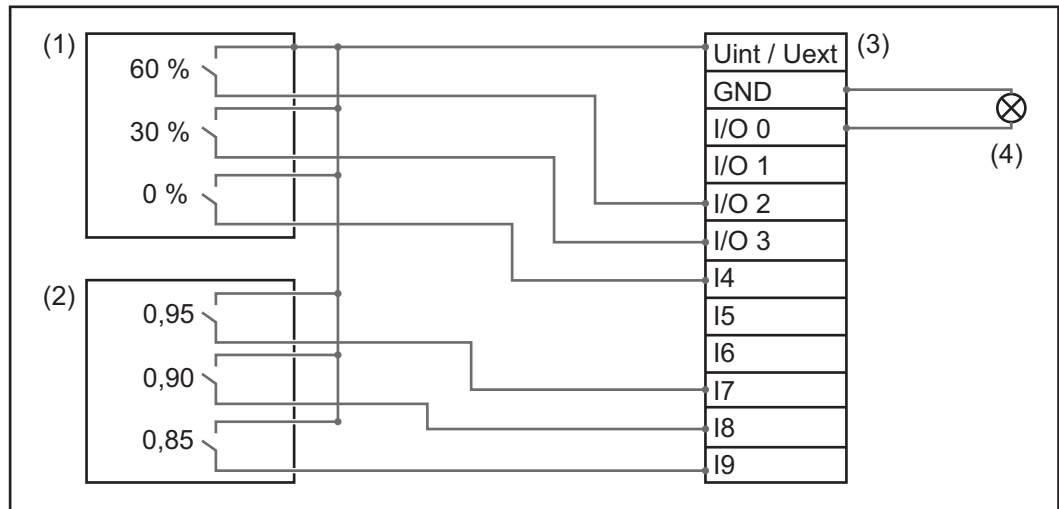
The function of the "Import" button depends on the browser used, e.g., Firefox and Google Chrome support the function.
- (10) Click "Export" button
to save the rules separately in *.fpc format
- (11) "Apply/Save" button
- (12) "Cancel/Discard entries" button



NOTE! The print function of the web browser can be used to save the UC Editor settings as a PDF or print them out (e.g., as a commissioning report).

Connection Ex-ample

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



The ripple control signal receiver and the Fronius Datamanager 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 Fronius Datamanager and the ripple control signal receiver, a shielded cable is recommended.

Settings on the UC Editor:

Approved	Input pattern	Effective power	Power factor cosφ	PSC output	Excluded inverters	
	I/O 0 I/O 1 I/O 2 I/O 3 4 5 6 7 8 9			I/O 0		
↑	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> 60 %	<input type="checkbox"/> 1 <input type="radio"/> ind <input type="radio"/> cap	<input checked="" type="checkbox"/>		⊖
(1) ↓	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> 30 %	<input type="checkbox"/> 1 <input type="radio"/> ind <input type="radio"/> cap	<input checked="" type="checkbox"/>		⊖
↓	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> 0 %	<input type="checkbox"/> 1 <input type="radio"/> ind <input type="radio"/> cap	<input checked="" type="checkbox"/>		⊖
↑	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> 100 %	<input checked="" type="checkbox"/> 0.95 <input type="radio"/> ind <input checked="" type="radio"/> cap	<input checked="" type="checkbox"/>		⊖
(2) ↓	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> 100 %	<input checked="" type="checkbox"/> 0.9 <input type="radio"/> ind <input checked="" type="radio"/> cap	<input checked="" type="checkbox"/>		⊖
↓	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> 100 %	<input checked="" type="checkbox"/> 0.85 <input type="radio"/> ind <input checked="" type="radio"/> cap	<input checked="" type="checkbox"/>		⊖
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> %	<input type="checkbox"/> <input type="radio"/> ind <input type="radio"/> cap	<input type="checkbox"/>		⊕

☒ ... not usable
 ☐ ... not considered
 ☐ ... contact open
 ☒ ... contact closed

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 counter for determining self-consumption per S0 can be connected directly to the inverter (for Fronius Galvo, Fronius Symo, Fronius Primo, and Fronius Eco only).



Dynamic power reduction

(1) (2)
 Power limit: ☐ No limit ☒ limit for entire system
 total DC power of the system: Wp (3)
 max. production power of entire system: (4) (5)

Power limit

Option to define the maximum output power of the photovoltaic system.

- (1) No limit
 The photovoltaic system converts all available PV energy and feeds it into the grid.
- (2) Dynamic power reduction limit for the entire system
 The entire photovoltaic system is limited to a fixed power limit.
- (3) 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., counter failure).
- (4) Field for entering the max. power in W or %

 If no counter has been selected in the "Counter" menu item:
 Max. power generated for the entire system

 If S0 inverter has been selected in the "Counter" menu item:
 Max. energy fed into the grid
- (5) Selection field % or W
- (6) "Apply/Save" button
- (7) "Cancel/Discard entries" button

UC Editor – Control Priorities

	
(4)	(5)

Controlling priority

	1	2	3	
Ripple control signal receiver	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	(1)
Dynamic power reduction	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	(2)
Controlling via Modbus	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	(3)

1 = highest priority, 3 = lowest priority

- (1) Used to set control priorities for the ripple control signal receiver
- (2) Used to set control priorities for dynamic power reduction
- (3) Used to set control priorities for control via Modbus
- (4) "Apply/Save" button
- (5) "Cancel/Discard entries" button

Appendix

Technical Data

Technical Data

Memory capacity	16 MB
Supply voltage	230 V AC
Energy consumption	typ. 1.4 W (without WiFi) typ. 2.2 W (with WiFi)
Dimensions	132 x 103 x 22 mm 5.2 x 4.1 x 0.9 in.
Ethernet (LAN)	RJ 45, 100 MB
WiFi	IEEE 802.11b/g Client
RS 485 (Fronius Solar Net)	RJ 45
Ambient temperature	-20 – +65°C -4 – +149°F
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. 30 V
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, 10.7 V in total for all 4 digital outputs (minus other 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 energy of digital outputs	76 mJ (per output)

- * When sufficient power is coming from Fronius Solar Net, the green LED lights up on every DATCOM component.
If the green LED does not light up, the power pack available from Fronius should be inserted into the 12 V power pack connection socket of the DATCOM component.
Check the cable and plug connections if necessary.

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