/ Perfect Welding / Solar Energy / Perfect Charging

Fronius
SHIFTING THE LIMITS

Introduction to
FRONIUS SMART METER, SETUP
CT‘s, 3G ROUTER

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THE FRONIUS GROUP IN DETAIL

R & D EMPLOYEES

As we always want to be the leader, we employ 422 people in Research and Development.

EMPLOYEES

3,344 people work in the 20 international Fronius subsidiaries worldwide.

TURNOVER

Fronius achieved a turnover of 343 million euros in 2013.

EXPORT

Fronius supplies the world: we export 92 % of products.

GRANTED PATENTS

Innovation in figures: we currently own 1.008 granted patents.

APPRENTICES

The development of young talent is important to Fronius. We currently employ 120 apprentices.

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FRONIUS – THREE DIVISIONS

PERFECT CHARGING

PERFECT WELDING

SOLAR ENERGY

Fronius UK Ltd / Fronius Smart Meter Training

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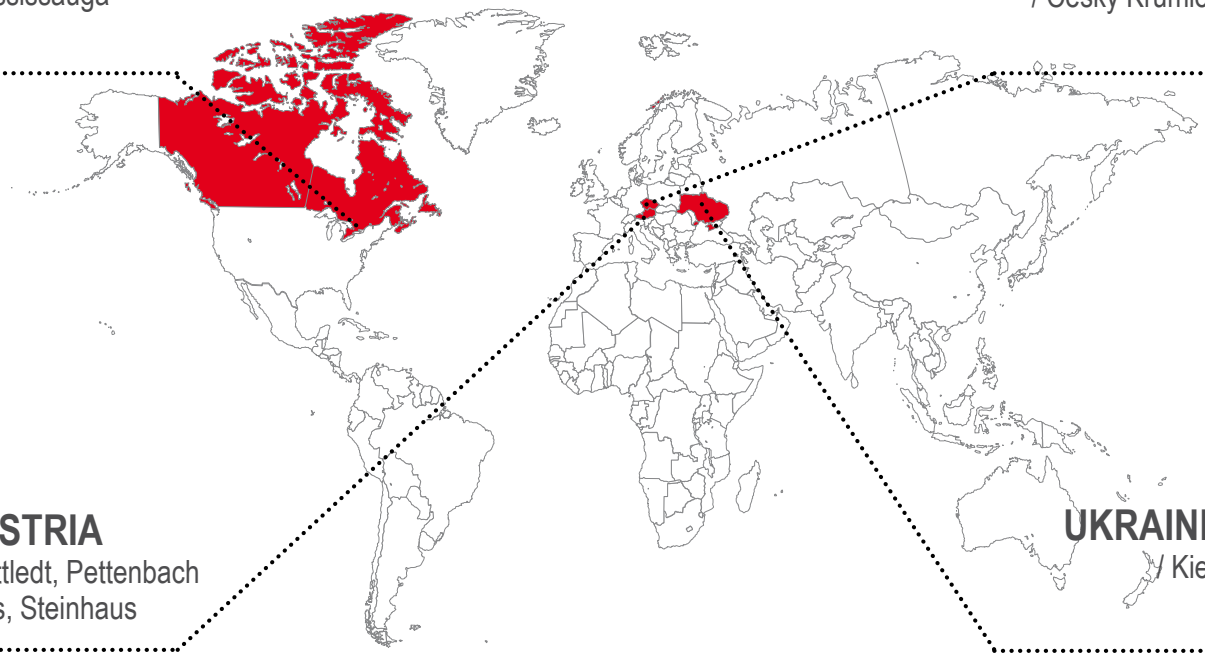
FRONIUS – PRODUCTION SITES

CANADA
/ Mississauga

CZECH REPUBLIC
/ Český Krumlov



AUSTRIA
/ Sattledt, Pettenbach
Wels, Steinhaus

UKRAINE
/ Kiev

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INVERTERS AT A GLANCE

1995
/ Sunrise

2005
/ Fronius IG Central

2009
/ Fronius IG TL

2010
/ Fronius CL

2001
/ Fronius IG

2007
/ Fronius IG Plus

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INVERTERS AT A GLANCE

2013
/ Fronius Galvo

2013
/ Fronius Symo

2012
/ Fronius Agilo

2013
/ Fronius Datamanager

2014
/ Fronius Agilo TL

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INVERTERS AT A GLANCE

2015
/ Fronius Primo

2015
/ Fronius Eco

2014
/ Fronius
Datamanager 2.0

2015
/ Fronius Energy Package

2016
/ Fronius are Go!

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FRONIUS INVERTERS

STRING INVERTERS

/ Fronius Galvo

/ Fronius Symo Hybrid

/ Fronius Primo

/ Fronius IG Plus

/ Fronius Symo

/ Fronius Eco

/ Fronius IG TL

CENTRAL INVERTER

/ Fronius Agilo

/ Fronius Agilo TL

FRONIUS SYSTEM SOLUTIONS

FRONIUS ENERGY PACKAGE

FRONIUS POWER PACKAGE

FRONIUS SYMO HYBRID

FRONIUS SOLAR BATTERY

FRONIUS SMART METER

FRONIUS SYMO RESP.. FRONIUS ECO

FRONIUS AC COMBINER

VORKONFEK-TIONIERTE KABEL

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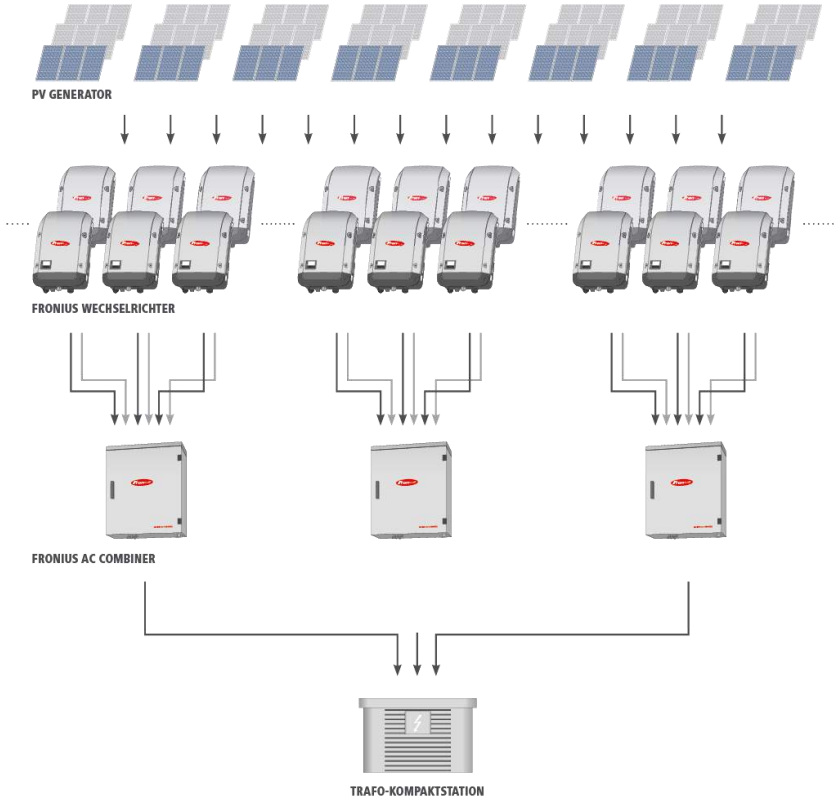
Fronius Power Package Symo 10-20 kW



Fronius UK Ltd / Fronius Smart Meter Training

Right!!
Lets Get Going !!!

A NEW FOCUS
On Solar conversion and Storage

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A NEW FOCUS
On Solar Storrage

A NEW FOCUS
Solar Inverters

ENERGY production

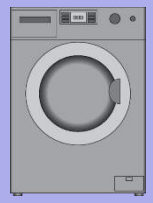
ENERGY storage

A NEW FOCUS
Feed In Tariff

ENERGY supply

A NEW FOCUS
Export Control

ENERGY Control



ENERGY consumption

A NEW FOCUS
Solar Self consumption

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/ Perfect Charging
/ Perfect Welding
/ Solar Energy

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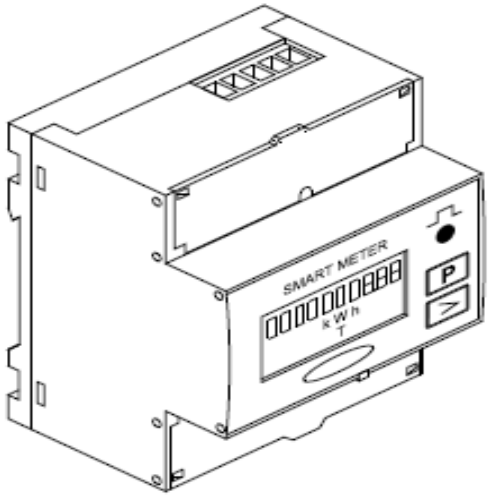
Fronius Smart Meter 50kA-3



EN / DE / IT / FR

42,0410,2169 01/2015

Fronius Worldwide
www.fronius.com/addresses

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

VERSION's

FRONIUS Smart Meter

Managing your power requierments!

Introduction

63A-1

63A-3

50kA-3

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SMART METER TECHNOLOGY

nominal voltage: 230 -240 V

max. current: 1-phase 63 A

cable dimensions

AC cables: **1 – 16 mm²**

communication: 0,05 – 4 mm²

Mounting: Din rail

Housing: 4 Modules DIN 43880

Power measurement per phase

SINGLE PHASE

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SMART METER TECHNOLOGY

nominal voltage: 400 – 415 V

max. current: 3-phase 63 A

cable dimensions

AC cables: **1 – 16 mm²**

communication: 0,05 – 4 mm²

Mounting: Din rail

Housing: 4 Modules DIN 43880

Power measurement per phase

THREE PHASE

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SMART METER TECHNOLOGY

nominal voltage: 230 – 415 V

max. current: 1 - 3-phase 50,000 A

cable dimensions

AC cables: 1 – 16 mm²

communication: 0,05 – 4 mm²

Mounting: Din rail

Housing: 4 Modules DIN 43880

Power measurement per phase

SINGLE OR THREE PHASE.

1ph / 3ph

Smart Meter display

Active power L1, L2, L3

Reactive power L1, L2, L3 (inductive / capacitive)

Total power

Current: L1, L2, L3

Voltage: L1-N, L2-N, L3-N, L1-L2, L1-L3, L2-L3

cos phi: L1, L2, L3

Average frequency on all phases

monitoring of mains voltage and frequency

detection of power consumption

communication via Modbus RTU

Interface: JSON, Modbus TCP, Push-Service

bidirectional measurement

data can be used to optimize self-consumption rate

Mounting in power distribution box

INTEGRATED MONITORING
FRONIUS SMART METER
Bidirectional meter

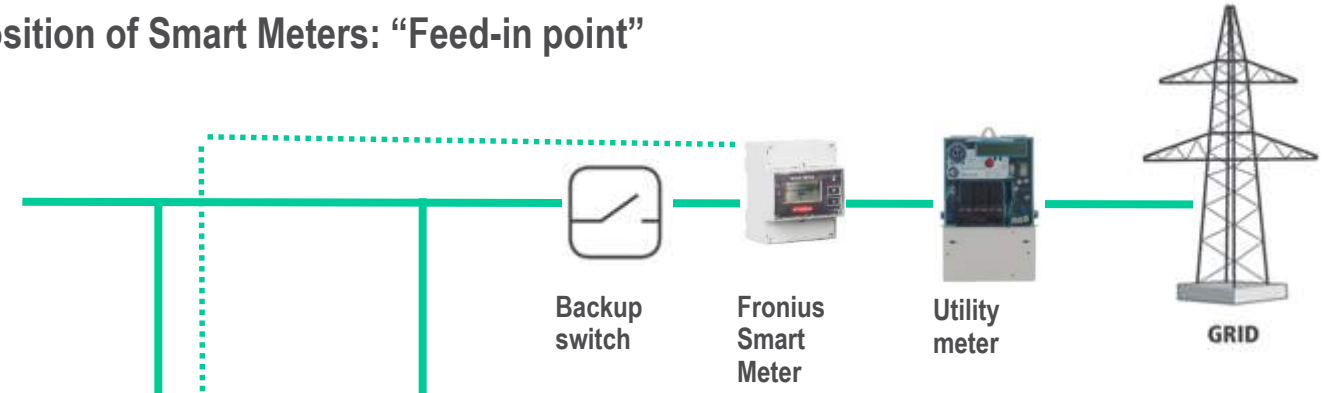
50 KA-3 **1ph – 3ph**

Optimises self-consumption and records household`s load curve. When setting up the Ct‘s, to obtain the ratio take the primary turns and divid by the secondary turn‘s. P turns / S turns = Ratio i.e. 200 / 40 = 5 ratio so enter the value 0005 Terminals 5,8,11 must be linked out for single phase operation, or the meter will not work.

GENERAL DATA	FRONIUS SMART METER
Nominal voltage	230 – 240V 400 – 415 V
Max. current	3 x 50 A
Installation	DIN rail
Interface to inverter	Modbus RTU (RS485)
Display	8-digit LCD

Block diagram

Position of Smart Meters: “Feed-in point”



Fronius Symo

load

Commercial

Transmission

Industrial

Domestic

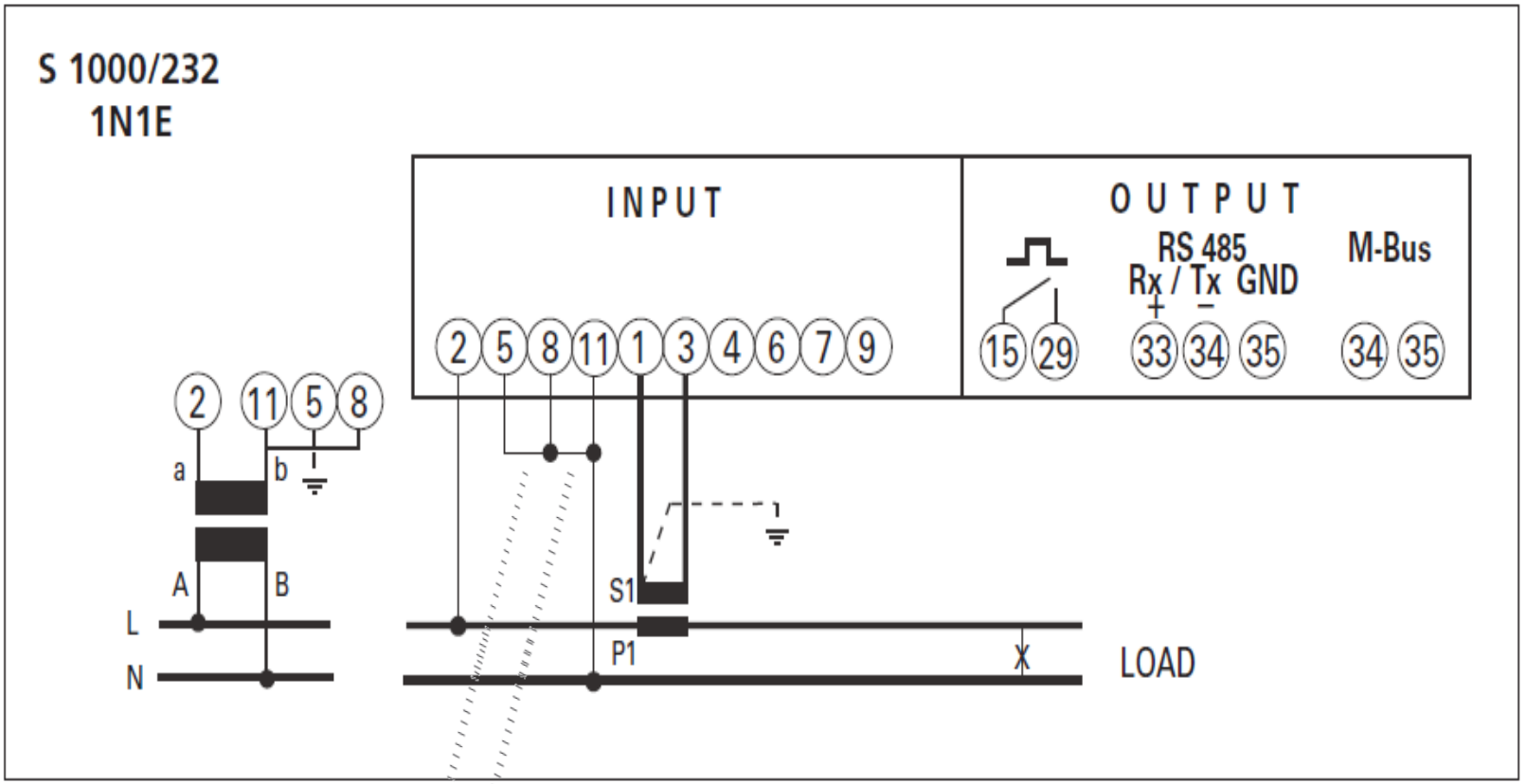
Facts about the Fronius Smart Meter

- Monitoring of grid parameters voltage and frequency
- Bidirectional measurement
- Capturing of load curves
- Data is utilized for optimizing self-consumption
- Communication via Modbus RTU
- Mounting in the electric cabinet (DIN rail)
- Position of the meter:

FRONIUS SMART METER

Whether Industrial commercial or
Domestic The 50KA will do the Job!

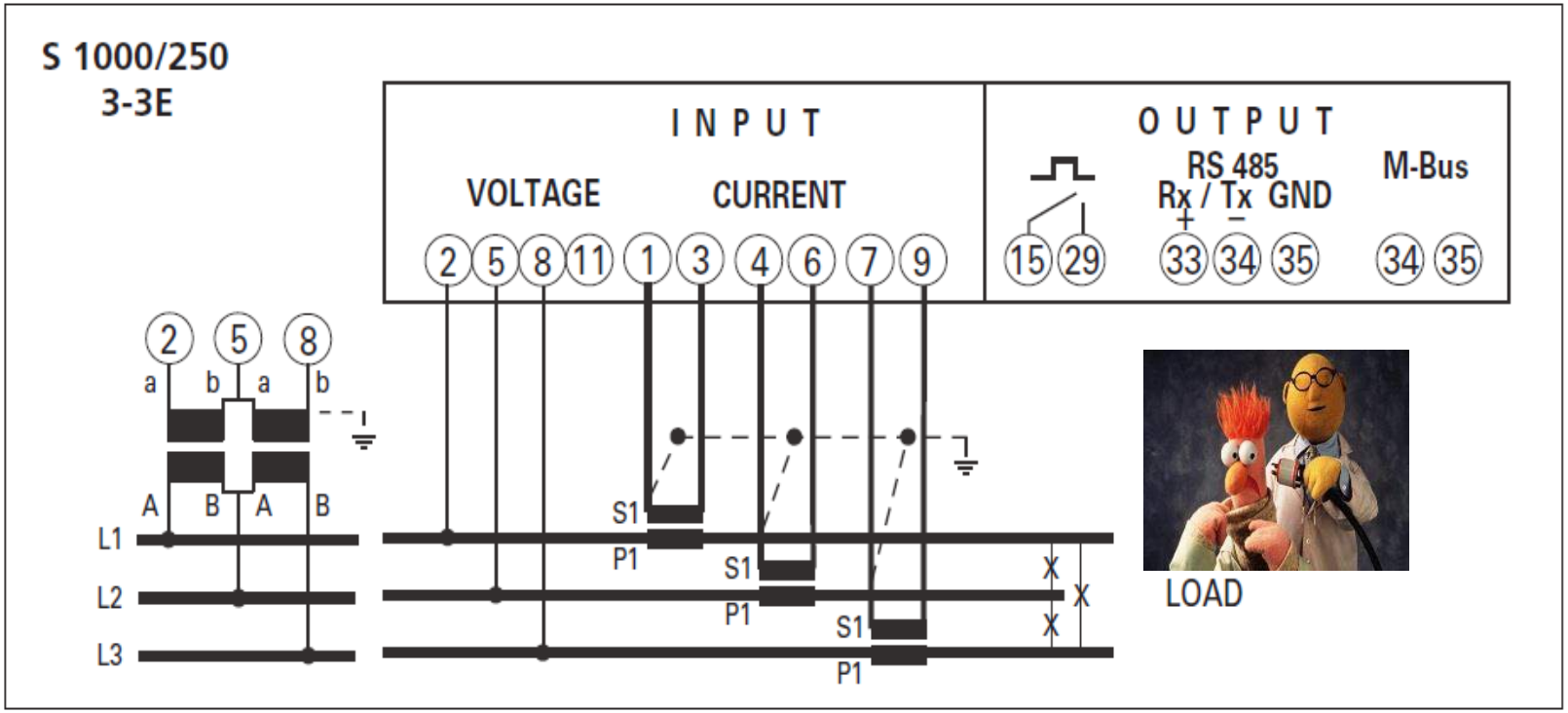
FRONIUS SMART METER **Two Wire System**



Important links

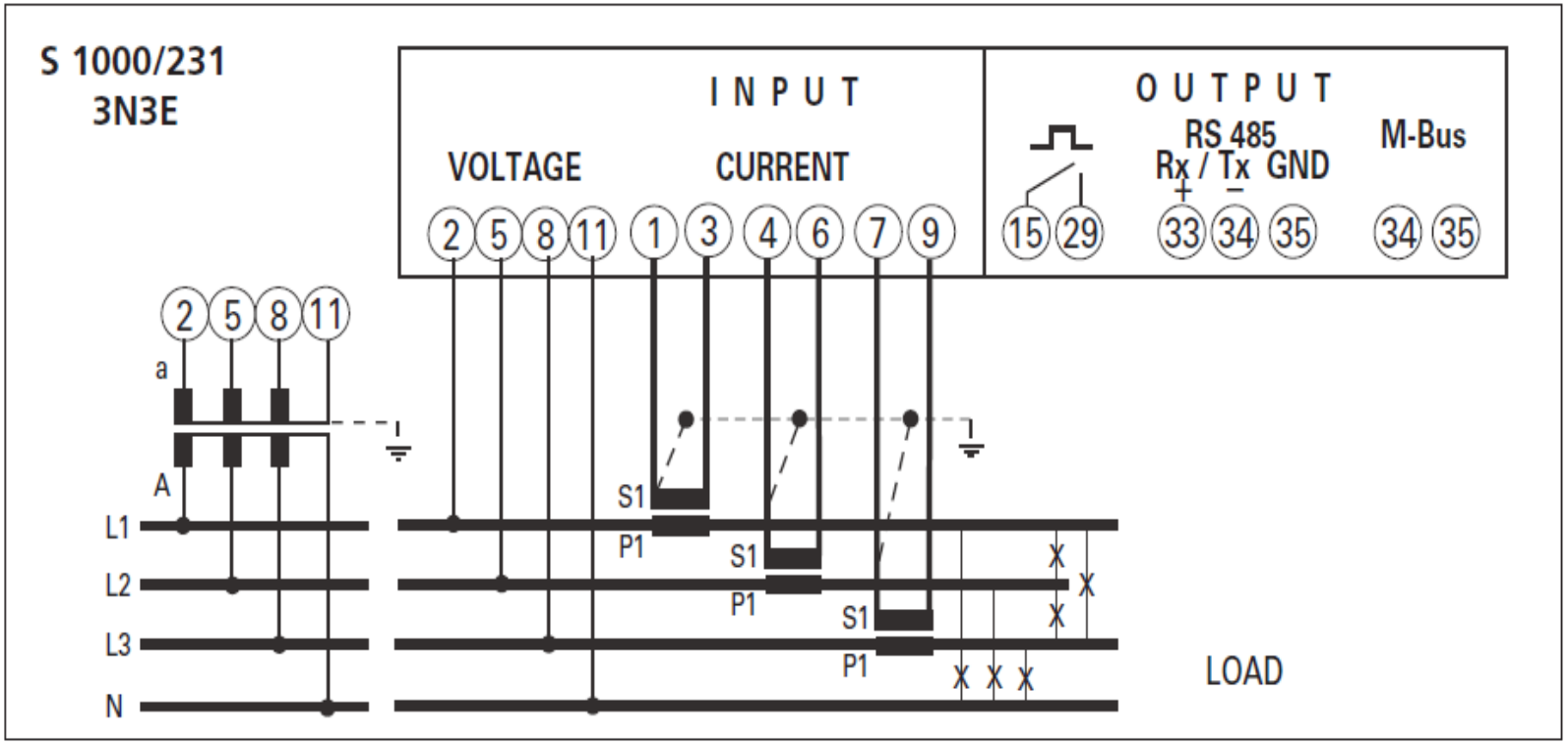
FRONIUS SMART METER

FRONIUS SMART METER **Three Wire System**



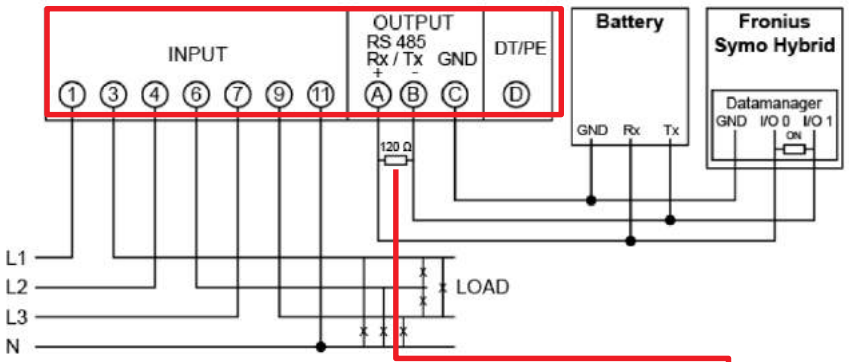
FRONIUS SMART METER

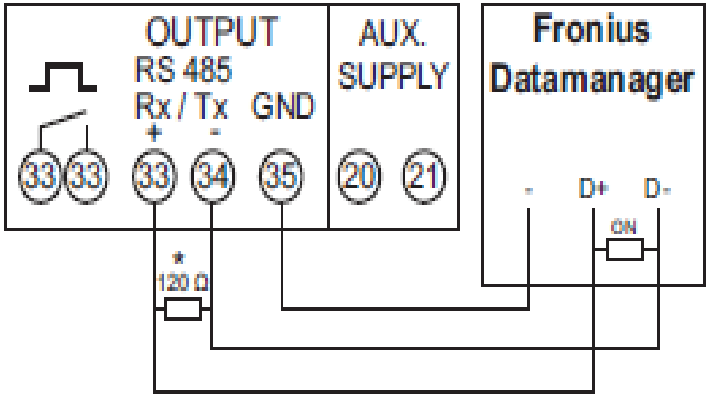
FRONIUS SMART METER **Four Wire System**



FRONIUS SMARTMETER

C





Wiring according to schematic diagram

- Wiring between meter and inverter (CAT 5) Screen twin twisted
- Data line for Modbus RTU
- Maximum distance: 300 m (980 feet)

120 Ohm terminating resistor is Supplied with the meter

If the Smart Meter pass word is forgotten then the back door entry method is available:

The Master reset is 9753

FRONIUS SMART METER

SELECTION CRITERIA FOR A CURRENT CONVERTER FOR THE FRONIUS SMART METER 50KA-3

/ Primary current
Maximum current per phase. A current converter with a primary current greater than the maximum expected current per phase should be selected. The closer the expected current is to this value, the more precise the measurement will be.

/ Secondary current
1 - 5 A

/ Power
The Fronius Smart Meter needs 0.3 VA to carry out its measurements. Losses also occur on the outgoing and return leads. The power of the current converter must be greater than the sum total of the power of the Fronius Smart Meter and the leads. The higher the power, the better.

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/ Power

The Fronius Smart Meter needs 0.3 VA to carry out its measurements. Losses also occur on the outgoing and return leads. The power of the current converter must be greater than the sum total of the power of the Fronius Smart Meter and the leads. The higher the power, the better.

For example: Outgoing and return lead between Fronius Smart Meter and current converter (together):
2 x 0.5 m = 1 m length with a copper cable cross-section of 1.5 mm² -> 1 x 0.6 VA
Fronius Smart Meter self-consumption = 0.3 VA
Sum total = 0.9 VA
A current converter with a rating of 1 VA, 1.5 VA, 5 VA or higher is suitable here.

Line resistances at different cross-sections (copper wires)

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

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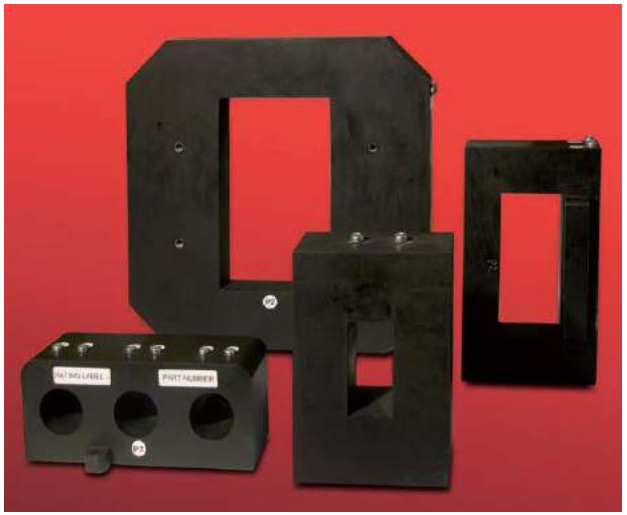
INTEGRATED MONITORING Current & Voltage Transformers

We can advise on Current& Voltage Transformers,
Let our frendly Technical staff help, get it right first time



The snap-in range comes

IP65.

Black out cover.

Communications failure default to safe pri-determined power level 100% - 0%

5a – 1A for extended hours of outdoor use

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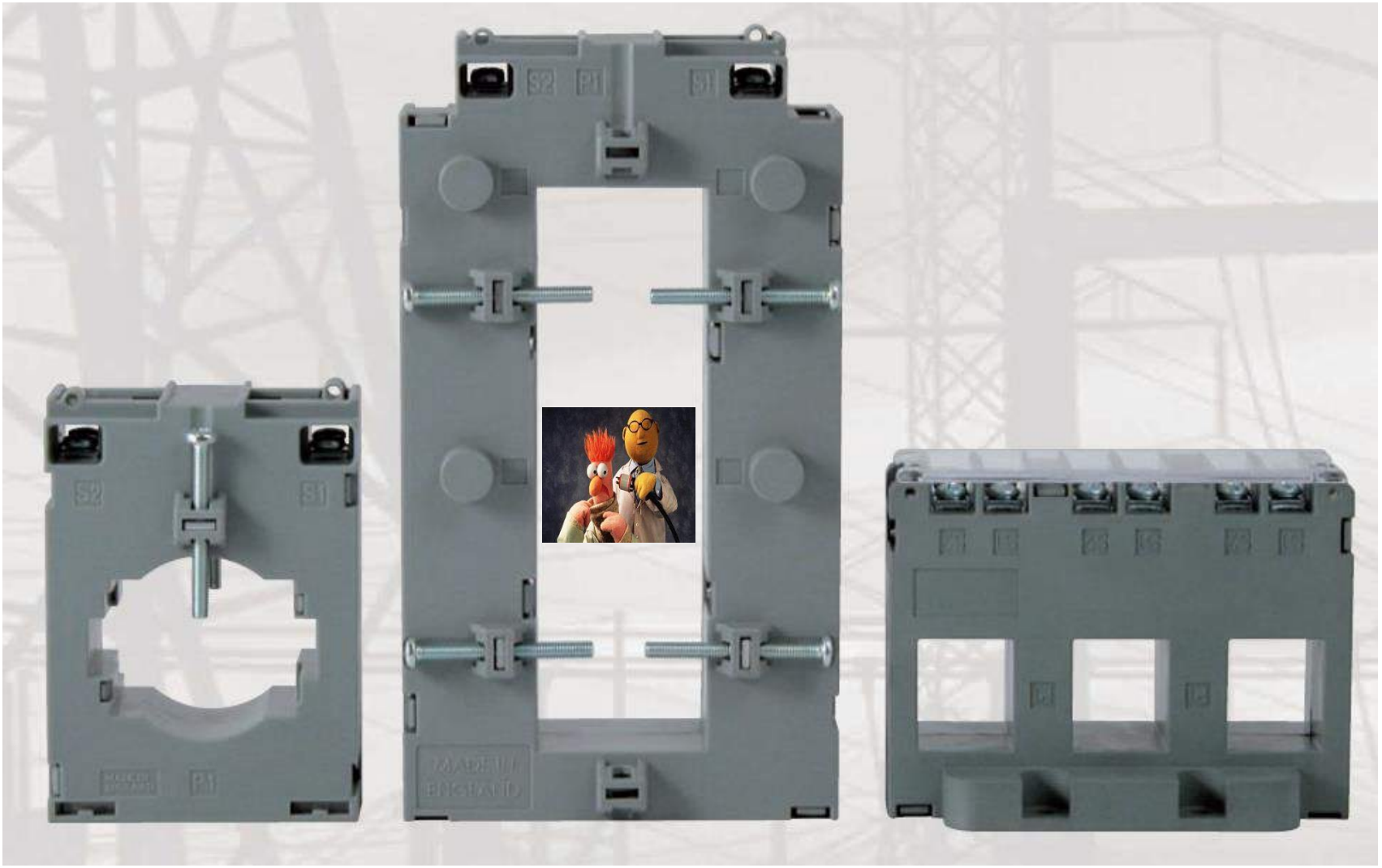
Take the Primary windings and divided it by the secondary windings the result is the Ratio you enter in the Smart Meter



CT sensors - An introduction

Often referred to as a current clamp, a CT is in fact, ***not*** a clamp.
These are Clamps. On the left are two bus bar clamps, on the right, a carpenter's G-clamp:

Pictured above, is an example of a Split-Core CT.

Here's an example of a ***split-core*** CT

In addition to the split-core type, solid core, (aka ***ring core***) CTs are available.
Here's an example of a ***solid-core*** CT

Basics

Current transformers (CTs) are sensors that measure alternating current. They are particularly useful for measuring whole building electricity consumption (or generation, for that matter).

The split core type, such as the CT in the picture above, is particularly suitable for DIY use, as it can be clipped onto either the live ***or*** neutral wire coming into the building, without the need to do any high voltage electrical work.

Like any other transformer, a current transformer has a primary winding, a magnetic core, and a secondary winding.

In the case of whole building monitoring, the primary winding is the live ***or*** neutral wire (not both!) coming into the building, that is passed through the opening in the CT. The secondary winding is made of many turns of fine wire housed within the transformer case.

The alternating current flowing in the primary produces a magnetic field in the core, which induces a current in the secondary winding circuit [1].

The current in the secondary winding is proportional to the current flowing in the primary winding:

I secondary = Ct turns Ratio × I primary Is = Ct ratio x Ip

Ct turns Ratio = Turns primary / Turns secondary Ct ratio = Pt / St

The number of secondary turns in the CT pictured above, is 2000, so the current in the secondary is one 2000th of the current in the primary.

Normally, this ratio is written in terms of currents in Amps e.g. 100:5 (for a 5A meter, scaled 0 - 100A). The ratio for the CT above would normally be written as 100:0.05.

Burden resistor

A "current output" CT needs to be used with a burden resistor. The burden resistor completes or closes the CT secondary circuit. The burden value is chosen to provide a voltage proportional to the secondary current. The burden value needs to be low enough to prevent CT core saturation.

Safety

In general, a CT must **never** be open-circuited once it's attached to a current-carrying conductor.
A CT is potentially dangerous if open-circuited.

If open-circuited with current flowing in the primary, the transformer secondary will attempt to continue driving current into what is effectively an infinite impedance. This will produce a high and potentially dangerous voltage across the secondary [1]

Some CT's have built-in protection. Some have protective Zener diodes as is the case with the SCT-013-000 recommended for use in this project. If the CT is of the 'voltage output' type, it has a built in burden resistor. Thus, it cannot be open-circuited.

Installing a CT

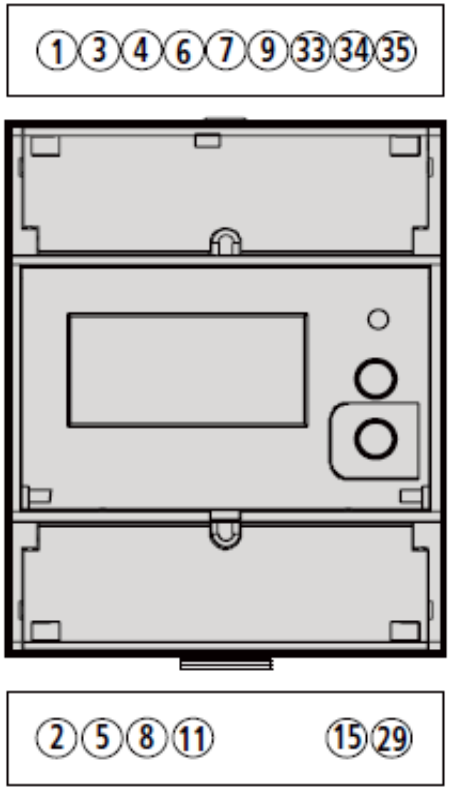
The primary winding of the CT is the wire carrying the current you want to measure. If you clip your CT around a two or three core cable that has wires carrying the same current but in opposite directions, the magnetic fields created by the wires will cancel each other, and your CT will have no output.

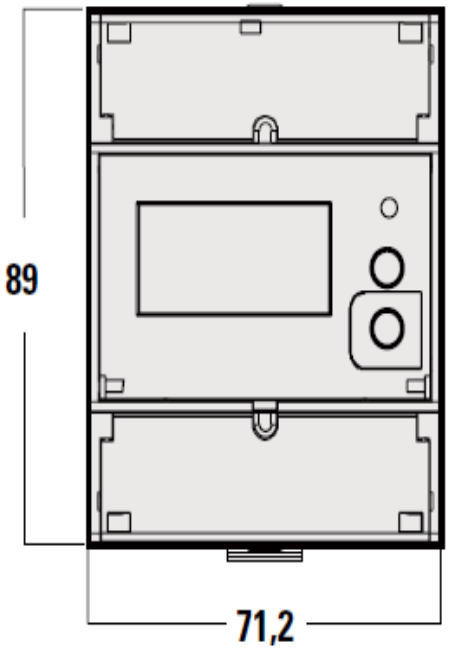
[3] & [4]
A split-core CT, especially one that has a ferrite core (such as the ones made by YHDC) should ***never*** be "clamped" to the cable using any sort of packing material, because the brittle nature of the ferrite core means that it might easily be broken, thus destroying the CT.

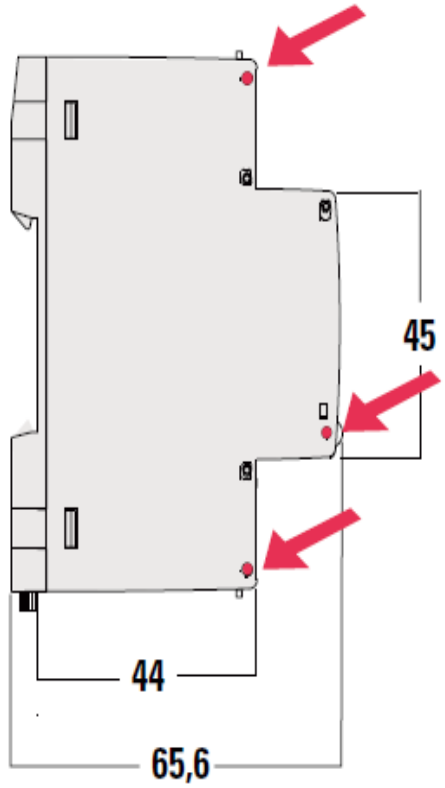
You should only clamp the CT to the cable or bus bar if the housing is specifically designed to do so. Similarly, a ring-core CT should ***never*** be forced onto a cable that is too large to pass freely through the centre.

The position and orientation of the cable within the CT aperture does ***not*** affect the output.

FRONIUS SMART METER DIMENTIONS





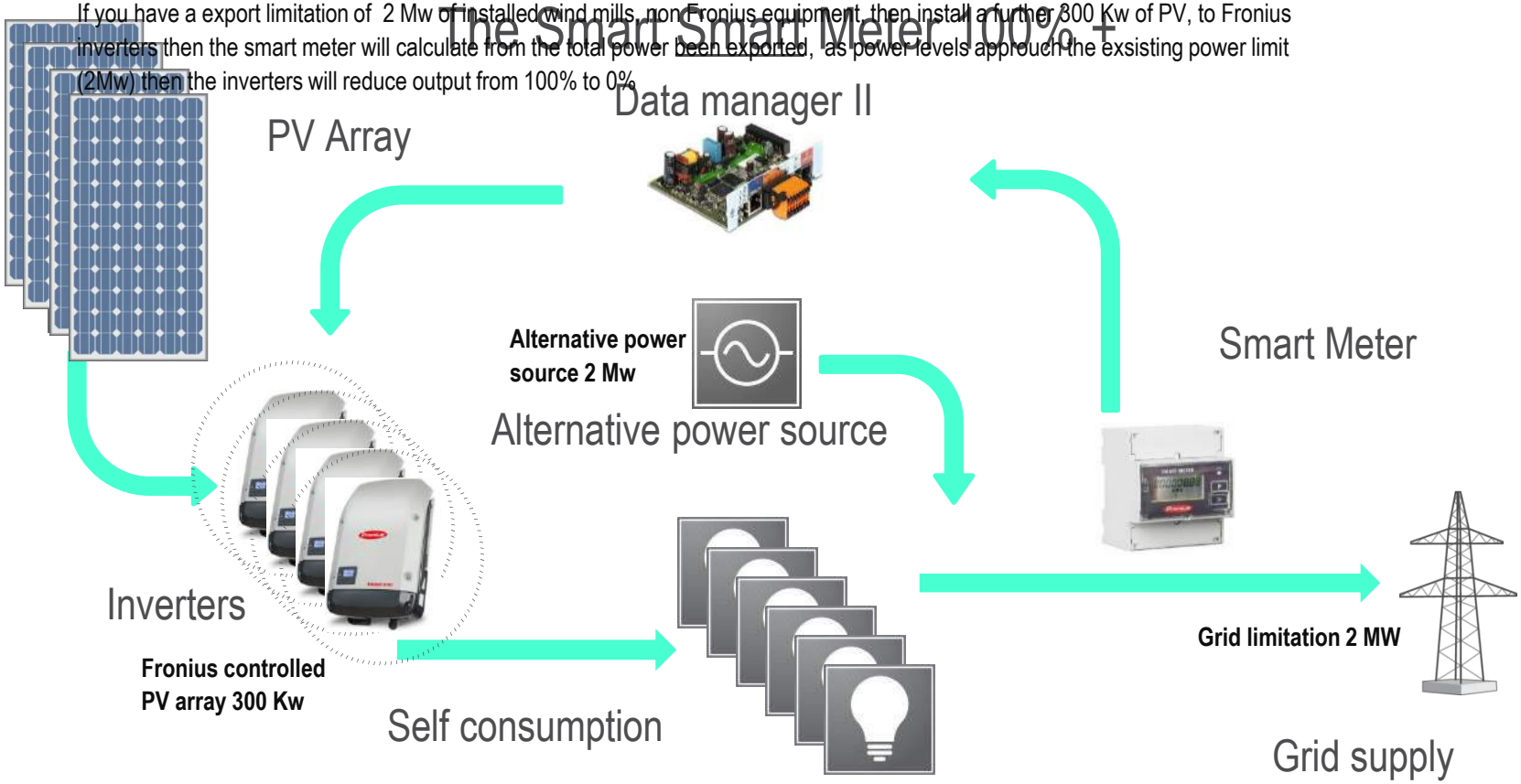


The fronius Export limitation plus 100%, Now you can have an exsisting alternative power source and add to your generation and still have exsisting export limitation.

If you have a export limitation of 2 Mw of installed wind mills, non Fronius equipment, then install a further 800 Kw of PV, to Fronius inverters then the smart meter will calculate from the total power been exported, as power levels approach the exsisting power limit (2Mw) then the inverters will reduce output from 100% to 0%

Inverters

The Smart Smart Meter 100% +



The fronius Export limitation plus 100%, Now you can have an exsisting alternative power source and add to your generation and still have exsisting export limitation.

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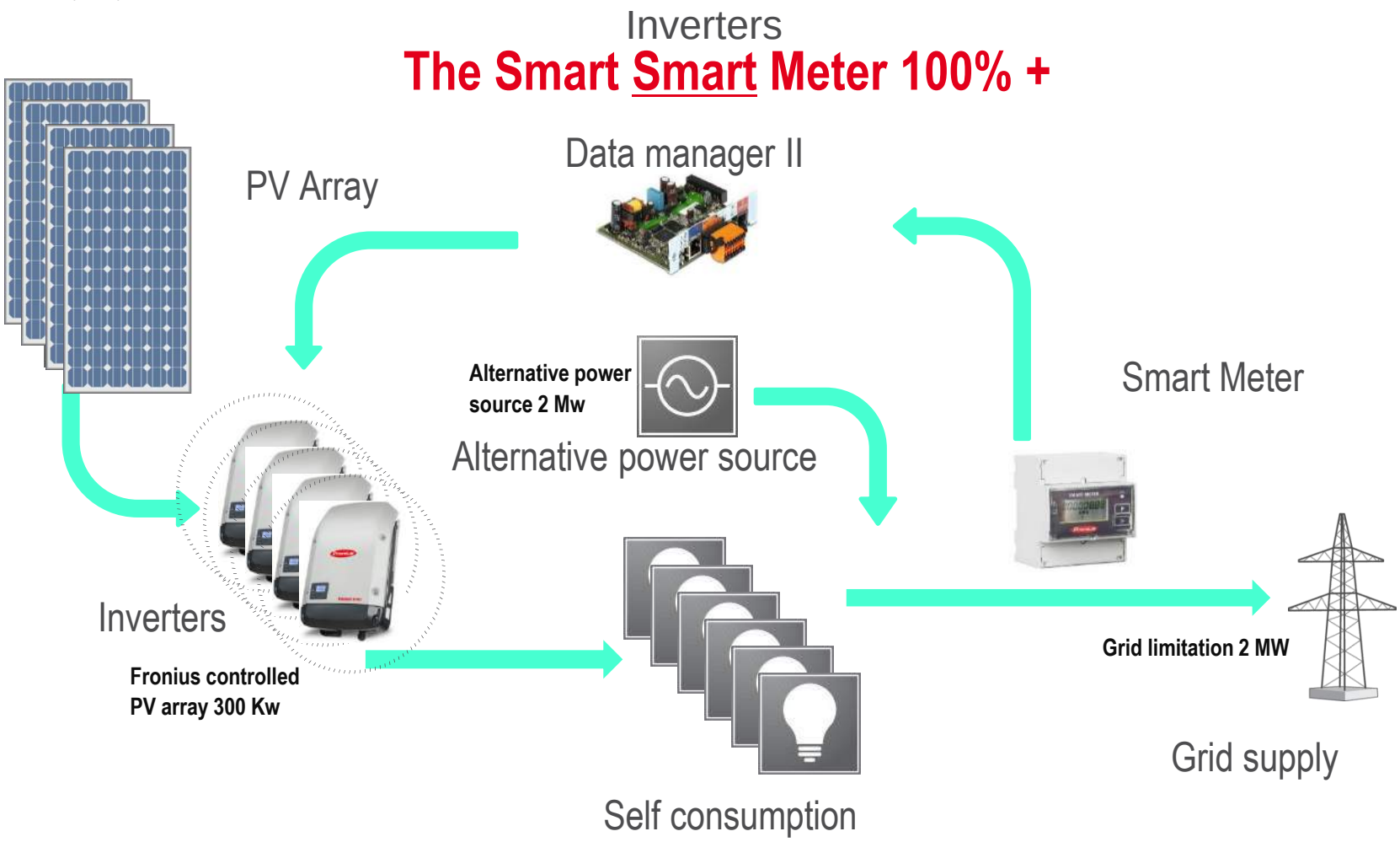
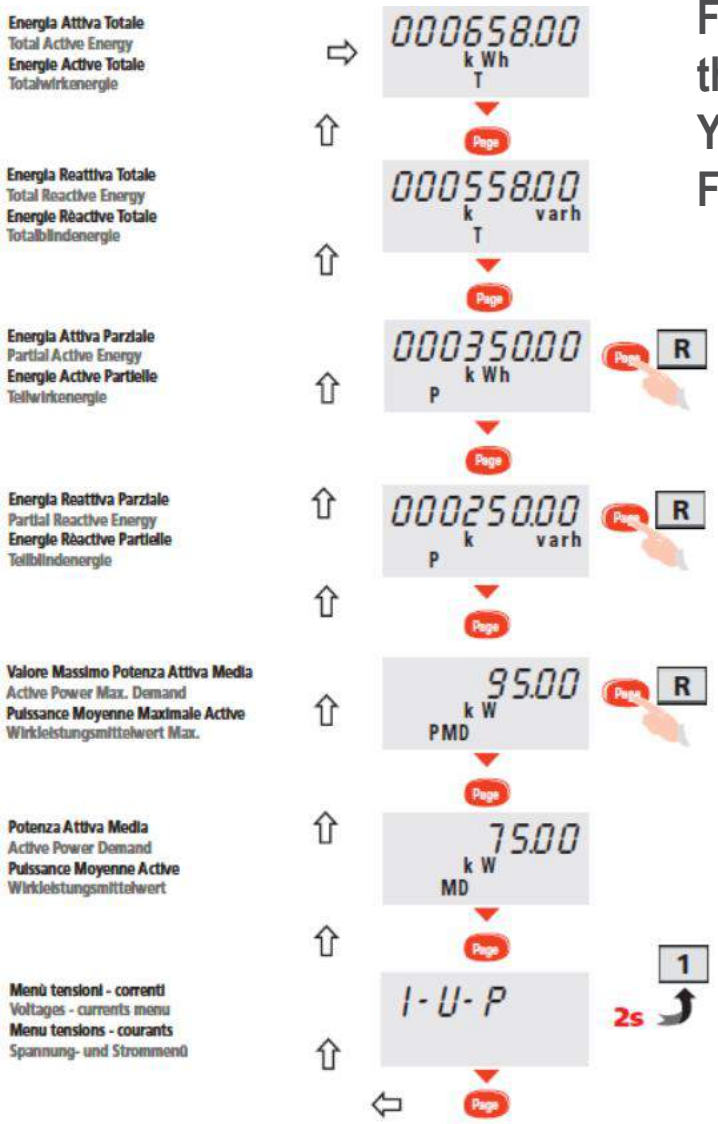


DISPLAY



FRONIUS SMART METER When stepping though the menu's, as shown; Once at I.U.P. leave 2'Sec's You can step though CT's settings, Voltages, Frequency's.

=

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

=

Tenere premuto per 2 secondi
Keep pressed the key for 2 seconds
Tenir appuyé la touche pour 2 secondes
Halten Sie die Taste für 2 Sekunden gedrückt

Attendere 2 secondi
Wait for 2 seconds
Attendre 2 secondes
Warten Sie auf 2 Sekunden

FRONIUS **DATA MANAGER 2.0 CARD/BOX**

Wifi card

Monitoring- and visualisation at Solar.web portal

Open interface,

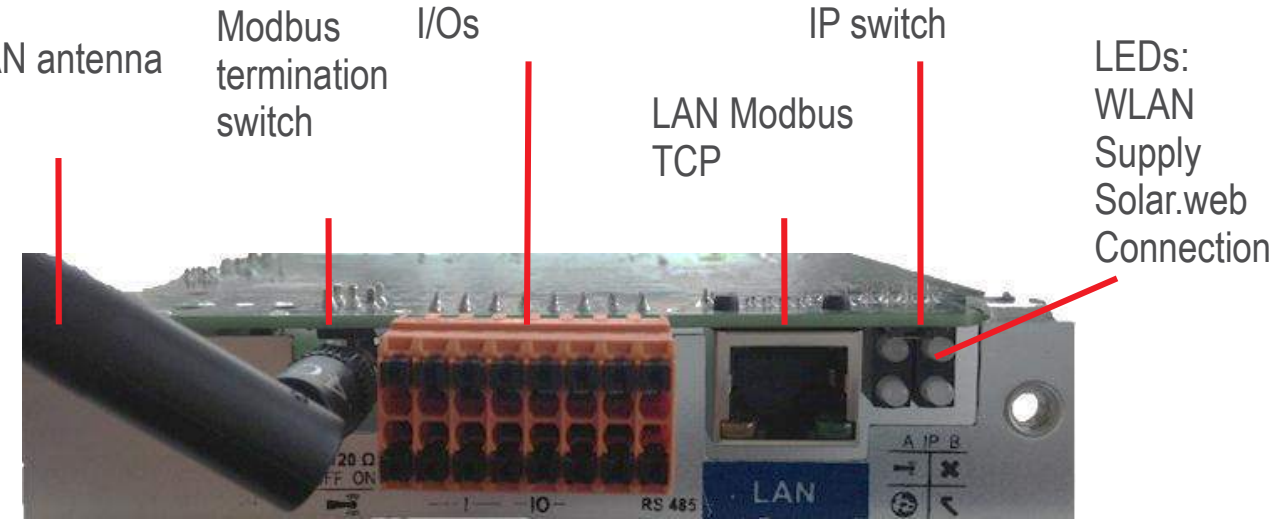
- Modbus TCP SunSpec (Ethernet) and Modbus RTU (RS-485)
- Fronius Solar API (JSON- SunSpec)
- Fronius Smart Meter interface
- No Solar.net RS 485 available.

Fronius Datamanager Box 2.0

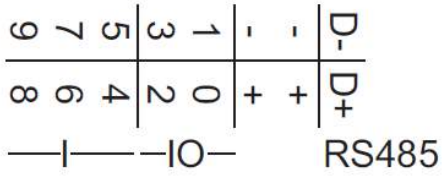
Fronius Datamanager 2.0 Card

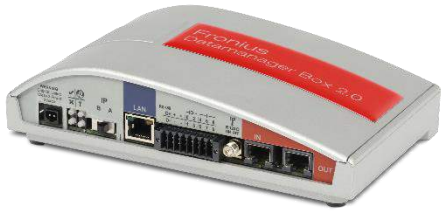
DATA MANAGER 2.0 CARD

With its own on board Software for multible programming events LAN/WLAN on dianostic leds external powers, for switching and communications.



Fronius Datamanager 2.0

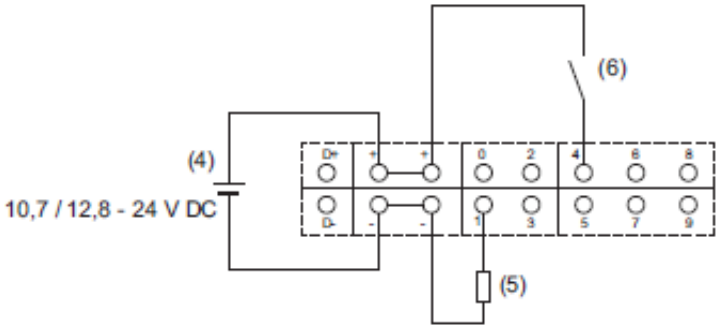


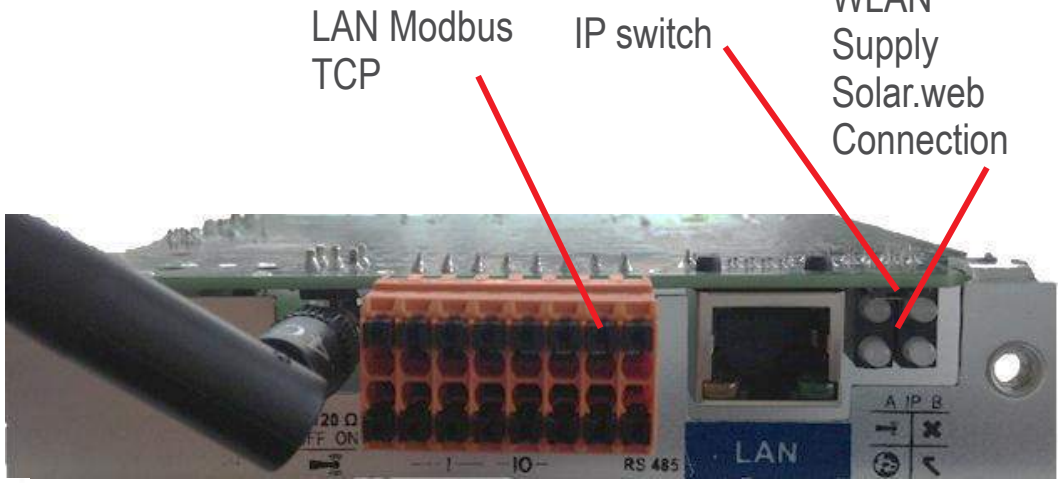


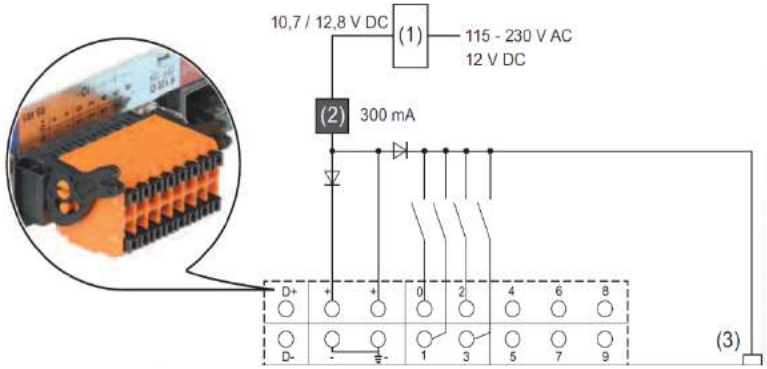
Fronius Datamanager Box 2.0

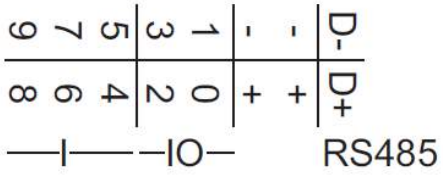
DATA MANAGER 2.0 CARD

With its own on board Software for multible programming events LAN/WLAN on dianostic leds external powers, for switching and communications.









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SHIFTING THE LIMITS

FRONIUS SMARTMETER S/W SETUP

FRONIUS SMARTMETER SOFTWARE SETUP

DATA MANAGER II CARD

There are srerveral ways to communicate with the data manager II, This can be achevied via a Iphone, Sansung Phono, Tablits, Windows Phono or with a laptop directly connected. As in this example. Using a standard ethernet cable, plug one end in to your laptop and the other end in to your Datamanerger II card or box version,
then go to your wifi signal indicater Fig 1. Now Disconnect all Wifi signals as in Fig 2..

Find your wifi signal Fig 1.

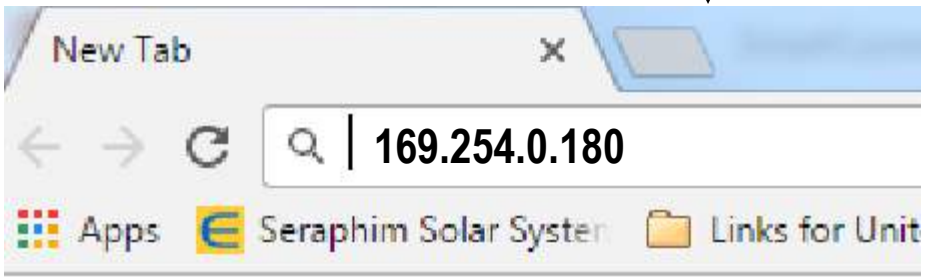
Fronius Inverter

Ethernet Cable CAT 5

Standard Laptop

Then run Google Chrome,

Type in to the search bar 169.254.0.180

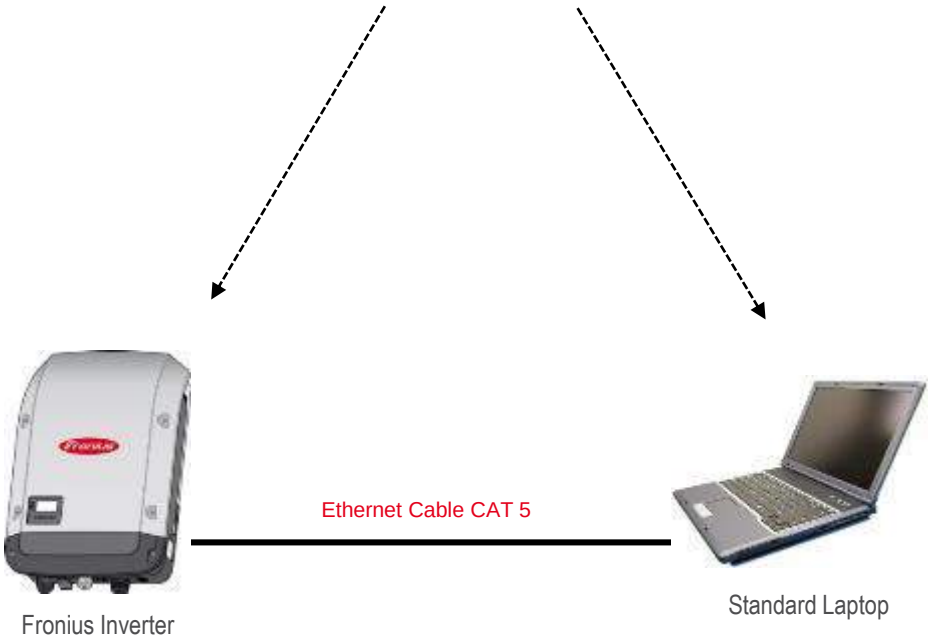


Disconnect you wifi signal Fig 2.

Now the Data Manager will establish it own macro Solar Web system as in Fig 3. Next!

DATA MANAGER II CARD

The Laptop should be directly connected. As in this example. Using a standard ethernet cable, plug one end in to your laptop and the other end in to your Datamanerger II card or box version,



Now the Data Manager will establish it‘s own macro Solar Web

DATA MANAGER II CARD

Then go to your wifi signal indicater Fig 1 . Now Disconnect all Wifi signals as in Fig 2..

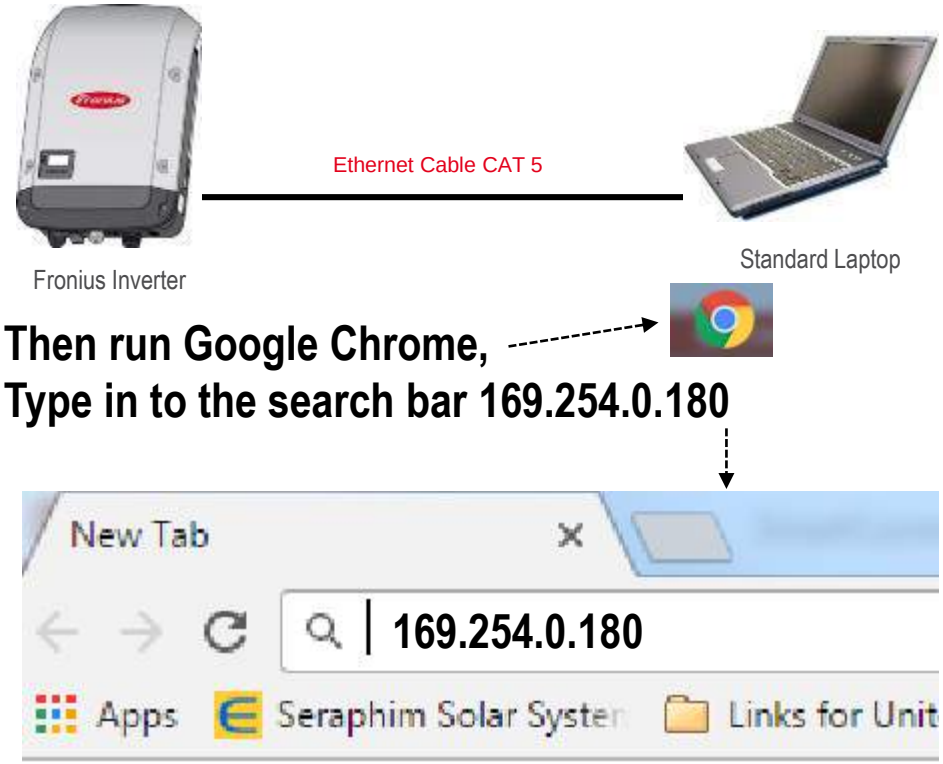
Find your wifi signal Fig 1.

Disconnect you wifi signal Fig 2.

Now the Data Manager will establish it‘s own macro Solar Web

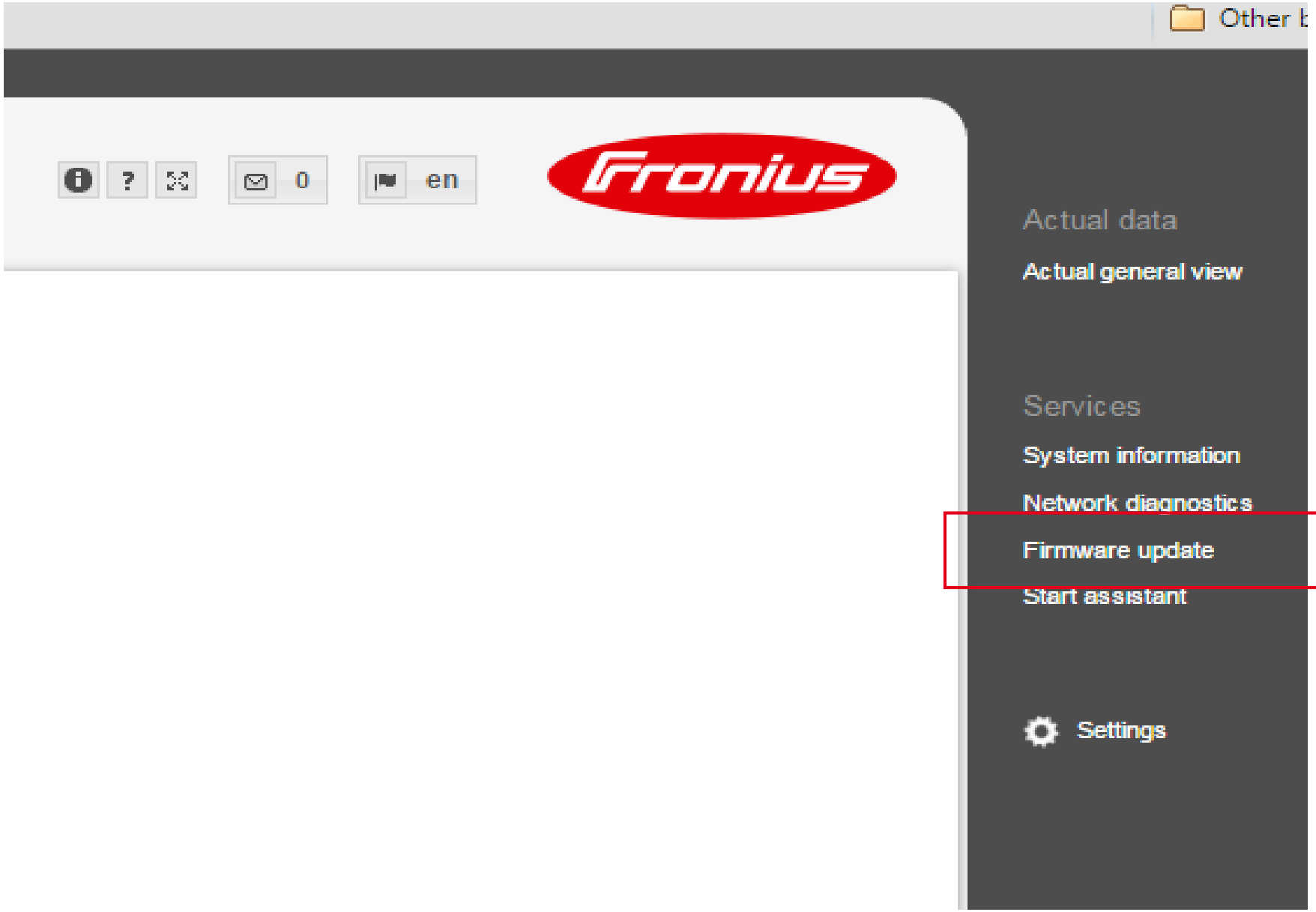
DATA MANAGER II CARD

Laptop directly connected. As in this example. Using a standard ethernet cable, plug one end in to your laptop and the other end in to your Datamanerger II card or box version,



Now the Data Manager will establish it own macro Solar Web system as in Fig 3. Next!

Macro system Fig 3


Other b
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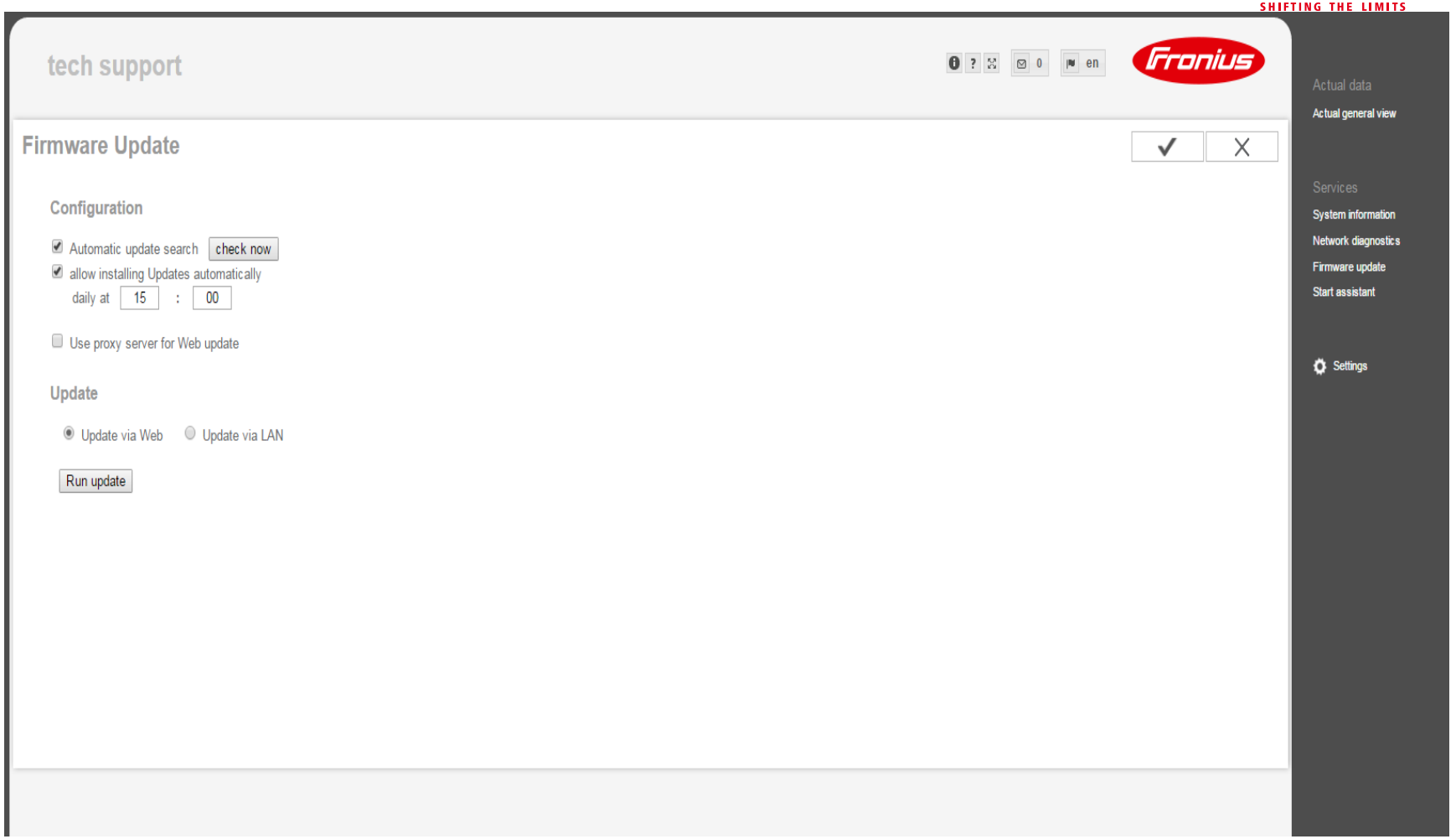
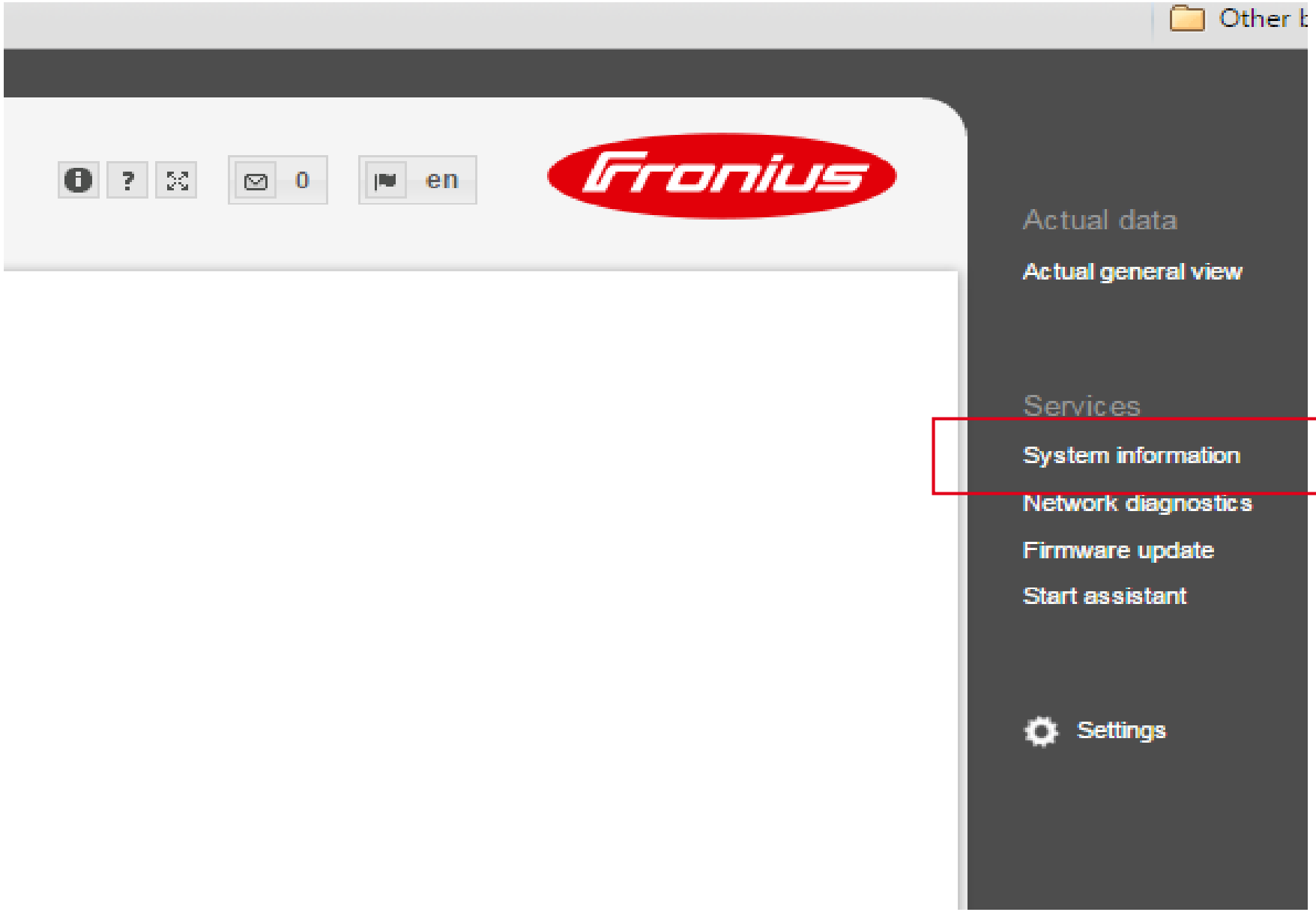
Actual data
Actual general view
Services
System information
Network diagnostics
Firmware update
Start assistant
Settings



You can update software via the internet (WiFi) or though updating from your lap top, there is a facility where you can update the Datamanager II by down loading the update file from the Fronius web site.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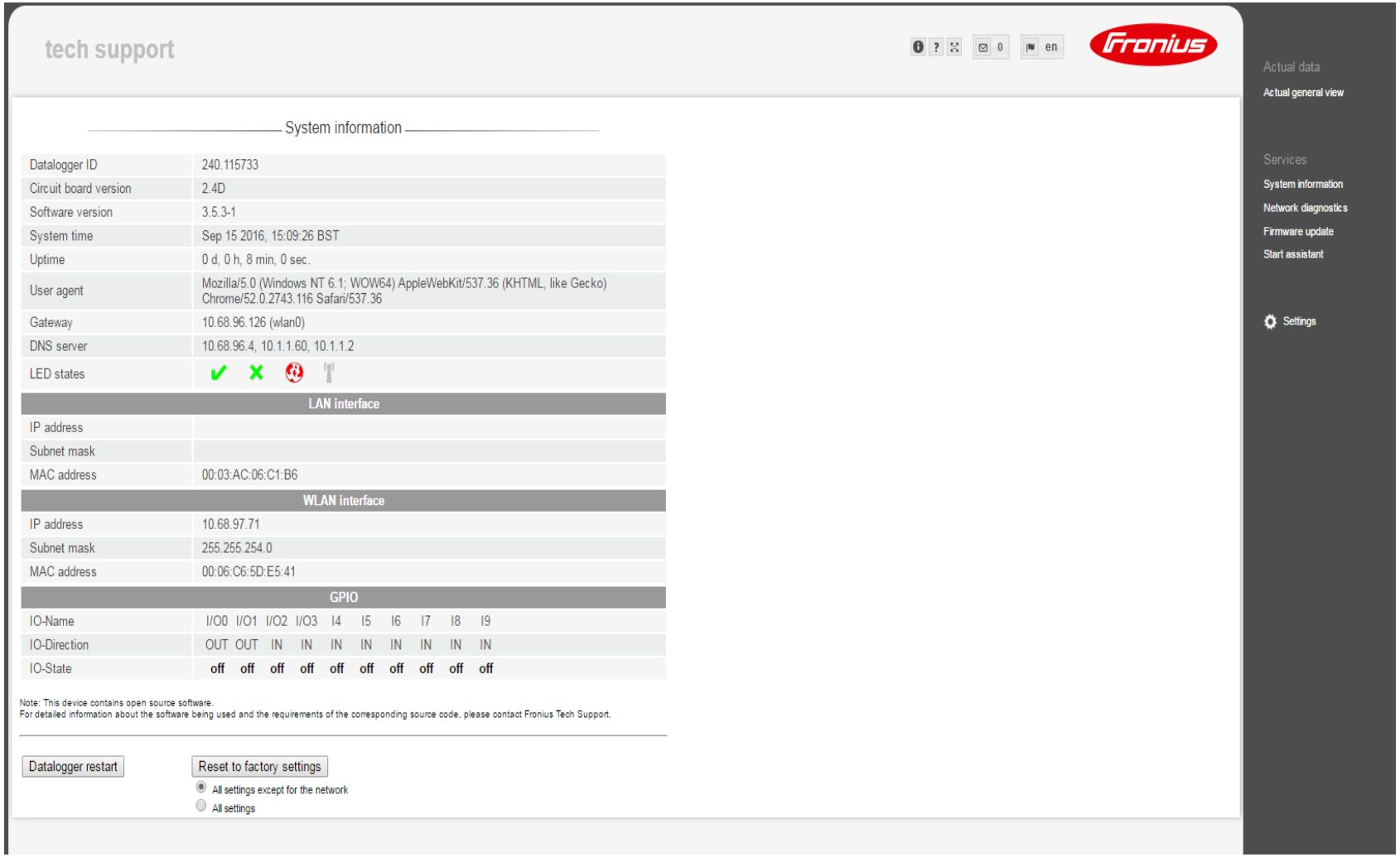
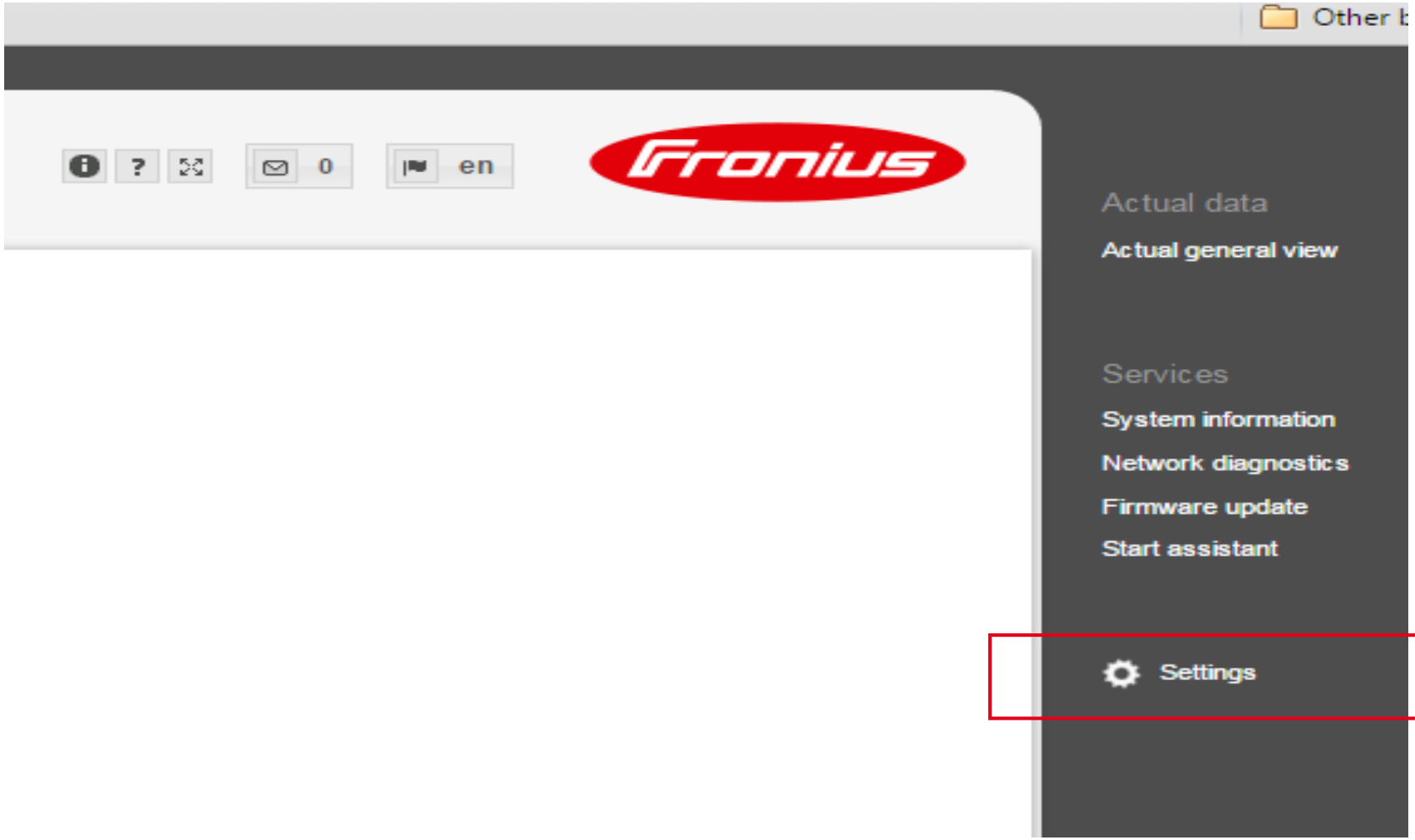


System Information shows in real time the condition and versions plus the I/O‘s status‘



The setting‘s option allows you to enter the system and alter setting‘s

Fronius
SHIFTING THE LIMITS

- GENERAL
- PASSWORDS
- INVERTERS
- FRONIUS SENSOR CARDS
- FRONIUS SOLAR.WEB
- SERVICE MESSAGES
- NETWORK
- ENERGY MANAGER
- PUSH SERVICE
- MODBUS
- METER

DNO EDITOR

DNO editor

Tech Support, on 9/14/2016, 8:18:18 AM

IO control

unlocked	Input pattern										Active power	Power factor cosφ			UC output	excluded inverter(s)	
	I/O 0	I/O 1	I/O 2	I/O 3	I4	I5	I6	I7	I8	I9					I/O 0		
☑	■	■	▒	▒	□	□	□	□	□	▒	☑ 40 %	☑ 1	○ ind	◉ cap	☑		⊖
☑	■	■	▒	▒	□	□	□	□	□	▒	☑ 30 %	☑ 1	○ ind	◉ cap	☑		⊖
☑	■	■	▒	▒	□	□	□	□	□	▒	☑ 20 %	☑ 1	○ ind	◉ cap	☑		⊖
☑	■	■	▒	▒	□	□	□	□	□	▒	☑ 10 %	☑ 1	○ ind	◉ cap	☑		⊖
☑	■	■	▒	▒	□	□	□	□	□	▒	☑ 0 %	☑ 1	○ ind	◉ cap	☑		⊖
☐	■	■	▒	▒	▒	▒	▒	▒	▒	▒	☐ %	☐	○ ind	◉ cap	☐		⊕

■ ... not applicable ▒ ... not considered □ ... pin open ■ ... pin closed

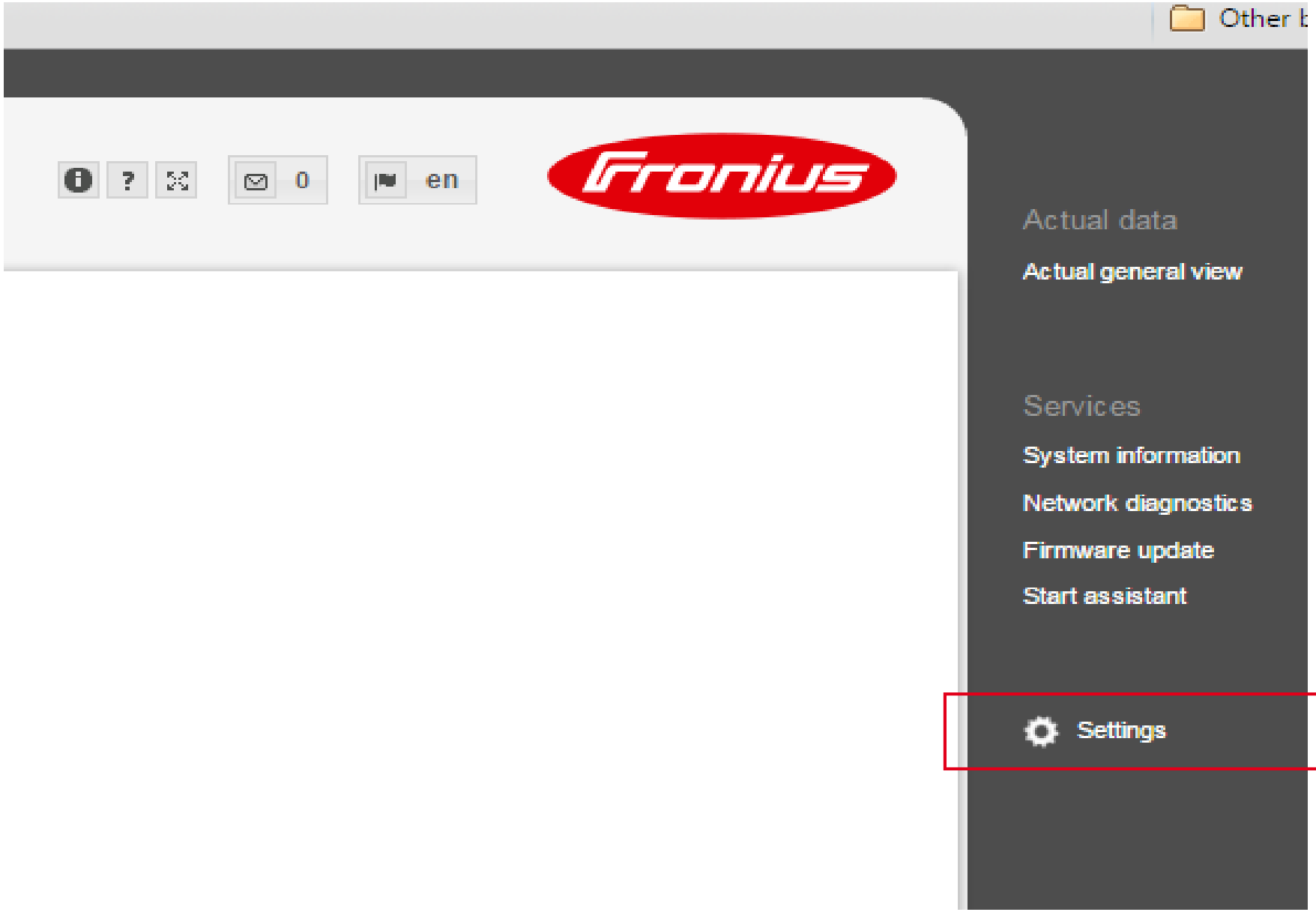
Import Export

Dynamic power reduction

Power limit: ○ No limit ◉ limit for entire system

total DC power of the system: 1500 Wp

Maximum grid feed-in power: 100 W


Other
0
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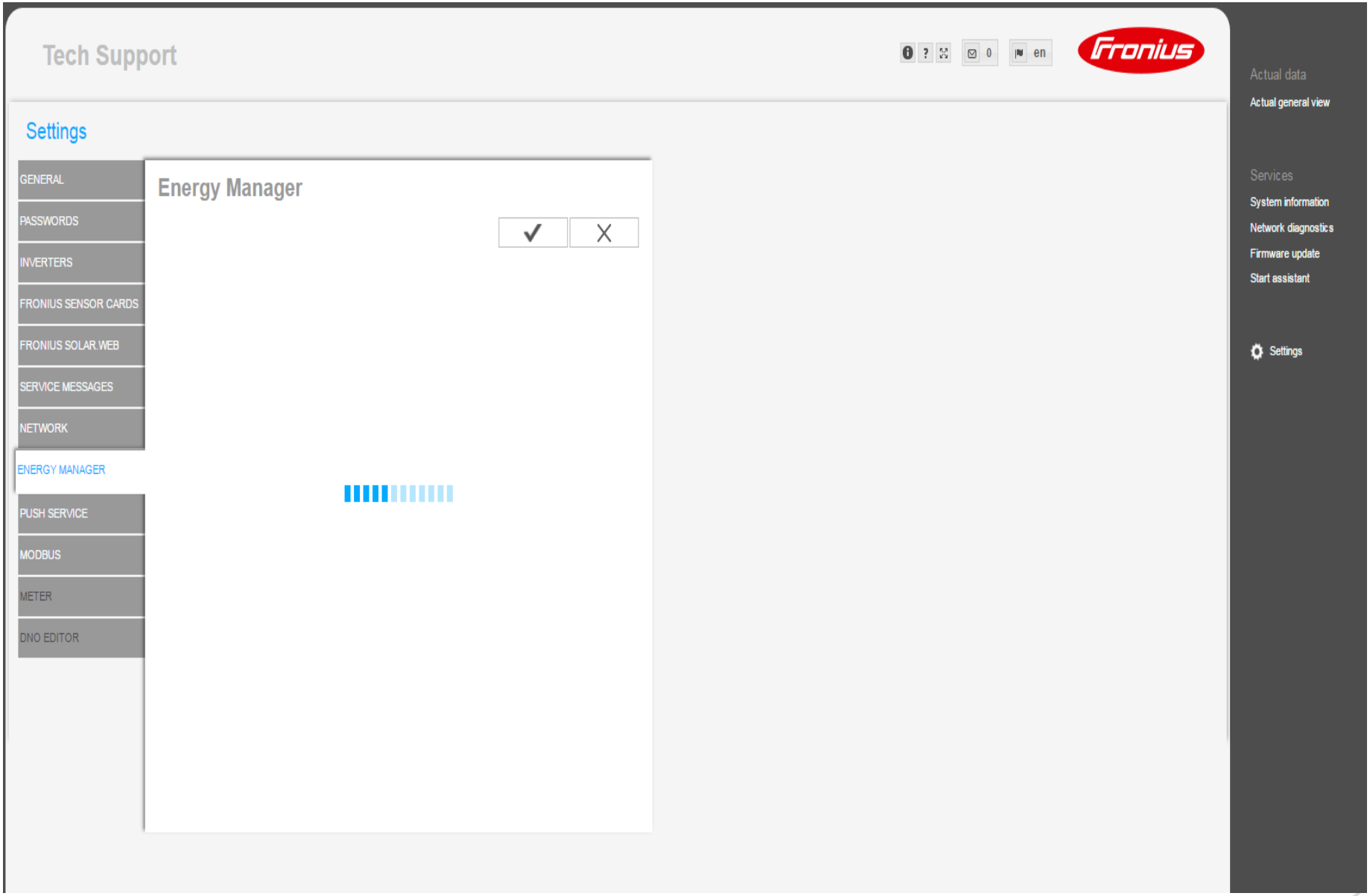
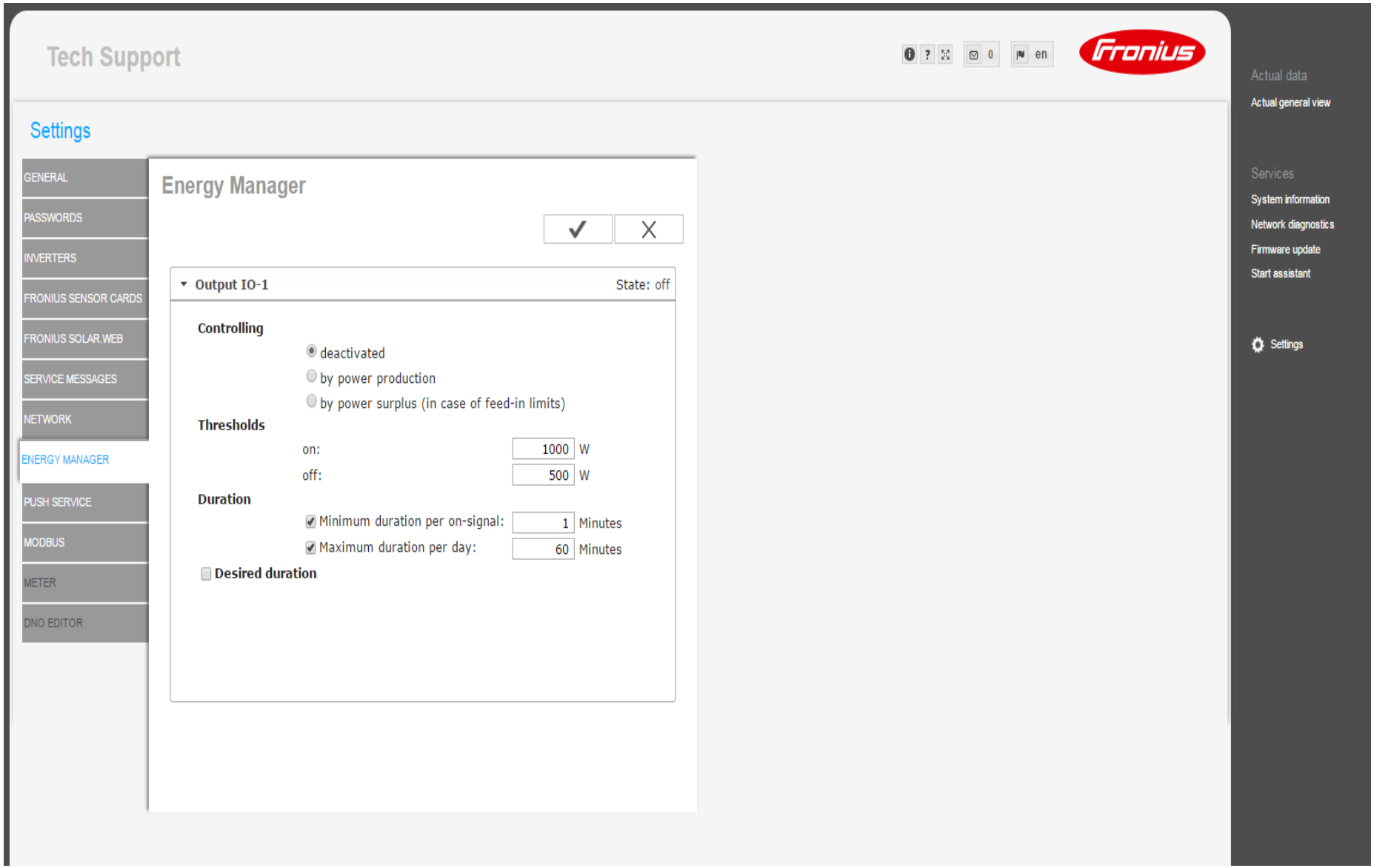
Firmware update
Start assistant
Settings

Fronius
SHIFTING THE LIMITS

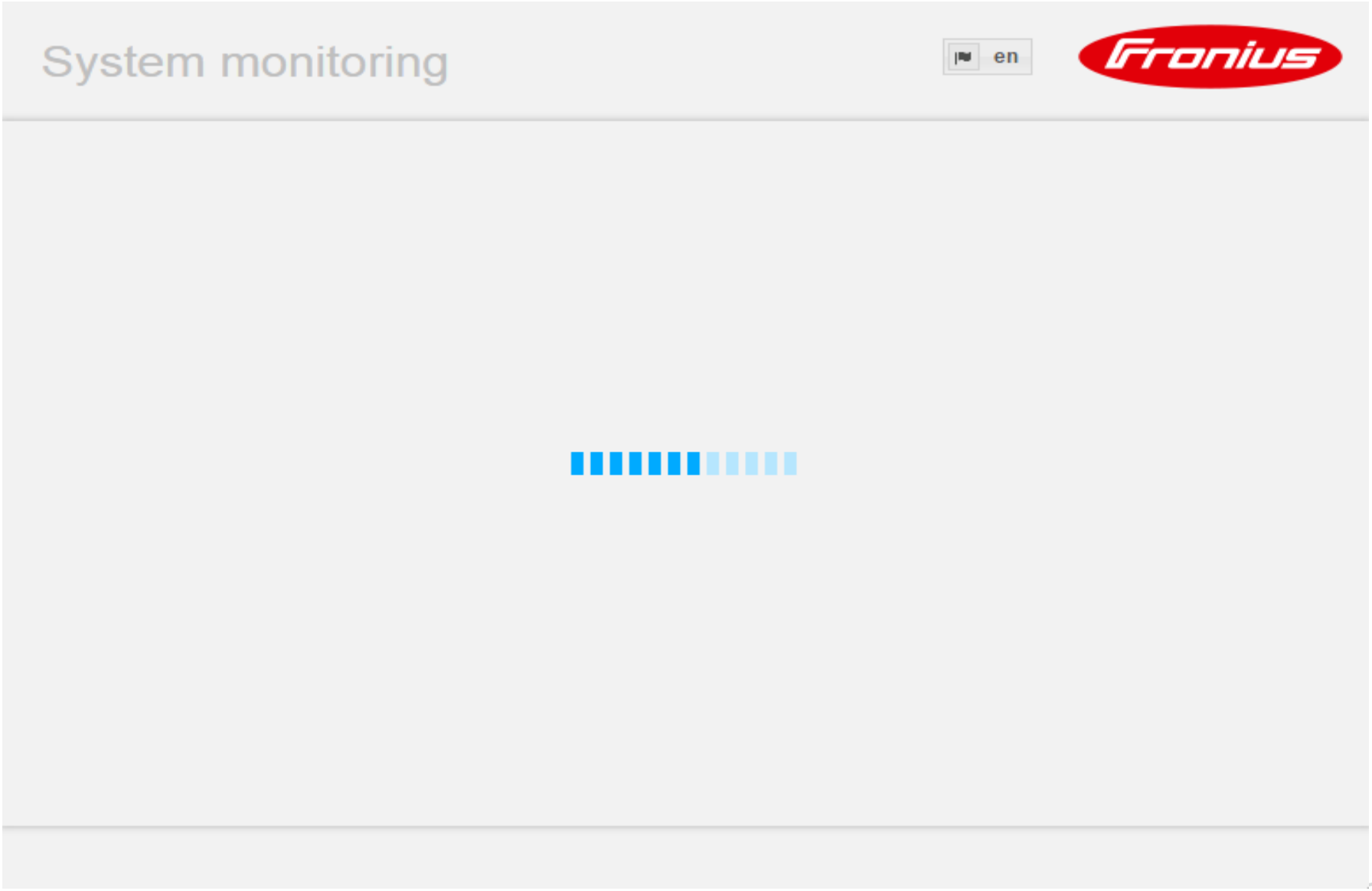


Tech Support

Energy Manager



FRONIUS SMARTMETER S/W SETUP



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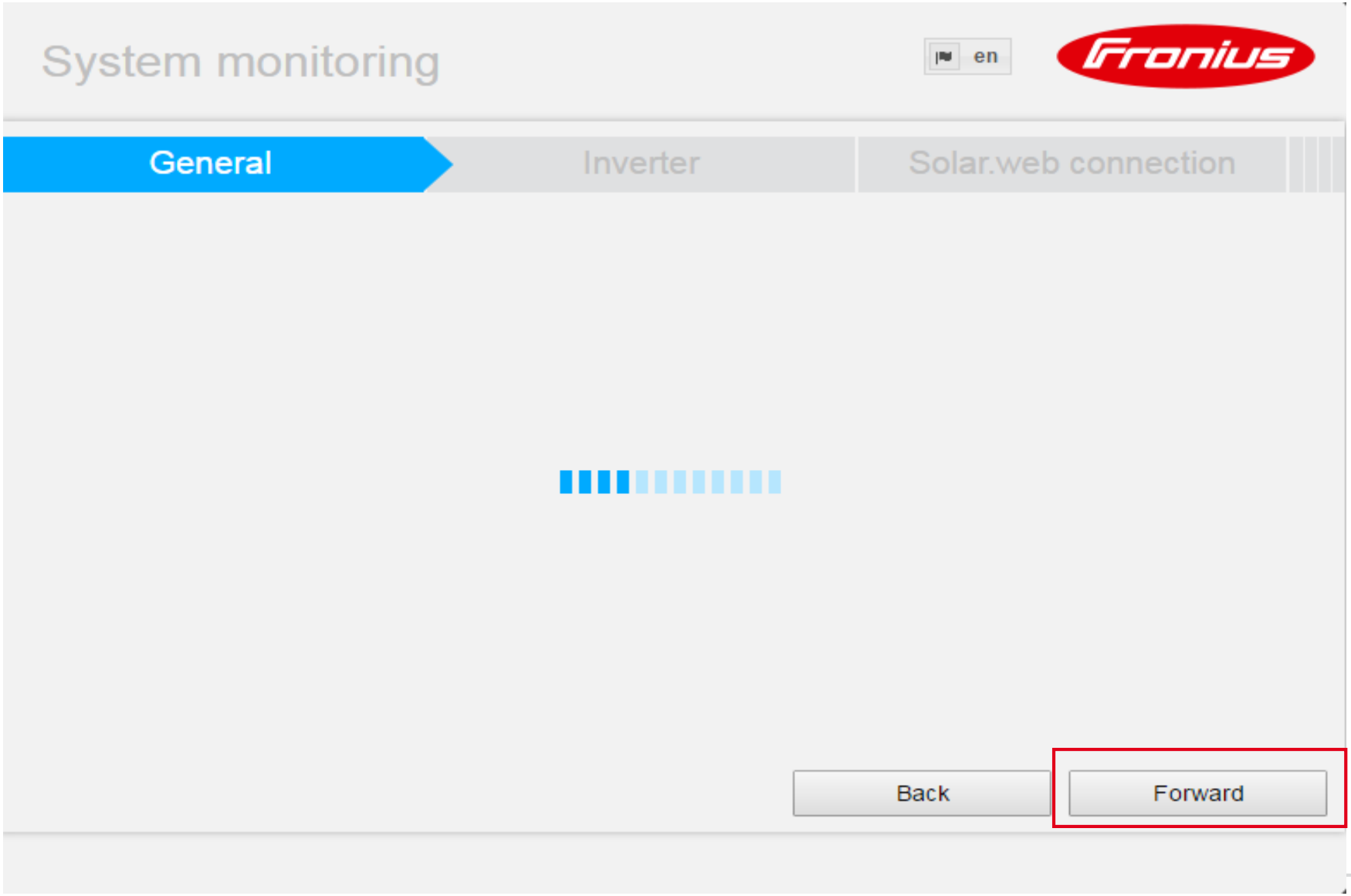
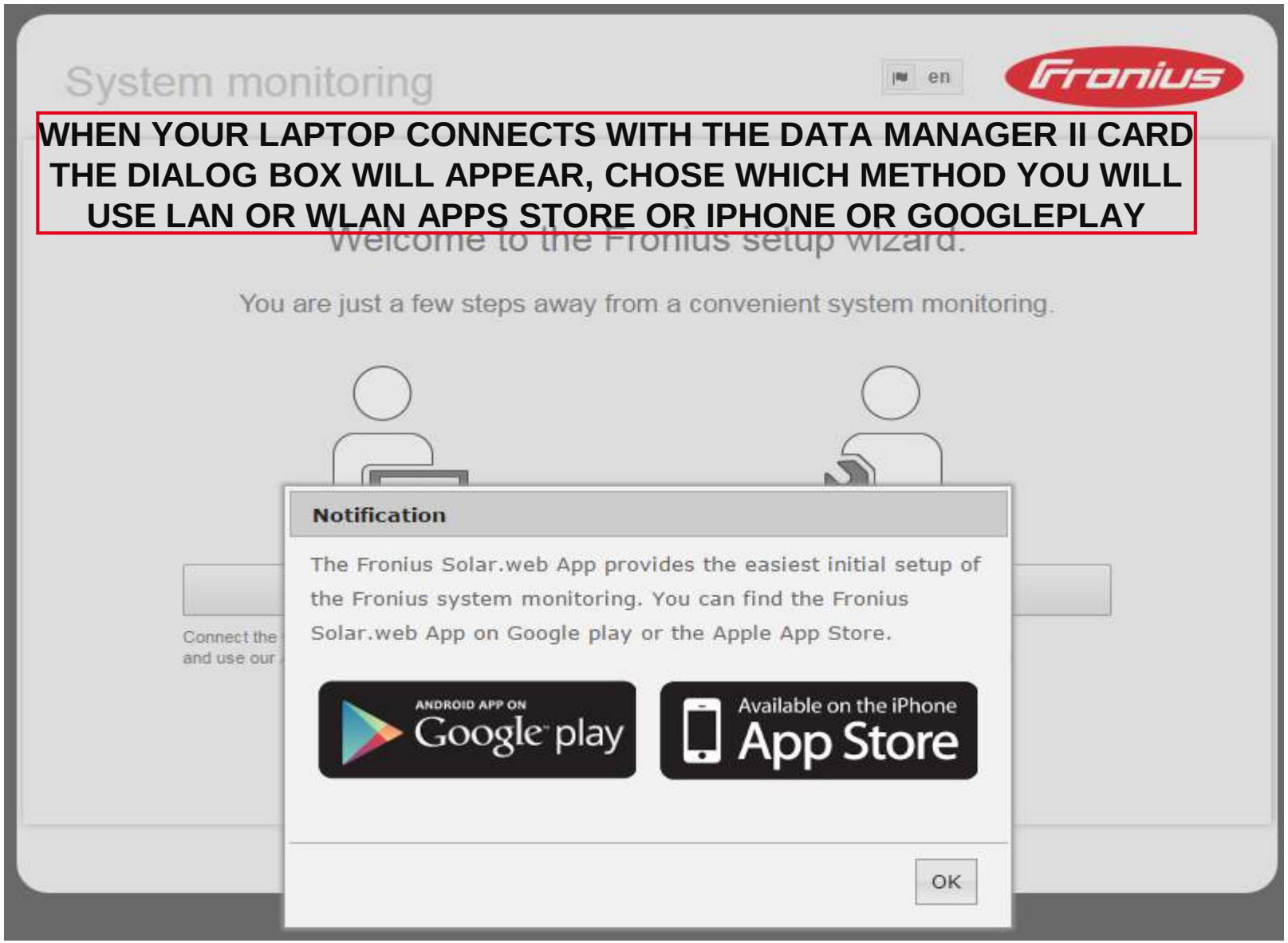
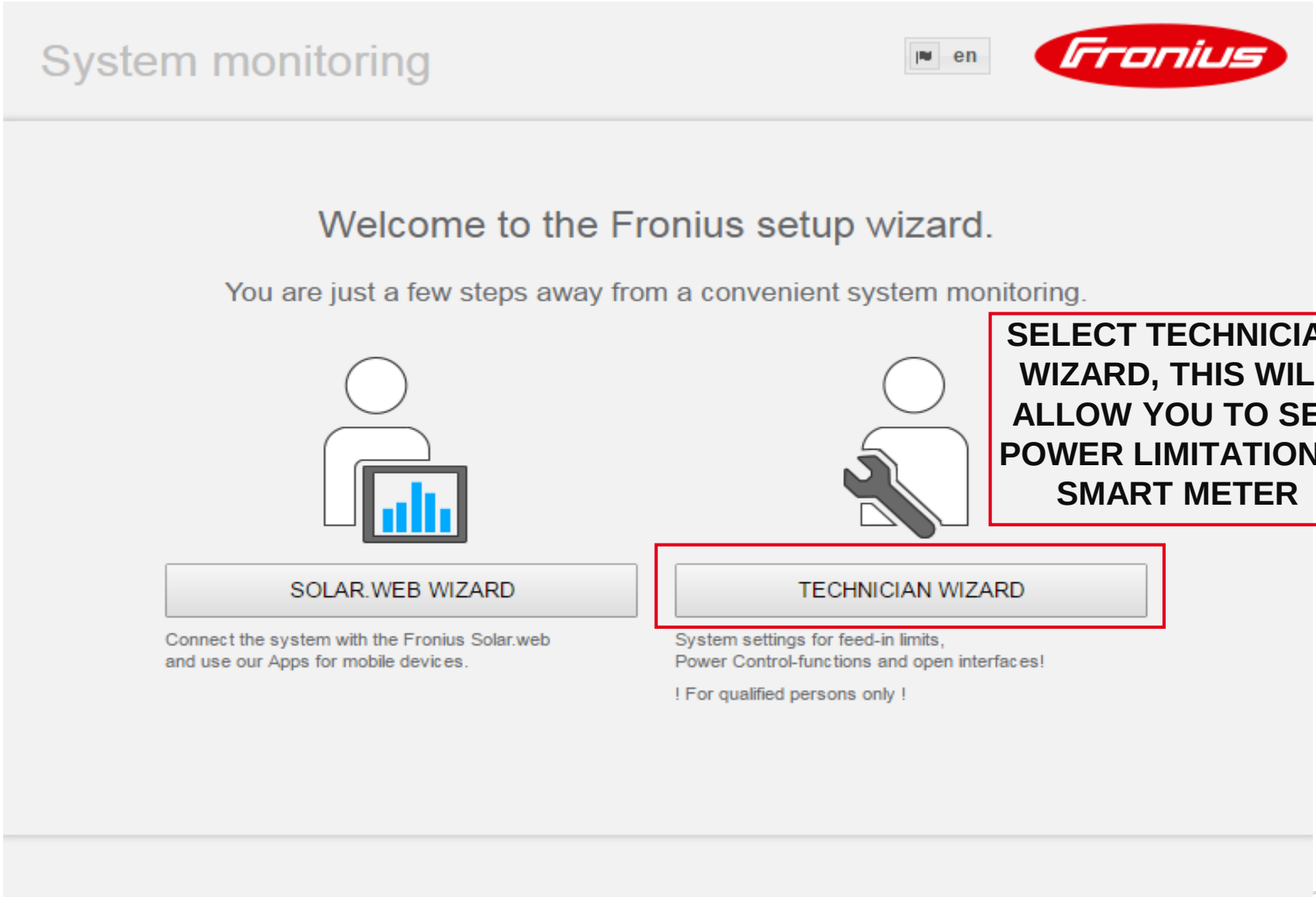


FRONIUS SMARTMETER S/W SETUP

WHEN YOUR LAPTOP CONNECTS WITH THE DATA MANAGER II CARD THE DIALOG BOX WILL APPEAR, CHOSE WHICH METHOD YOU WILL USE LAN OR WLAN APPS STORE OR IPHONE OR GOOGLEPLAY



FRONIUS SMARTMETER S/W SETUP



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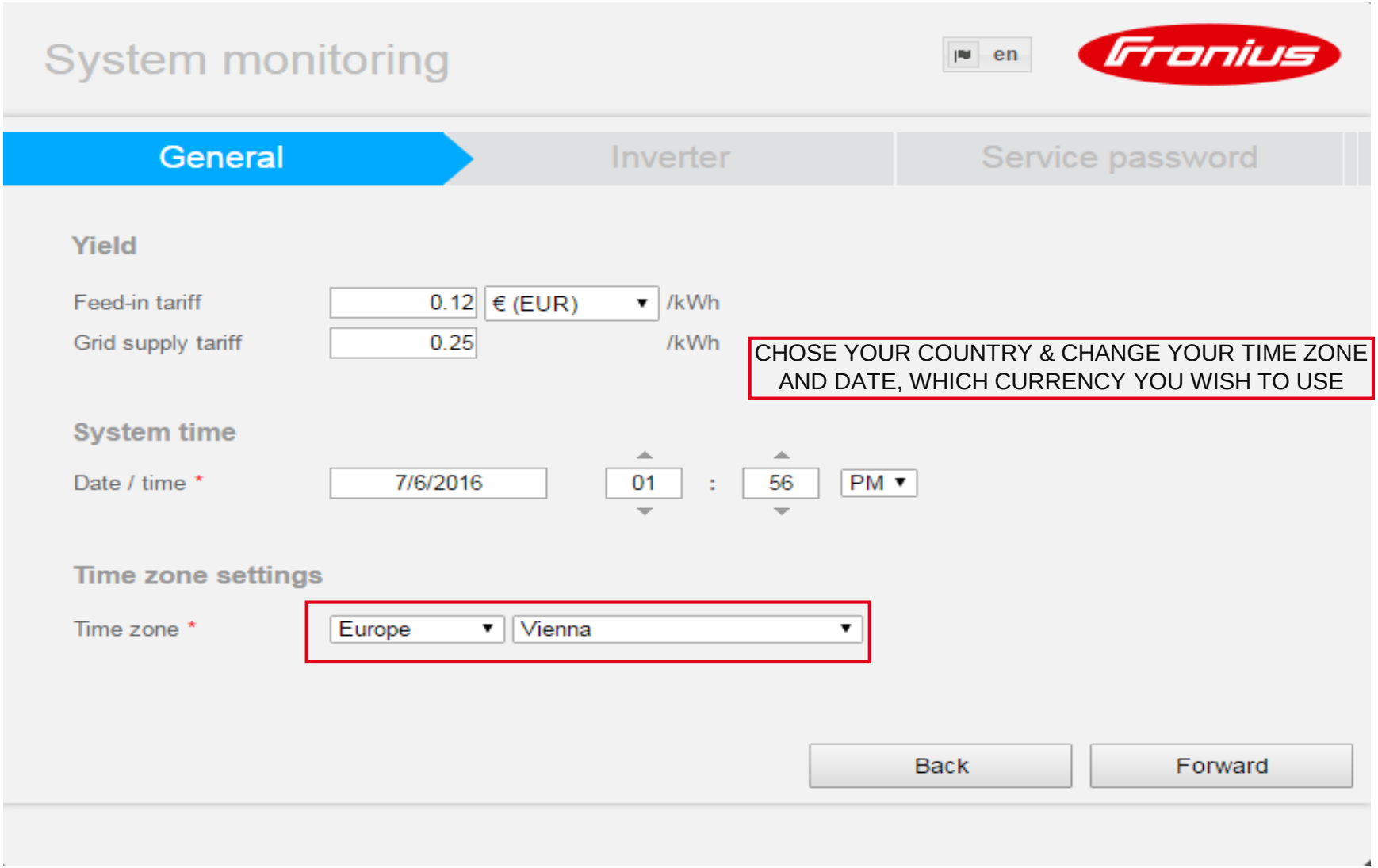

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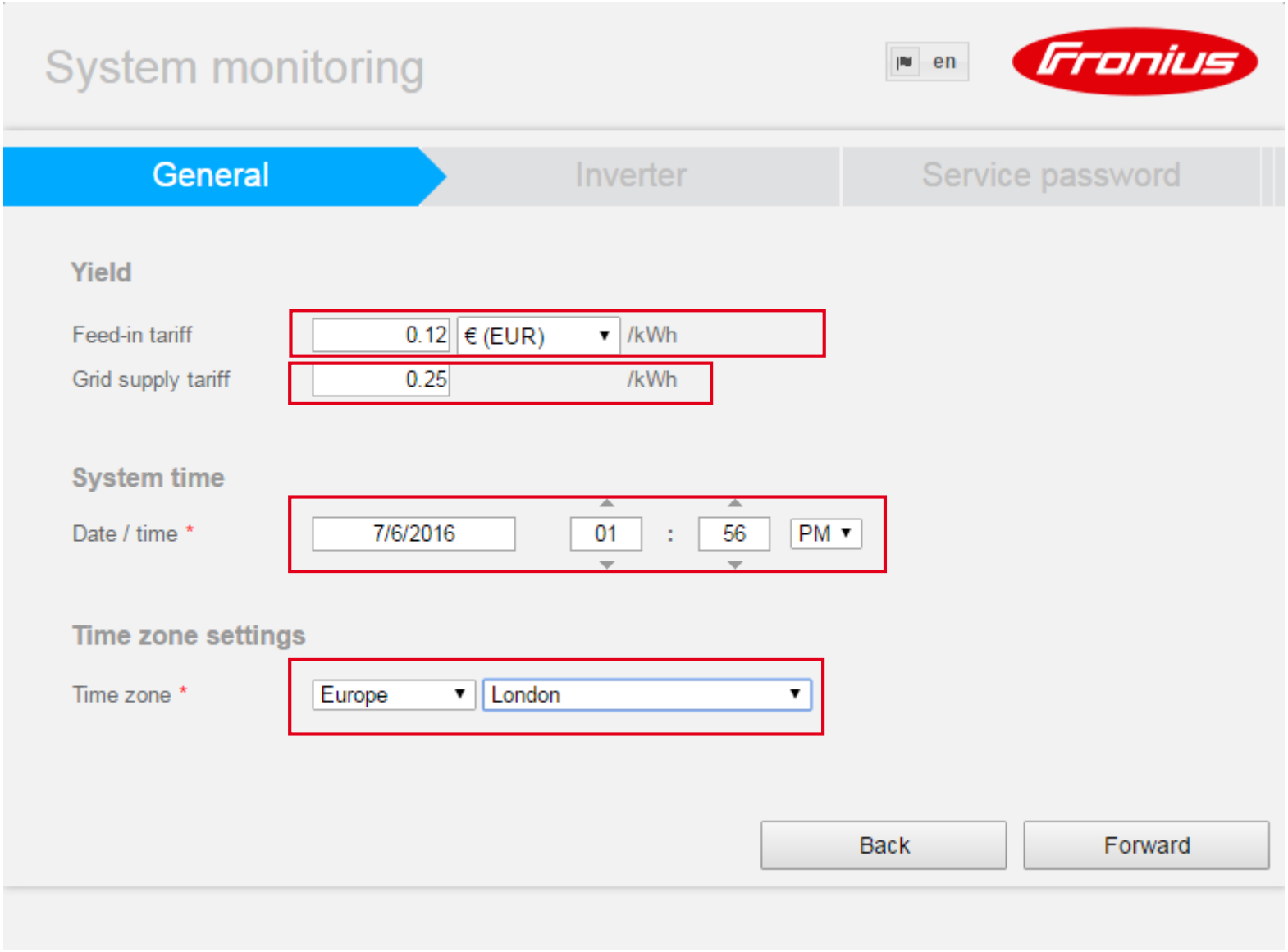

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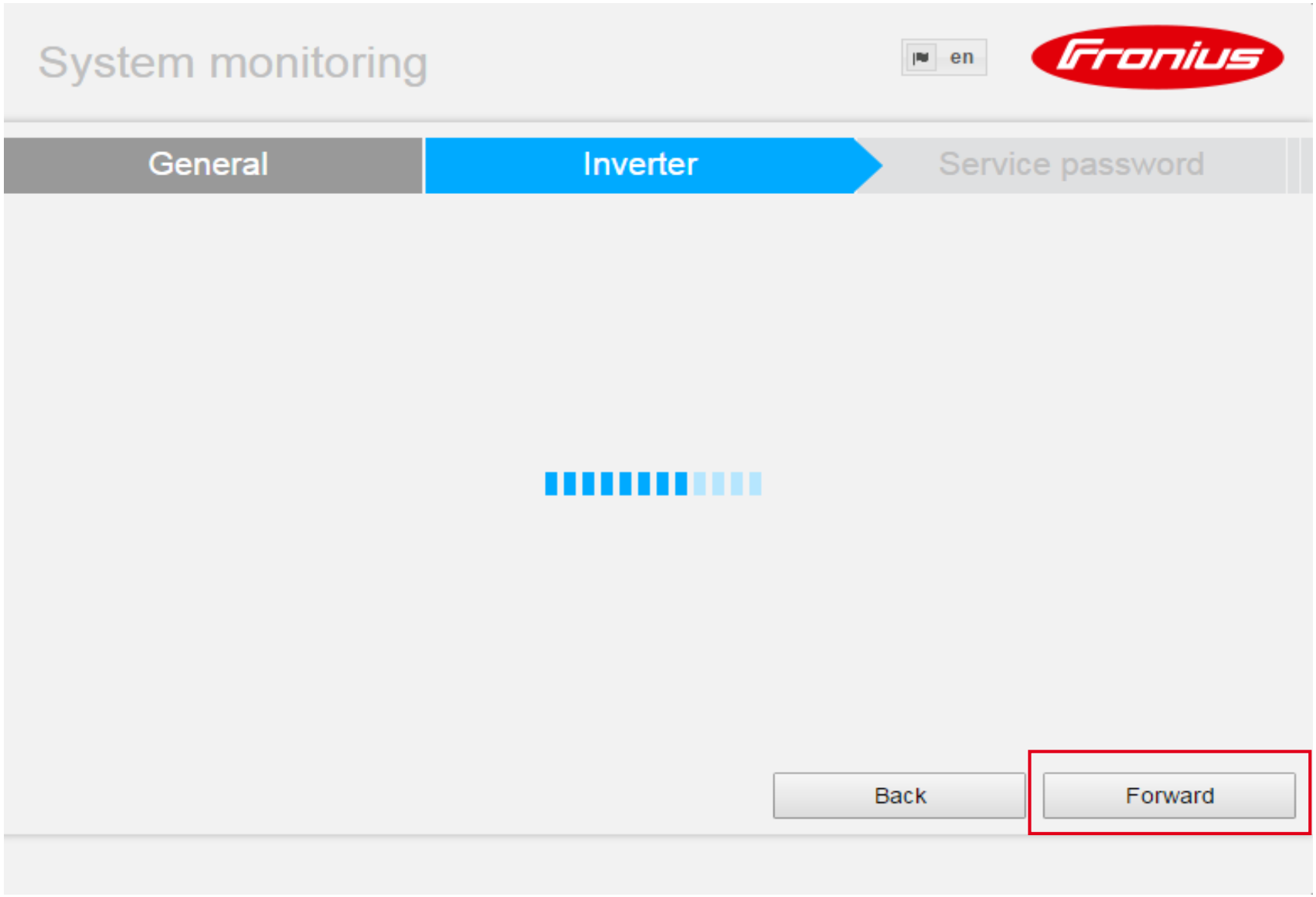

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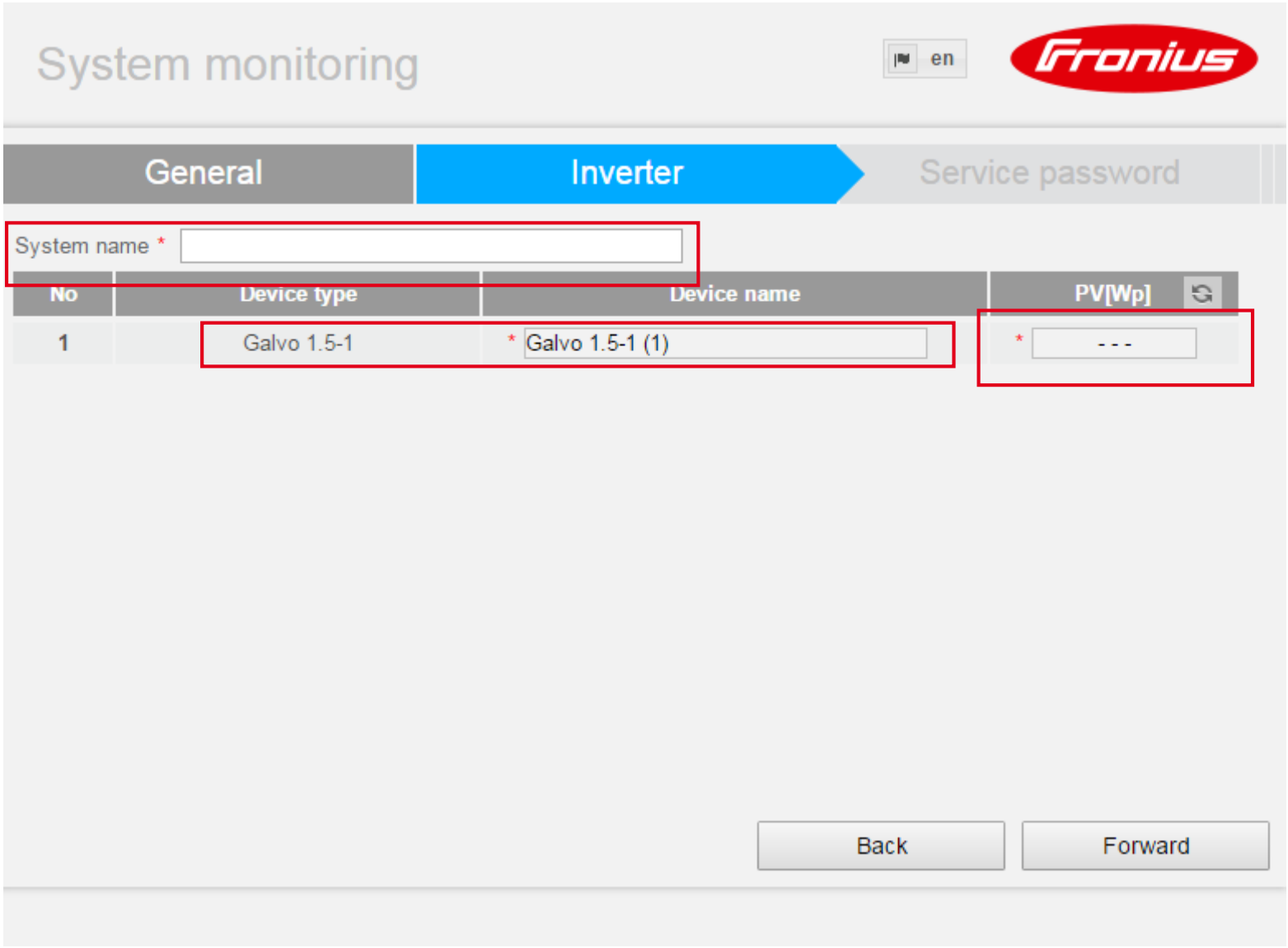

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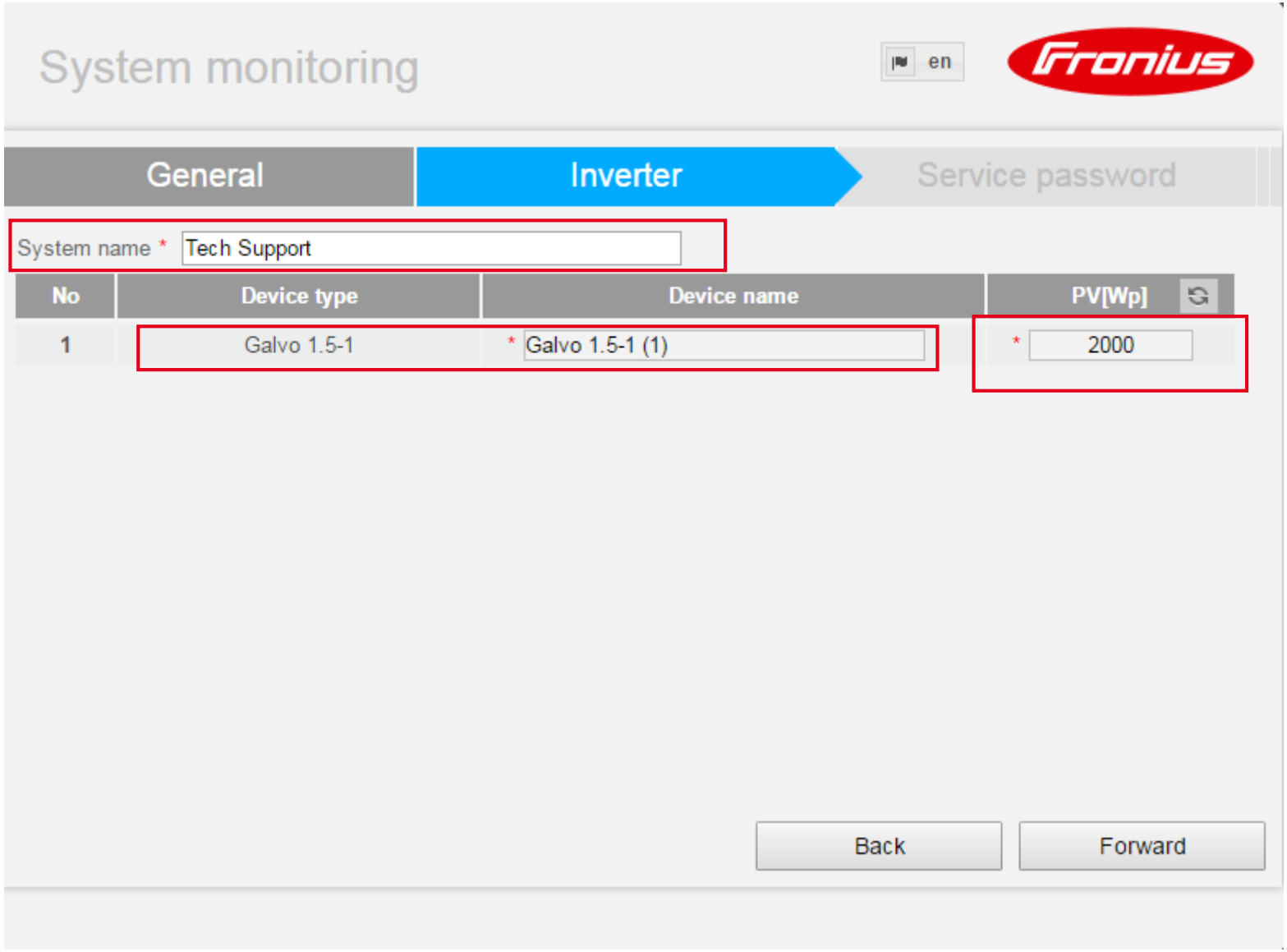
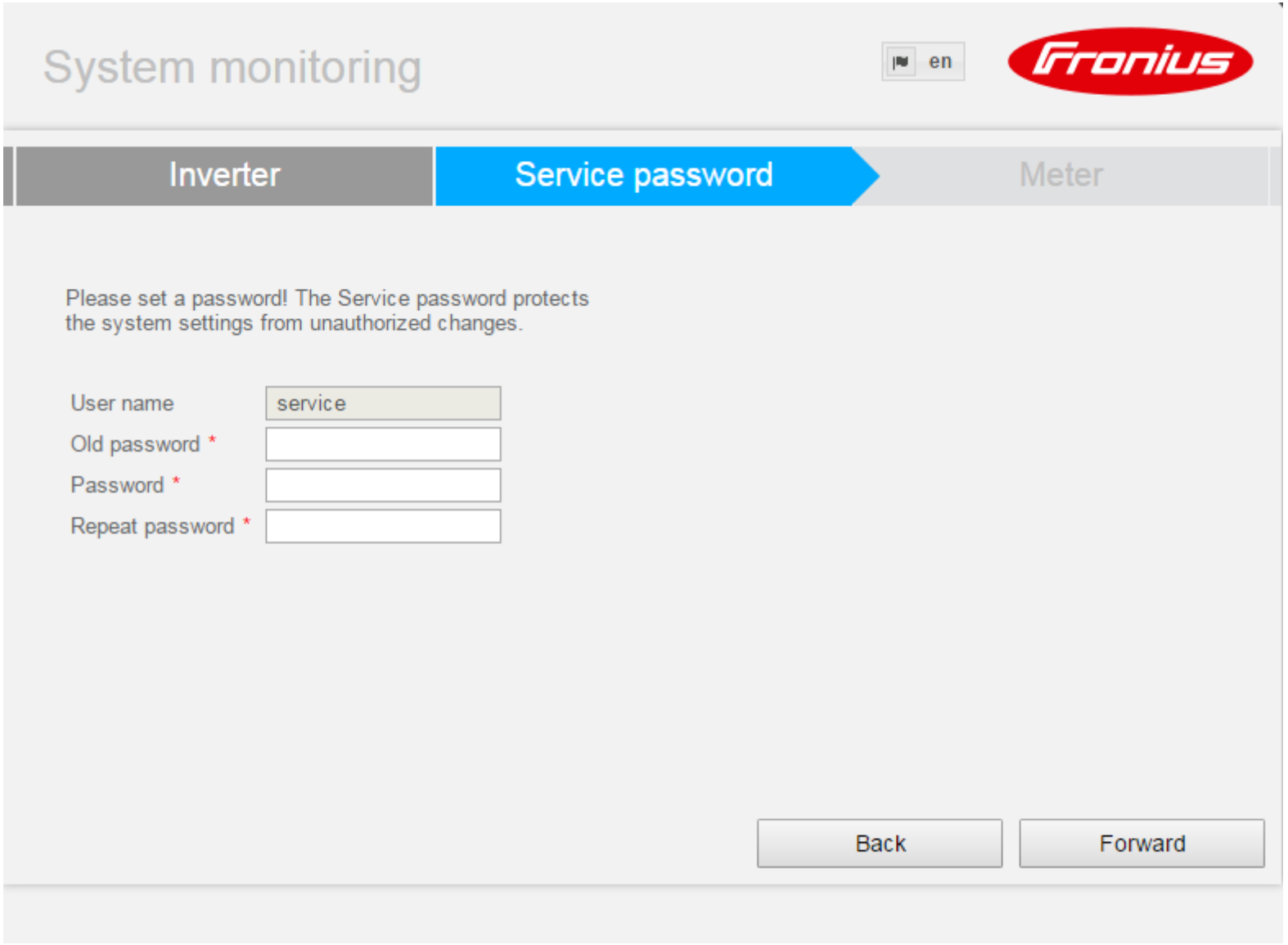


Fronius
SHIFTING THE LIMITS

FRONIUS SMARTMETER S/W SETUP



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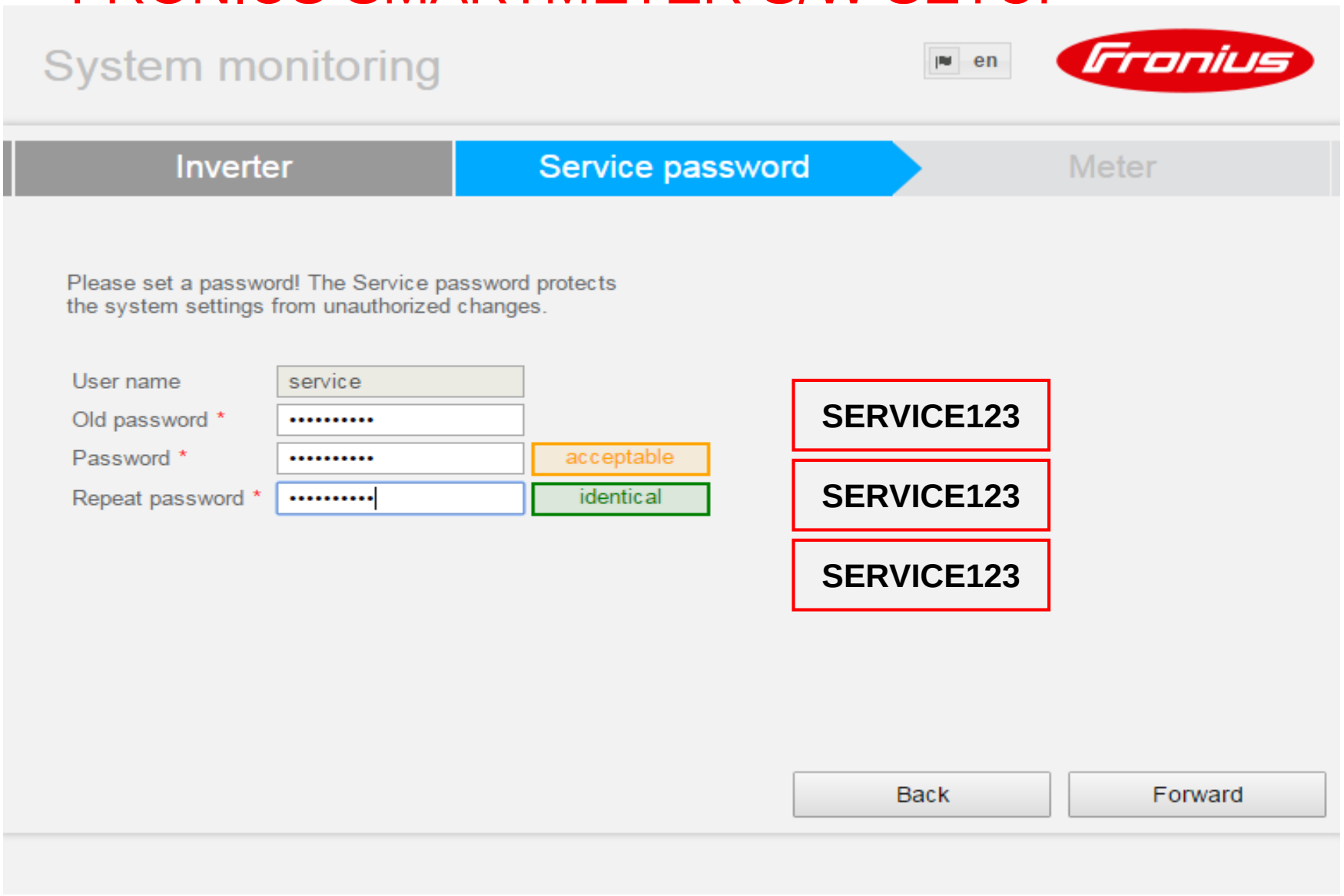

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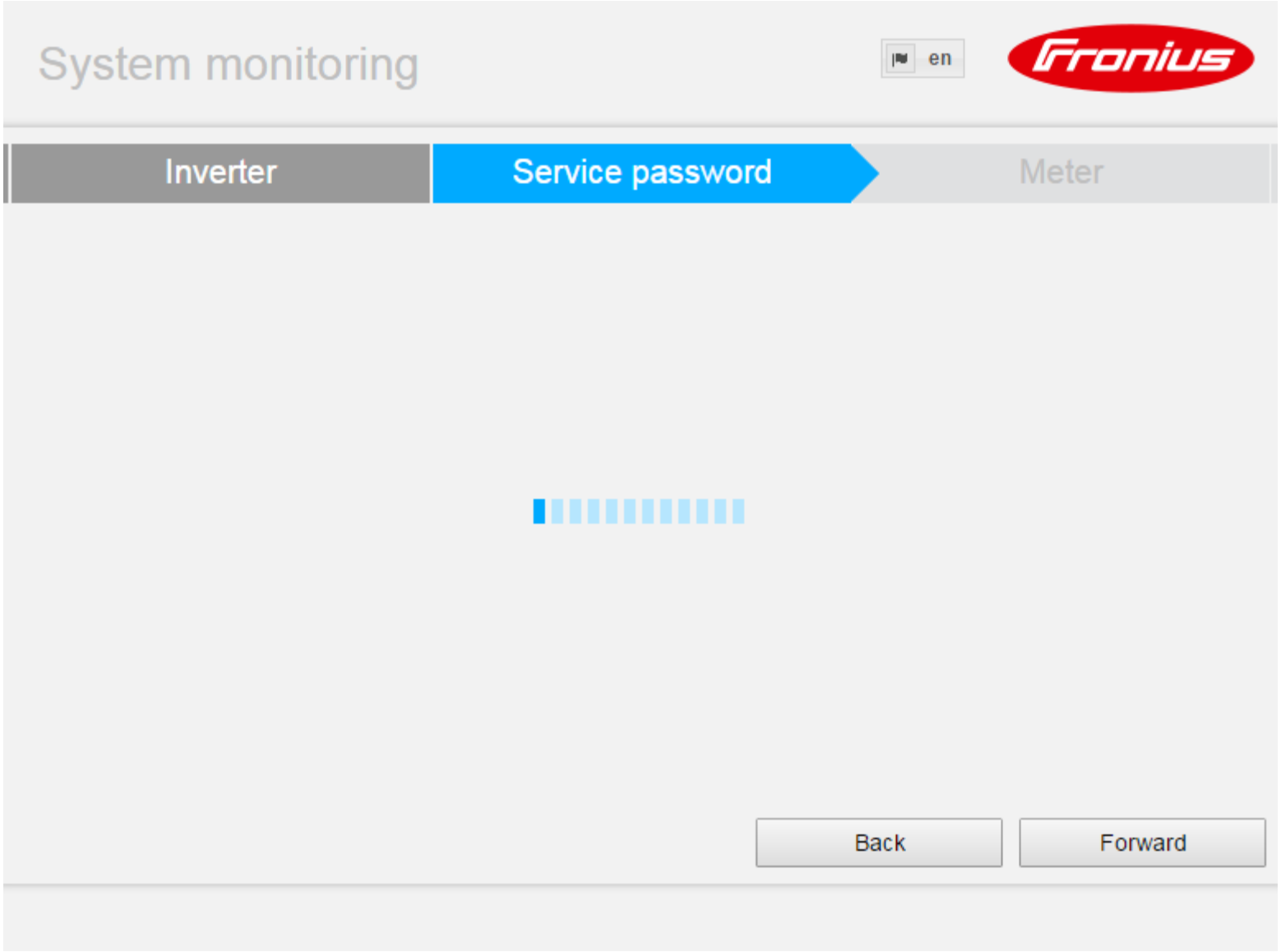

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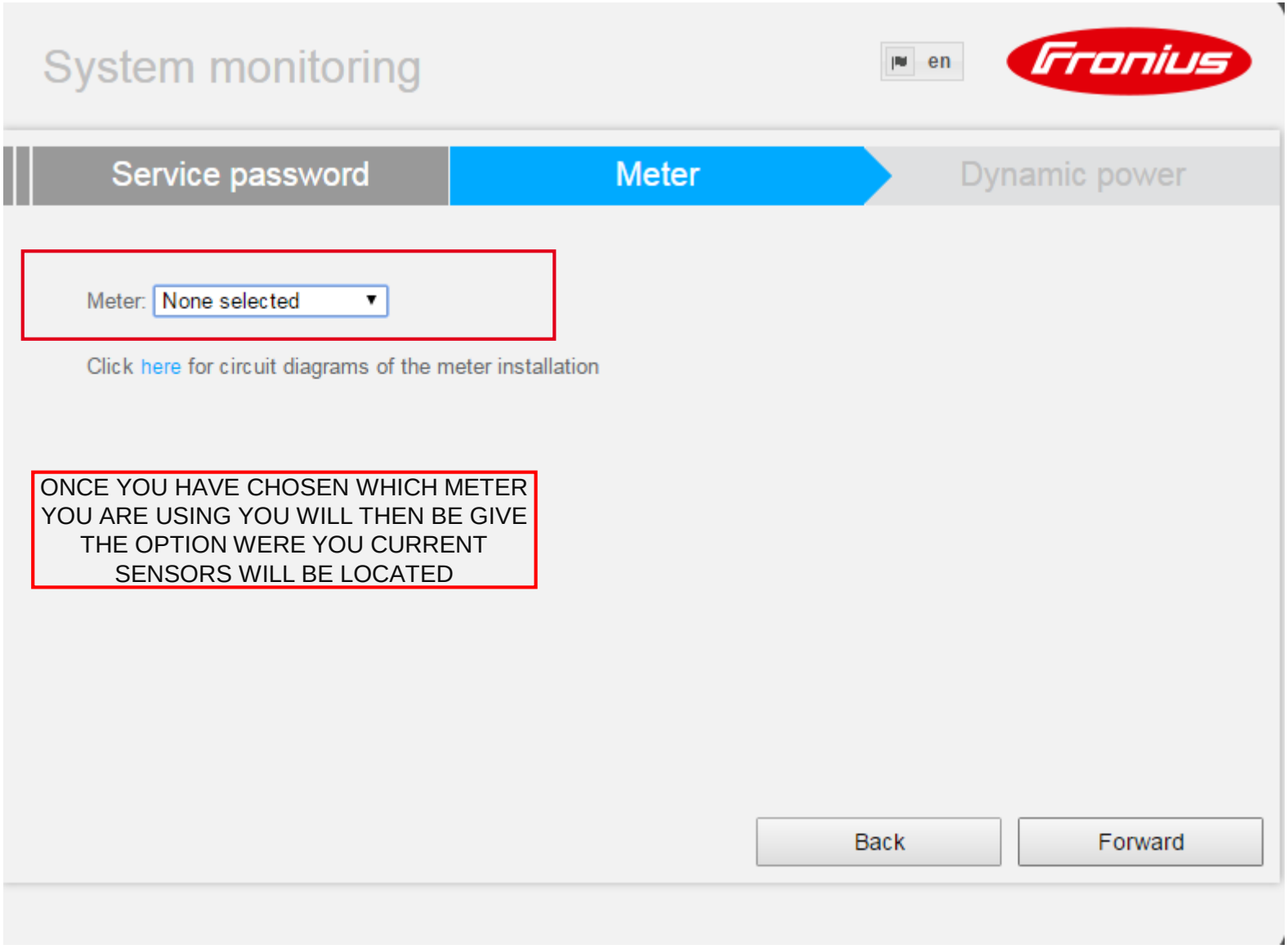

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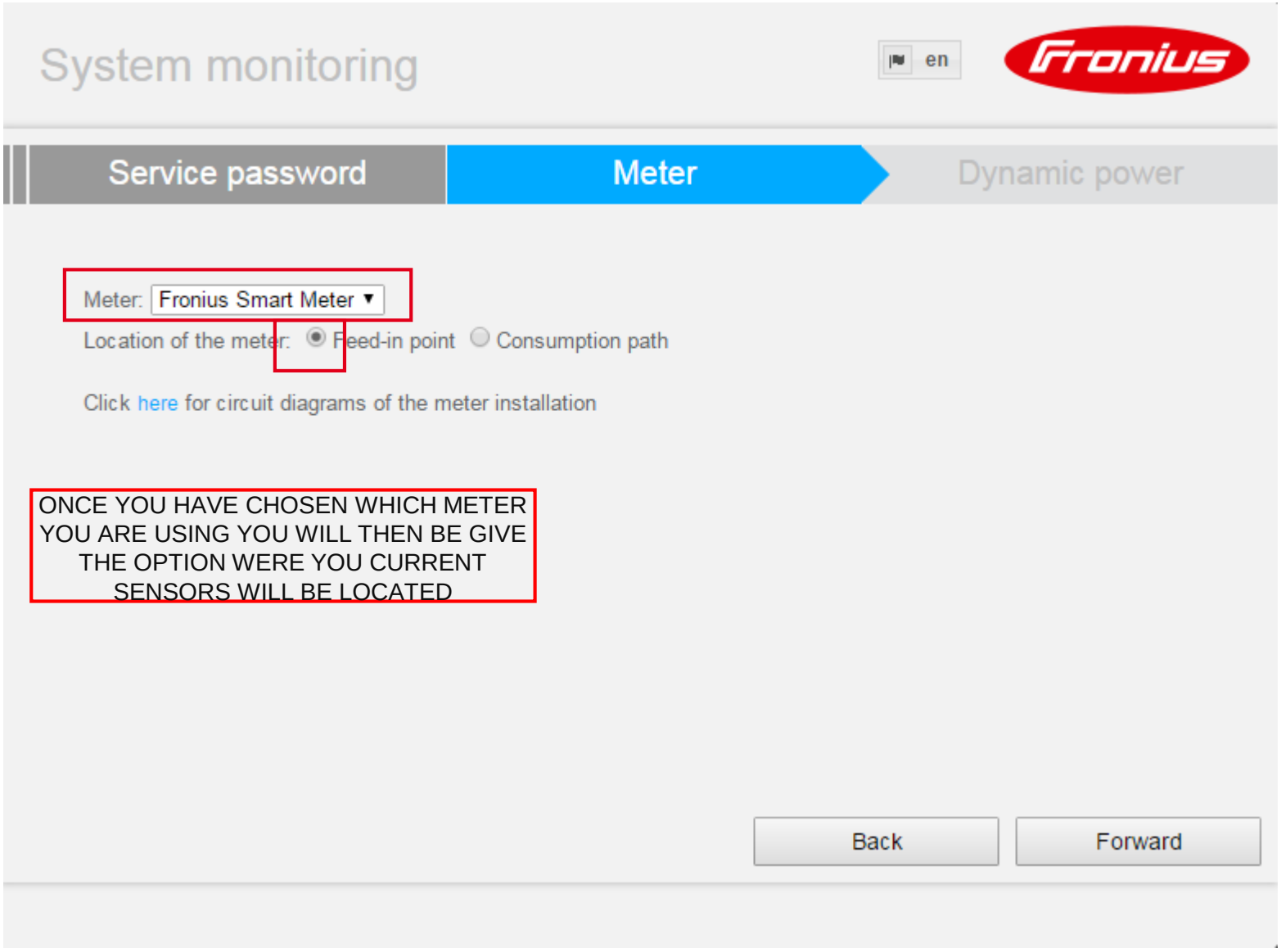

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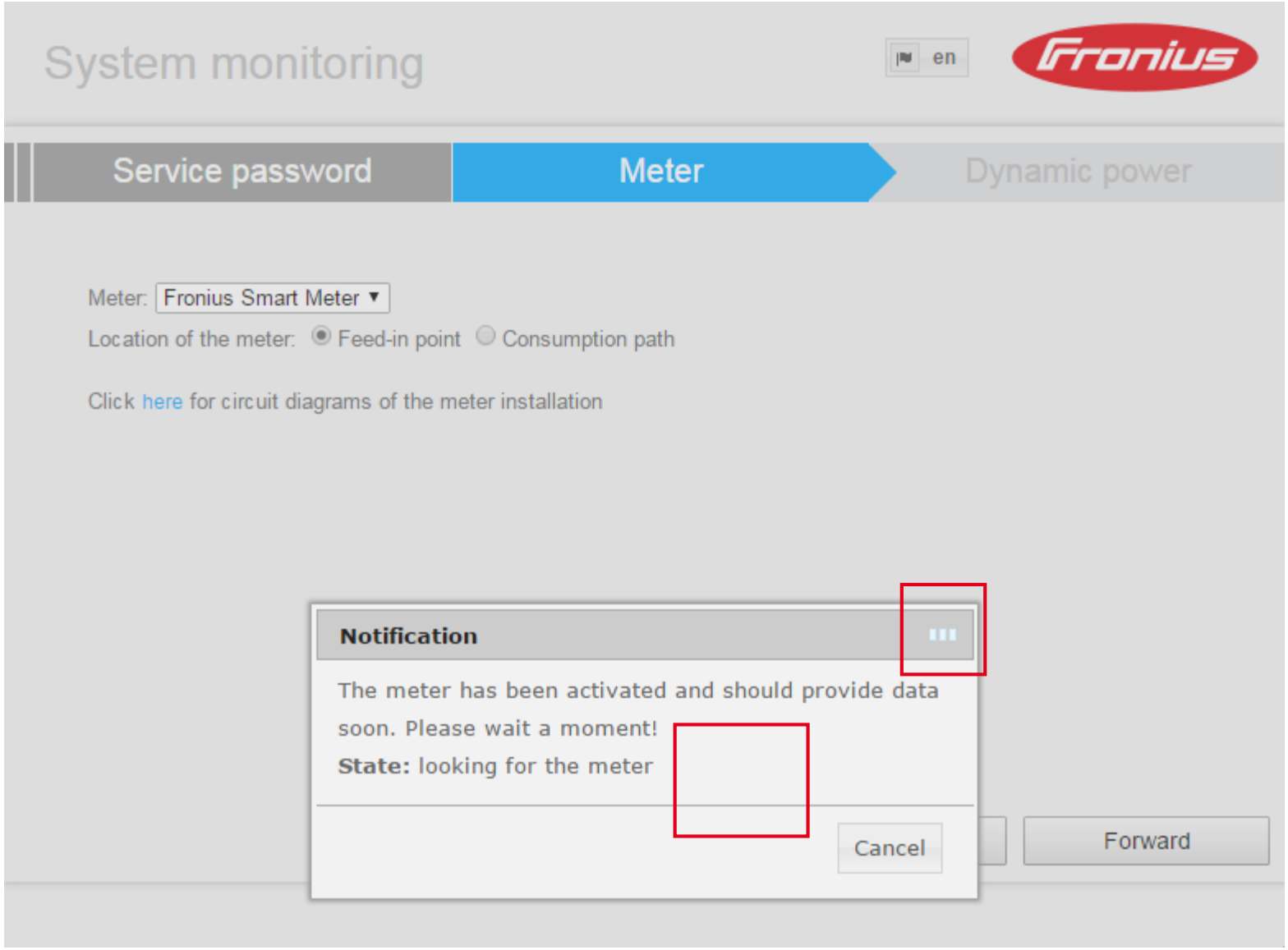

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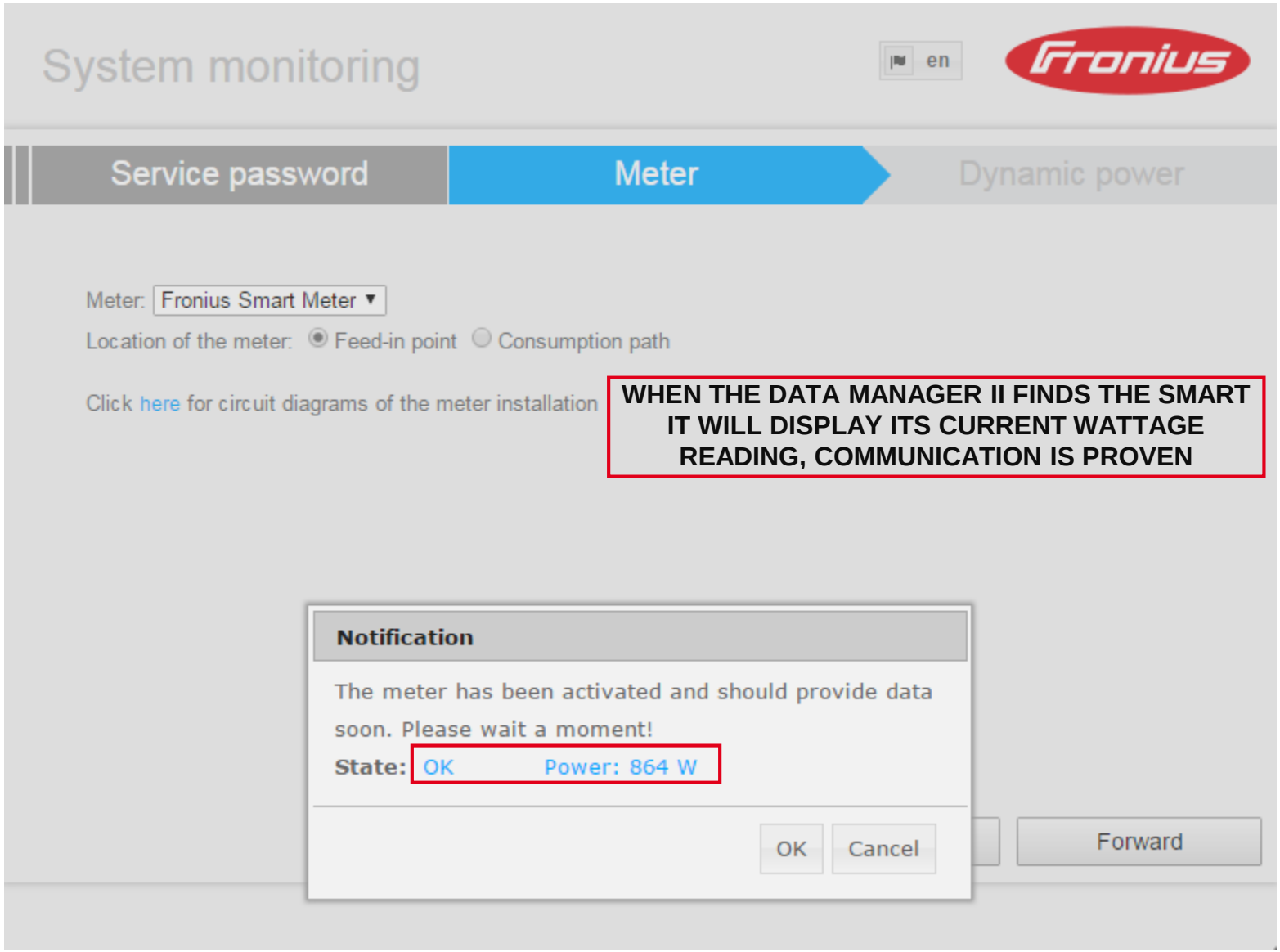

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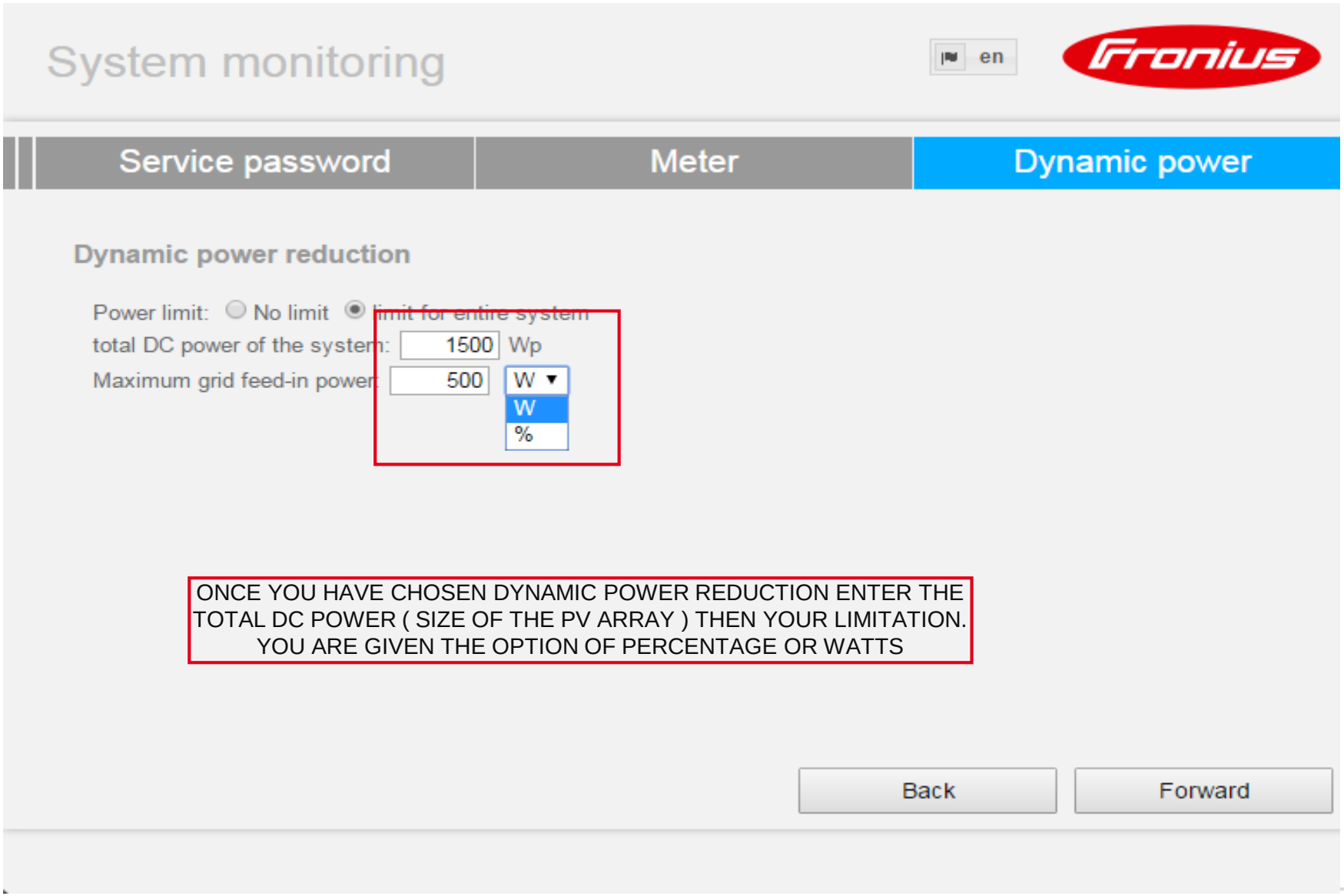

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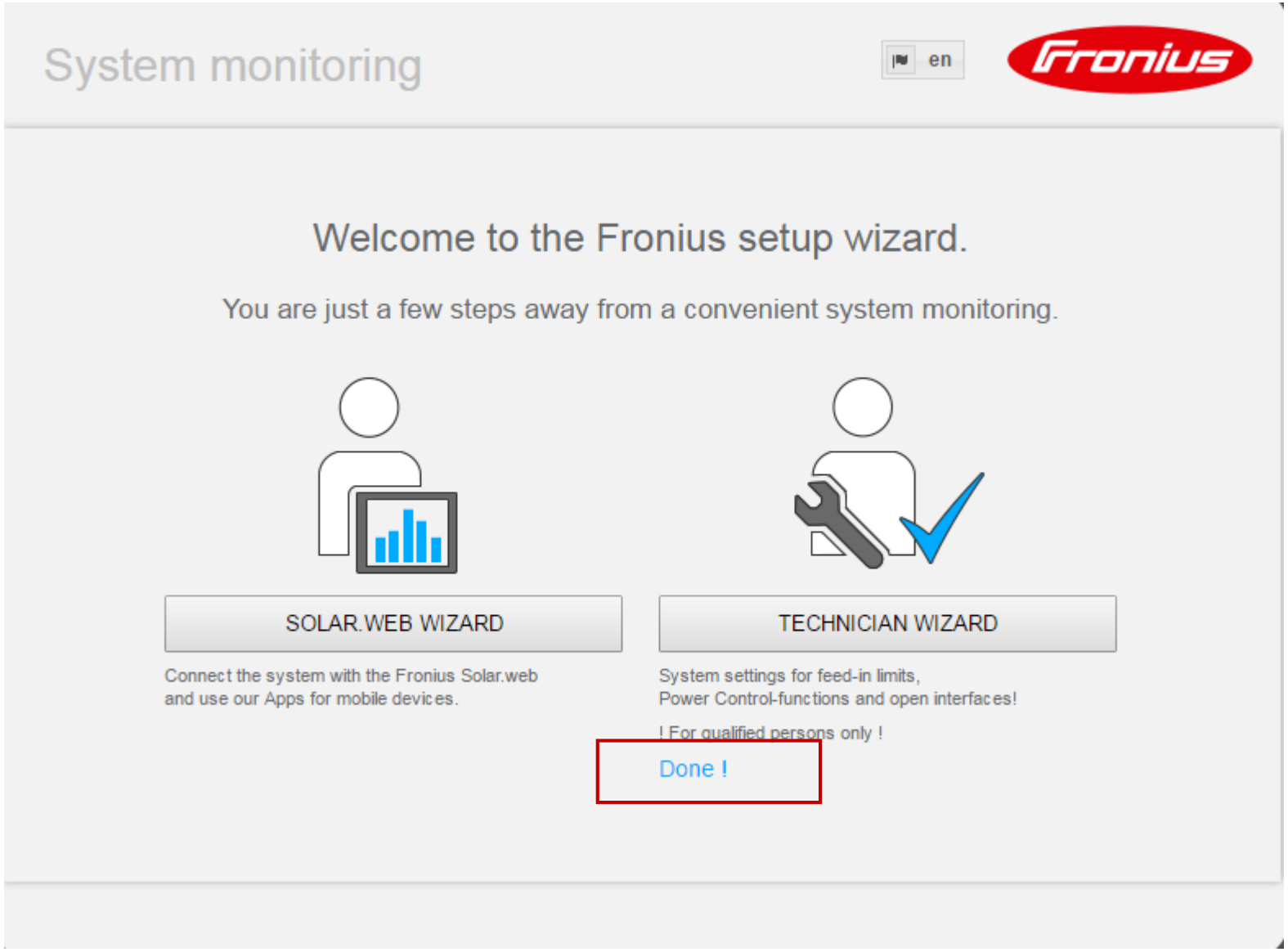
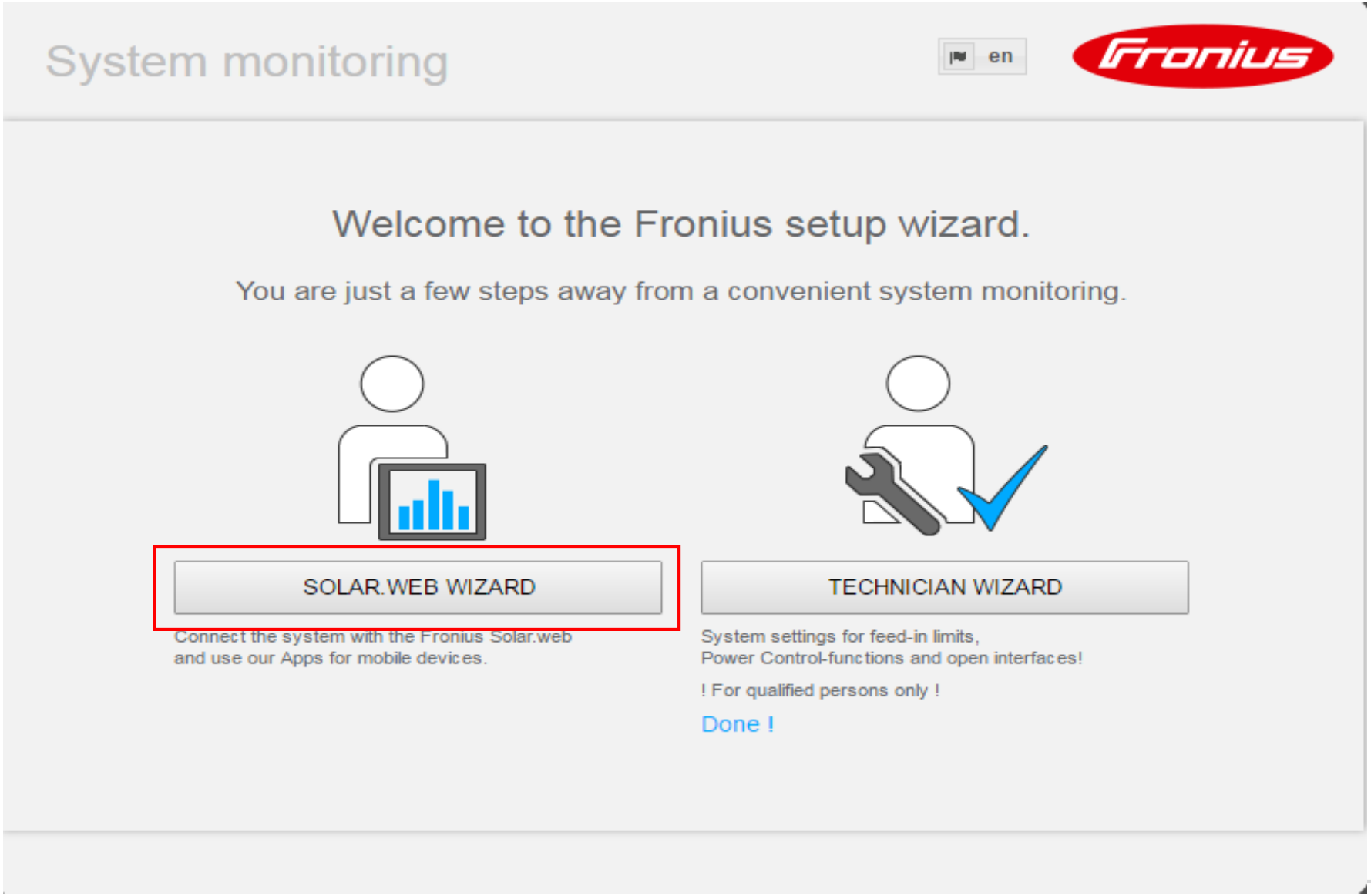


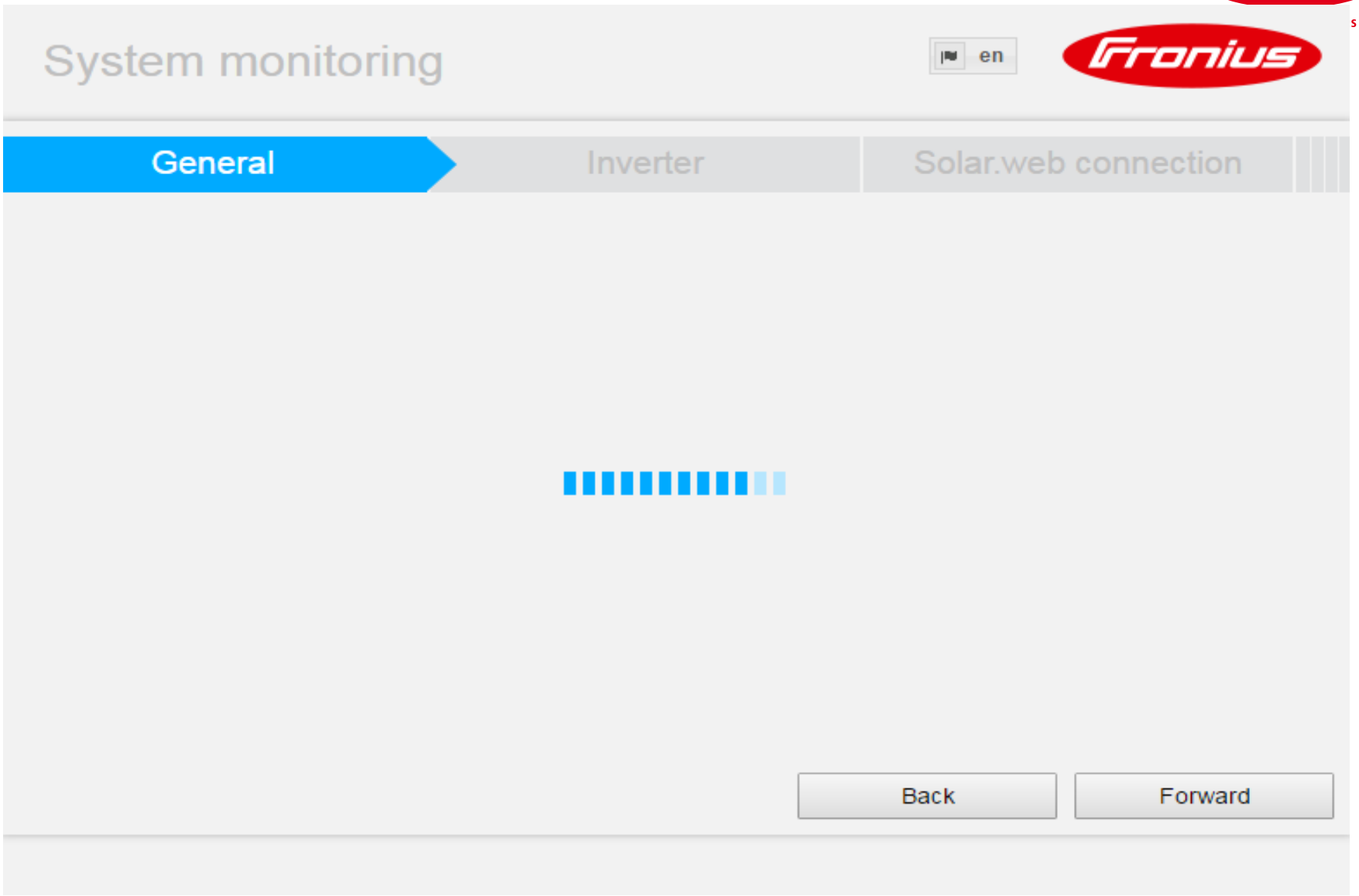
Fronius
SHIFTING THE LIMITS

Technician wizard is complete !

Any questions?

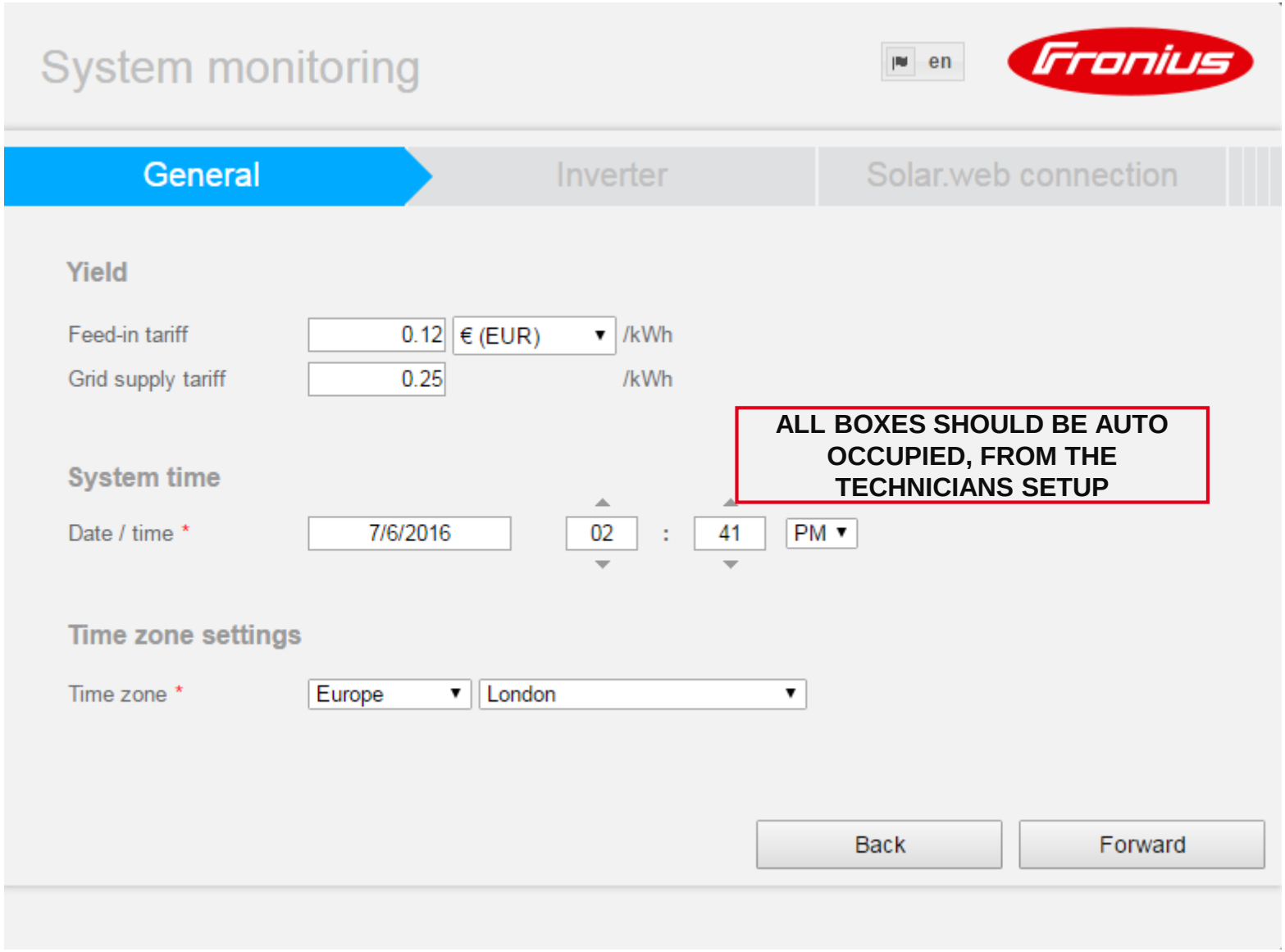
FRONIUS SMARTMETER S/W SETUP




System monitoring
en
General
Inverter
Solar.web connection
Back
Forward

Fronius
SHIFTING THE LIMITS

FRONIUS SMARTMETER S/W SETUP



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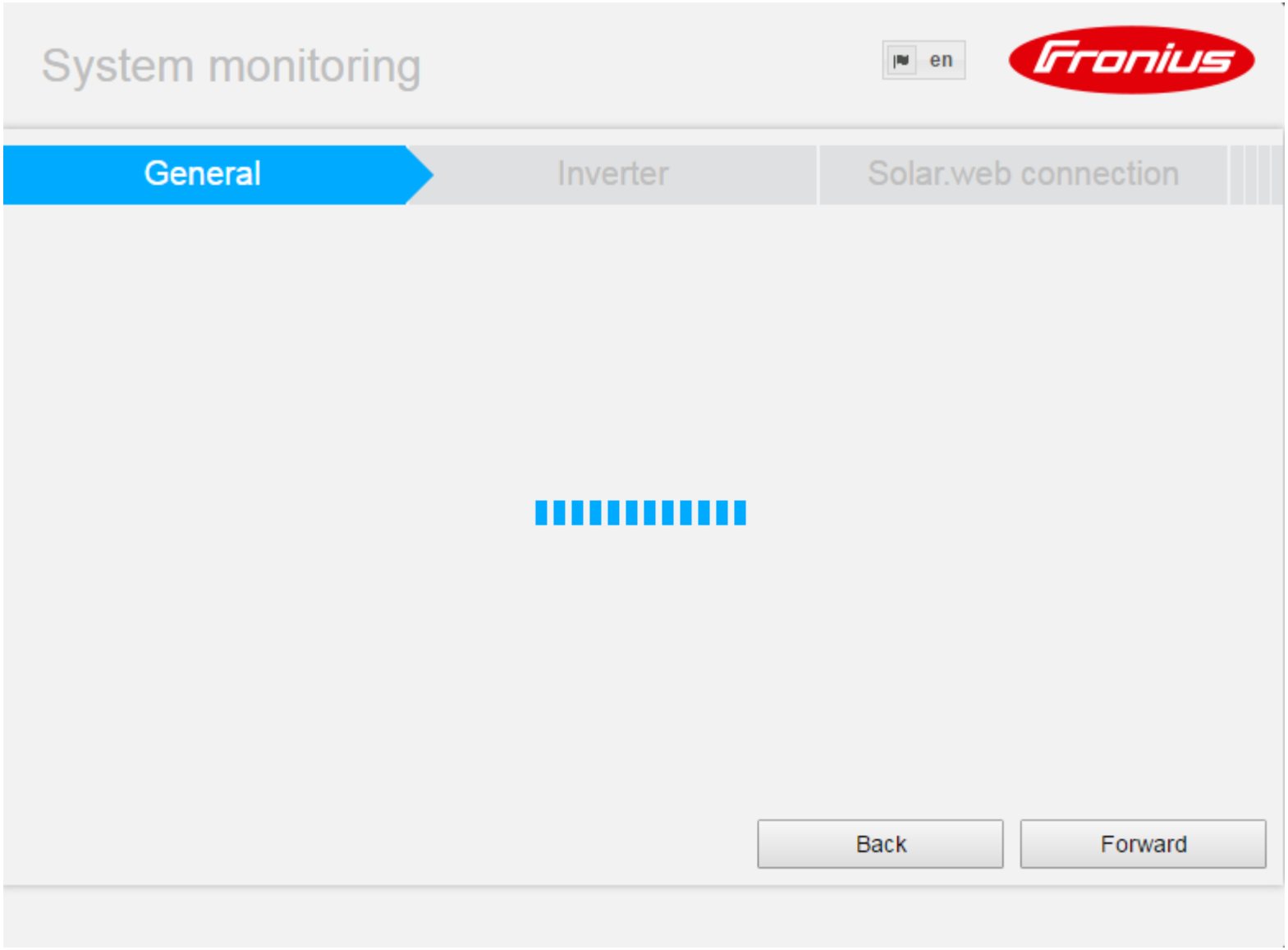

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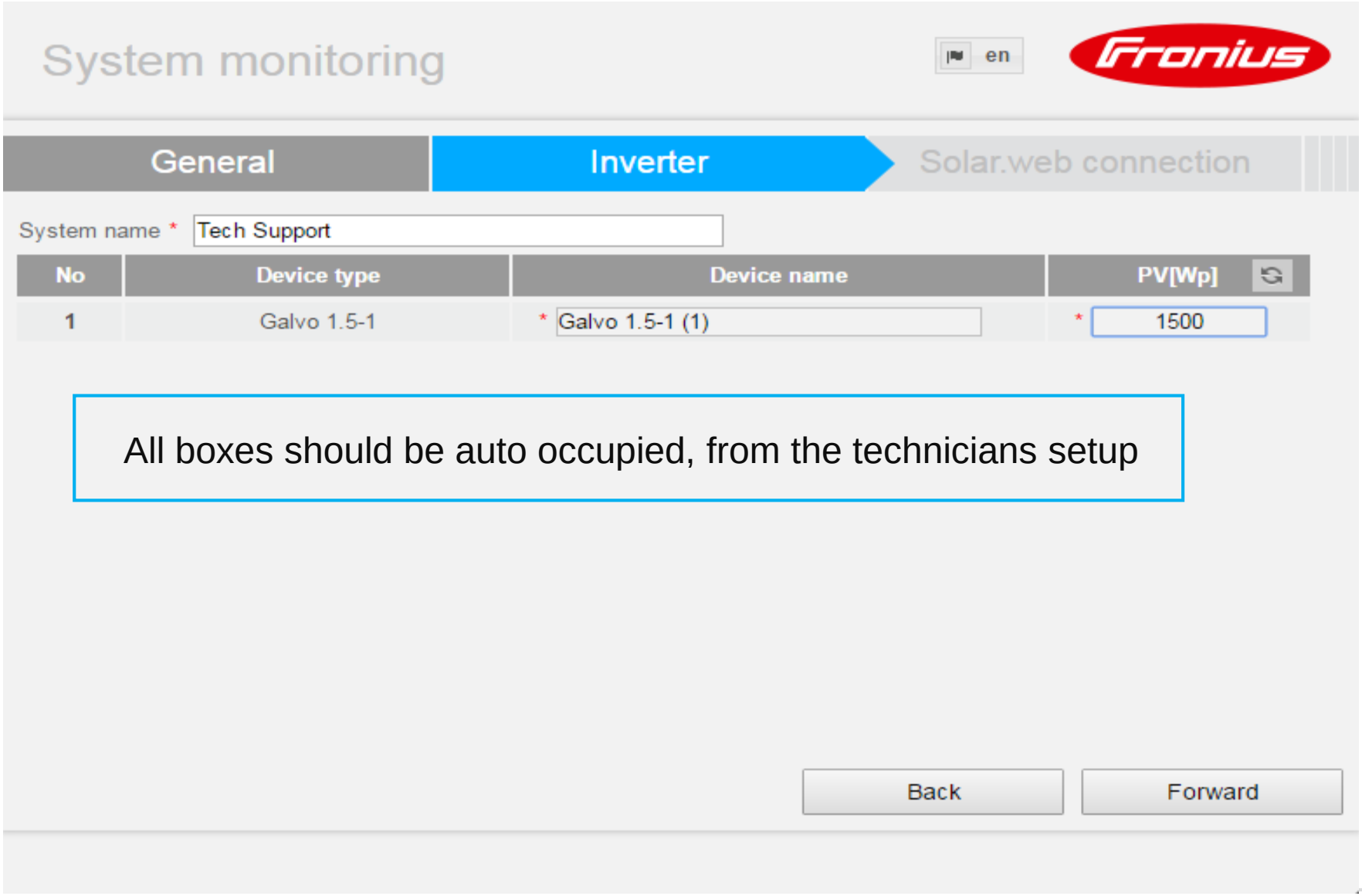

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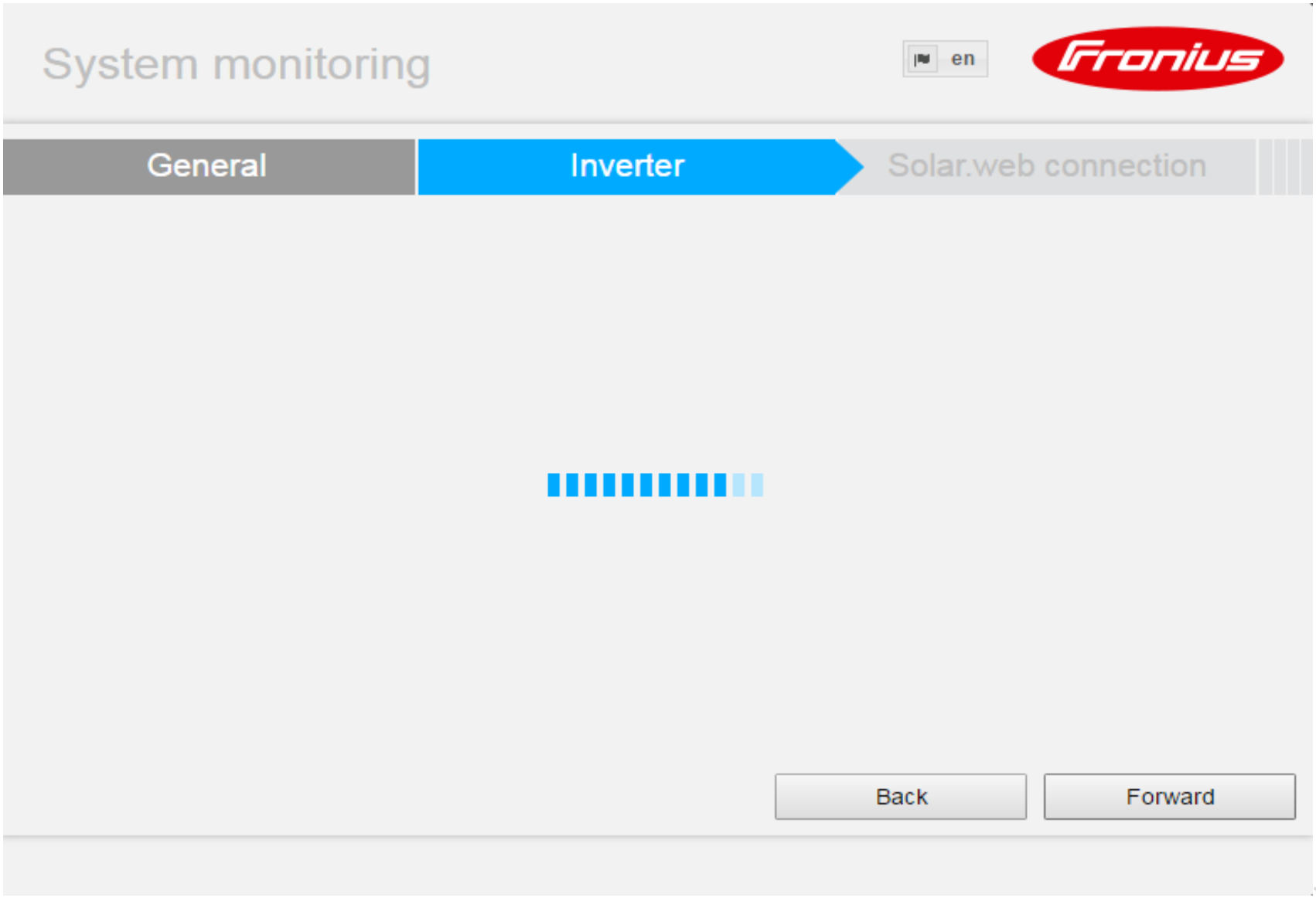

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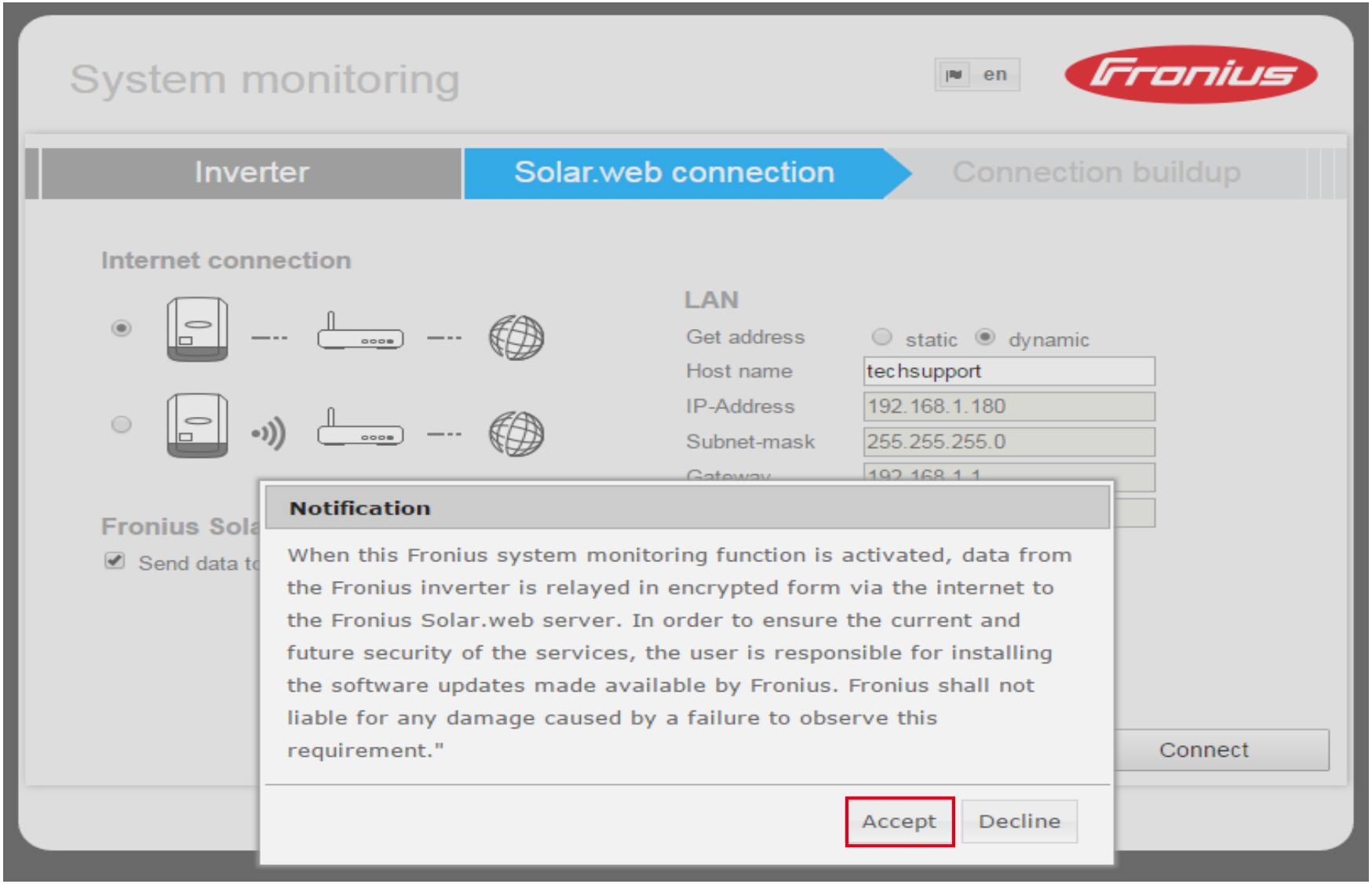

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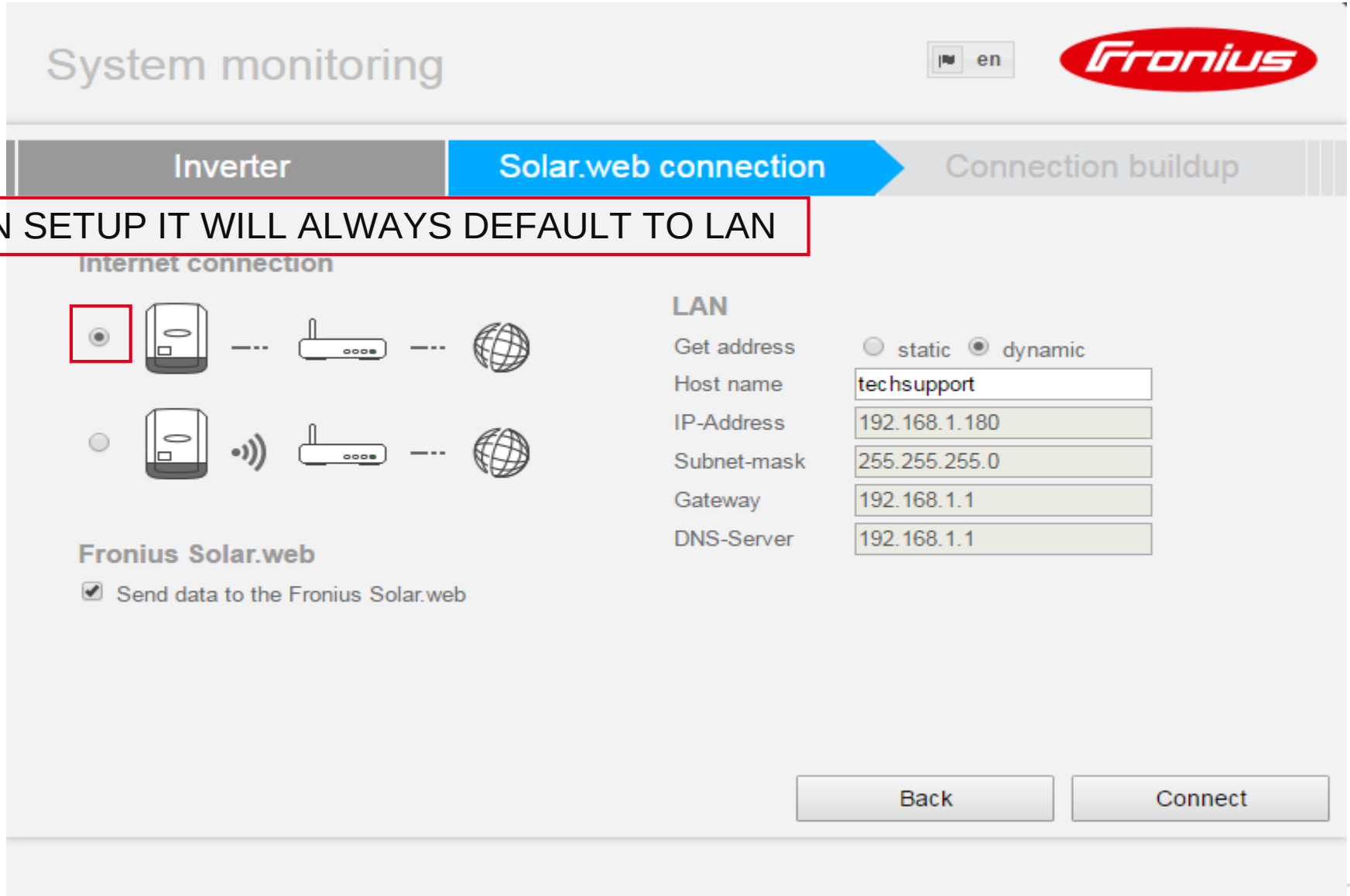

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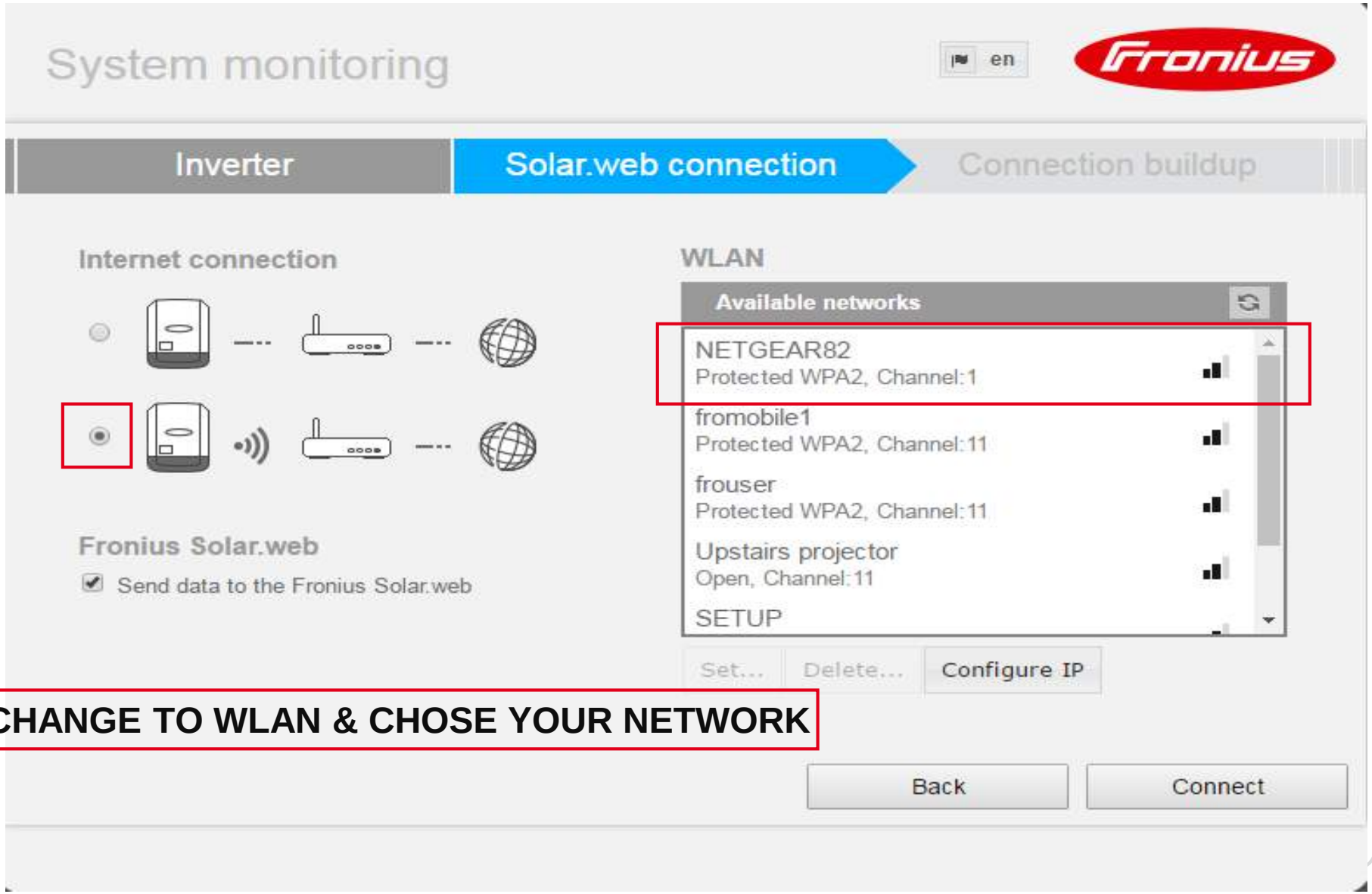
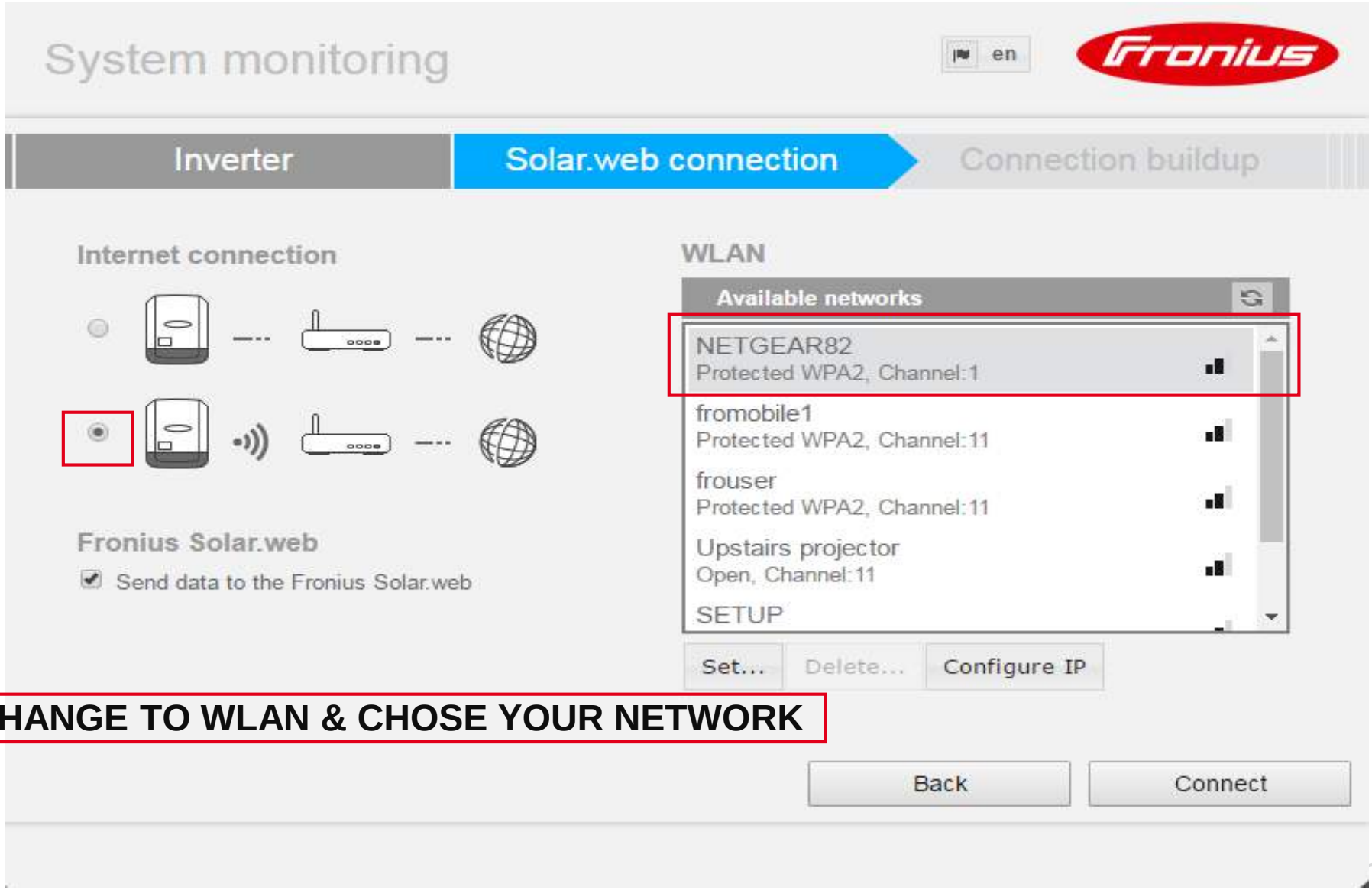
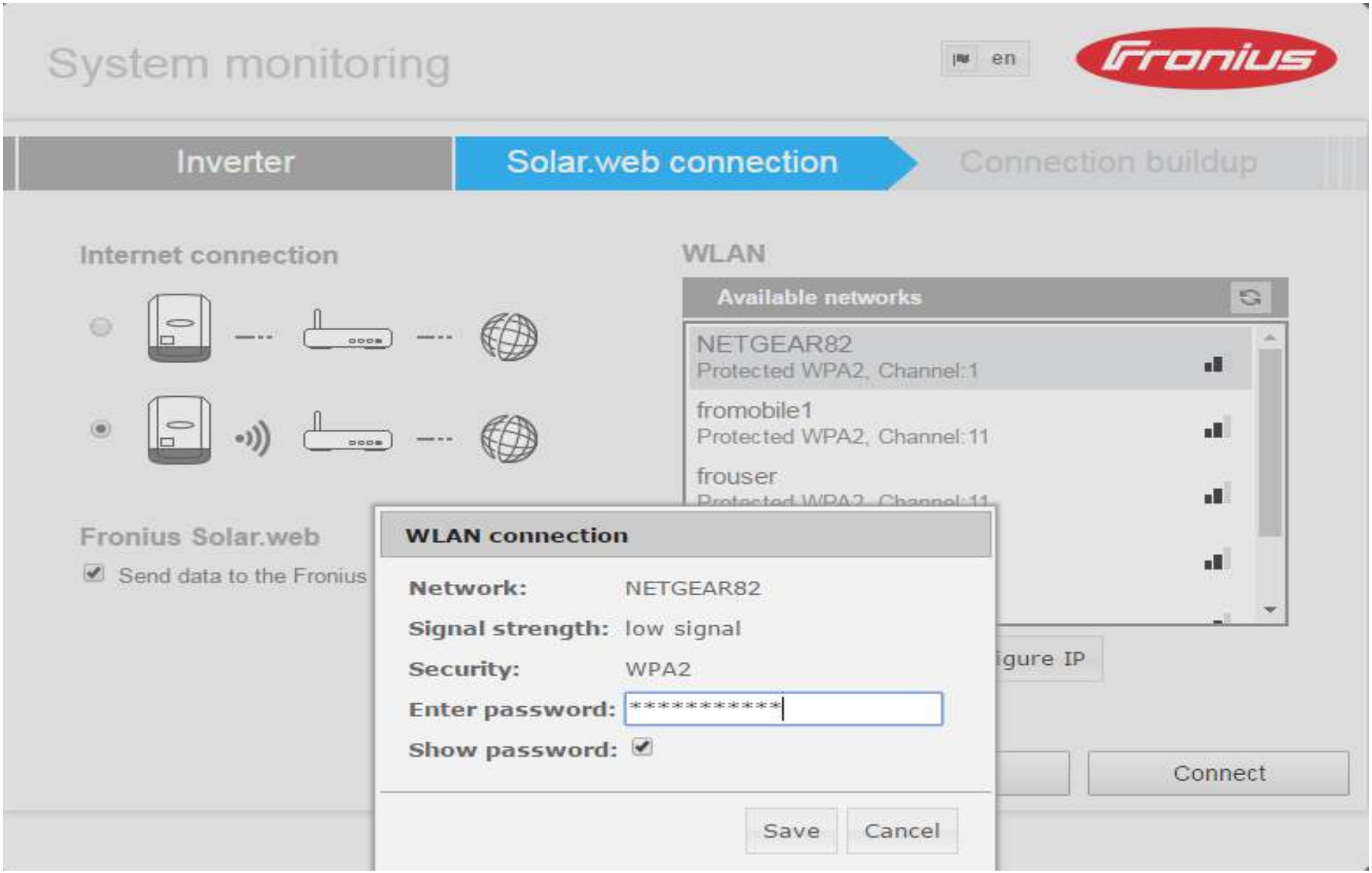


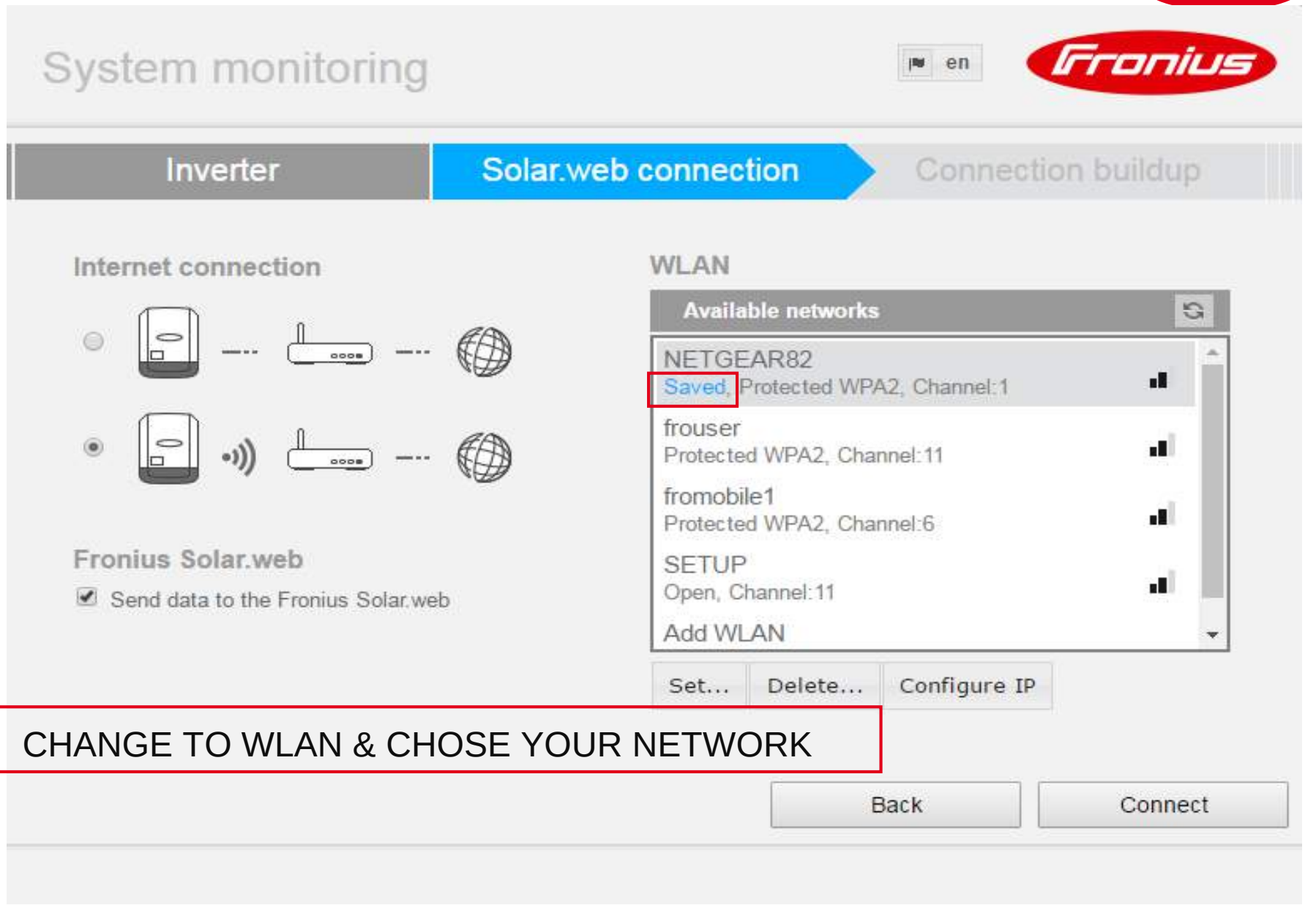
FRONIUS SMARTMETER S/W SETUP



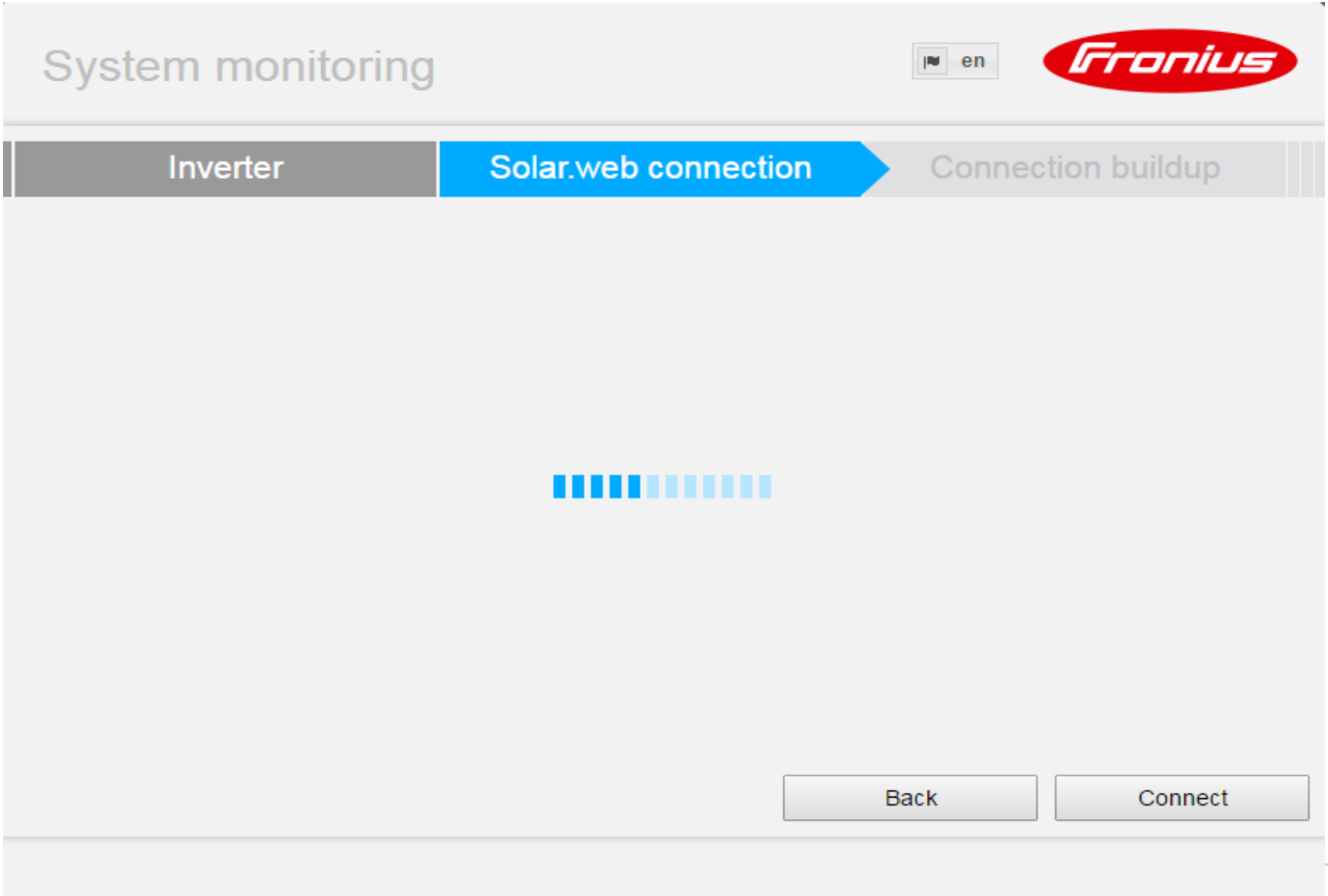
CHANGE TO WLAN & CHOSE YOUR NETWORK

FRONIUS SMARTMETER S/W SETUP




System monitoring
en
Inverter
Solar.web connection
Connection buildup
Internet connection
Fronius Solar.web
Send data to the Fronius Solar.web
WLAN
Available networks
NETGEAR82
Saved, Protected WPA2, Channel:1
frouser
Protected WPA2, Channel:11
fromobile1
Protected WPA2, Channel:6
SETUP
Open, Channel:11
Add WLAN
Set...
Delete...
Configure IP
CHANGE TO WLAN & CHOSE YOUR NETWORK
Back
Connect

FRONIUS SMARTMETER S/W SETUP



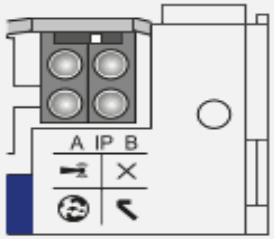
FRONIUS SMARTMETER S/W SETUP

System monitoring

en

Solar.web connection | Connection buildup | Network status

The network connection is in progress...



- **Notification!** The IP switch is still in position A.
  Please switch to position B, so the configuration of the network interface can be finished!
- Please connect your device (computer, tablet, smartphone,...) with the chosen WLAN network "NETGEAR82".
- If you have connection problems, check the WLAN-LED of your inverter. If it is red, the connection to your WLAN network was not possible.
  In that case, change the IP switch from position B to A and check the given WLAN password!
- Please open the wizard again by using the IP address that your router assigned to the system. If you have problems to reconnect to your system monitoring, the Fronius Solar.web App can help you!

DON'T FORGET TO MOVE YOUR IP NETWORK SLIDER SWITCH FROM A BACK TO POSITION B

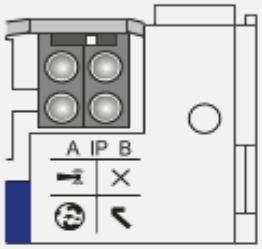
FRONIUS SMARTMETER S/W SETUP

System monitoring

en

Solar.web connection | Connection buildup | Network status

The network connection is in progress...



- **Notification!** The IP switch is still in position A. Please switch to position B, so the configuration of the network interface can be finished!
- Please connect your device (computer, tablet, smartphone,...) with the chosen WLAN network "NETGEAR82".
- If you have connection problems, check the WLAN-LED of your inverter. If it is red, the connection to your WLAN network was not possible.
  In that case, change the IP switch from position B to A and check the given WLAN password!
- Please open the wizard again by using the IP address that your router assigned to the system. If you have problems to reconnect to your system monitoring, the Fronius Solar.web App can help you!

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ANY QUESTIONS???

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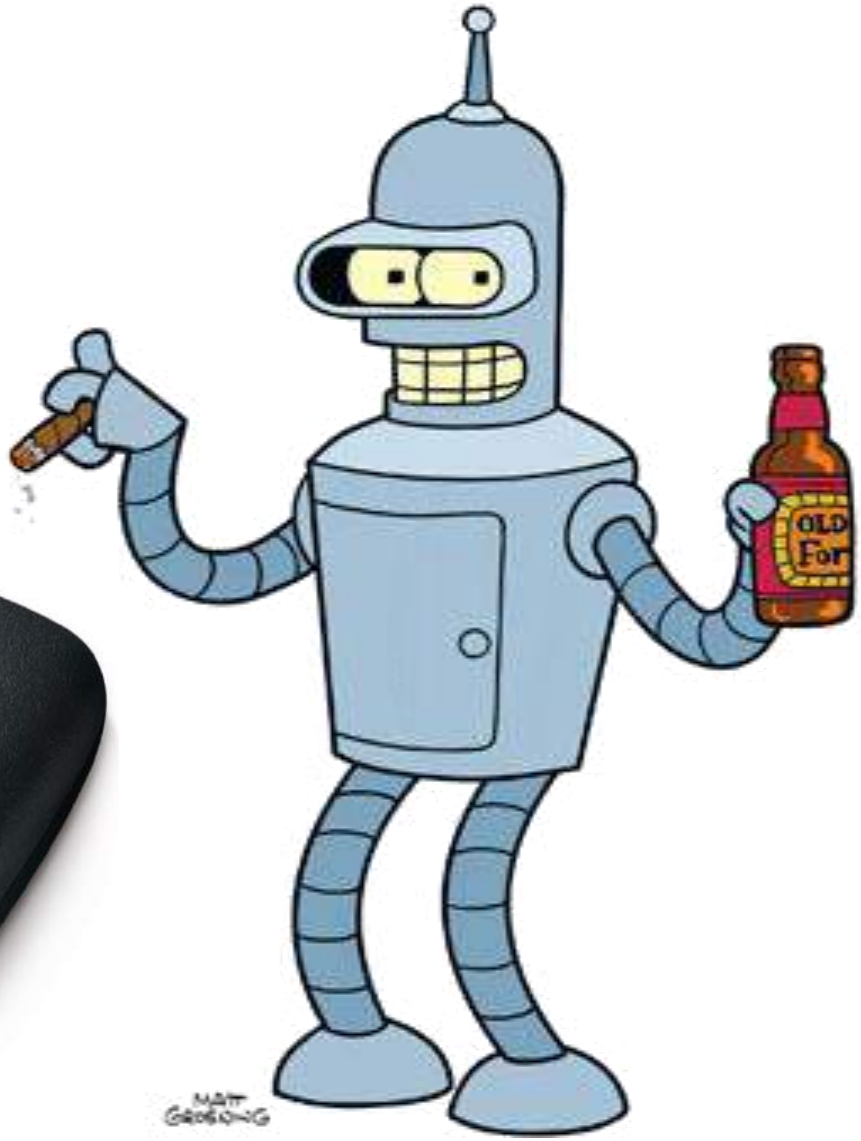
3 Party Equipment, Can't be that Hard ?



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INTEGRATED MONITORING

FRONIUS 3G ROUTER OPTION

THE SLIP IN YOUR POCKET OPTION

- The snap-in range comes with USB charger point.
- IP65.
- Black out cover.
- Communications failure default to safe pri-determined power level 100% - 0%
- OSG - On Screen Graphics
- Equipped with a built-in 3G modem - No other bulky devices
- HSPA+ supported with up to 21.6Mbps download and 5.76Mbps
- 2000mAh internal battery for extended hours of outdoor use
- Portable and cobblestone design ideal for travel use
- Micro USB port for versatile recharging
- OLED display provides a intuitive view of the device's working status
- Equipped with a micro SD card slot for up to 32GB of optional storage

Dimensions (W x D x H 3.7 × 2.2 × 0.8 in. (94 × 56.7 × 19.8 mm))

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SHIFTING THE LIMITS

INTEGRATED MONITORING
FRONIUS 3G ROUTER OPTION THE SLIP IN YOUR POCKET

3G Mobile Wi-Fi
M5350

Features:

- Equipped with a built-in 3G modem - No other bulky devices required
- HSPA+ supported with up to 21.6Mbps download and 5.76Mbps upload speeds
- Supports up to 10 users simultaneously
- 2000mAh internal battery for extended hours of outdoor use
- Portable and cobblestone design ideal for travel use
- Micro USB port for versatile recharging
- OLED display provides a intuitive view of the device's working status
- Equipped with a micro SD card slot for up to 32GB of optional storage

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INTEGRATED MONITORING
FRONIUS 3G ROUTER OPTION THE SLIP IN YOUR POCKET OPTION

3G Mobile Wi-Fi
M5250

Features:

- Equipped with a built-in 3G modem - No other bulky devices required
- HSPA+ supported with up to 21.6Mbps download and 5.76Mbps upload speeds
- Supports up to 10 users simultaneously
- 2000mAh internal battery for extended hours of outdoor use
- Portable and cobblestone design ideal for travel use
- Micro USB port for versatile recharging
- Equipped with a micro SD card slot for up to 32GB of optional storage

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SHIFTING THE LIMITS

INTEGRATED MONITORING
FRONIUS 3G ROUTER OPTION THE SLIP IN YOUR POCKET

IW-033 21.6 Mbps HSPA+ WiFi 3.5G Mobile Hotspot

infinity WIRELESS

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INTEGRATED MONITORING
FRONIUS 3G ROUTER OPTION THE SLIP IN YOUR POCKET OPTION

3G Mobile WiFi 5200mAh Power Bank

M5360

Features:

- Instantly establish a 3G hotspot and share wireless with several mobile devices on business or road trips.
- HSPA+ supported with up to 21.6Mbps download and 5.76Mbps upload speeds
- Internal Battery for up to 17 hours of sharing 3G connections*
- 5200mAh Power Bank for charging smart phones or tablets (Power output: 5V/1A)
- OLED display provides a intuitive view of the device's working status
- Equipped with a micro SD card slot for up to 32GB of optional storage

* Actual service duration may vary due to different user environments.

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INTEGRATED MONITORING
FRONIUS 3G ROUTER OPTION THE SLIP IN YOUR POCKET

Network Technology	WiFi, HSPA+, EDGE, GRPS and GSM
Chipset	**Qualcomm MDM8200A, Qualcomm WCN1314**
Antenna	Internal antenna Internal diverstiy antenna Internal WiFi antenna Internal GPS antenna (Optinal)
Frequency Bands	Quad-Band Class 12 EDGE/GPRS/GSM: 850 / 900 / 1800 / 1900MHz (Rx Diversity in WCDMA2100Mhz) HSPA/UTMS: 850 / 1900 / 2100MHz
Data Rates	**HSPA+ (R7) - 21.6 Mbps (download), category 14** **HSPA (R6) - 5.76 Mbps (upload), category 6** **UMTS (R4) - 384 Kbps (download/upload)** **EDGE (R4) - 3GPP R4, category 12** **GPRS - Download 85.6 Kbps / Upload 42.8 Kbps**
Wi-Fi Class	**802.11b/g/n**
Wi-Fi Encryption	WEP, WPA, WPA2
Servers	DHCP / DNS / VPN
Power Supply	**Removable, rechargeable Li-Ion battery**
USB Speed	**2.0 Hi-Speed (1.1 compatible)**
SIM Card Interface	3GPP 31.101 and 31.102
Memory Card Slot	**MicroSD Memory Card Slot (32Gb Maximum)**
SIM Lock	**Unlocked (free to use any network)**
OS Support	Windows 7 SP1, Vista SP2 and XP SP3 Mac OS X (10.5 - 10.7) Linux
Operating/Storage Temp	**0 > 35 ºC, -40 > +85 ºC**

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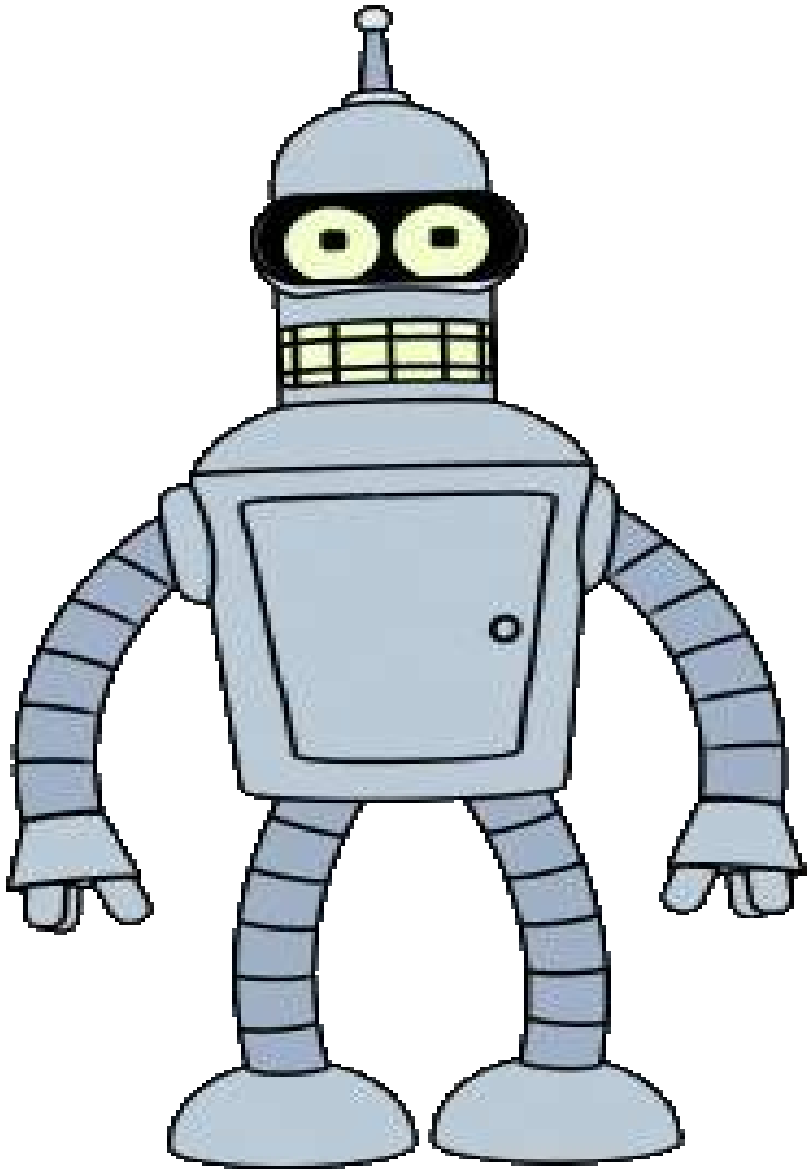
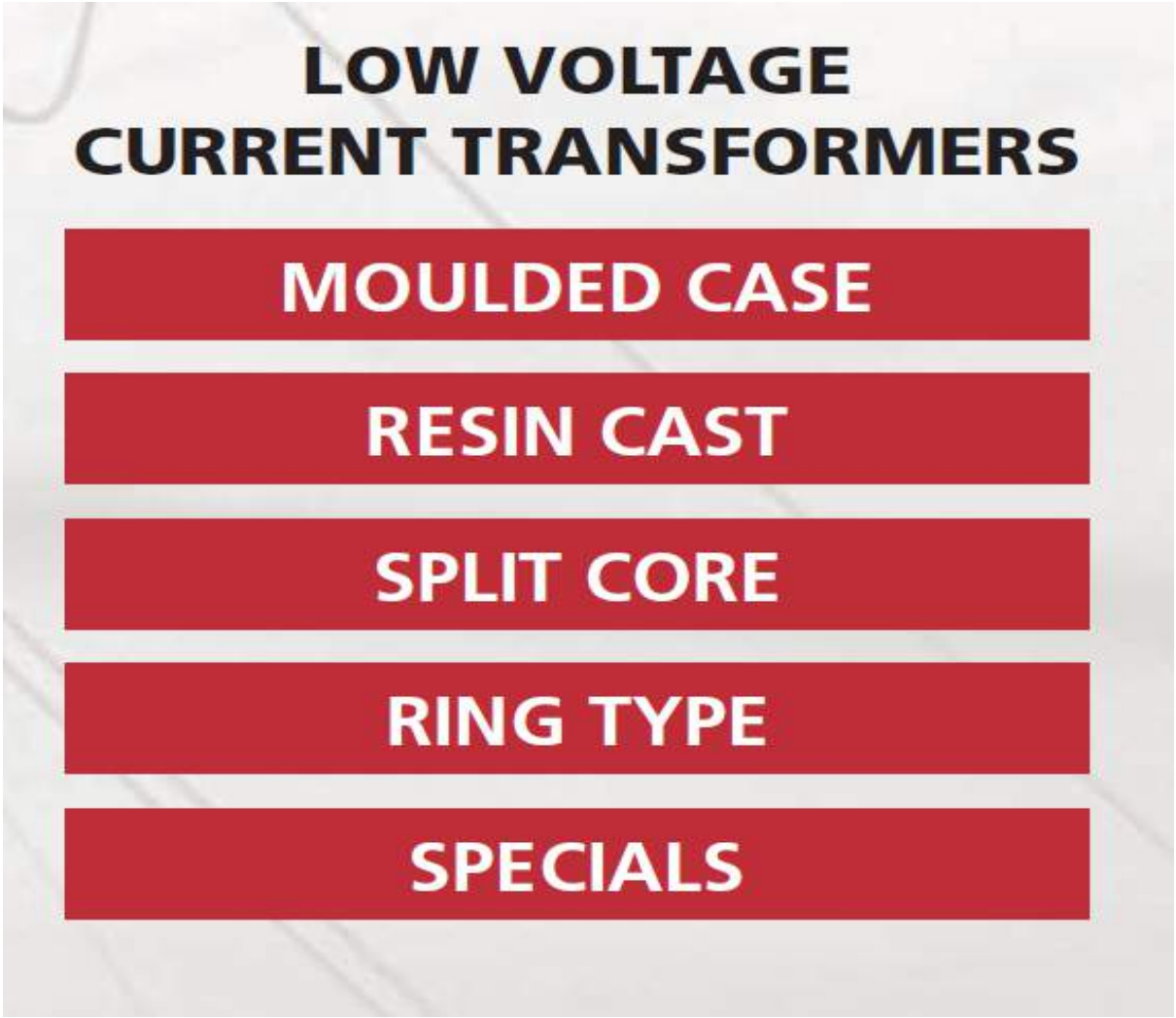
3 G What's

Where's the WD 40




LOW VOLTAGE
CURRENT TRANSFORMERS
MOULDED CASE
RESIN CAST
SPLIT CORE
RING TYPE
SPECIALS

Applications

Monitoring current waveforms in semiconductor switches

Development, test and servicing of power electronic equipment.

Pulsed Power capacitor discharge and magnetic accelerator current measurements

Welding, motor drive, generator, currents

Ground currents in rotating machine shafts

Induction heating and plasma current measurements

Measuring AC currents in the presence of large DC currents

Fault monitoring, circuit breaker interuption and lightening strike currents

Monitor Battery and Capacitor Ripple Current

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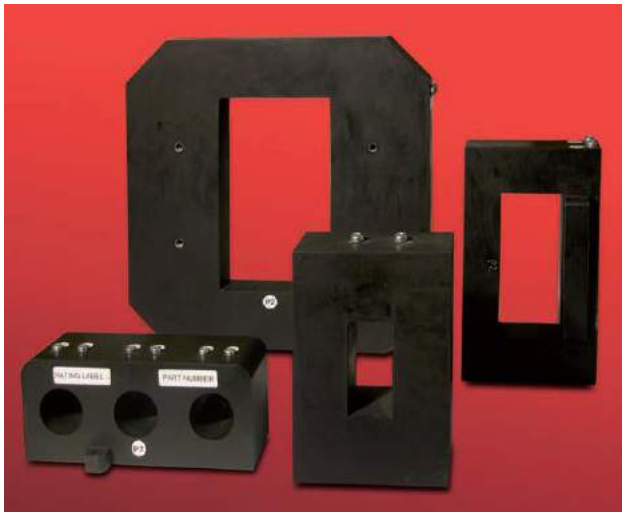
INTEGRATED MONITORING Current & Voltage Transformers

We can advise on Current& Voltage Transformers,
Let our frendly Technical staff help, get it right first time



The snap-in range comes

IP65.

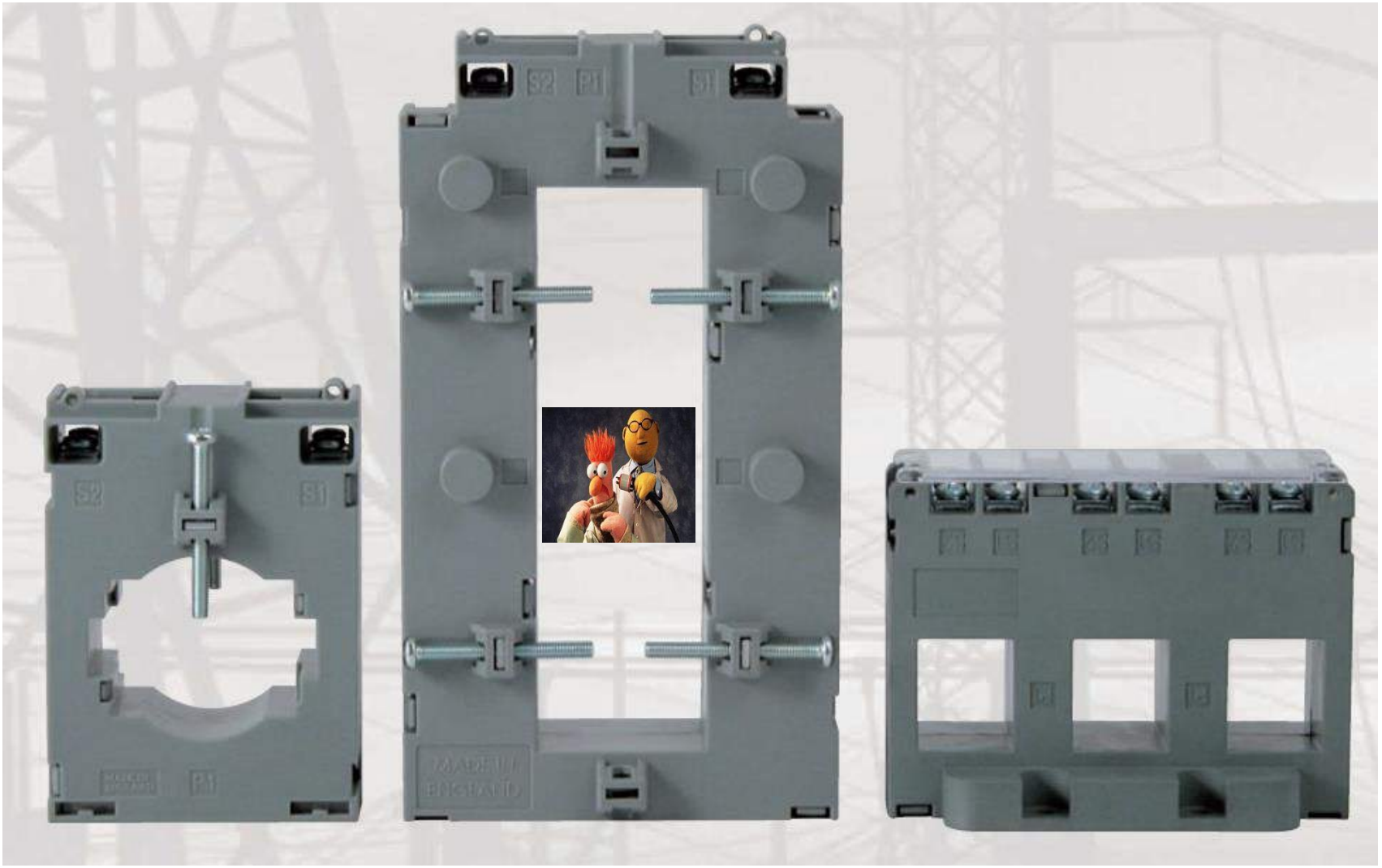
Black out cover.

Communications failure default to safe pri-determined power level 100% - 0%

5a – 1A for extended hours of outdoor use

Fronius
SHIFTING THE LIMITS

Take the Primary windings and divided it by the secondary windings the result is the Ratio you enter in the Smart Meter



CT sensors - An introduction

Often referred to as a current clamp, a CT is in fact, ***not*** a clamp.
These are Clamps. On the left are two bus bar clamps, on the right, a carpenter's G-clamp:

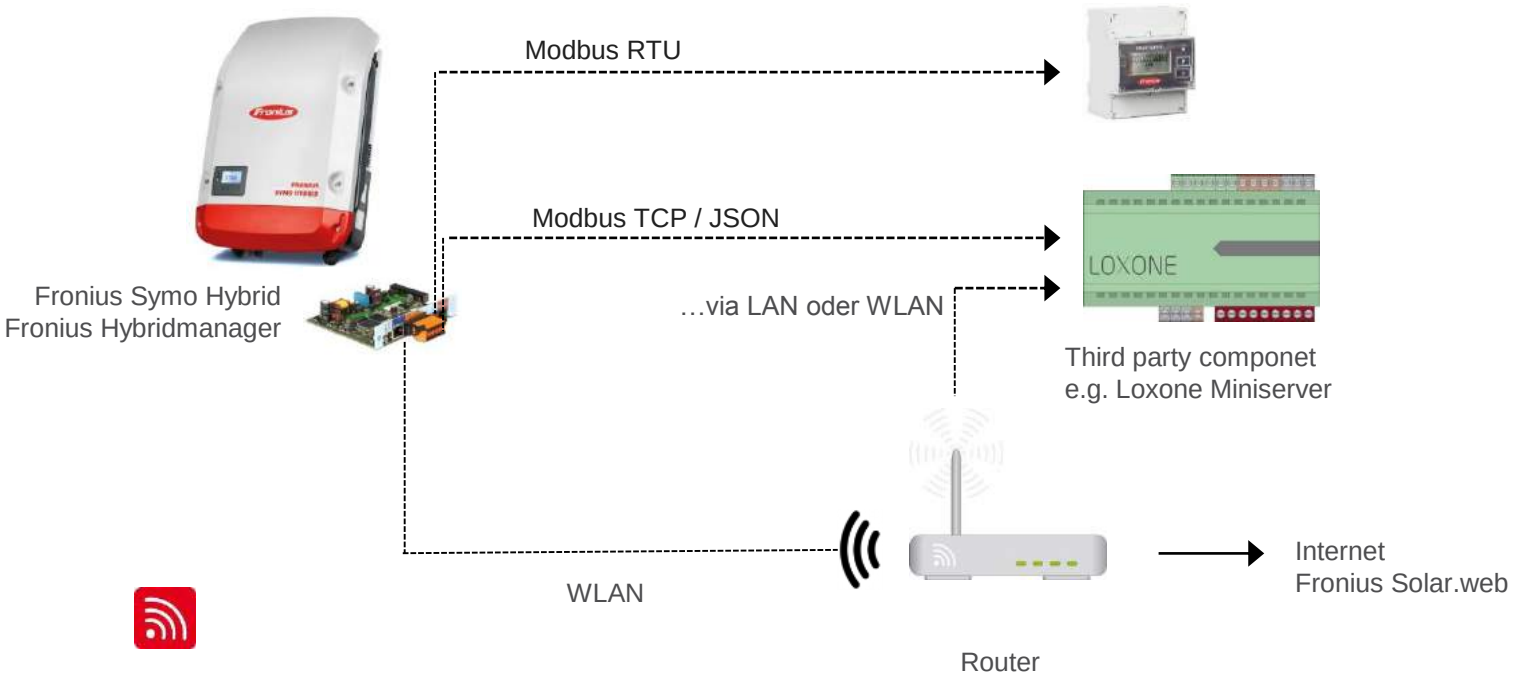
Pictured above, is an example of a Split-Core CT.

Here's an example of a ***split-core*** CT

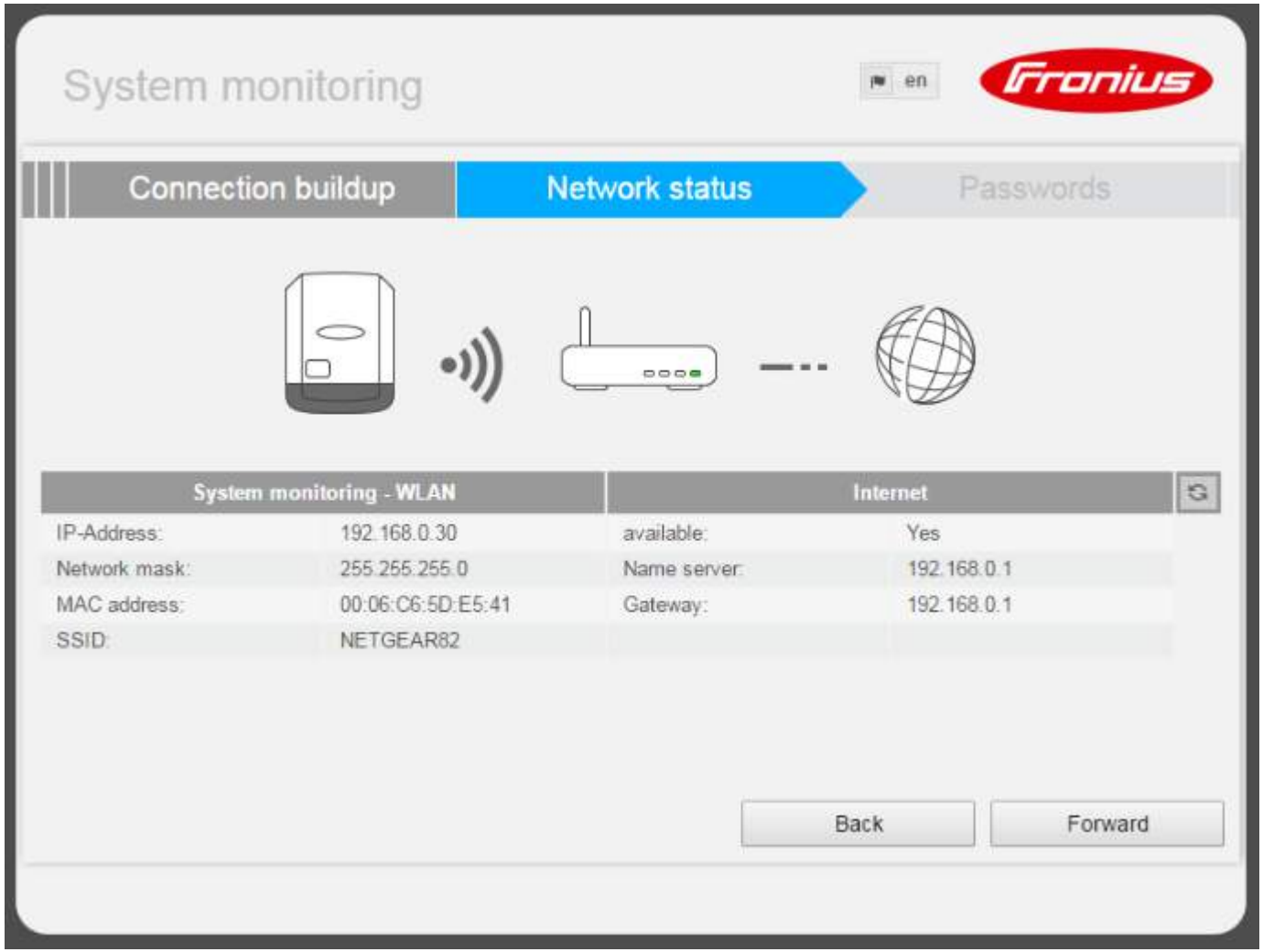
In addition to the split-core type, solid core, (aka ***ring core***) CTs are available.
Here's an example of a ***solid-core*** CT

FRONIUS HYBRIDMANAGER - diagram

PV data transmission via Modbus RTU, Modbus TCP or JSON to Third party components.



FRONIUS SMART METER Wi-Fi Technology


System monitoring
en
Connection buildup
Network status
Passwords
System monitoring - WLAN
Internet
IP-Address: 192.168.0.30
Network mask: 255.255.255.0
MAC address: 00:06:C6:5D:E5:41
SSID: NETGEAR82
available: Yes
Name server: 192.168.0.1
Gateway: 192.168.0.1
Back
Forward

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Solar Web wizard is complete !

Any questions?

Fronius
SHIFTING THE LIMITS

The SnapINverter product families - overview

Fronius Galvo 1.5 - 3.1 kW

The single-phase inverter of choice **for private households** – particularly suitable **for self-consumption systems**.

Also ideal for existing PV systems: electrical isolation makes it suitable for all module technologies.

Fronius Symo 3.0 - 8.2 kW

Three-phase transformerless inverter, ensuring optimum symmetrical infeed.

In SuperFlex Design- two MPP trackers, high system voltage. **Impressive flexibility in system design.**

Fronius Symo 10.0 - 20.0 kW

Like the Fronius Symo 3.0 - 8.2 kW.

Designed for use in field installations and/or systems in the commercial sector.

With protection class IP 66: extremely robust even under most challenging environmental conditions.

Fronius Symo Hybrid 3.0 - 5.0 kW

Flexible storage solution based on the Fronius Symo.

Its modular design means the system **can be perfectly customised to suit individual configuration and extension requirements** - up to and including emergency power stand alone operation.

Fronius Eco 24.0 - 27.0 kW

The **project inverter** combines all the benefits of the SnapINverter series with **extremely high efficiency**. Also available as a light version with basic interface package.

Fronius Primo 3.6 – 8.2 kW

The single-phase transformerless inverter **boasts maximum flexibility in system design**.

With two MPP trackers integrated as standard.

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Solar.web

My PV systems PV system comparison

Fronius

Fronius UK Ltd - Milton Keynes

24HRS SUN YOU ARE 24 HOURS OF SUN!
Visit website for more information

Overview Realtime Archive Reports Service messages Administration TSI

0.51 kW
Current power

Online

3,616.41 Wh
Energy today

14/10/2016 12:07

1.56 GBP
Yield today

Month
51.83 GBP

Year
1,410.81 GBP

Total
2,045.14 GBP

1.92 kg
CO_2 savings today

Corresponds to car kilometers...
Today: 13 km
Total: 16,805 km

Corresponds to trees planted...
Today: 0
Total: 65

No messages

SOLAR.WEB

pv-support-uk@fronius.com
premium
Logout

Mailbox

User settings

Contacts
Support
Feedback

Fronius services
Fronius Solar.configurator
Fronius Solar.TV
Fronius homepage
Search for installer
References
Product Registration

Fronius Solar.web Live App
Android
iOS
Mac OSX
Windows 7
Windows 8.1

Fronius Solar.web Pro App
Android
iOS

Solar.web News
Terms and Conditions
Imprint
TSI Portal

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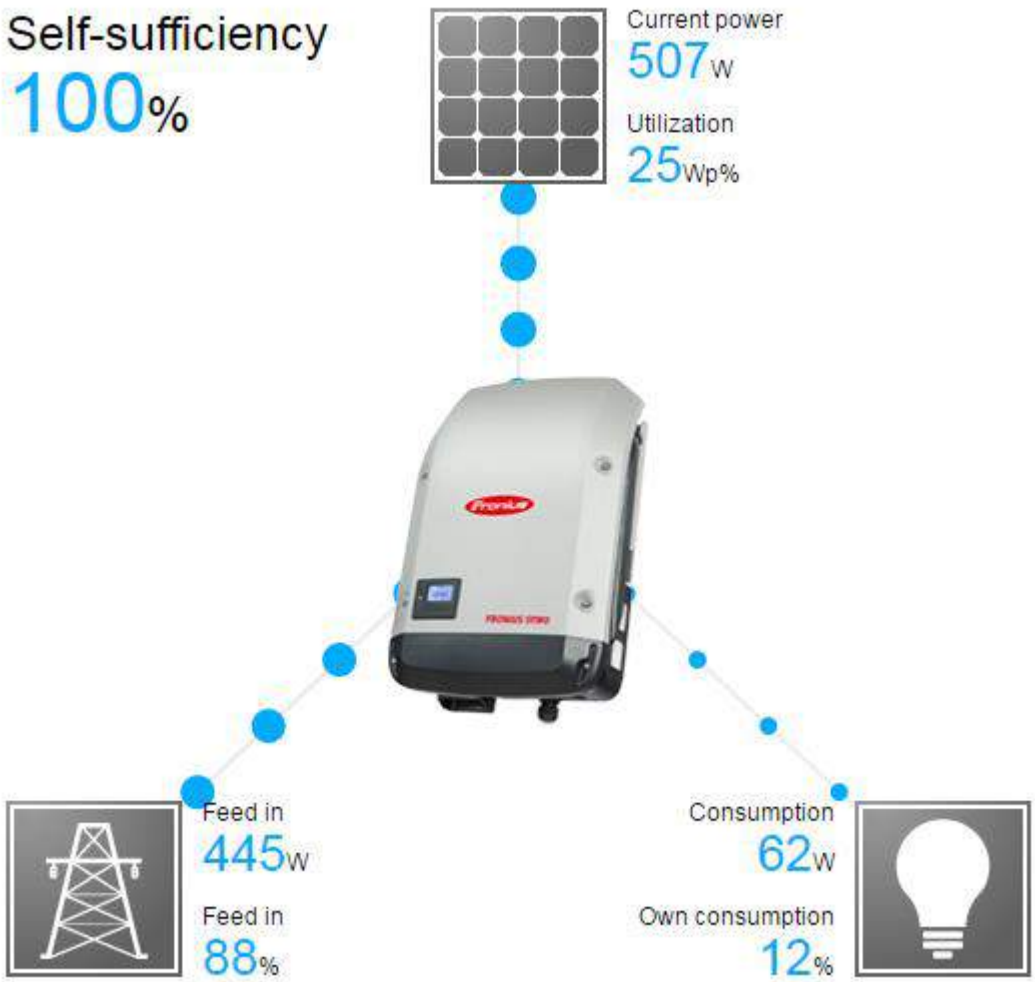
FRONIUS SMART METER DAY MODE

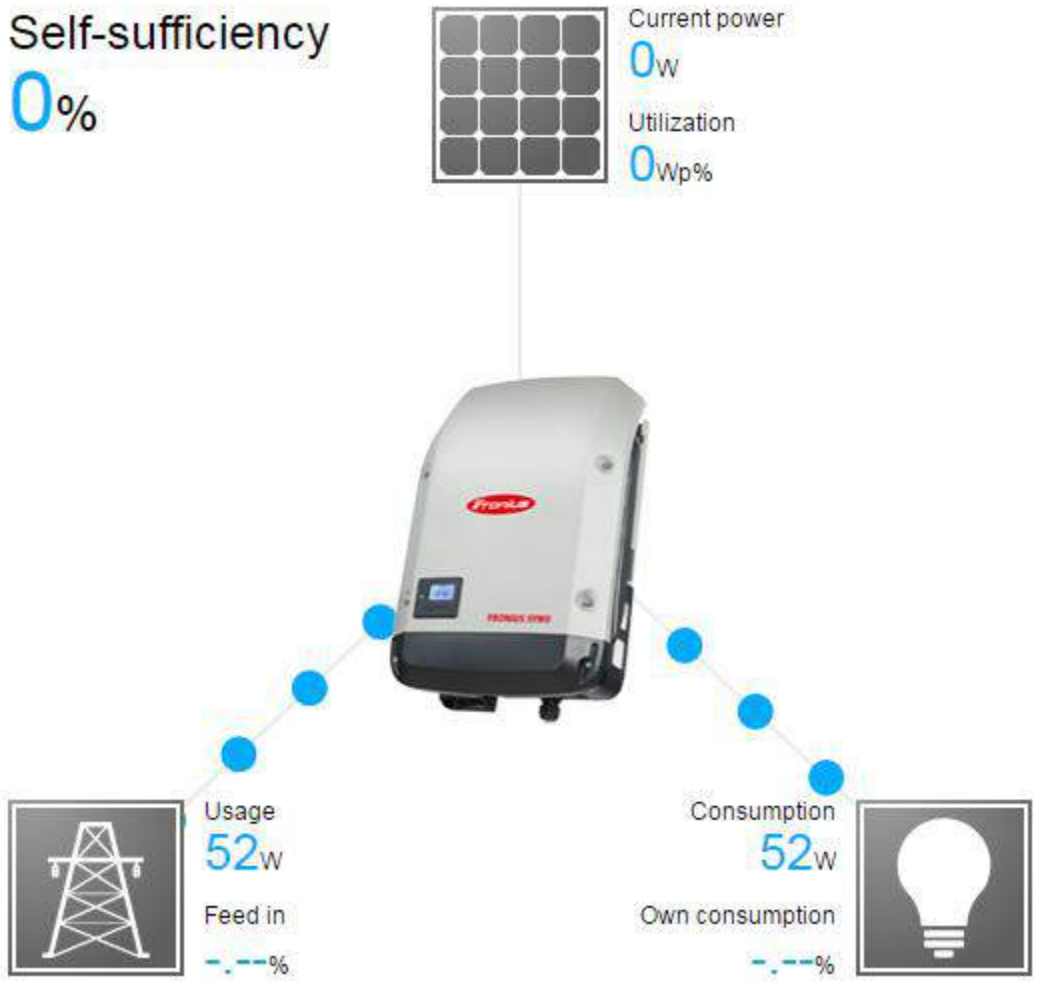
Fronius Solar.web

In Fronius Solar.web online portal, the Fronius Smart Meter provides a clear overview of power & Self consumption

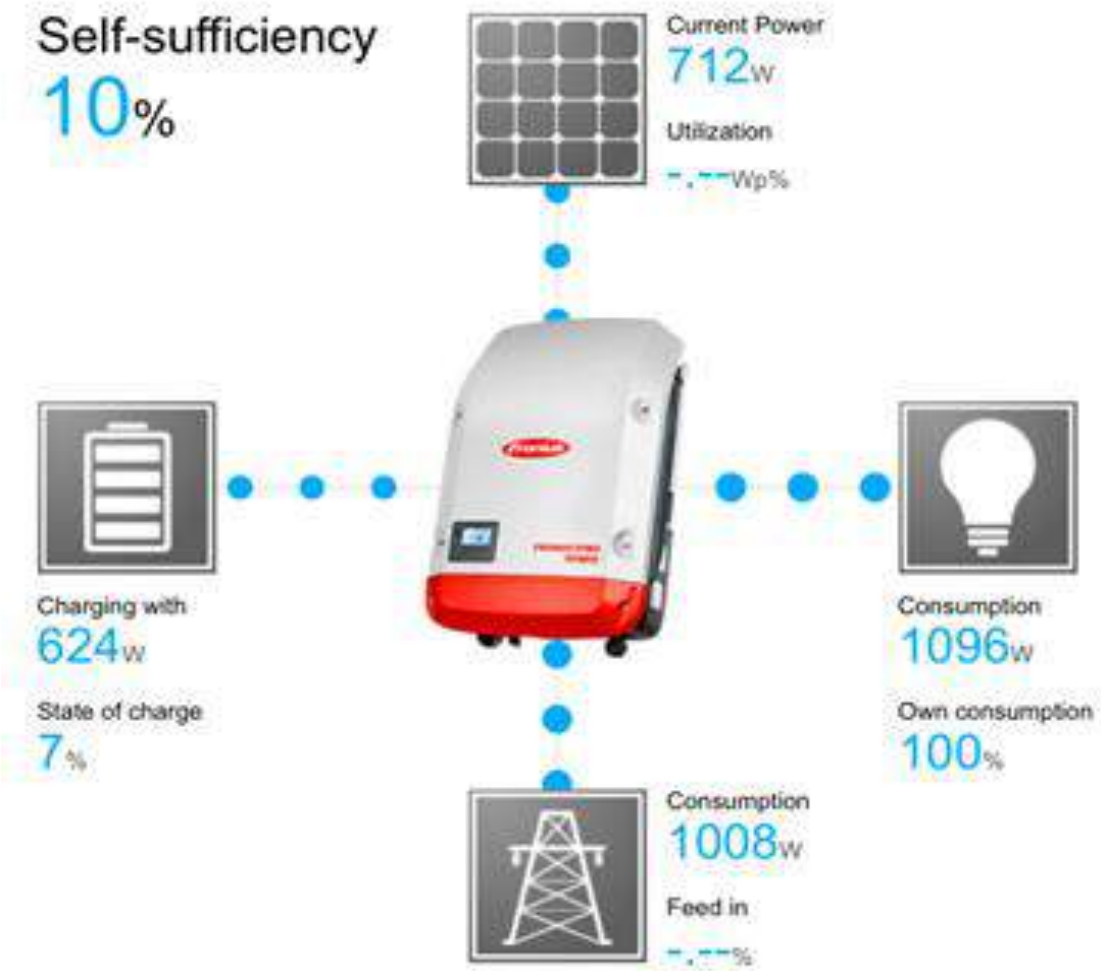
INTEGRATED MONITORING
FRONIUS SMART METER DAY MODE



INTEGRATED MONITORING
FRONIUS SMART METER NIGHT MODE



INTEGRATED MONITORING
FRONIUS SMART METER NIGHT MODE



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ANY QUESTIONS???

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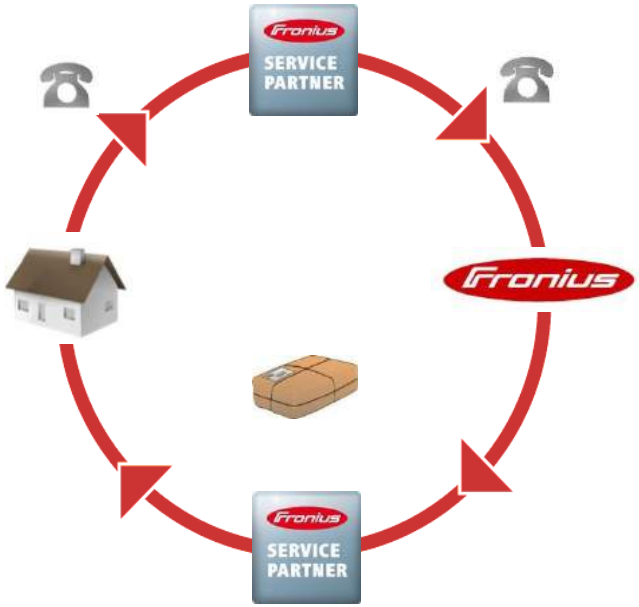
Needed Equipment

Fronius Replacement process

- Call hotline → Replacement process will be started
- Exchange component will be shipped → to the address of installer or endcustomer
- Defective component will be picked up and returned to Fronius Repair center



More INFORMATION and support

FRONIUS SOLAR ONLINE SUPPORT

Registration on sos.fronius.com

Overview warranty periode of components

Easy and quick- Order online replacement inverter from Fronius or required components

FRONIUS VIDEO TUTORIALS

HOW-TO VIDEOS

Find more under www.fronius.com

Thank you!

Visit www.Froniustraining.co.uk for our more info about our training courses

Our next training dates are;

– Fronius Service Partner

– Fronius OV Storage Solution Training

– Fronius Agilo Service Training

– Fronius IG Service Training

– Fronius IGTL Service Training

/ Peter Wood,

/ Technical Advisor

/ T: 01908 512 316

/ M: 07896 294 108

/ wood.peter@Fronius.com

24 HRS SUN

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