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

*Single phase or 3-phase Energy Meter

White Paper

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1. GENERAL

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

The Fronius Datamanager 2.0 is able to limit the inverter output power dynamically and therefore to control and limit the amount of energy which is export into the grid in accordance to the consumption of the loads.

The Datamanager Card 2.0 offers the following options to control the power output of the inverter:
- Modbus RTU
- Modbus TCP
- 8-bit binary input
- Dynamic Power Reduction using the Fronius Smart Meter

Therefore there are two possible ways to achieve export limiting with Fronius Inverters:
- Using the Fronius Smart Meter. Datamanager controls the inverter as a Master
- 3rd party controller issuing commands to the Datamanager.

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

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

1.1   Location of the Fronius Smart Meter

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

Feed-in path – bi-directional energy measurement. Load = Meter reading + Inverter power
Consumption path – single direction energy measurement. Load is measured directly.

Due to NET metering and the common way installations are done in Australia, in almost all cases, the Fronius Smart Meter will be installed in the **feed-in path**. This is also the default setting on the Datamanager METER tab.

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

Fronius Smart Meter   Site main switch   Grid

Loads

PV System
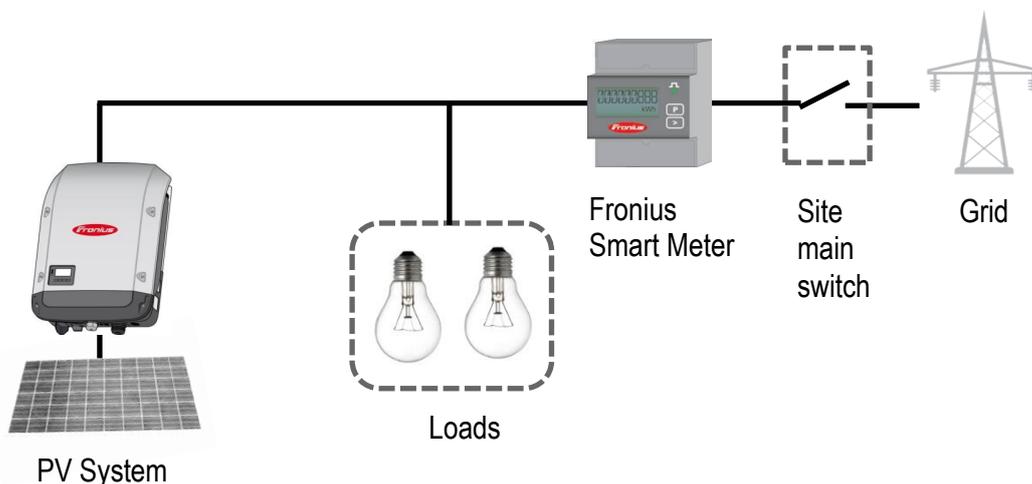
/ Consumption path

In this position the solar & the loads are separated by the meter. The solar is connected to the "grid" side of the Fronius Smart Meter.
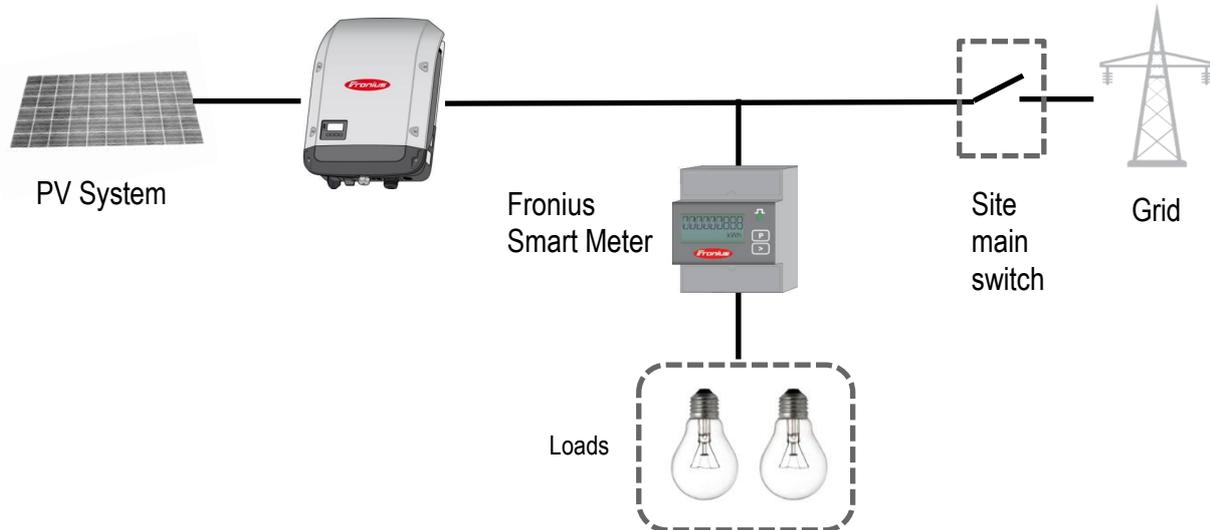
1.2 Requirements

Important! The Fronius Datamanager 2.0 needs a software version of **3.5.1-2** or greater. It can be downloaded from the Fronius Website under *Solar Energy/Info & Support/Software Downloads/Software Updates* or click here: http://www.fronius.com/cps/rde/xchg/SID-1CE5A97E-8EC72008/fronius_australia/hs.xsl/25_7671.htm

For more detailed information on how to upgrade the firmware of Fronius Datamanger 2.0 please see the Operating Instructions on the Fronius website under *Solar Energy / Products / System monitoring / Datalogging /Fronius Datamanager 2.0* or click: http://www.fronius.com/cps/rde/xbcr/SID-DBD64F5C-18F6818F/fronius_australia/42_0426_0191_EA_388899_snapshot.pdf

2. EXPORT CONTROL USING A FRONIUS SMART METER

2.1 Intro

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

It is required to connect it to the Fronius Datamanager 2.0 (comes built-in in SnapINverters Galvo, Primo, Symo and Eco) and can be retrofitted to all other Fronius inverters.

2.2 Schematics and Wiring

The following schematics shows the system configuration

Fronius inverter with Datamanager 2.0

ModBus RTU / RS485

L1
N

Fronius Smart Meter
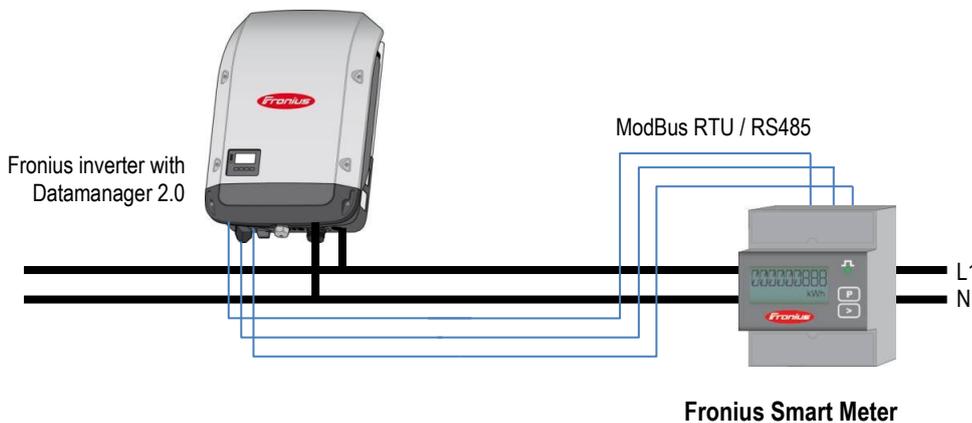
Please note:
/ Wiring between meter and inverter should use CAT5 or CAT6 cable (LAN cable)
/ Connection is a data line for Modbus RTU / RS485 using screw terminals on the meter
/ Maximum distance: 300 m (980 feet)

Meter connection on the Datamanager 2.0
The meter needs to be connected to the Datamanager's terminal block.
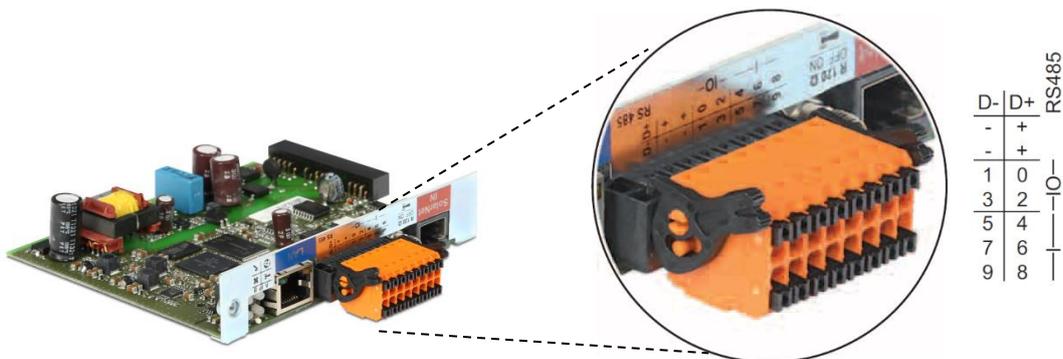
Wiring detail for Single Phase Fronius Smart Meter 63A/1PH* and Datamanager 2.0**

Fronius Smart Meter 63 A / 1 PH
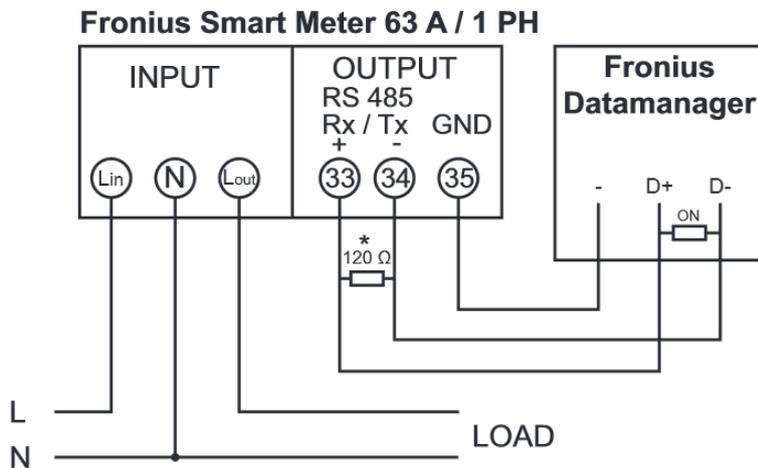
* The 120 Ohm terminating resistor is enclosed with the meter

*** Please note that the connections 33, 34, 35 on the Fronius Smart Meter are in the reverse order than shown in the graphics left!

Wiring detail for 3-Phase Fronius Smart Meter 63A/3PH and Datamanager 2.0
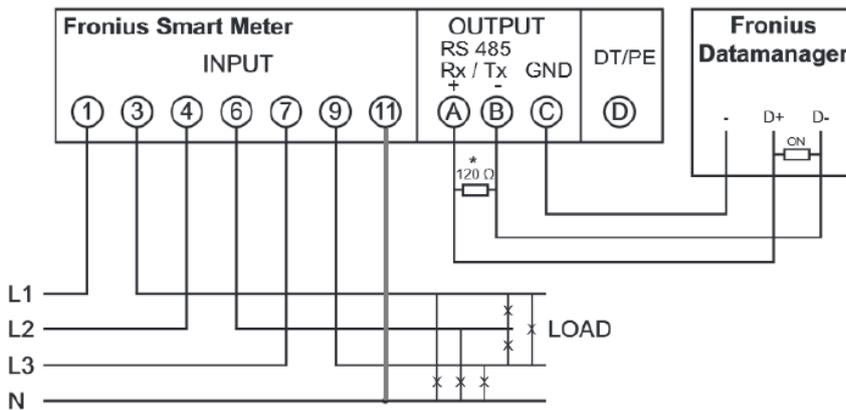
* The 120 Ohm terminating resistor is enclosed with the meter

Wiring detail for 3-Phase Fronius Smart Meter 50kA/3PH and Datamanager 2.0
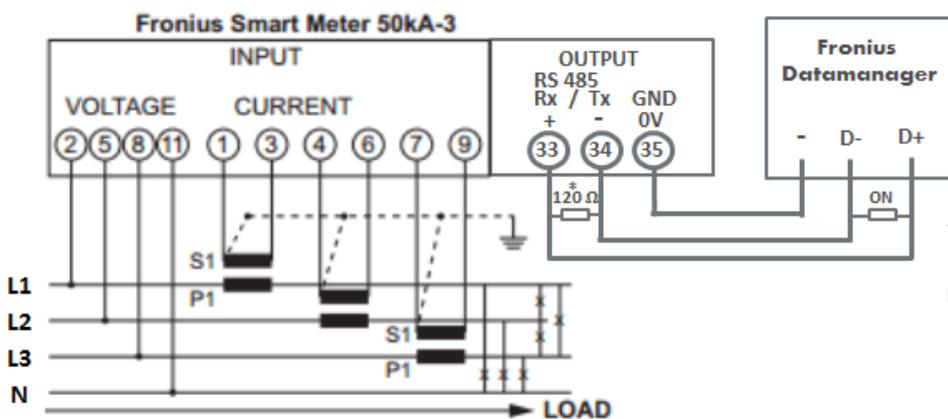
* The 120 Ohm terminating resistor is enclosed with the meter

Current transducers with a secondary current of 1A and 5A can be used.

Programmation

Only the transmission ratio has to be set!
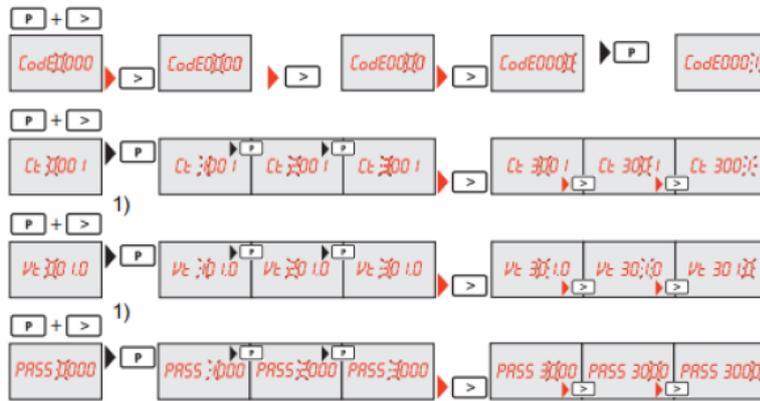
Password / type in Code **0001**

transmission ratio of the current transducer
*) If your CT ratio is 20 once set this will now read Ct 0020

transmission ratio of the voltage transducer – not in use.

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

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

Modbus termination switch on the Datamanager
The internal bus termination 120-Ohm resistance (for Modbus RTU) needs to be switched to *ON*.

Please Note:
The termination resistance must be activated for the first and last device in an RS-485 bus.

2.3 Activating the Fronius Smart Meter on the Datamanager web interface

The Datamanager Web interface can be accessed in two ways:

1. Via the Wi-Fi Access Point:
   - Activate the Wi-Fi Access Point on the Datamanager card (inverter) or Datamanager Box 2.0
   - Connect your computer/table/smart phone to the ,,**Fronius_240.XXXXXX"** Wi-Fi network
   - Open a web browser and go to http://192.168.250.181.
     Alternatively you can use Fronius SolarWeb App (Tablet/Smart Phone), go to **'Settings'** and click **'PV Inverter Homepage'** *(IOS)* or **My System Monitoring** *(Android)*

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

For information of how to set up the Fronius Datamanager please see the manual of the Fronius inverter or the Fronius Datamanager (for Fronius Galvo/Symo/Primo/Eco):
http://www.fronius.com/cps/rde/xbcr/SID-DBD64F5C-18F6818F/fronius_australia/42_0426_0191_EA_388899_snapshot.pdf
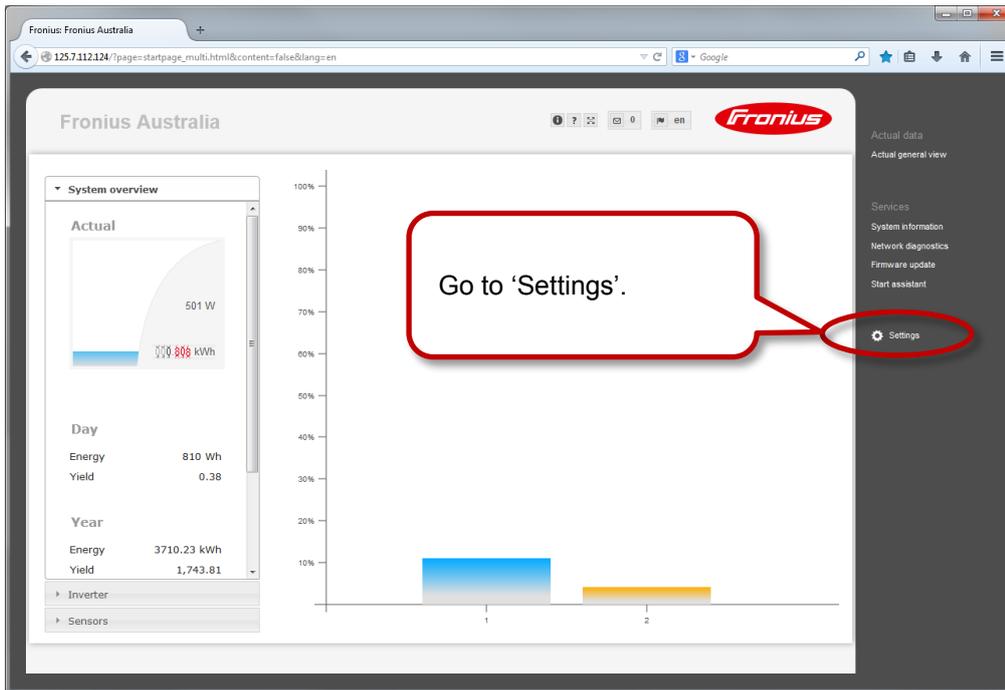
Go to 'Settings'.

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

If no service password has been set: Choose a service password under *PASSWORDS*.

Go to '*METER*' to do the relevant settings.

Choose the type of meter.
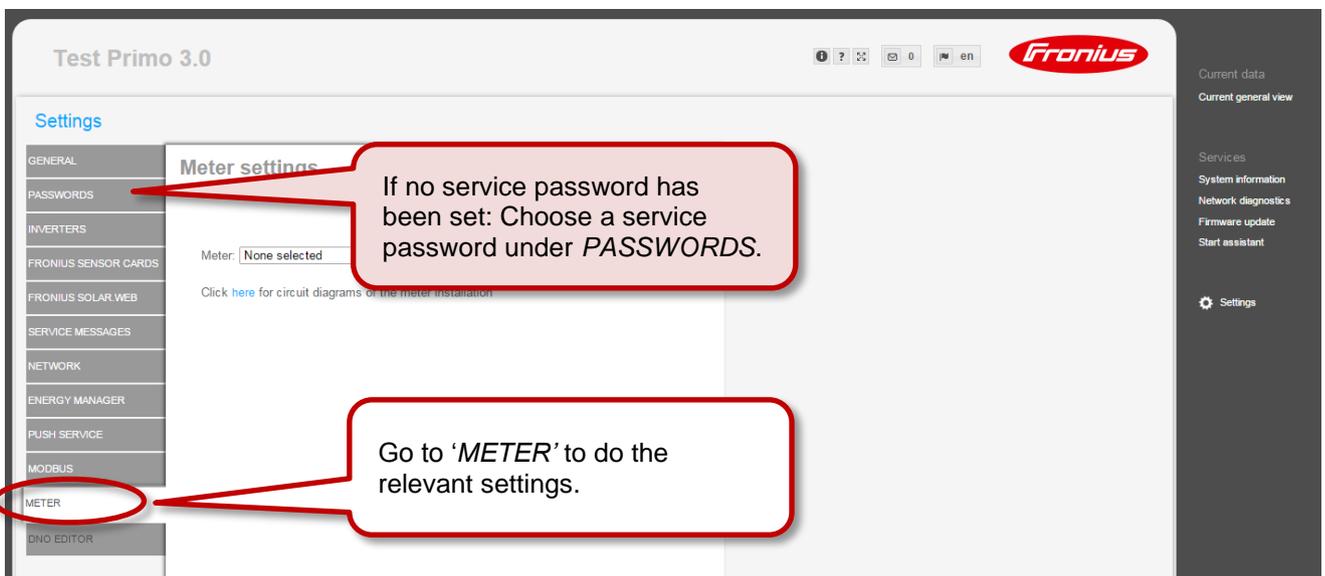
Select 'Fronius Smart Meter'
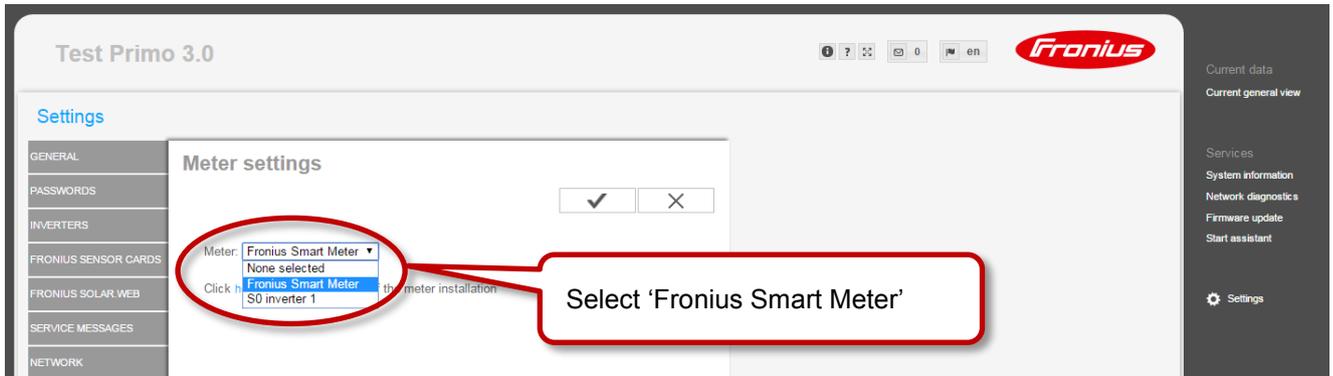
Choose location.
For further explanations on feed-in path and consumption path see chapter *1.1 Location of the energy meter*

Select whether the meter is located in the *feed-in path* or in the *consumption path*
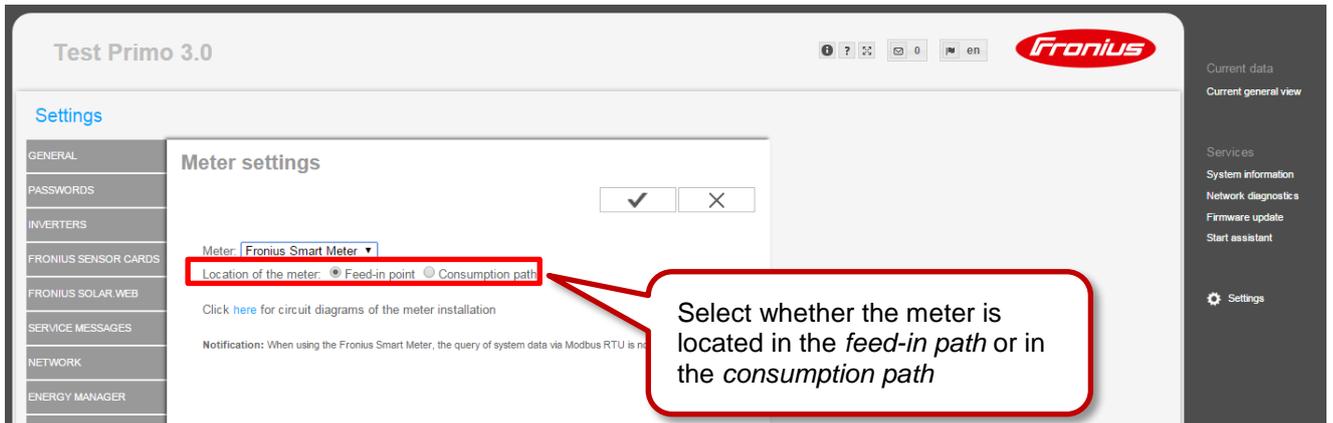
The meter is activated once you get the following message.
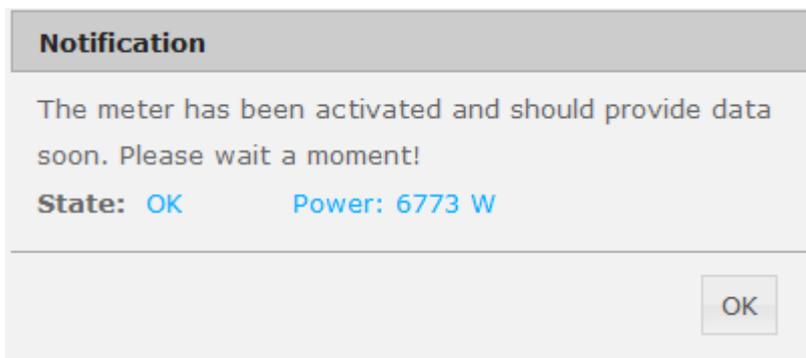
2.4 Set up Limit Export on the Datamanager web interface

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

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

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

For more information on the Fronius Datamanager 2.0 please see the Operating Instructions on the Fronius website under *Solar Energy / Products / System monitoring / Datalogging /Fronius Datamanager 2.0* or click: http://www.fronius.com/cps/rde/xbcr/SID-DBD64F5C-18F6818F/fronius_australia/42_0426_0191_EA_388899_snapshot.pdf