



Wels, January 17th 2017

FRONIUS EXPORT LIMITATION: UK REQUIREMENTS

Fronius International GmbH

confirms that inverters

- / **Fronius Eco 25.0-3-S – 27.0-3-S**
- / **Fronius Symo 3.0-3-S – 20.0-3-M**
- / **Fronius Primo 3.0-1 – 8.2-1**
- / **Fronius Galvo 1.5-1 – 3.1-1**
- / **Fronius Symo Hybrid 3.0-3-S – 5.0-3-S**

can be used together with

- / **Fronius Smart Meter 50kA-3**

to limit the export power to the grid to a predefined value between 0% and 100% of the inverter power. (The datamanager firmware has to be version 3.5.1-2 or above. The Fronius Hybrid inverter has to have a firmware version of 1.4.1-11 or above.)

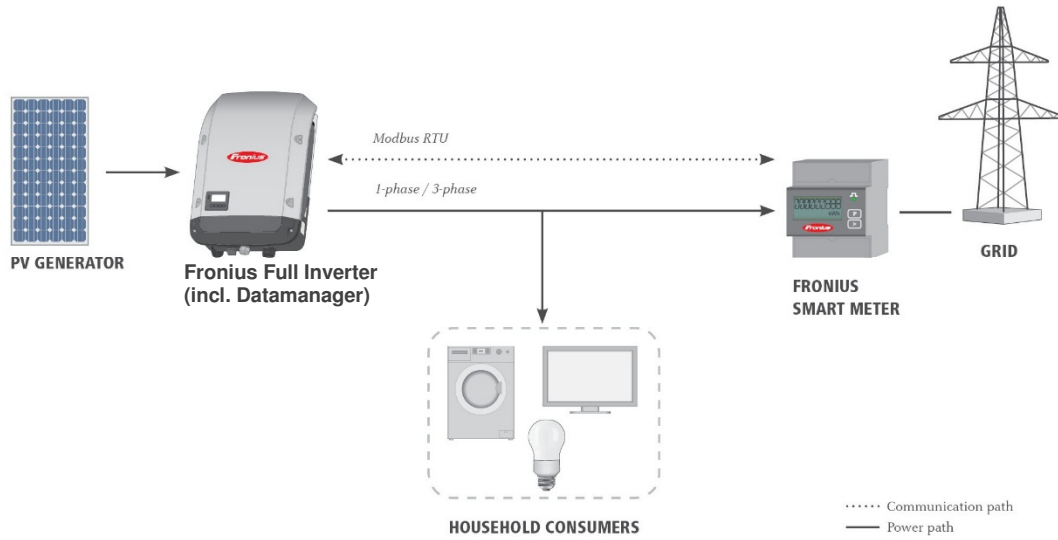
The predefined value has to be set within a password protected menu.

UK Requirements:

- *The scheme has hard wired communication links between the various component parts of the export limiter scheme.*
The Fronius Export Limitation does not rely on any wireless communication links. Inverter is connected to the Fronius Smart Meter via hard wired Modbus RTU (RS-485).
- *The export limitation scheme operates signals to the generation to reduce output within 1 second.*
The communication interval between the Fronius Smart Meter and the inverter is 1 second. Inside the inverter the new output power set point is calculated.
- *When the export limitations scheme operates it will reduce the exported Apparent Power to a value that is equal to, or less than, the Maximum Export Capacity within 5s.*
This performance requirement is fulfilled with any step change in load within the controlled system. See "Examples of test results".
- *Granular monitoring data can be made available upon request.*
Instantaneous monitoring is available via a Modbus interface as well as via the Solar-API (JSON interface). The 10 minute average log data are available via an online web portal Fronius Solar.Web, whereas the granularity must be adjusted in the settings page "Fronius Solar.Web" of the datamanager.
- *The scheme is fail-safe and limits export if the any of the discrete units and signalling systems that comprise the export limitation scheme fail or lose their source of power.*
If the Fronius Inverter does not receive signals from the Fronius Smart Meter (e.g.: because of a defect Smart Meter, or a disconnection of the Modbus Communication,...) the inverter immediately limits its output power to a maximum of the predefined value. In case of an AC power loss at the inverter, the inverter stops operation.

Configuration scheme with one inverter:

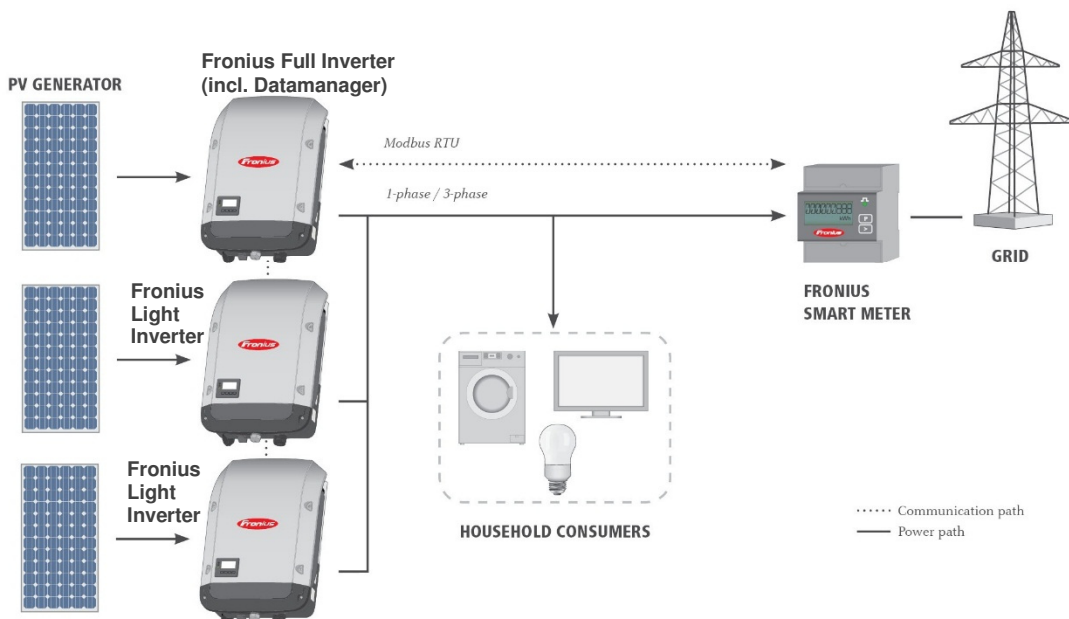
CONFIGURATION DIAGRAM



Configuration scheme with several inverters:

The configuration with several inverters is not possible with Fronius Hybrid inverters. Only one Fronius Hybrid inverter can be combined with one Fronius Smart Meter.

CONFIGURATION DIAGRAM

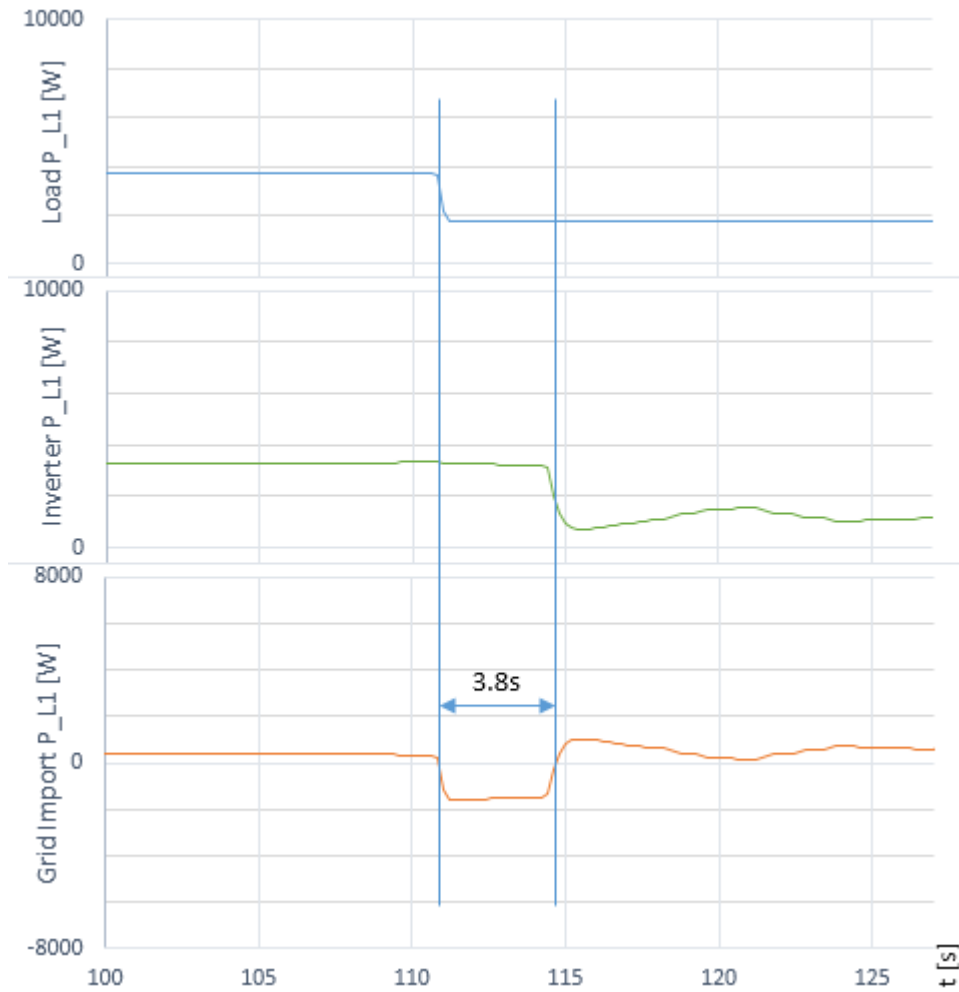




SHIFTING THE LIMITS

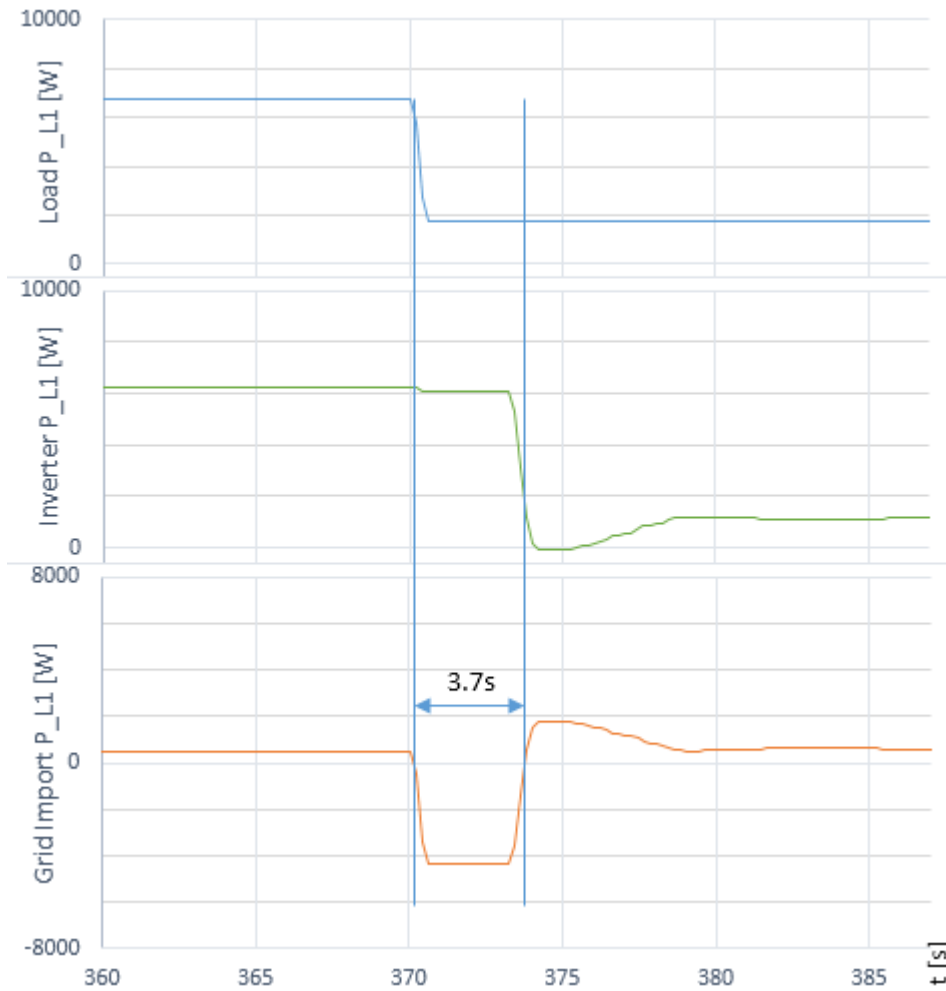
Examples of test results to show the compliance to *reduce the exported power to a value that is equal to, or less than, the Maximum Export Capacity within 5s:*

Test Case 1:
Export Limit: 0%
Fronius Primo 8.2-1
Load step from 3690 W to 1720 W



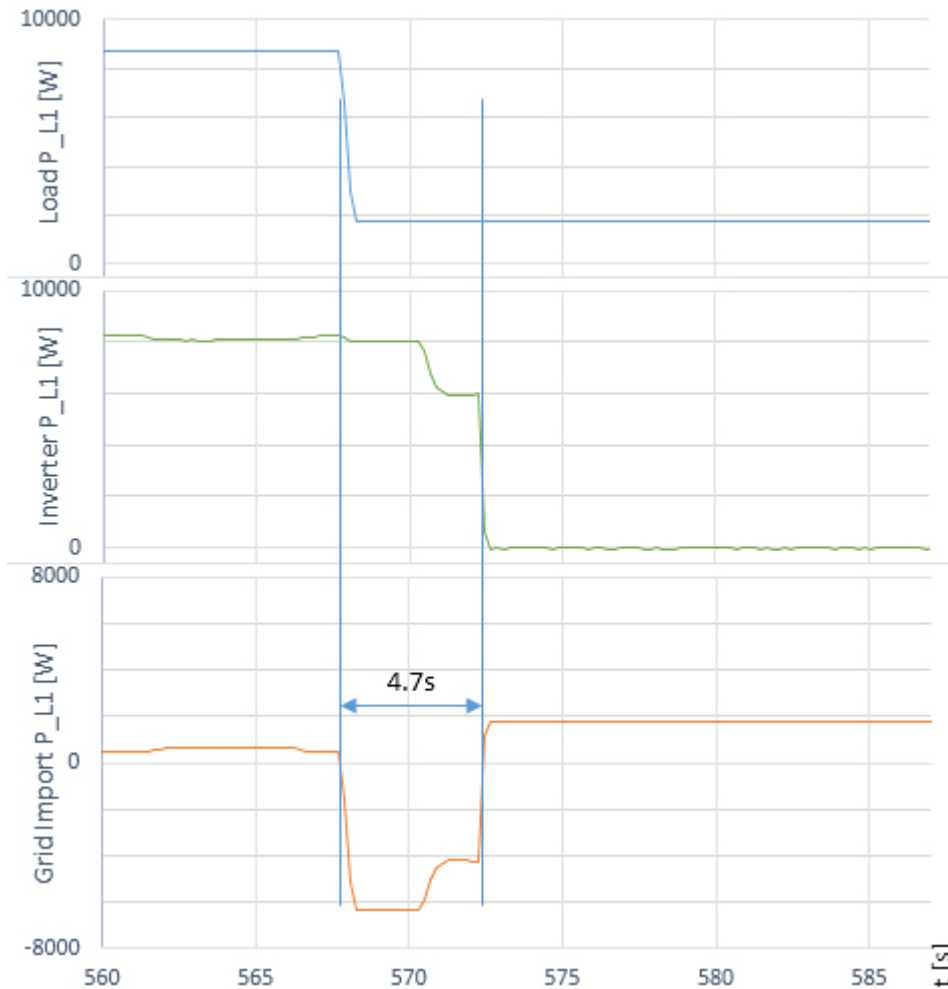
The inverter operates at a safety margin. At a change in load of 1970 W (24%) there is no export power after 3.8 s.

Test Case 2:
Export Limit: 0%
Fronius Primo 8.2-1
Load step from 6710 W to 1725 W



The inverter operates at a safety margin. At a change in load of 4985 W (61%) there is no export power after 3.7 s.

Test Case 3:
Export Limit: 0%
Fronius Primo 8.2-1
Load step from 8710 W to 1730 W



The inverter operates at a safety margin. At a change in load of 6980 W (85%) there is no export power after 4.7 s. In this case the inverter trips as a precaution at 4.7 s not to reach the 5 s limit.

All above listed inverters behave the same way as the inverter shown as example.

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