



Wireless RS485 for Fronius

Introduction

This document outlines the steps required to install a wireless Managed AC Coupled system with a Fronius Selectronic Certified grid inverter.

NOTE: The Fronius wireless link can only be used between the SP PRO and the first Fronius inverter. Any subsequent Fronius inverters must be hard wired, in a daisy chain, back to the first Fronius.

Applicability

1. Suitable for all Selectronic Certified Fronius Inverters
2. Suitable for Selectronic SP PRO Series II in single phase systems
3. Suitable for Selectronic SP PRO Series II in three phase or dual phase systems
4. Suitable for Selectronic SP PRO Series I in single phase systems ONLY. Need additional product "Adaptor, SP PRO series I to SCERT", stock code 005077

A summary of the installation steps are:

- ☐ Install the SP PRO and Fronius Inverters according to the SP PRO and Fronius installation manuals.
- ☐ Connect the Selectronic RS485 wireless link devices to the SP PRO.
- ☐ Connect the other half of the Selectronic RS485 wireless link devices to the first Fronius inverter in the system.
- ☐ Connect power, via the plug packs, to all the RS485 wireless devices.
- ☐ Provide a hardwire connection between the first Fronius inverter and subsequent Fronius inverters on that phase.
- ☐ Configure the Fronius inverter(s) and SP PRO(s) according to the document *IN0042_xx SP PRO Fronius Managed AC Coupling Installation Notes* or for Series 1 *IN0045_xx SP PRO Series I Fronius Managed AC Coupling Installation Notes*.

Note: This document needs to be read in conjunction with *IN0042_xx SP PRO Fronius Managed AC Coupling Installation Notes* or for Series 1 *IN0045_xx SP PRO Series I Fronius Managed AC Coupling Installation Notes*. and the SP PRO AU or GO Series Instruction Manual.

Installation Notes



Overview

The diagram below (fig. 1) shows a typical single phase managed AC coupled system with one Fronius inverter.

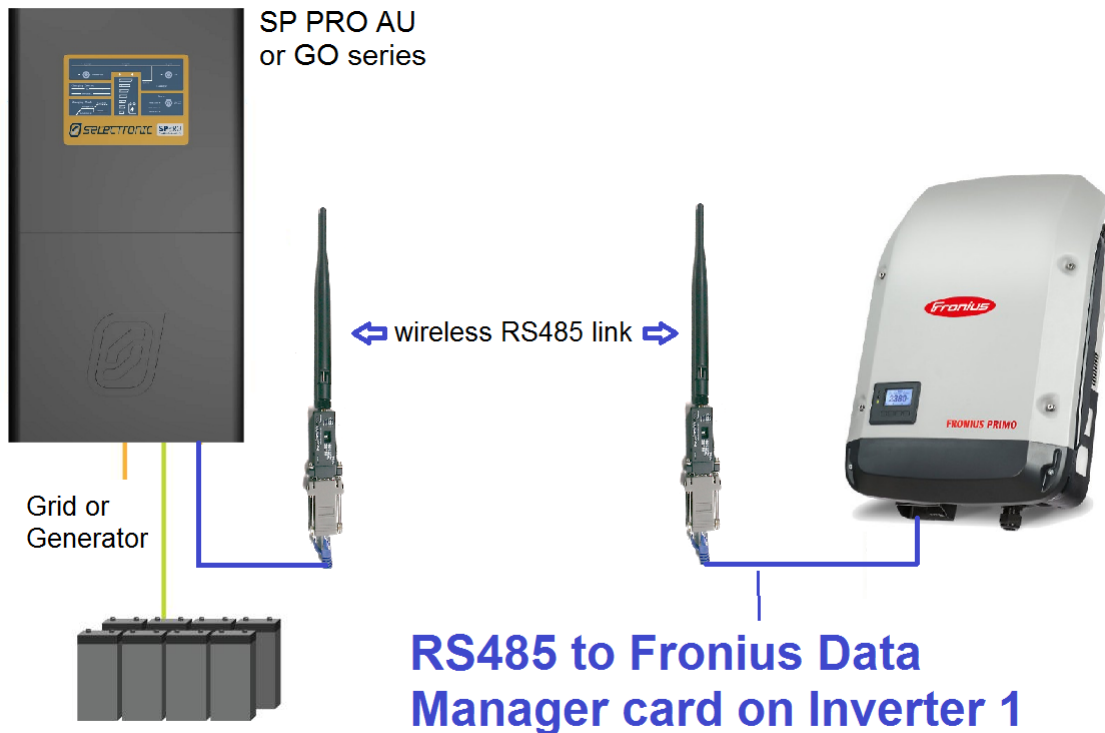


Fig. 1 – Overview of single phase system using the Wireless RS485 – One Fronius Inverter

Diagram below (fig 2) shows a larger system with five Fronius connected.

Note: Only one (Master) is connected with wireless, and the four others (Slaves) are connected with the Fronius Link.



Fig. 2 – Overview of single phase system using the Wireless RS485 – Five Fronius inverters

Installation Notes



The diagram below (fig. 3) shows a typical three phase managed AC coupled system with one Fronius inverter per phase.

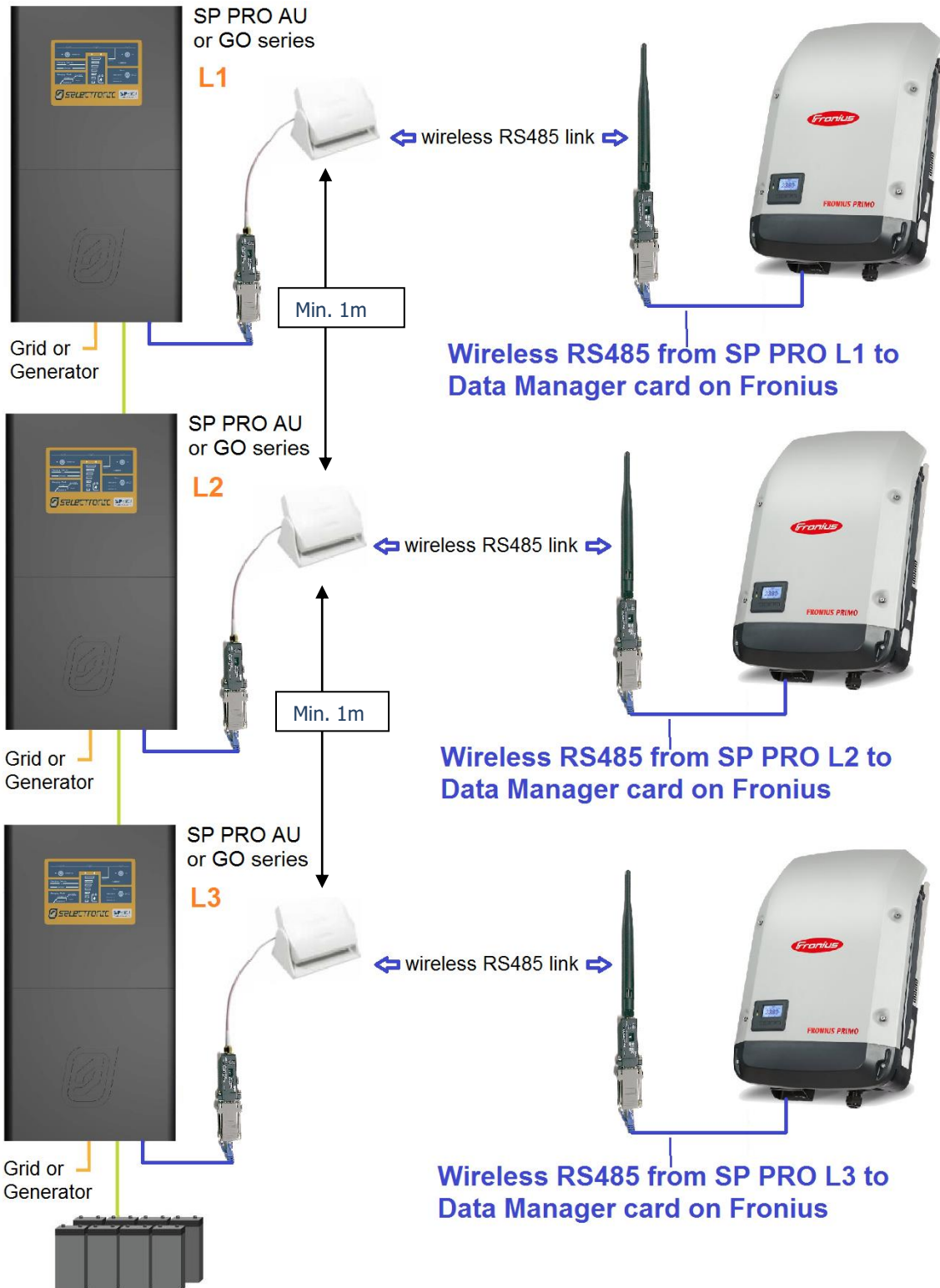


Fig. 3 – Overview of three phase system using the Wireless RS485 – one Fronius per phase

Installation Notes



Diagram below (fig 4) shows a larger three phase system with five Fronius connected.

Note: Only one (Master) per phase is connected with wireless, and the four others (Slaves) on each phase are connected with the Fronius Link.

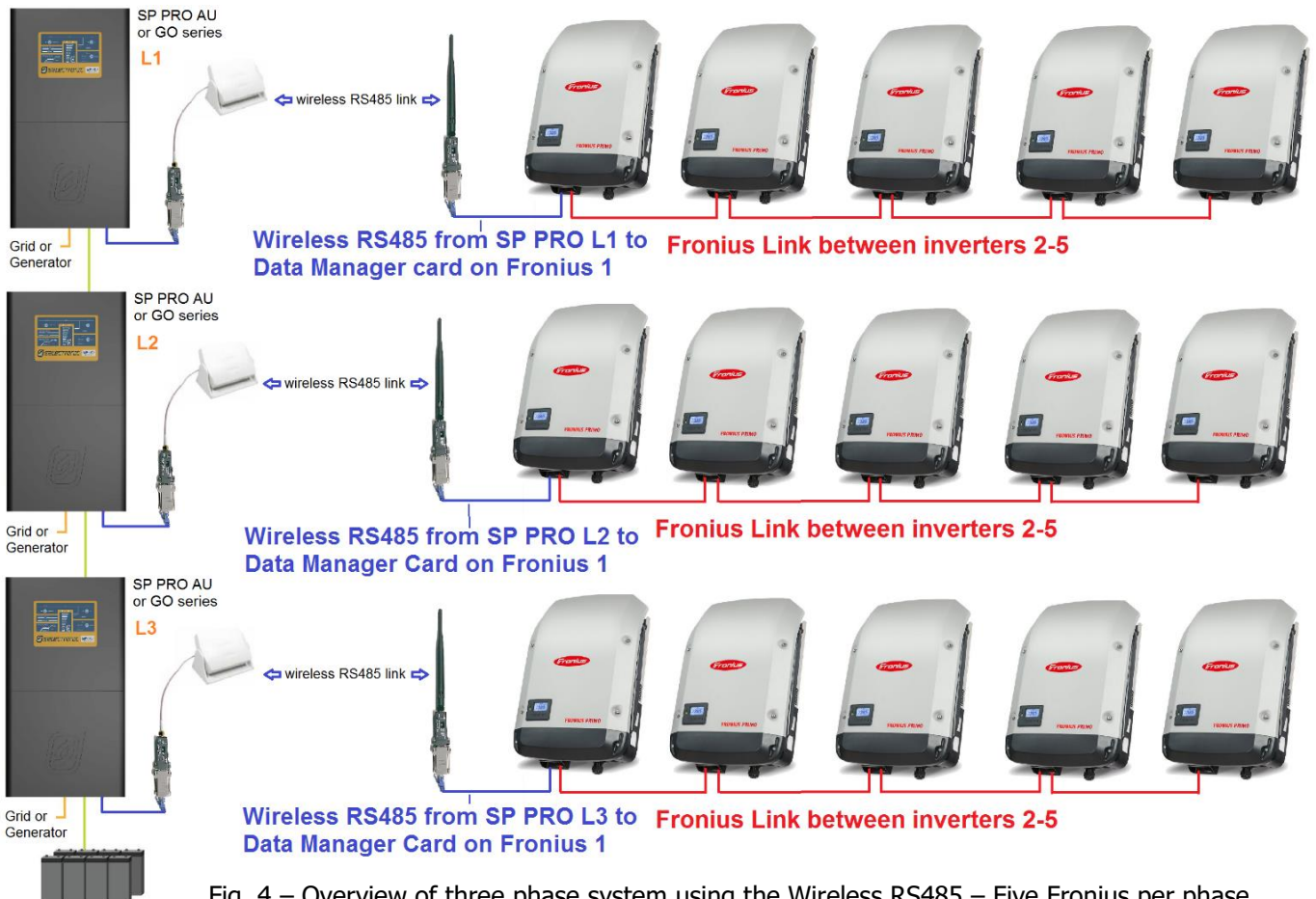


Fig. 4 – Overview of three phase system using the Wireless RS485 – Five Fronius per phase

NOTE: In a three phase or dual phase system, a patch antenna must be installed on each of the wireless RS485 devices at each of the SP PRO inverters. The minimum separation distance between patch antennas for different phases is 1 metre.

Installation Notes



Wireless link restrictions

The wireless link uses the same frequency band as WiFi (2.4GHz). Any obstructions between the two devices or interference from other devices using the same frequency band (other Bluetooth or WiFi devices) will have a significant impact on their range.

To achieve the maximum range of 200m there must be line of sight between the two devices with no interference. As a rule of thumb, each obstruction that is equivalent to a stud wall will reduce the distance by about 20%. Mud brick walls, double brick or concrete walls will have a much larger impact on the range.

Any obstruction from the landscape such as levy banks, hills or undulating land will totally block the signal so the wireless link will not function.

If more than one wireless link is required within the same installation (such as a three phase system), then the interference between the devices will further reduce the distance. In this case patch antenna must be used on the SP PRO end of link and recommended at Fronius End of the link.

Separate multiple antennas by at least 1m to assist in reducing interference.

Extending the Wireless Range

If the required distance is longer than the specified 200m clear line of sight, or there is multiple devices being used then the range of the devices can be extended by replacing the dipole antenna with a "patch" antenna. The table 1 below gives an indication of the expected range when using a combination of dipole and patch antennas:

Table 1: Maximum "Line of sight" distance between Wireless RS485 device pairs.

Wireless device antenna at SP PRO	Wireless device antenna at Fronius	Max distance, one pair of devices, line of sight (single phase)	Max distance, multiple pair of devices, line of sight (dual phase or 3 phase)
Dipole (supplied)	Dipole (supplied)	200m	Not recommended
Patch – Optional (stock code 004810)	Dipole (supplied)	300m	150m
Patch – Optional (stock code 004810)	Patch – Optional (stock code 004810)	500m	250m



Optional Patch Antenna to extend the range of the wireless devices. Please order Selectronic Stock code 004810.

Note: Patch antenna is directional and must be mounted in a fixed position that is directly facing the antenna of the other wireless device.

Installation Notes

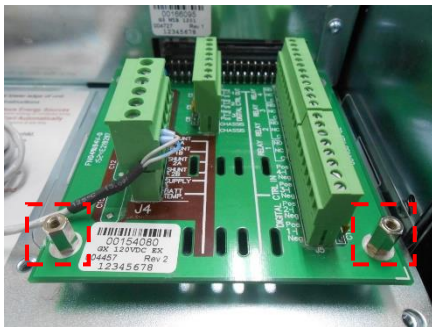


Installation

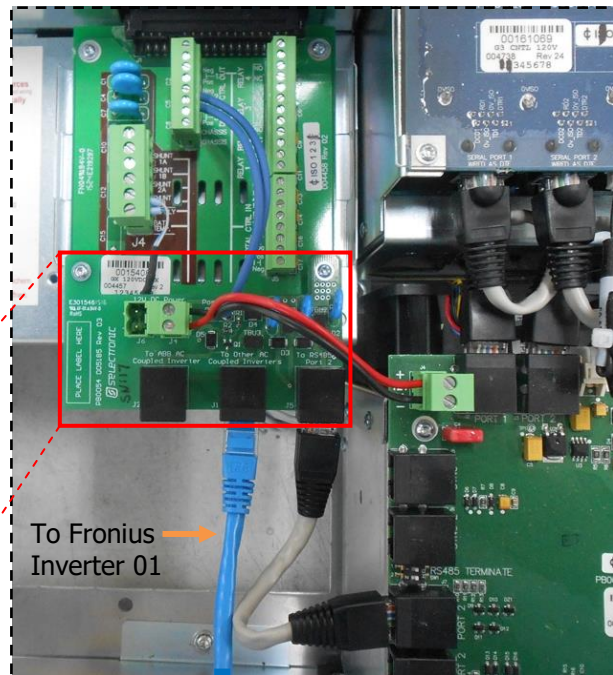
Connection from the SP PRO series II to Local Wireless RS485 device(s)

Install the AC coupled interface card into the SP PRO inverter (or each inverter in a multiphase system) following the instructions in *IN0042_xx SP PRO Fronius Managed AC Coupling Installation Notes*.

Using the supplied 'CAT5' network cable, plug one end into the AC coupled interface card and the other end onto the RS485 wireless adaptor as shown below. If a longer cable is required, then this can be any 'Cat 5' cable (network patch lead).



Expansion Card bottom screws replaced with stand offs.



Installation Notes



Connection from the SP PRO series I to Local Wireless RS485 device(s)

NOTE:

1. ONLY SUITABLE FOR SINGLE PHASE SYSTEMS:
2. Must use the "Adaptor, SP PRO series I to SCERT", stock code 005077.

Using the supplied 'CAT5' network cable, cut off one of the RJ45 plugs and bear the Brown, Orange and the White/Orange wires.

Connect the wires as follows to the LTC100 found in the "Adaptor, SP PRO series I to SCERT" kit. The other end of the network cable connects to the RS485 Wireless adaptor. Use a cable tie as a strain relief for the network cable as required.



Cat 5 wire colour	Terminal on the LTC100
Brown	GRND
Orange	TX-
Orange/White	TX+



Plug in the DB9 to RJ45 lead supplied with the "Adaptor, SP PRO series I to SCERT" kit into the LTC100 (DB9 end). The other end of the lead plugs into the SP PRO series I "RS232 port 2".

Installation Notes



Single Phase SP PRO connection to Local Wireless RS485 device

The plug packs must be connected to the same AC power circuit as the connected Fronius inverters. This is normally the AC load side of the SP PRO.



Fig. 5 – Communications wiring with SP PRO

Multi Phase Installation: SP PRO, Local Wireless RS485 device (Series II ONLY)

To incorporate the Wireless RS485 devices in a multi-phase (three phase or split phase) Managed AC coupled system, one Wireless RS485 device pair is installed per phase.

In this configuration there will be one Wireless RS485 device attached to each of the SP PRO inverters. At the remote end, the matching Wireless RS485 device will only be connected to the Fronius inverters for that phase.



Fig. 6 – Communications wiring for local Wireless RS485 Adaptors in a three phase system.

NOTE: When using multiple Wireless RS485 device pairs, Patch Antennas (Selectronic Stock code 004810) must be used on SP PRO End of link and recommended for Fronius End of link. This will reduce the interference between devices and help ensure trouble free operation.

Maintain at least 1m separation between each phase's Patch Antennas, to reduce interference.

Installation Notes



Remote Wireless RS485 device and Fronius Inverters

Now connect the wireless RS485 device to the Fronius inverter 1 using the supplied patch lead. One end of the patch lead plugs into the RS485 wireless device, the other end has the wires stripped and connected to the Fronius Inverter Comms connector (See Fig 8).

See *IN0042_xx SP PRO Fronius Managed AC Coupling Installation Notes for connection details to the Fronius inverter.*



Fig. 7 – Remote Wireless RS485 and Multiple Remote Fronius inverters.

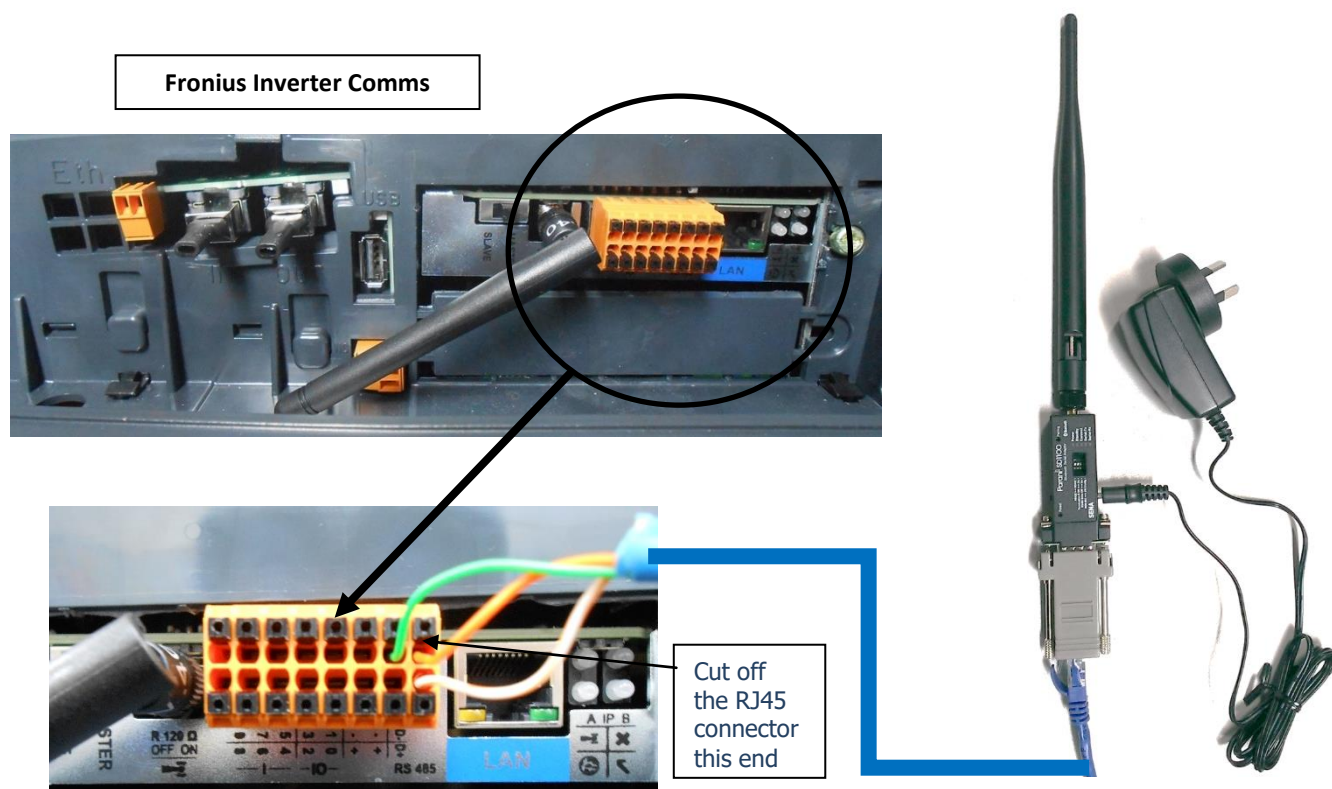


Fig. 8 - Connection between Fronius Datamanager connector and the RS485 Wireless device



Configuration settings for SP PRO / Fronius managed AC coupling

Refer to the installation instructions *IN0042_xx 005230 SP PRO Fronius Managed AC Coupling Installation Notes* for information on setting up and commissioning the inverters.

Selectronic web site – <http://www.selectronic.com.au> or contact the Selectronic Sales Team.