



Innovative Electrical Automation Solutions

IES WIRELESS FEED-IN LIMITER

Installation and User Manual



Model
IPS-W-RX

**CONTAINS IMPORTANT INSTALLATION AND TESTING PROCEDURES
THAT MUST BE FOLLOWED TO ENSURE COMPLIANCE WITH THE
DISTRIBUTION NETWORK SERVICE PROVIDER.**

www.integrelec.com.au

Version 5.1, 31 March 2020

(07) 3123 9538

Manufactured by



Disclaimer

The Information contained in this document is subject to change without notice. Integrelec reserves the right to make modifications and/or improvements to this document as well as to the products that this document refers to. Such changes will be incorporated into new editions of this document.

IPS series feed-in limiters and grid protection devices are designed and manufactured by Integrelec.

The design, installation and certification the solar installation (including the equipment this manual refers to) must also be done in accordance with all regulations and requirements of the local distribution network service provider.

Warranty Information

This product is supplied with 12 months manufacturer warranty.

Contact Information

Phone:
(07) 3123 9538

Internet:
www.integrelec.com.au

Email:
admin@integrelec.com.au

Address:
8/19 Lensworth St
Coopers Plains
QLD 4108

Table of Contents

Disclaimer.....	2
Warranty Information.....	2
Contact Information.....	2
1 Product Overview	4
1.1 Functional Description	4
2 Package Contents.....	6
3 Safety instructions	6
4 Installation and Setup	6
4.1 Mounting.....	6
4.2 Configuration	7
4.3 Electrical Connections.....	8
4.3.1 External Connections	8
4.3.2 Inverter Protocol Selection	9
4.4 Cable Selection & Installation Guide.....	10
4.4.1 Voltage Monitoring.....	Error! Bookmark not defined.
4.4.2 RS485 Cable.....	11
4.4.3 Current Transformer Cables and Installation.....	Error! Bookmark not defined.
4.5 Setting CT ratio.....	Error! Bookmark not defined.
4.6 Setting the Export Limit	Error! Bookmark not defined.
5 Testing.....	11
5.1 Verify Communications with Inverter.....	12
5.2 Test Operation	Error! Bookmark not defined.
6 Operation Guide.....	13
6.1 “BUILDING MAINS NET POWER FLOW” display.....	Error! Bookmark not defined.
6.2 “SYSTEM STATUS” display.....	Error! Bookmark not defined.
6.3 System Status Faults	Error! Bookmark not defined.
6.4 Display Indicators.....	Error! Bookmark not defined.
7 Technical Data.....	13

1 Product Overview

The IPS-W-RX has been developed to serve as an extension to the IPS board series – allowing remote inverters to be controlled wirelessly by a central feed-in limiter. The following inverter brands are currently supported for export control: ABB Trio, ABB PVS, Huawei, Sungrow, SMA, and Fronius.

The IPS-W-RX is to be used in tandem with either the IPS01, or IPS02 central boards. The central board must also be outfitted with the transmitter module.



Figure 1 – Interior Layout

1.1 Functional Description

- Once powered the IPS-W-RX will automatically connect to – and begin receiving data from – the paired transmitter. The *LINK OK* indicator will light up to indicate a connection has been established.
- When connected, if the transmitting grid-protection controller allows it, the contactor relay will become energized. The *RUNNING* indicator will light up to indicate the inverters are connected.
- Once a full data packet is received (typically within 2 seconds), the connected inverter will ramp to the value given by the feed-in controller.
- The receiver will continue to follow the direction of the feed-in controller, matching the inverter power to the transmitted value.

- If the grid-protection of the transmitting controller is triggered, the receiver unit will follow suit – deenergizing the contactor relay. This will disconnect the inverter. Note that the *RUNNING* light will also power-off.
- If the receiver loses connection to the transmitter, the receiver will immediately deenergize the contactor relay – disconnecting the inverter. Both the *RUNNING* and *LINK OK* lights will turn off.
- If a disconnection persists for 2 seconds, the receiver unit will instruct the inverter to output 0% power.
- Once a connection is re-established, the contactor relay will reenergize and the inverter will restart normal operation.

1.2 Antenna Options

Integrelec offers two antenna options for use with the IPS-W-RX system.

- The 4.5dBi antenna pair – capable of 350m line-of-sight.
- The 6dBi high-gain antenna pair – capable of 450m line-of-sight.

2 Package Contents

- 1 x Installation and User Manual
- 1 x IPS-W-RX IES Wireless Feed-In Limiter (WFIL)

In addition, the installer must also supply: (see Sec. 4.3 for details)

- 2C+E cable from Main Switch Board to WFIL
- 1 x 3 Pole Contactor (rated to the full inverter output current) per inverter.
- RS485 cable from WFIL to Inverter
- Receiver Antenna (Can be purchased separately)

3 Safety instructions

Installation and testing of this device must be performed by a licenced electrician in accordance with AS3000, AS4777 and all other applicable standards.

4 Installation and Setup

For the WFIL to function as an approved power limiting device in accordance with the connection standard as discussed in Sec. 1, it must be installed as follows.

4.1 Mounting

Wall mount the WFIL as close as practicable to the inverter and transmitter.

The attached antenna should be placed as high as practicable, mounted vertically.

4.2 Configuration

Figure 1 shows the overall cable topology for installation.

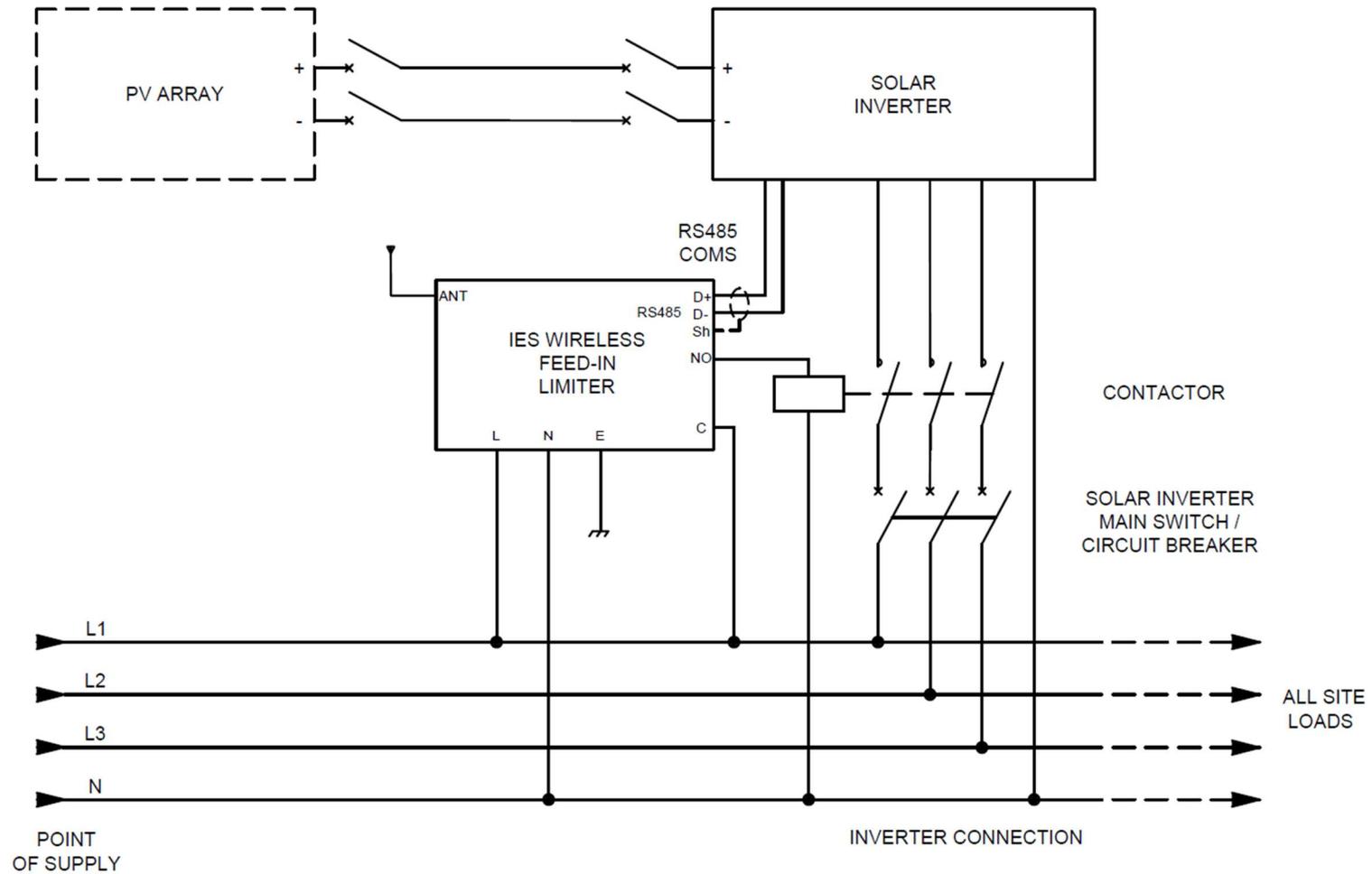


Figure 2 - Installation Topology

4.3 Electrical Connections

4.3.1 External Connections

All electrical connections to the device (Excl. Antenna) are made at the terminals inside the enclosure. Below is the list of terminations:

E	EARTH
T1	MAINS - NEUTRAL
T2	MAINS - LIVE
T3	RS485 INVERTER - D+
T4	RS485 INVERTER - D-
T5	RS485 INVERTER - SHIELD
T6	INVERTER TRIP RELAY - NO
T7	INVERTER TRIP RELAY - C

Figure 3 - Interface Terminals for the WFIL

The NO (normally open) and C (common) terminals are supplied as dry contacts to control inverter contactors. Appropriate control voltage must be wired to the common (C) terminal to power contactor coils, wired as normally open. Refer to Figure 2 - Installation Topology.

Inverter contactor(s) must be located within an adjacent enclosure.

The antenna SMA terminator must be connected to the receiver within the enclosure, located below:

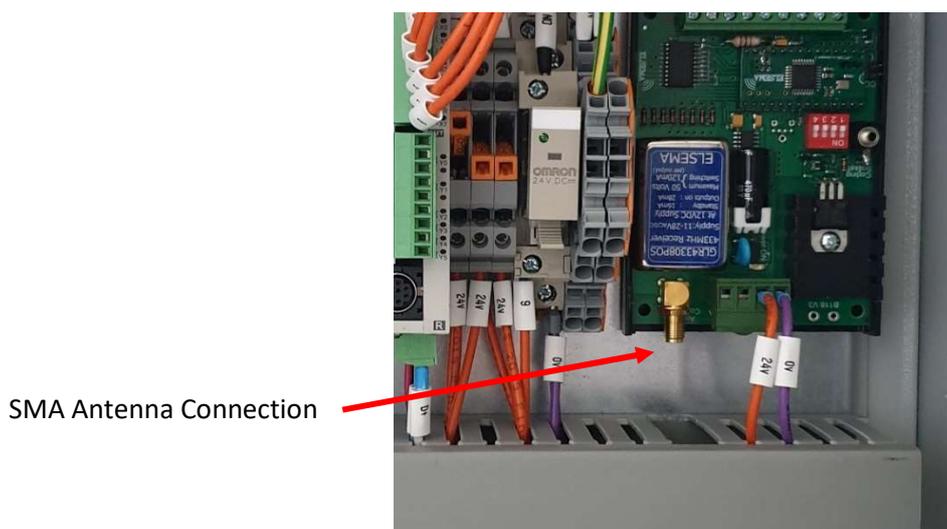


Figure 4 - SMA Location

4.3.2 Inverter Protocol Selection

The IPS-01 is compatible with the following Inverter brands: ABB Trio, Huawei, Sungrow, SMA, Fronius and ABB PVS.

The brand of inverter in use must be selected via the inverter select switches X0, X1, and X2 so that the corresponding inverter communication protocol is enabled. The below table shows the switch configuration corresponding to each protocol:

INVERTER PROTOCOL SELECT

X0	X1	X2	
0	0	0	Sungrow
0	0	1	SMA
0	1	0	ABB PVS
0	1	1	Fronius
1	0	0	Power One
1	0	1	Huawei

Figure 5 - Inverter Protocol Selection Table

The below example has the Sungrow protocol selected (switches 1,2,3 in off position):

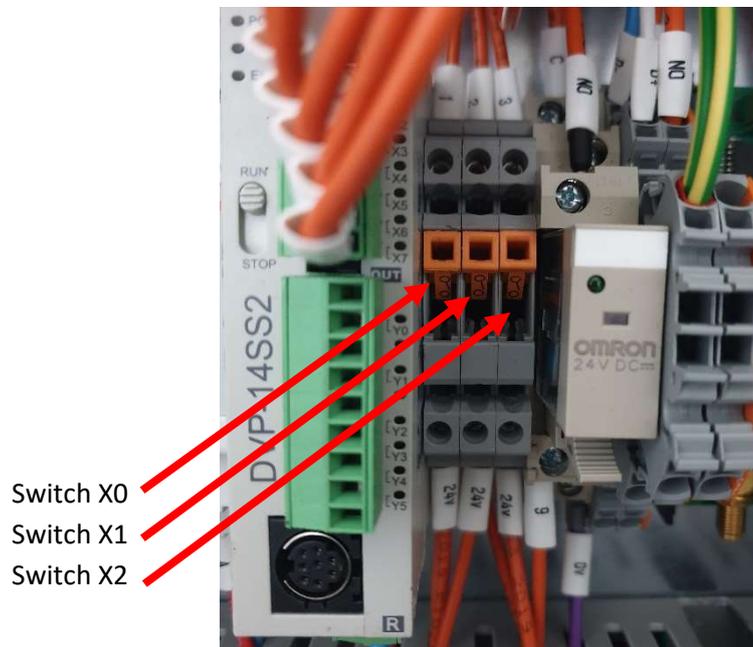


Figure 6 - Inverter Protocol Selection Switches

4.4 Transmitter / Receiver Pairing

Prior to installation at the receiving site, the WFIL must be paired to the transmitting GFIL. To do this, follow the below steps:

1. Locate the WFIL next to the GFIL board and ensure both are powered-off.
2. Connect the transmitter to the receiver via the pairing cable provided.
3. Place a jumper between the two CC pins on the receiver board.
4. Power the WFIL, followed by the GFIL – Wait 5 seconds.
5. Disconnect the jumper from the CC pins.
6. Disconnect the pairing cable and deenergize the boards.

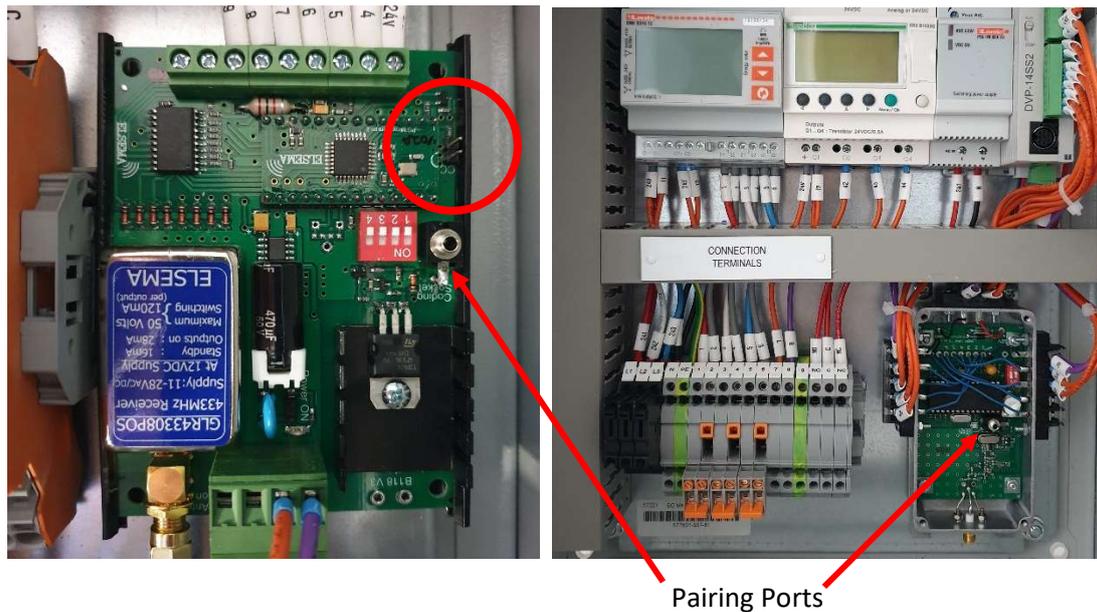


Figure 7 - CC Pins and Pairing Port Location

Once paired, the receiver can then be installed at the receiving site. Repeat 1-6 to pair multiple receivers to the single transmitter.

To unpair a receiver from the transmitter – temporarily connect the two CC pins on the receiver board whilst powered.

After performing the pairing sequence, it is advised to perform a test – see Verify Wireless Communications with Tx GFIL

Note: If purchased together (IPS-01-W + IPS-W-RX), Integrelec will pre-pair the devices in-house, and these steps will not be necessary.

4.5 Cable Selection & Installation Guide

Use appropriate cable glands through the bottom gland plate of the enclosure to gain cable access to connection terminals. The chosen antenna should also be brought through a cable gland.

4.5.1 RS485 Cable

Terminals 3-5 in the connection terminals are used for the RS485 interface to the inverter. Use 0.25mm² (minimum) twisted pair, shielded cable. Refer to Figure 2 - Installation Topology for correct wiring configuration at the WFIL end. Refer to inverter documentation for wiring configuration at the inverter end. For multiple inverter applications, a parallel connection of RS485 cable looping to each inverter is required.

4.5.2 Antenna / Antenna Cable

The antenna should be mounted as high as practicable, with minimal obstructions to line-of-sight.

The antenna options are provided with a 3.8m Low Loss SMA-terminated cable. This cable should be brought through the gland-plate along with any excess cable length and connected to the receiver unit. Do not power either the transmitter nor receiver without an antenna connected.

Additional space is provided at the bottom of the enclosure for excess antenna cable.

5 Testing

5.1 Verify Wireless Communications with Tx GFIL

- The connection status can be viewed with the indicator LED on the enclosure door. If a connection exists, then the communications can be tested.
- Put the transmitting GFIL into manual mode by pressing the left and right buttons together on the Schneider Zelio Controller inside the GFIL until “TEST MODE” is displayed on the screen.
- Hold the Up arrow until the contactor relay energizes.
- Check that the Corresponding contactor relay on the receiving WFIL has also energized – The *RUNNING* indicator will show this.
- Return the system to automatic mode by pressing the left and right buttons together on the Schneider Zelio controller again, or by power cycling the board.

5.2 Verify Inverter Communications

- To test and confirm that the RS485 interface is correctly communicating with the inverter, refer to the inverter documentation. For multiple inverter applications, ensure that each inverter has been configured with a unique RS485 port address.
- Put the transmitting GFIL into manual mode by pressing the left and right buttons together on the Schneider Zelio Controller inside the GFIL until “TEST MODE” is displayed on the screen.
- Hold the Up arrow until the contactor relay energizes.
- Use the Up and Down arrows on the Schneider Controller to manually drive the inverter limit from 0 to 100% and check the measured site loads changes accordingly on the Lovato Power Meter.
- Return the system to automatic mode by pressing the left and right buttons together on the Schneider Zelio controller again, or by power cycling the board.

6 End User Guide

Once installed and tested, the WFIL is a fully autonomous system that requires no end user interaction. The WFIL will replicate the output state of the paired transmitting GFIL. This can be confirmed with the indication LEDs on the enclosure door.

6.1 Indication LED

The door of the enclosure is fitted a pair of status LEDs. The *LINK OK* indicator is lit when a connection to the transmitter exists. The *RUNNING* Indicator is lit when the contactor relay is energized, as commanded by the transmitter.

6.2 Contactor not energized

In the event that the contactor is not energized – and the connection *LINK OK* indication is lit – then it can be assumed the transmitting GFIL grid-protection has been activated.

7 Technical Data

Parameter	MODEL
MODEL	IPS-W-RX
Phases	1
Inverter compatibility	ABB Trio, Huawei, Sungrow, SMA, Fronius, ABB PVS
Input Voltage	240V (1P + N)
Power Consumption	5W
Inverter Interface	RS485
Dimensions	300(h)x300(w)x150(d)
Weight	5kg
Ingress Protection	IP54
Warranty	12 months
Approvals	Energex Ergon Energy

IPS-W-RX

IES WIRELESS
FEED-IN LIMITER

Designed & Manufactured
By



www.integrelec.com.au