

**RTU+<sup>®</sup> V6**

# **RF-Modem Installation Guide**

**Serial Number**

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**Document Code**

**EMNL000020\_01\_EN\_RTU<sup>®</sup> V6**

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## Notice on Interference

### **Class B digital device**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

### **Use of radio frequency energy**

This device generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

### **Preventing interference**

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the distance between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## RF Description

This module enables the RTU+<sup>®</sup> V6 to communicate with multiple EpIO's via radio frequency;



The network between the data concentrator and the EpIO's is self-forming and self-healing, with the data concentrator acting as central master and the EpIO's acting as slaves. It is self-forming because after installation, each EpIO auto-configures itself and detects if any other possible EpIO's are in the vicinity, thereby creating a network capable of expanding itself without any manual intervention. Each EpIO sends its consumption data via RF directly or indirectly to the data concentrator. Indirect communication is possible thanks to the dual role of the EpIO: It can send its own data to the data concentrator but can also act as a repeater for the data of another EpIO simultaneously. Moreover, the network is self-healing due to automatic repair when one device fails (due to disconnection, fire, etc...): a remote EpIO simply detects another EpIO in its vicinity to send its data to.

This network communication is very similar to the one used by routers on the Internet, which communicate amongst each other and update their internal routing tables, in order to recalculate a new routing path should a router fail. But contrary to this mesh-networking by routers, EpIO's can never serve as master, only as slave or as submaster; in which case a single EpIO collects the data from multiple EpIO's before sending it to the RTU+<sup>®</sup> V6 (the master data concentrator).

## Technical Specifications

For the USA (915 MHz):

Feature	Implementation
FREQUENCY RANGE	902 – 928 MHz
OUTPUT POWER	50 $\Omega$ antenna: -7 to +9 dBm
RECEIVER SENSITIVITY	-104 to -111 dBm
CHANNELS	25 channels (Frequency Hopping)
MODULATION	FSK
DATA RATE	< 20 kbs
RANGE	Outdoor: up to 300 meters (line of sight) Indoor: up to 100 meters

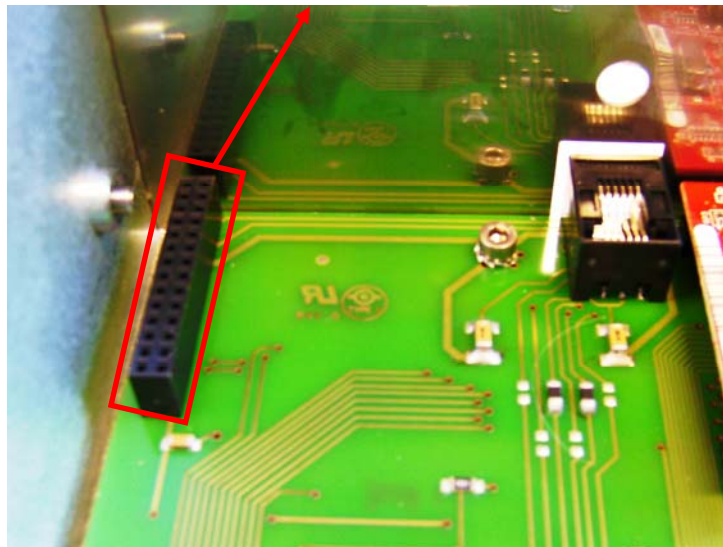
For Europe (868 MHz):

Feature	Implementation
FREQUENCY RANGE	868 – 870 MHz
OUTPUT POWER	50 $\Omega$ antenna : -6 to 8,5dBm
RECEIVER SENSITIVITY	-105 to -111 dBm
CHANNELS	1 channel
MODULATION	FSK
DATA RATE	< 15 kbs
RANGE	Outdoor: up to 300 meters (line of sight) Indoor: up to 100 meters

## RF Modem Location

The RTU+<sup>®</sup> V6 RF modem needs to be installed in the upper left corner of the main board using the pin connector shown below.

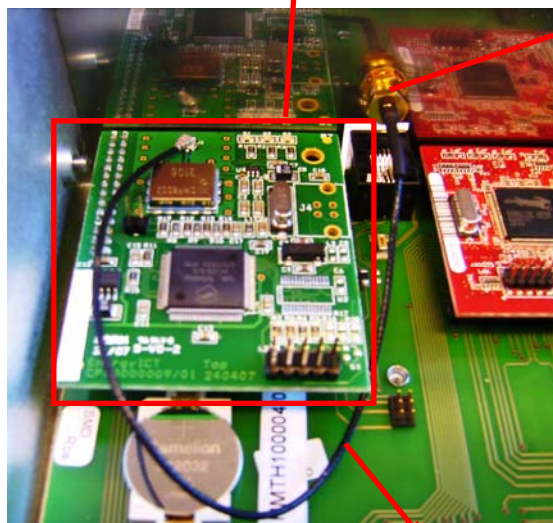
**Pin Connector**



The image below shows the main board with the RF modem properly installed.

**RF modem**

**Copper Fitting**



**Antenna**

## Installing the RF modem

### Note

This section is meant to be purely informative; the RF modem and antenna may only be installed and repaired by EnergyICT<sup>®</sup> personnel.

Proceed as follows to install the RF modem on the RTU+<sup>®</sup> V6 main board:

- 1 Switch off the device and make sure it is no longer powered.
- 2 Loosen the protective panel screws.
- 3 Remove the upper and lower protective panels.
- 4 Insert the RF modem, making sure that all pins of the card fit exactly in the designated pin connector. If any resistance is felt, or if the card was not correctly inserted, gently remove the card and insert again. Always make sure the pins are never damaged.
- 5 Install the antenna. The RF antenna is packed together with the RTU+<sup>®</sup> V6.
  - Remove the antenna from the package.
  - Screw the antenna to the copper fitting on the RTU+<sup>®</sup> V6.
  - Make sure to check the reception before fixing the antenna.

### Note

Antenna's are fixed to the RF module and are not exchangeable. They are installed by EnergyICT<sup>®</sup> at production time and may not be removed by the customer. For all installations and repairs to the RF antenna, please send your RTU+<sup>®</sup> V6 to EnergyICT<sup>®</sup>.

- 6 Replace the protective panels.

- 7 Fasten the screws.