



eleven-X Interface Unit (XIU)

User Integration Manual

Model XIU001000

version 1.0 (2018-04-30)



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Revision History

Version	Date	Description
1.0	2018-04-30	Initial Document Creation



Introduction

The eleven-X Interface Unit (XIU) module, model XIU001000, is a LoRaWAN™ compliant module providing low power, long range communication in the 915MHz ISM band in North America.

The XIU allows users to retrofit existing devices, converting a device that is only readable onsite at infrequent intervals, to a device that can report data (eg meter readings, water levels) instantly and remotely through a LoRaWAN™ wireless network.

The XIU can be configured by the user remotely using over the air commands, or locally using the built in NFC receiver. The XIU contains an integrated temperature sensor, acceleration sensor, and magnetic switch.

LoRaWAN Overview

LoRaWAN™ [which stands for long range wide area network], is the undisputed leader in open standard LPWA [low power wide area] networks with deployments globally. The technology is backed by the LoRa Alliance™, which is a global organization comprised of over 500 organizations with the goal of moving IoT forward.

Some of the key features of LoRaWAN™ include:

1. **LOW POWER CONSUMPTION:** Wireless, battery-powered devices operate up to 10 years on standard batteries.
2. **LOW TOTAL COST OF OWNERSHIP:** Low-cost battery-powered devices combined with low connectivity and installation fees and little-to-zero maintenance keep overall program costs down.
3. **OPEN STANDARD:** LoRaWAN™ is based on open architecture which enables open data environments.
4. **LONG RANGE:** Reliable connectivity in urban and indoor environments with connectivity extending up to approximately 48 km [30 miles].
5. **SECURITY:** LoRaWAN™ utilizes 128-bit AES encryption.

For more information, refer to the LoRaWAN™ specification.



XIU Integration

For interfacing with the host device, the XIU provides a 6 pin terminal block for wired connections, and a 40-pin board to board connector. Power for the XIU is supplied by its bundled battery pack.

Integration of the XIU will be done with the support of eleven-x. For further details and design support contact eleven-x Incorporated.

Antennas

The gain of the antenna used for the XIU module (FCC ID 2AOX5XIU001000) must not exceed the 3dBi as specified in the FCC Grant for mobile and fixed or mobile operating conditions.

This radio transmitter, ISED ID 22369-XIU00100 has been approved by Industry Canada to operate with the antenna types listed below with the maximum gain of 3dBi. Antenna types not included in this list or having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

External Part Number	Eleven-X Part Number	Mfg.	Type	Gain (dBi)	Connector Type
n/a	ANT-180321-001	eleven-x Inc.	Monopole	1 dBi	U.FL (internal)
W1063	n/a	PulseLarsen Antennas	Dipole	3 dBi	RP-SMA (external)

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module or change RF related parameters in the user manual of the end product.

Host Labelling

The following statements are required to be on the host label:

Contains FCC ID: 2AOX5XIU001000

Contains IC: 22369-XIU00100



Regulatory Information

Grant Limitations

The eleven-X Interface Unit (XIU) module has been certified for integration into products only by OEM integrators under the following conditions:

1. The antenna(s) must be installed such that a minimum separation distance of 20cm is maintained between the radiator (antenna) and all persons at all times.
2. The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter.

As long as the two conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions cannot be met (for certain configurations or co-location with another transmitter), then the FCC and Industry Canada authorizations are no longer considered valid and the FCC ID and IC Certification Number cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC and Industry Canada authorization.

Your final product with this embedded device may need to pass FCC Part 15B.

Other Information

The user manual for the end product must also include the following information in a prominent location:

“To comply with FCC and Industry Canada RF radiation exposure limits for general population, the antenna(s) used for this transmitter must be installed such that a minimum separation distance of 20cm is maintained between the radiator (antenna) and all persons at all times and must not be co-located or operating in conjunction with any other antenna or transmitter.”



47 CFR Part 15 Regulation Class B Devices

Per FCC 47 CFR 15.105, 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. This equipment 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. 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 separation between the equipment and 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.

FCC Interference Notice

Per FCC 47 CFR 15.19(a)(3) and (a)(4), this device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

Modifications

As per FCC 47 CFR 15.21 and ISED Canada, changes or modifications not expressly approved by eleven-x could void the user's authority to operate the equipment.



Industry Canada Notice

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicable aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Safety

For Indoor Installations:

To comply with FCC/IC RF exposure limits for general population / uncontrolled exposure, the radiator used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter except as authorized in the certification of the product.

For Outdoor Installations:

To comply with FCC/IC RF exposure limits for general population / uncontrolled exposure, the radiator used for this transmitter must be installed on outdoor permanent structures to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter except as authorized in the certification of the product.



Contact Information

Please contact your local sales representative or our support team for further assistance.

Web: <https://eleven-x.com/>

Email: support@eleven-x.com

Phone: 1-226-887-0011



Legal Notices

The eleven-x products are not designed, manufactured or intended for use, and should not be used, or sold or re-sold for use, in connection with applications requiring fail-safe performance or in applications where the failure of the products would reasonably be expected to result in personal injury or death, significant property damage, or serious physical or environmental damage. Examples of such use include life support machines or other life preserving medical devices or systems, air traffic control or aircraft navigation or communications systems, control equipment for nuclear facilities, or missile, nuclear, biological or chemical weapons or other military applications (“Restricted Applications”). Use of the products in such Restricted Applications is at the user’s sole risk and liability.

ELEVEN-X DOES NOT WARRANT THAT THE TRANSMISSION OF DATA BY A PRODUCT OVER A COMMUNICATIONS NETWORK WILL BE UNINTERRUPTED, TIMELY, SECURE OR ERROR FREE, NOR DOES ELEVEN-X WARRANT ANY CONNECTION OR ACCESSIBILITY TO ANY COMMUNICATIONS NETWORK. ELEVEN-X WILL HAVE NO LIABILITY FOR ANY LOSSES, DAMAGES, OBLIGATIONS, PENALTIES, DEFICIENCIES, LIABILITIES, COSTS OR EXPENSES (INCLUDING WITHOUT LIMITATION REASONABLE ATTORNEYS FEES) RELATED TO TEMPORARY INABILITY TO ACCESS A COMMUNICATIONS NETWORK USING THE PRODUCTS.

The eleven-x products and the final application of the eleven-x products should be thoroughly tested to ensure the functionality of the eleven-x products as used in the final application. The designer, manufacturer and reseller has the sole responsibility of ensuring that any end user product into which the eleven-x product is integrated operates as intended and meets its requirements or the requirements of its direct or indirect customers.

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