

LoRa Module Users Manual

QRC LoRa Radio Module
Model: 1Q7T
FCC ID: 2BHXO-Q1700L

The radio module is a LoRa module intended for communications at long range.

Specifications:

Frequency Range:	902-928 MHz	Voltage:	3.6v
Power Output:	22 dBm @ 915 MHz	Current:	118 mA
Range:	>1 mi	Power Consumption	0.43 w

Applicable Transmitter Rules:

USA: FCC 15.247

Conditions for integration.

- 1) FCC certifications valid for the approved antenna shown below. Suitable substitutions can be sources as long as they include antennas of same type with equal or lower gain, and same in-band and out of band characteristics. Any antennas of different type or higher gain require separate approval.
- 2) Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- 3) This module is approved for integration into hosts in mobile RF exposure category (>20cm from persons).
- 4) This module may be collocated with other radios in mobile RF exposure configurations. If the host includes additional radio transmitters and those transmitters operate simultaneously with this module, then the integrator is responsible for performing an RF exposure assessment (usually MPE calculations).
- 5) This module is approved for integration into only those hosts shown below for portable RF exposure category (<20cm from persons):

Description	Photo
QRC BlueFly LoRa Dongle	

Approved Antenna Information

<i>Manufacturer</i>	<i>Antenna</i>	<i>Description</i>	<i>Type</i>	<i>Peak Gain (dBi)</i>	<i>Min Cable loss (dB)</i>	<i>Ω</i>	<i>Connector Type</i>
Linx Technologies	ANT-915-NUB-RPS	902Mhz-928Mhz	Monopole	-3.0	0	50	RP-SMA-M

For detachable antennas, FCC 47 CFR 15.203 requires use of a unique connector. Connector types such as SMA, BNC, N or other 'standard' connectors are not considered unique and are not approved for use with this module. Approved connectors include u.FL, RPSMA, RTSMA, PRTSMA, RPTNC and other similar non-standard connector types.

The radio module arrives from the OEM with a SMA connector soldered to the board. When embedding the radio module board within the chassis, an Adapter Coaxial Connector SMA Plug, Male Pin To RP-SMA Plug must be used inside the chassis inaccessible to the user, between the radio module board and the external antenna to ensure compliance with FCC 47 CFR 15.203.

Testing Requirements

This modular transmitter is only authorized for the specific rule parts (i.e., FCC transmitter rules) listed above. The host product manufacturer (integrator) is responsible for compliance to any other rules that apply to the host not covered by the modular transmitter grant of certification. The integrator is responsible for testing the final host product to applicable requirements for the combined product including host and module. For example, US 47 CFR Part 15 Subpart B compliance testing is required with the modular transmitter installed.

The integrator is responsible for verifying emissions of this modular transmitter in the host do not exceed applicable requirements. For additional requirements, see FCC KDB 996369 D04 Module Integration Guide.

The only authorized test mode is to utilize the radio Diagnostic and Regulatory Testing Utility (DRTU) application QRC 1QKJ WIOE5 – LoRa - DRTU and the test procedures found within the QRC 1QPQ – BlueFly DRTU Manual, both of which are available from the QRC Q1700-A Manifest to enable test mode on this module. For additional details on use of this SDK, contact us at qrc.support@qrc.tech.com.

Integrator is recommended to use FCC KDB 996369 D04 Module Integration Guide recommending as "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties. For standalone mode, reference the guidance in D04 Module Integration Guide and for simultaneous mode; see D02 Module Q&A Question 12, which permits the host manufacturer to confirm compliance.

Link to FCC modular transmitter requirements:

<https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?switch=P&id=44637>

How to authorize changes to this module

Changes to the certifications may be requested by contacting QRC at qrc.support@qrctech.com. This includes requests for new host configurations, or additional antennas not previously approved.

Host Labelling Requirements.

If the host product is constructed in such a way that the module's certification is not visible from the exterior of the enclosure then the completed host products must include an ID label which displays the certification number of the module. Electronic labels are not authorized.

Physical labels shall include the following text:

Contains FCC ID: 2BHXO-Q1700L

The prefix contains may be replaced by any text conveying similar meaning, such as "This device contains" If the host product is separately subject to certification, the host product's FCC ID shall not utilize the "Contains" prefix text.

The host product label shall also include the following statement:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

If the product is too small or of a design which precludes the addition of this statement, then it may be included in the host product's users manual.

Host product's Users Manual Requirements

The host product's users manual shall include the following required legal statements:

FCC Required Statements:

When to include:	Statement to include:
Always	<i>Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.</i>
Always	<i>This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.</i>
15.109 Class B hosts only.	<i>Note: 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:</i> <i>—Reorient or relocate the receiving antenna.</i> <i>—Increase the separation between the equipment and receiver.</i> <i>—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.</i> <i>—Consult the dealer or an experienced radio/TV technician for help.</i>
15.109 Class A hosts only	<i>Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.</i>

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors, are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, *i.e.*, shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge, at the time of purchase.

For additional information on host requirements see 47 CFR 15.27



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Regulatory:

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: 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.