QT-300A Module

User Manual

Rev: 1

History

Rev 1	January 2, 2018	Original

FCC Notices:

Information to users:

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.

***Warning*: Changes or modifications not expressly approved by Quantum5X Systems Inc, could void the user's authority to operate the equipment.**

Innovation, Science and Economic Development Canada (ISED)

This device complies with ISED's license-exempt RSSs. 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 applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. L'appareil ne doit pas produire de brouillage;
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.

This radio transmitter (**IC: 4614A-QT300A**) has been approved by ISED to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (**IC: 4614A-QT300A**) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Approved antenna and connectors

Antenna / Connector Type	Manufacture	Connector Type	Max Gain
Integrated Antenna	Q5X	NA	3dBi
SSMA Whip Antenna	Sam Woo Electronics	SSMA	0 dB

This device operates on a no-protection, no-interference basis. Should the user seek to obtain protection from other radio services operating in the same TV bands, a radio licence is required. For further details, consult Innovation, Science and Economic Development Canada's document Client Procedures Circular CPC-2-1-28, Voluntary Licensing of Licence-Exempt Low-Power Radio Apparatus in the TV Bands.

Ce dispositif fonctionne selon un régime de non-brouillage et de non-protection. Si l'utilisateur devait chercher à obtenir une certaine protection contre d'autres services radio fonctionnant dans les mêmes bandes de télévision, une licence radio serait requise. Pour en savoir plus, veuillez consulter la Circulaire des procédures concernant les clients CPC-2-1-28, Délivrance de licences sur une base volontaire pour les appareils radio de faible puissance exempts de licence et exploités dans les bandes de télévisiond'Innovation, Sciences et Développement économique Canada.

RF Exposure Compliance:

The QT-300 Module is granted with a modular approval for mixed mobile and portable applications. The module is to be used by Quantum5X in their final products without additional FCC/ISED (Innovation, Science and Economic Development Canada) certification if they meet the following conditions. Otherwise, additional FCC/ISED approvals must be obtained.

Mobile Application:

1) This equipment complies with radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

2) This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

3) To comply with FCC and ISED regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile-only exposure condition must not exceed the 3 dBi.

4) For Canada, the EIRP power shall not to be greater than 250mW to meet ISED regulations (Conducted power plus antenna gain)

Portable Application:

This low power module when used in the specfied host configgurationzs listed below complies with applicable RF exposure requirements that meet FCC/ISED for a portable device, which are approved with this filing. For this application see the the output power reduction settings in specifiation table page 8.

PlayerMic
AquaMic
Incognito
BeltMic

Module Integration into Host End Products

The QT-300A Module Transmitter has been designed by Quantum5X Systems Inc. to be used by Quantum5X as a building block for their wireless audio transmitter products. The module, as designed, is a standalone unit that is ready for integration into final form factor with the limitation for mobile use as specified in RF Exposure compliance. For proper usage of the module, the module integrator must ensure that the input power and input audio signal do not exceed the specified limits as outlined in the specification section. Failure to do so will result in damage to the module.

Final product(s) after integration with this module shall be tested to comply with all applicable FCC requirements and Unintentional radiators (FCC section 15.107, 15.109 and ISED ICES-003) before declaring compliance to Part 15 of the FCC Rules and ISED ICES-003.

The module integrator may not:

1) Alter, modify or remove the module case.
2) Make changes to the Circuit Card Assembly of the module.

Failure to comply with these restrictions will result in violation of the FCC certification.

Labeling of the End Products:

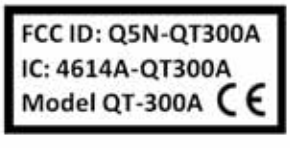
The modular transmitter must be equipped with either a permanently affixed label.

The modular transmitter must be labeled with its own FCC identification number, and, if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: ‘‘Contains Transmitter Module” or ‘‘Contains “. Any similar wording that expresses the same meaning may be used.

Below are Sample Module and Product lables that must be used for the Module and the Product.

Product Label

Module Label



RF Exposure for FCC

WARNING: To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended. The antenna used for this transmitter must not be co-located in conjunction with any other antenna or transmitter.

The preceding statement must be included as a CAUTION statement in end product (module)manuals in order to alert users of FCC RF Exposure compliance.

Introduction

The QT-300 has 3,000 transmit frequencies, the standard frequency range is from 470.250 to 545 Mhz in 25Khz steps. There are 3 user inputs; 1) the Mic dial, 2) the SEL/PWR button and 3) an Alpha Numeric 16 position dial. The Mic dial adjust microphone gain. The SEL/PWR button has 2 functions, On/Off and SEL for programming. The frequencies are programmed by using the 16-position dial and the SEL (select) button. The LED shows the current menu, the charge status, the battery status and the operating status.

Overview

The QT-300 has multiple parameters that can be changed in different menus. A combination of the SEL (select) button and the adjacent Alpha Numeric 16 position dial are used to access and make changes to the various device parameters.

The table below outlines each menu:

Menu	Input	Action
SET FREQ	'A' - Single press	Allows user to Set the 6 frequency digits.
READ FREQ	'B' - Single press	Reads the 6 digits of the tuned frequency.
SET PWR	'C'- Single press	Allows user to Set RF output power level.
READ PWR	'D' - Single press	Reads the current RF output power level.
READ BATT	'E' - Single press	Reads the current battery percentage.
READ FW VER	'E' - Double press	Reads the Firmware Version
	'F' - Unused	Reserved for additional feature.

Powering On

To operate the transmitter, press and hold the SEL/PWR button for 5 seconds. The LED will flash red then illuminates green to indicate the transmitter has powered on. After a short delay, the color of this LED will reflect the current battery level color.

Battery Level

- If the LED is illuminated Green, the battery is full (100% – 66%) approx. 8 – 5 hr.
- If the LED is illuminated Orange, the battery is half empty (66% – 33%) approx. 5 – 3 hr.
- If the LED is illuminated Red, the battery is nearly empty (33% – 0%) approx. 3 – 0 hr.

At full charge the QT-300 will operate for approximately 8 hours at 100mw of RF power. A finer measurement of the remaining battery life is available under menu item E.

Set Frequency

To change the frequency, the six digits of the desired frequency must be entered. To enter the frequency programming mode, turn the dial to position 'A' and press the SEL button. The LED will begin single Red flashes to indicate you are now editing the first digit of the frequency setting. The first set of numbers (470.XXX) will be indicated by Single Flashes the second set (XXX.025) by Double Flashes.

- Single Flash = SF
- Double Flash = DF
- Rapid Flash = error - a rapid Red Flash indicates the first digit is wrong, it can only be 4, 5, or 6. If it's a rapid Green Flash then the second digit is out of range, etc.

To program in 470.025 Mhz, turn the dial to position 'A', press the SEL button, then do the following;

Red - SF - turn dial to **5** - press SEL button

Green - SF - turn dial to **7** - press SEL button

Orange - SF - turn dial to **5** - press SEL button

Red - DF - turn dial to 0 - press SEL button

Green - DF - turn dial to **2** - press SEL button

Orange - DF - turn dial to **5** - press SEL button

The last SEL button press completes the programming steps and the new frequency is set. The LED will resume displaying the battery status and the transmitter is now operating on the new frequency.

If the user inputs a number that is not within the tunable range or is not a 25 kHz step, the transmitter will not allow the user to proceed until a valid number is input. Upon entry of an incorrect digit, the LED blink pattern will change to a rapid flash in the color of the current digit being edited. To continue, the user must select a valid number on the dial and press the SEL button again.

If there is no user input for 10 seconds, while in any of the programming modes, the transmitter will time out and return to its previous settings and the LED will resume displaying the battery status.

Display Frequency

To view the current frequency, turn the dial to the letter 'B' and press the SEL button. The LED will display the six digits of the frequency the transmitter is currently tuned to.

For example, the transmitter is tuned to 525.025 MHz.

- The LED will flash Red 5 times to indicate the first digit is 5.
- After a short pause, the LED will flash Green 7 times to indicate the second digit is 7.
- After a short pause, the LED will flash Orange 5 times to indicate the third digit is 5.
- After a short pause, the LED will be solid Red for 1 second to indicate the fourth digit is 0.
- After a short pause, the LED will flash Green 2 times to indicate the fifth digit is 2.
- After a short pause, the LED will flash Orange 5 times to indicate the third digit is 5.

Once the sixth digit has been displayed, the LED will resume displaying the battery status.

Set Output Power

To set the output power, turn the dial to the letter 'C' and press the SEL button. The LED will begin flashing triple Red Flashes to indicate you are now editing the output power. There are 5 different output power levels that can be set: 10 mW, 25 mW, 50 mW, 100 mW and 250 mW for North American Standard Mode or 3 difference level that can be set: 10 mW, 25 mW, 50 mW for European Mode.

Output Power	Entered Value
10mW	1
25mW	2
50mW	3
100mW	4
250mW	5

To set the output power to 100mW, turn the dial to 4 and press the SEL button.

When the SEL button is pressed, the new RF Output Power will be programmed and the LED will then resume displaying the battery status.

Display Output Power

To display the output power, turn the dial to the letter ‘D’ and press the SEL button. The Red LED will flash the number that is related to the output power. For example, if the output power is set to 100mW, the LED will flash Red 4 times.

Battery Level

To display the current battery level, turn the dial to the letter ‘E’ and press the SEL button. The LED will blink red 1 to 10 times. 10 blinks indicate 100% battery remaining and 1 blink indicates 10% battery remaining.

Display Firmware Version

To view the current firmware version, turn the dial to the letter ‘E’ and double press the SEL button. The LED will display the 3 digits of the current firmware version.

For example, the firmware version is 0.2.2.

- The LED will turn on Red solid for 1 second to indicate the first digit is 0.
- After a short pause, the LED will flash Green 2 times to indicate the second digit is 2.
- After a short pause, the LED will flash Orange 2 times to indicate the third digit is 2.

Once the third digit has been displayed, the LED will resume displaying the battery status after a short pause.

Mic Gain

There is a Mic dial on the left side of the QT-300 that has a range of -20 dB to +20 dB. To increase the Microphone gain, turn the dial clock-wise. To decrease the Mic gain, turn the dial counter-clock-wise. 0 dB is located at the mid-point of the dial and is indicated on the case.

Powering Off

To power off the device, press and hold the SEL button for 5 seconds. The LED will turn red then off to indicate the device has been powered off.

Specifications

Technical Data UHF Radio

RF Carrier Frequency Range:470.025 – 545 MHz

Working Range – 500m (line of sight, outdoors for a single system)
Note: Actual working range depends on RF signal absorption, reflection and interference
Antenna impedance: 50 Ω Impedance

RF Power Output: see table below

Item #	Product Name	Max RF Power
1	QT-300 Module	250 mw
2	PlayerMic (Body Mounted Only)	100 mw
4	AquaMic (Body Mounted Only)	250 mw
7	Incognito (Body and head Mounted)	100 mw
9	BeltMic (Body Mounted Only)	250 mw

Antenna impedance: 50 Ω Impedance

Technical Data QT-300A Module

Power Requirements: 3.7V
Current Drain: 140 mA
Max Input Audio Signal: 1 VRMS
Audio Gain Adjustment Range: -20 dB – 20 dB
Overall Dimensions: 31mmX12.9mmx52mm (Battery on top of module)
Net Weight: depends on model