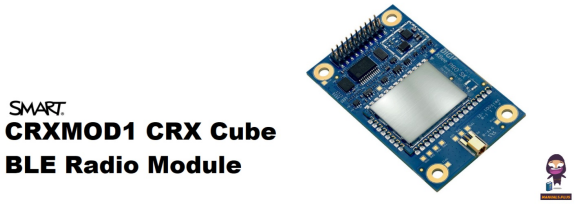


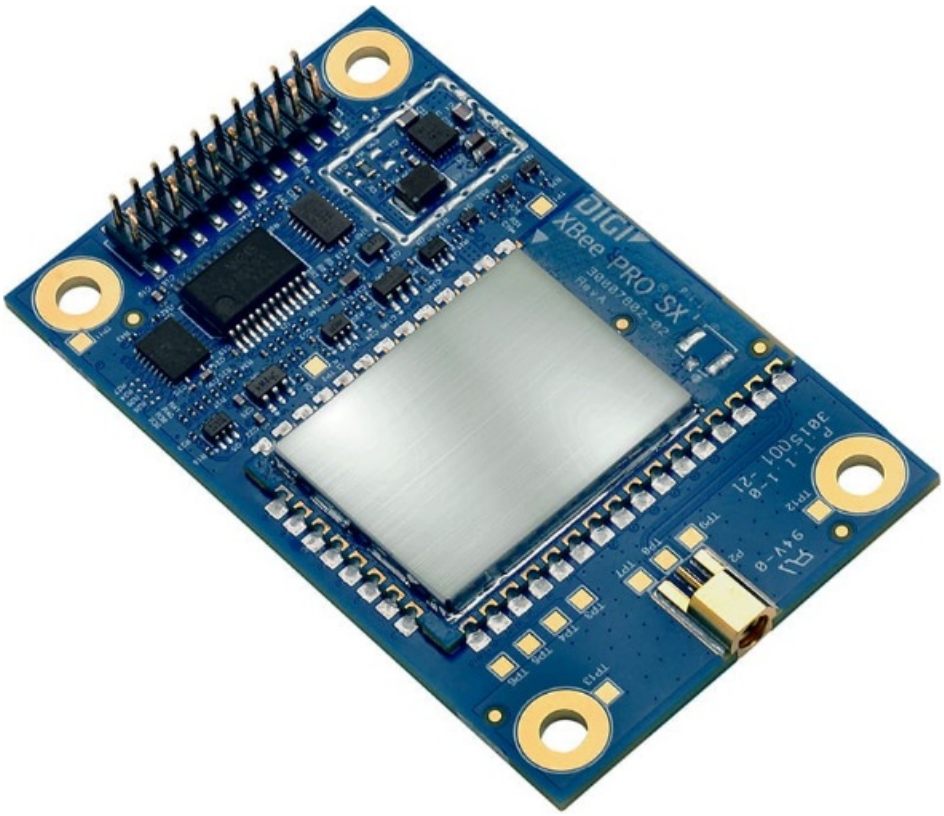

# SMART CRXMOD1 CRX Cube BLE Radio Module Instruction Manual



Contents



## SMART CRXMOD1 CRX Cube BLE Radio Module




## Specifications

- **Manufacturer:** SMART Technologies ULC
- **Model:** CRXMOD1
- **FCC ID:** QCI-CRXMOD1, IC: 4302A-CRXMOD1
- **Antenna Type:** Multilayer Chip Antenna (MCA)
- **Antenna Gain:** 3.0 dBi
- **Antenna Impedance:** 50 ohms

## Product Usage Instructions

- The CRXMOD1 radio module is designed for integration within the SMART RX Series Cube, Model: CRX-1, for use with SMART QX-V2/RX Series Interactive Flat Panel displays.
- It is intended for portable applications within the host product and must not be used as a stand-alone product.
- The integrated antenna is a Multilayer Chip Antenna (MCA) with a gain of 3.0 dBi and an impedance of 50 ohms.
- The antenna is fixed and permanently attached to the host product; it cannot be replaced.
- The radio module is compliant with FCC Part 15 and RSS-247 regulations.
- Host products must be labeled with the FCC ID: QCI-CRXMOD1 and IC: 4302A-CRXMOD1. E-labeling is permitted for host products intended to operate with devices having a built-in display.

## FAQ

- **Q:** Can the CRXMOD1 radio module be used independently without the SMART RX Series Cube?
- **A:** No, the CRXMOD1 radio module is specifically designed for integration within the SMART RX Series Cube, Model: CRX-1, and should not be used as a stand-alone product.

- **Q:** Is the antenna on the CRXMOD1 replaceable?
- **A:** No, the antenna integrated into the CRXMOD1 is a Multilayer Chip Antenna (MCA) that is fixed and permanently attached to the host product.

## Module Integration Instructions

**FCC ID: QCI-CRXMOD1, IC: 4302A-CRXMOD1**

- Dear Application Examiner
- SMART Technologies is seeking limited modular approval for SMART CRX Cube BLE radio module Model: CRXMOD1, FCC ID: QCI-CRXMOD1, IC: 4302A-CRXMOD1.
- Per KDB 996369, the integration instructions for the radio module within the host product are described below:

**List of Applicable Rules**

- The radio module complies with FCC Part 15.247 and RSS-247

**Summarize the specific operational use conditions**

- The CRXMOD1 radio module is specifically designed and intended only for portable application within the host product:

**SMART RX Series Cube, Model**

- CRX-1, which is a battery-powered handheld accessory used in conjunction with SMART QX-V2/RX Series Interactive Flat Panel (IFP) displays.
- The CRXMOD1 radio module is not intended for sale as a stand-alone product.

## FCC STATEMENT

**Limited Module Procedures:** The CRXMOD1 radio module does not include its own RF shielding. To demonstrate compliance, testing was performed with the radio in a standalone configuration under the test plan outlined below:

- Duty Cycle: KDB 558074 -6.0 / RSS-Gen 3.2
- DTS Bandwidth (6 dB): FCC 15.247(a)(2), KDB 558074 -8.2 / RSS-247 5.2(a)
- Occupied Bandwidth (99%): KDB 558074 -2.1 / RSS-Gen 6.7
- Output Power: FCC 15.247(b)(3), KDB 558074 -8.3.1 / RSS-247 5.4(d, f), RSS-Gen 6.12
- EIRP: FCC 15.247, KDB 558074 -8.3.1 / RSS-247 5.4(d, f), RSS-Gen 6.12
- Power Spectral Density: FCC 15.247(e), KDB 558074 -8.4 / RSS-Gen 5.2(b)
- Band Edge Compliance: FCC 15.247(d), KDB 558074 -8.5 / RSS-247 5.5
- Spurious Conducted Emissions: FCC 15.247(d), KDB 558074 -8.5 / RSS-247 5.5
- Spurious Radiated Emissions: FCC 15.247(d), KDB 558074 -8.6, 8.7 / RSS-247 5.5, RSSGen 6.13, 8.10
- RF Exposure Assessment: FCC 1.1310, 2.1093, KDB 447498 / RSS-102

The test results demonstrate compliance with FCC Part 15.247 and RSS-247 for the CRXMOD1 radio module to support integration within the host, Model: CRX-1, for which the CRXMOD1 was specifically designed. Spurious radiated emissions testing of the CRXMOD1 integrated into the CRX-1 was completed.
Integration of the CRXMOD1 radio within a new host product requires testing according to the plan is outlined below:

**Conducted Testing**

- Output Power: FCC 15.247(b)(3), KDB 558074 -8.3.1 / RSS-247 5.4(d, f), RSS-Gen 6.12
- Band Edge Compliance: FCC 15.247(d), KDB 558074 -8.5 / RSS-247 5.5

**Radiated Testing**

- Spurious Radiated Emissions: FCC 15.247(d), KDB 558074 -8.6, 8.7 / RSS-247 5.5, RSSGen 6.13, 8.10
- When compliance is demonstrated, a C2PC is required to authorize the integration of the CRXMOD1 within the new host product.

**Trace Antenna Designs:** Not applicable.
**RF Exposure Considerations**

1. The CRXMOD1 radio is intended for handheld use and meets the portable use condition with a 5 mm separation distance between the antenna and the user's hand and having the maximum operational duty cycle of 9.02% coded into the firmware for the radio module. An RF exposure assessment was completed for the CRXMOD1 radio to demonstrate compliance with FCC 2.1093 by applying the exemption defined in FCC 1.1307. A separate RF exposure assessment was completed to demonstrate compliance with RSS-102.
2. This equipment complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. Further RF exposure assessment of the CRXMOD1 is not required for integration in new portable host products, provided there are no changes to the radio module and/or other radios are collocated within the host. A new RF exposure assessment will be required in the event the radio is modified, integrated in a mobile host, or collocated with other radios within a host. Collocation conditions shall be assessed following the FCC guidelines for collocated transmitters.

**Antennas**

| Type | Gain | Impedance | Application |
|---|---|---|---|
| Multilayer Chip Antenna (MCA) | 3.0 dBi | 50 Ω | Fixed |

- When integrated within the host product, the antenna is permanently attached and cannot be replaced.

**Label and Compliance Information**

The radio module is labeled with radio identifiers. Host products must be labeled with the following statements:

- Contains FCC ID: QCI-CRXMOD1
- Contains IC: 4302A-CRXMOD1

E-labeling is also permitted for host products that are intended to operate in conjunction with devices having a built-in display.
Additionally, the radio identifiers shall be applied to the host product packaging.

- The following statements apply to the radio module and must be included in the user documentation for the host product:

**Contains FCC ID: QCI-CRXMOD1**
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 A digital device, according 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 under 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.
**Caution:** Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

**Contains IC: 4302A-CRXMOD1**
This device complies with RSS-247 of the Innovation, Science, and Economic Development Canada 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.

**Information on test modes and additional test requirements:** For stand-alone configuration, the CRXMOD1 radio is connected to a laptop through the Atmosic interface board. CRXMOD1 operation and test modes are controlled from the laptop using the Atmosic RF Tool application using the following settings:

- Channel selection (Low = Ch 0, Mid = Ch 20, High = Ch 39)
- Packet Payload: PRBS9
- PHY: LE 1M
- TX Power:
    - Power setting 7 (corresponding to 4 dBm) is used for low and mid channels
    - Power setting 5 (corresponding to 0 dBm) is used for high channel

For testing the CRXMOD1 radio within the host product, the radio is controlled by firmware to configure the CRXMOD1 to support continuous transmission on low, mid, or high channels using the same power settings as used with the stand-alone configuration.

**Additional test, Part 15 Subpart B disclaimer**

- The CRXMOD1 radio module is only authorized for the specific rule parts (FCC 15.247 and RSS-247) listed on the FCC grant and ISED certificate.
- The host product, containing unintentional-radiator digital circuitry, complies with Part 15 Subpart B and ICES-003 with the radio module installed.

**Note EMI Considerations**

- D04 Module Integration Guide has been considered as “best practice” for RF design engineering testing and evaluation of non-linear interactions which can generate additional non-compliant limits due to module placement to host components or properties.
- For stand-alone mode, the D04 Module Integration Guide was referenced, and simultaneous mode was considered for the host product to confirm compliance.

**How to make changes**

The CRXMOD1 radio is intended for use by SMART Technologies only and is not intended for sale as a stand-alone product. Only the Grantee is permitted to make permissive changes.
The Grantee may seek permissive changes to authorize:

- Changes to the radio module, and/or
- Permit the use of the radio module within additional SMART host products.

Testing shall be repeated following the test plan identified in 2.4. Upon demonstration of continued compliance, a Permissive Change application will be submitted to authorize the change.

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## Documents / Resources

| | |
|---|---|
|  | SMART CRXMOD1 CRX Cube BLE Radio Module [pdf] Instruction Manual<br>CRX-1, CRXMOD1 CRX Cube BLE Radio Module, CRXMOD1, CRX Cube BLE Radio Module, Cube BLE Radio Module, BLE Radio Module, Radio Module, Module |

## References

- **User Manual**