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# User Manual

## Quectel Bluetooth & Wi-Fi Module

### Model Number: H-FC900E

### 1. Product Overview

The Quectel FC900E is a high-performance, cost-effective wireless module that supports dual-band Wi-Fi (2.4 GHz and 5 GHz) and Bluetooth 5.2. Designed for consumer and industrial applications, the FC900E enables seamless wireless connectivity for smart devices, IoT systems, and embedded applications.

### 2. Features and Functions

- Wi-Fi: 802.11 a/b/g/n/ac, dual-band support
- Bluetooth: Bluetooth 5.2, backward compatible with BT 4.x/3.0/2.1
- Interfaces: SDIO 3.0 for Wi-Fi, UART for Bluetooth
- Operating Temperature: -40°C to +85°C
- Security: WPA/WPA2/WPA3, WEP, TKIP, AES
- Antenna Support: Supports external antennas via IPEX connector

### 3. Installation Instructions

1. Hardware Integration:
   - Mount the module to the host PCB via recommended SMT layout.
   - Connect SDIO, UART, power, and control signals according to the reference design.
2. Power Supply:
   - Use 3.3V DC input, regulated with adequate decoupling.
3. Antenna:
   - Attach certified external antennas to the IPEX connector. Ensure impedance matching.
4. Software Configuration:
   - Integrate Quectel's driver packages for Linux or Android (available from Quectel).
   - Configure parameters via UART AT commands (Bluetooth) or SDIO/driver stack (Wi-Fi).

### 4. Certification Numbers

FCC ID: 2BOIM-FC900E
IC ID: 33905-FC900E

HVIN: H-FC900E

## 5. RF Exposure Statement

This equipment complies with FCC and ISED RSS-102 radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. In order to avoid the possibility of exceeding the FCC and ISED RSS-102 radio frequency exposure limits, this equipment should be installed and operated with minimum distance 20 cm (7.9 inches) between the antenna and your body during normal operation. Users must follow the specific operating instructions for satisfying RF exposure compliance.

Cet équipement est conforme aux limites d'exposition aux rayonnements FCC et ISED CNR-102 établies pour un environnement non contrôlé. Cet émetteur ne doit pas être installé ou utilisé en conjonction avec une autre antenne ou un autre émetteur. Afin d'éviter la possibilité de dépasser les limites d'exposition aux radiofréquences FCC et ISED, cet équipement doit être installé et utilisé avec une distance minimale de 20 cm (7.9 pouces) entre l'antenne et votre corps pendant le fonctionnement normal. Les utilisateurs doivent suivre les instructions spécifiques d'utilisation pour respecter la conformité à l'exposition aux RF.

## 6. Regulatory Notices

**FCC Certification Requirements.**

According to FCC Part 2.1091(b), this device qualifies as a **mobile device**. The following conditions must be met:

1. **Modular Approval** is limited to OEM installation for mobile and fixed applications only. The antenna installation and operating configurations—including any applicable source-based time averaging duty factor, antenna gain, and cable loss—must satisfy the MPE categorical exclusion requirements of §2.1091.
2. The device must maintain a **minimum separation of 20 cm** between the user and the equipment. It must not transmit simultaneously with any other antenna or transmitter.
3. A label must be affixed to the host end-product stating:
   **"This device contains FCC ID: 2BOIM-FC900."**
4. The module must not transmit simultaneously with any other antenna or transmitter.

5. The host end-product must include a **user manual** that clearly outlines the operating requirements and conditions necessary to ensure compliance with current FCC RF exposure guidelines.

For **portable devices**, in addition to conditions 3–5 above, a **separate approval** is required to meet the SAR requirements of FCC Part 2.1093. If the device is used in other equipment or configurations (e.g., portable use or different antenna setups), separate approval is also required.

OEM integrators must be provided with **labeling instructions** for finished products. Refer to **KDB 784748 D01 v07, Section 8 (pages 6–7)** for guidance. A certified module may use either a permanently affixed label or an electronic label. If the FCC ID is not visible once installed, an additional label must state:
**"Contains Transmitter Module FCC ID: 2BOIM-FC900"**
or
**"Contains FCC ID: 2BOIM-FC900."**

The host user manual must also explain how end users can locate or access the module and its FCC ID.

The final host/module combination may also require evaluation under **FCC Part 15B** for unintentional radiators. The user manual must caution that **unauthorized changes or modifications** could void the user's authority to operate the equipment.

*Note: If the manual is provided digitally (e.g., via disk or online), the required information must still be accessible to the user.*

**FCC Part 15 Compliance Statement**

This equipment has been tested and complies 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 residential installations.

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used according to the instructions, it may cause harmful interference to radio communications. There is no guarantee that interference will not occur in a particular installation. If interference does occur, users are encouraged to try the following:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to a different outlet or circuit.

- Consult the dealer or an experienced radio/TV technician.

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.
2. This device must accept any interference received, including interference that may cause undesired operation.

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

**OEM Responsibilities**

The host manufacturer is responsible for ensuring that the final product remains compliant with all applicable FCC requirements after module integration. For example, if the host was previously authorized under the Supplier's Declaration of Conformity (SDoC) without a transmitter module, the manufacturer must ensure continued compliance with **Part 15B** after integration.

**End User Manual Requirements**

OEM integrators must **not** provide instructions to end users on how to install or remove the RF module. The end-user manual must include all required regulatory information and warnings as outlined above.

**ISED Canada Certification statements**

**ISED Non-Interference Disclaimer**

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's (ISED) licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with the Canadian **ICES-003 Class B** specifications:
**CAN ICES-003(B) / NMB-003(B)**

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

**ISED RF Exposure Statement**

This equipment complies with ISED RSS-102 radiation exposure limits set forth for an uncontrolled environment. It must be installed and operated with a minimum distance of **20 cm (7.9 inches)** between the radiator and any part of the user's body. This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites d'exposition aux radiations ISED CNR-102 établies pour un environnement non contrôlé. Une distance de séparation d'au moins **20 cm** doit être maintenue entre l'antenne de cet appareil et toute personne. Cette antenne ou ce capteur ne doit pas être utilisé conjointement avec d'autres.

**ISED Labeling Requirements**

The ISED certification label of the module must be clearly visible at all times when installed in the host product. If not, the host product must be labeled to display the ISED certification number for the module, preceded by the word **"Contains"** or similar wording, such as:

**"Contains IC: 33905-FC900E"**
(where **33905-FC900E** is the module's certification number)

Le produit hôte doit être correctement étiqueté pour identifier les modules qu'il contient. L'étiquette de certification d'Innovation, Sciences et Développement économique Canada d'un module doit être clairement visible en tout temps lorsqu'il est installé dans le produit hôte. Sinon, le produit hôte doit porter une étiquette indiquant le numéro de certification, précédé du mot **« Contient »** ou d'un libellé semblable, comme suit :
**« Contient IC: 33905-FC900E »**
(ou **33905-FC900E** est le numéro de certification du module)

## 7. Safety Warnings (English and French)

Warning: To reduce the risk of fire or electric shock, do not expose this module to rain or moisture. Ensure adequate ventilation during operation.

Avertissement : Pour réduire le risque d'incendie ou de choc électrique, n'exposez pas ce module à la pluie ou à l'humidité. Assurez une ventilation adéquate pendant le fonctionnement.

## 8. Troubleshooting Guidance

| Issue | Possible Cause | Recommended Action |
|---|---|---|
| Wi-Fi not detected | Antenna not connected properly | Reattach or replace antenna |
| Bluetooth pairing fails | UART misconfiguration | Check baud rate and protocol settings |
| Module not responding | Power or signal issues | Verify supply voltage and interface connections |

## 9. Technical Specifications

Wi-Fi Standard: IEEE 802.11 a/b/g/n/ac

Bluetooth Version: Bluetooth 5.2

Interface: SDIO 3.0 (Wi-Fi), UART (BT)

Power Supply: 3.3V ± 10%

Dimensions: ~15mm x 13mm x 2mm

Operating Temp: -40°C to +85°C

## 10. Additional Operational Requirements

i. Devices operating in the **5150–5250 MHz** band are restricted to **indoor use only** to reduce potential interference with co-channel mobile satellite systems.
ii. For devices with **detachable antennas**, the maximum antenna gain for the **5250–5350 MHz** and **5470–5725 MHz** bands must ensure compliance with the applicable **e.i.r.p. limits**.
iii. For the **5725–5850 MHz** band, the same applies—antenna gain must not exceed the e.i.r.p.

limits.

iv. The use of an **omnidirectional antenna** is recommended.