



# National Instruments

## RM10 User Manual

Rev #1.3

## Specifications

### RF Operating Frequency

Frequency range: 2402 – 2480 MHz  
 Frequency step: 2 MHz  
 Frequency accuracy:  $\pm 30$  ppm Maximum

### RF Transmitter Power

Maximum RF output power: 18 dBm  
 RF Power Control Range: 28 dB  
 RF Power Gain Step: 4 dB

### RF Receiver

Maximum useable input power: -5 dBm  
 Sensitivity, 1 Mbps BLE, 37Byte packet, 0.1% BER: -99 dBm

### Power Consumption

Typical: 220 mW  
 Maximum: 400 mW

### Physical Characteristics

Physical dimensions (L × W × H): 17 mm × 17 mm × 2.36 mm (0.67 in. × 0.67 in. × 0.093 in.)  
 Weight: 1.51 g (0.053 oz)

## Supported Antennas

| # | Type                 | Max Gain (dBi) | MFG             | MFG Part Number    |
|---|----------------------|----------------|-----------------|--------------------|
| 1 | Molded SMT           | 2              | TE Connectivity | 1513504-1          |
| 2 | Rubber Duck Monopole | 1.5            | Pulse           | W5010              |
| 3 | Rubber Duck Monopole | 1.5            | MMT Machrone    | WAS002-000178B-S12 |

## Firmware

This radio module is only compatible with authorized firmware images from National Instruments. It prevents unsigned firmware images from being remotely deployed.

## FCC Information

This radio module meets the requirements of the following Radio Equipment standards:

- FCC 47 CFR Part 15C: Intentional Radiators
- RSS-247: DTSSs, FHSs, and LE-LAN

### Federal Communications Commission Interferences Statement

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause interference with radio and television reception. 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.

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.

**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.

**Note** The FCC regulations provide that changes or modifications not expressly approved by NI could void your authority to operate this equipment.

## IC Information

### Industry Canada (IC) Notices / Avis d'Industry Canada (IC)

This radio module meets the requirements of the following Radio Equipment standards:

- RSS-247: DTSSs, FHSs, and LE-LAN

Class A digital circuitry of this device complies with Canadian ICES-003.

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.

Under Industry Canada regulations, the radio transmitter(s) in this device may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

La circuiterie numérique de Classe A de cet appareil est conforme à la norme canadienne ICES-003.

Cet appareil est conforme aux normes d'exemption de licence RSS d'Industry Canada. Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

Conformément aux réglementations d'Industry Canada, les émetteurs radio de cet appareil ne peuvent fonctionner qu'à l'aide d'une antenne dont le type et le gain maximal (ou minimal) pour ces émetteurs - transmetteurs sont approuvés par Industry Canada. Pour réduire le risque d'interférence éventuelle pour les autres utilisateurs, le type et le gain de l'antenne doivent être choisis de manière à ce que la puissance isotrope rayonnée équivalente (p.i.r.e.) minimale nécessaire à une bonne communication soit fournie.

### Radio Frequency (RF) Exposure Information / Informations sur l'exposition à la fréquence radio (FR)

The radiated output power of this device is below the Industry Canada (IC) radio frequency exposure limits. This device has been evaluated for and shown compliant with the IC Radio Frequency (RF) Exposure limits. The device should be used in such a manner such that the potential for human contact during normal operation is minimized.

This device has been certified for use in Canada. Status of the listing in the Industry Canada's REL (Radio Equipment List) can be found at the following web address:

<http://www.ic.gc.ca/app/sitt/reltel/srch/nwRdSrch.do?lang=eng>

Additional Canadian information on RF exposure also can be found at the following web address:

<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08792.html>

La puissance rayonnée de sortie de cet appareil est inférieure aux limites d'exposition à la fréquence radio d'Industry Canada (IC). Cet appareil a été évalué et jugé conforme aux limites d'exposition à la

fréquence radio (FR) d'IC. Cet appareil devrait être utilisé de manière à ce que le risque de contact humain au cours d'un fonctionnement normal soit réduit.

Cet appareil est homologué pour l'utilisation au Canada. Pour consulter l'entrée correspondant à l'appareil dans la liste d'équipement radio (REL – Radio Equipment List) d'Industry Canada, rendez-vous sur : <http://www.ic.gc.ca/app/sitt/reltel/srch/nwRdSrch.do?lang=eng>

Pour des informations canadiennes supplémentaires sur l'exposition FR, rendez-vous sur: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08792.html>

## End-User Integration

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that at least **39 mm** is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as the two conditions above are met, further intentional transmitter tests 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.

### IMPORTANT NOTE:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID 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 authorization.

### End Product Labeling:

This transmitter module is authorized only for use in device where the antenna may be installed such that at least 1.3 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: 2AGJ2-001" and/or "Contains IC: 3523A-001". The grantee's FCC ID and/or IC number can be used only when all FCC and/or ISED compliance requirements are met.

### Manual Information to the End User:

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that the after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements.