

## Trilliant Networks High Sensitivity 1 Watt Radio Module Installation Instructions



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The Trilliant Networks High Sensitivity 1 Watt Radio Module is a 2.4GHz 802.15.4 data transceiver module. The module contains a trace antenna or optional U.FL connector. Power is supplied by a host module with a nominal operating voltage of 3.3 volts.

Specification of the radio includes:

IEEE Standard:	802.15.4
Power Output:	+30 dBm
Radio Sensitivity:	-101 dBm
RF Data Rate:	250kbps
Operating Frequency:	2.4-2.485 GHz
Bit Error Rate:	$7 \times 10^{-7}$ @ -101dBm
Network Topology:	Mesh, Point to Point
Spread Spectrum:	Direct Sequence
Modulation:	O-QPSK
Radio Dimensions:	1.0" x 1.5"
Antenna Options:	Directional trace antenna or U.FL external

### Power Settings Note:

The maximum power setting possible for the module is 15, however, the manufacturer will set the maximum at 13 by means of firmware. The end user will not have access to power control and thus will limit the maximum power setting at 13. Power settings as listed below will be set by the manufacturer in the final product.

Although the end user does not have access to channel power settings, it is important to note that FCC approval for this module has been granted subject to channel power settings as stated below. Any deviation from said power level (P.L) would void the FCC Grant.

Module with DiPole Antenna	
Channel	P.L
0	7
1	13
2	13
3	13
4	13
5	13
6	13
7	13
8	13
9	13
10	13
11	13
12	11
13	7
14	5
15	0

Module with Inv. F Antenna	
Channel	P.L
0	7
1	13
2	13
3	13
4	13
5	13
6	13
7	13
8	13
9	13
10	13
11	13
12	13
13	11
14	7
15	0

**Compliance Statement (Part 15.19)**

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.

**FCC Interference Statement (Part 15.105 (b))**

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 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.

**OEM Responsibility to the FCC Rules and Regulations**

The 30 dB Radio Module has been certified per FCC Part 15 rules for integration into products without further testing or certification. To fulfill the FCC certification requirements the OEM of the 30 dB Radio

Module must ensure that the information provided on the 30 dB Radio Module Label is placed on the outside of the final product.

The 30 dB Radio Module is labeled with its own FCC ID Number. If the FCC ID 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 FCC ID: TMB-EM000038”**

or

**“Contains FCC ID: TMB-EM000038”**

The OEM of the 30 dB Radio Module must only use the approved antenna, which has been certified with this module.

The OEM of the 30 dB Radio Module must test their final product configuration to comply with Unintentional Radiator Limits before declaring FCC compliance per Part 15 of the FCC rules.

#### **Warning (Part 15.21)**

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

#### **RF Exposure (OET Bulletin 65)**

To comply with FCC RF exposure requirements for mobile transmitting devices, this transmitter should only be used or installed at locations where there is at least 20cm separation distance between the antenna and all persons.

#### **Industry Canada Statement**

The term “IC” before the certification/registration number only signifies that the Industry Canada technical specifications were met.

#### **Section 7.1.5 of RSS-GEN**

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.

#### **Section 7.1.4 of RSS-GEN**

This device has been designed to operate with an antenna having a maximum gain of 2 dB. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms."

#### **Section 7.1.5 of RSS-GEN**

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

