

TWIG Radio Module Installation Manual

1. Valve/Contact TWIG with (single or dual) internally mounted antenna

- a) Connect one end of a 200mm UMCC cable (TE Connectivity Model #2015357-4 200mm UMCC plug-UMCC plug) to a Nelson dipole antenna.
- b) Slide ferrite bead (Laird-Signal Integrity Products #28B0275-00) over the UMCC cable. Secure ferrite bead to antenna PCB.
- c) Connect the opposite end of the UMCC cable to J1 of the Twig radio module.
- d) Repeat steps a) and b) for dual antenna model. Connect the opposite end of the UMCC cable to J2 of the LSR module.
- e) Mount TWIG PCB and antennas on plastic subassembly frame as shown in figure1 below.

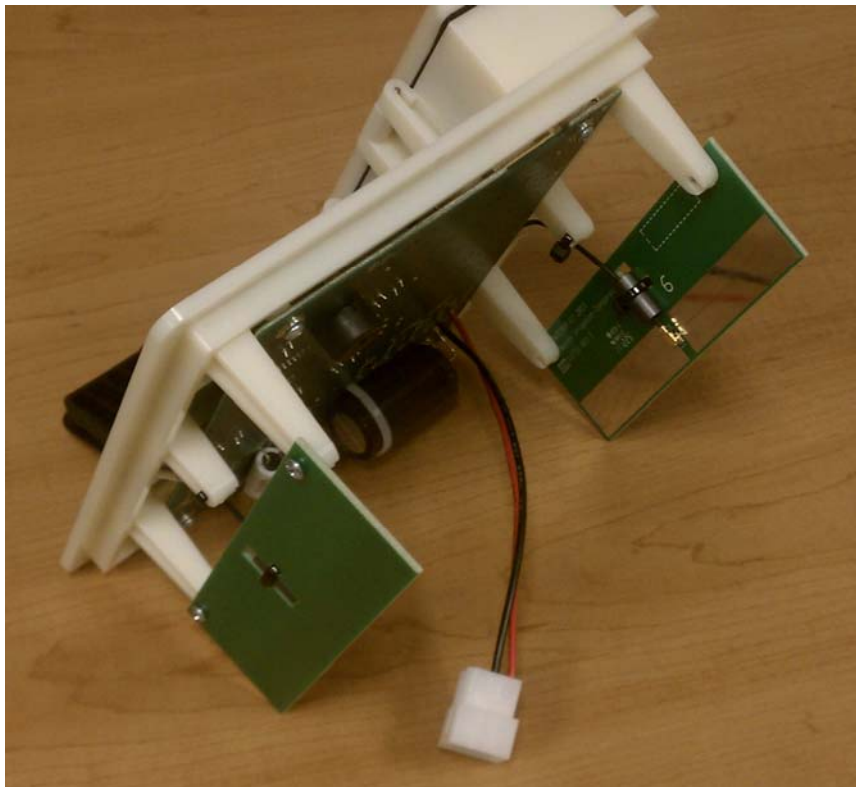


Figure 1

2. Valve/Contact TWIG with externally mounted antenna

- a) Connect U.FL. end of 200mm U.FL to RPSMA cable (L-Com Model #CA-UFLRSBQC20 U.FL to RP-SMA Cable, 20cm 1.13 Series Mini Coax (50 ohm)) to Twig radio module.
- b) Fasten RPSMA bulkhead end to TWIG housing.
- c) Connect at least three feet of LMR-195 coax cable with RPSMA connector to the RPSMA bulkhead and the opposite end to an N-type male connector
- d) Connect the N-type male connector to an L-Com Model #HGV-906V Omni having 6dBi gain.

3. TWIG hub/controller/repeater with externally mounted antenna

- a) Connect U.FL. end of 200mm U.FL to RPSMA cable (L-Com Model #CA-UFLRSBQC20 U.FL to RP-SMA Cable, 20cm 1.13 Series Mini Coax (50 ohm)) to LSR module.
- b) Fasten RPSMA bulkhead end to the gateway enclosure.
- c) Connect at least three feet of LMR-195 coax cable with RPSMA connector to the RPSMA bulkhead and the opposite end to an N-type male connector.
- d) Connect the N-type male connector to an L-Com Model #HGV-906V Omni antenna having 6dBi gain.

Federal Communication Commission Interference Statement

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.

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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

INDUSTRY CANADA STATEMENTS

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. 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 permitted for successful communication. This device has been designed to operate with the antennas listed below, and having a maximum gain of 6 dBi. Antennas not included in this list or having a gain greater than 6dBi dBd are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

Approved antenna list:

- Nelson VRS PCB dipole antenna (PN #11734) -9.9 dBi gain
- Nelson Bowtie antenna +3.7dBi gain
- L-Com Model #HGV-906V Omni 6dBi gain

"To comply with FCC and Industry Canada RF radiation exposure limits for general population, the antenna(s) used for this transmitter must be installed such that a minimum separation distance of 20cm is maintained between the radiator (antenna) and all persons at all times and must not be co-located or operating in conjunction with any other antenna or transmitter."

Son fonctionnement est soumis aux deux conditions suivantes: (1) cet appareil ne peut pas causer d'interférences, et (2) cet appareil doit accepter toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil. Pour réduire le risque d'interférence aux autres utilisateurs, le type d'antenne et son gain doivent être choisis afin que la puissance isotrope rayonnée équivalente (PIRE) ne dépasse pas celle admise pour une communication réussie. Ce dispositif a été conçu pour fonctionner avec les antennes énumérées ci-dessous, et ayant un gain maximal de 6,0 dBi. Antennes pas inclus dans cette liste ou ayant un gain supérieur à 6,0 dBi est strictement interdite pour une utilisation avec cet appareil. L'impédance d'antenne requise est de 50 ohms.

La liste d'antenne approuvé:

- Nelson VRS PCB antenne dipôle (PN # 11734) -9,9 dBi de gain
- Bowtie Nelson antenne 3,7 dBi de gain
- L-Com Modèle # PL-906V Omni 6dBi gain de

"Pour se conformer à la FCC et Industrie Canada limites d'exposition aux rayonnements RF pour la population générale, l'antenne (s) utilisée pour ce transmetteur doit être installé de telle sorte qu'une distance minimale de 20cm est maintenue entre le radiateur (antenne) et toutes les personnes à tout moment et ne doit pas être co-localisés ou fonctionner en conjonction avec une autre antenne ou un autre émetteur. "

OEM Responsibilities to comply with FCC and Industry Canada Regulations

The TWIG Module has been certified for integration into products only by OEM integrators under the following conditions:

1. The antenna(s) must be installed such that a minimum separation distance of 20cm is maintained between the radiator (antenna) and all persons at all times.
2. The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter.

As long as the two conditions above are met, further transmitter testing 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 (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions cannot be met (for certain configurations or co-location with another transmitter), then the FCC and Industry Canada authorizations are no longer considered valid and the FCC ID and IC Certification Number 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 and Industry Canada authorization.

End Product Labeling

The TWIG Module is labeled with its own FCC ID and IC Certification Number. If the FCC ID and IC Certification Number are 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. In that case, the final end product must be labeled in a visible area with the following:

“Contains FCC ID: ZH6-TWIG2014HP”

“Contains IC: 9686A-TWIG2014HP”

The OEM of the TWIG Module must only use the approved antenna(s) listed above, which have been certified with this module.

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module or change RF related parameters in the user manual of the end product.

The user manual for the end product must include the following information in a prominent location:

“To comply with FCC and Industry Canada RF radiation exposure limits for general population, the antenna(s) used for this transmitter must be installed such that a minimum separation distance of 20cm is maintained between the radiator (antenna) and all persons at all times and must not be co-located or operating in conjunction with any other antenna or transmitter.”