Installation and Weatherproofing Guide

for

Encom Broadband Radios

encom
WIRELESS

IMPORTANT

Read the following instructions before installing your Encom wireless radio.

- Keep these instructions in a safe location for ongoing and future reference. Ensure that you pay careful attention to all stated warnings.
- Use only the accessories and attachments provided and/or specified by Encom.
- Any and all servicing of the radio must be performed only by a qualified Encom Wireless technician. This includes opening the device which breaks the weatherproof seal.
- Any change or modification not expressly written in this manual is not approved by Encom Wireless and will void the warranty of your Encom product.
- Product warranty does not cover failure, malfunction or damage resulting from improper mounting or insufficient weatherproofing as prescribed in this guide.

For any questions or concerns regarding your Encom product, you can reach us in any of the following ways:

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Toll-Free 1.855.730.1122 | Canada (403) 230.1122

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1.0 EQUIPMENT CHECKLIST

Check that the following equipment has been received with your Encom broadband radio:

- Power Over Ethernet (P.O.E) adapter
- 150-ft Ethernet cable (straight through)
- 6-ft Ethernet Crossover Cable (jumper)
- AC Power Cord

The following items (not supplied) are also needed for the installation of your Encom broadband radio:

- Electrical Tape
- Vulcanizing Rubber Tape

2.0 RADIO SITE SURVEY

Each radio installation is unique due to the physical environment, radio network configuration and antenna configuration. A site survey is highly recommended to determine the best RF coverage, the optimal placement and location of the radios, and to ensure that the highest network performance is achieved.

NOTE **Failing to perform a site survey before installing a radio can result in degraded performance of the RF network.**

3.0 ETHERNET CABLE CONDITION

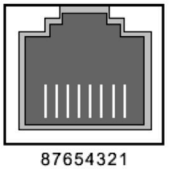
Dirt and debris can reside inside the conduit unit that houses the cables for an intersection. When it is required that the 150ft Ethernet cable is to be threaded through the conduit, the cable end (RJ45 jack) must be protected against any damage to it, including any exposure to weather elements. The cable end must remain free of debris, dirt and be clean and dry before installing it through the IPON connector and into the Ethernet connection port of the Encom radio unit.

NOTE **Failing to ensure your Ethernet cable is clean and dry, then installing it into your radio may result in degraded RF performance and may lead to full radio failure. This will void the warranty of your unit.**

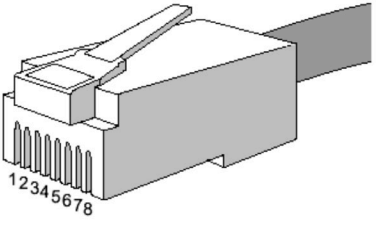
4.0 ETHERNET CABLE PIN-OUTS

It is recommended to use a shielded Ethernet cable with your Encom broadband product. The pin-outs and function of each pin is as follows:

PIN #	SIGNAL	Tx / Rx	COLOR	DESCRIPTION
1	TXD+	T	Orange–White	TX Data 10/100 BaseT
2	TXD–	R	Orange	TX Data 10/100 BaseT
3	RXD+	T	Green–White	RX Data 10/100 BaseT
4	PoE+	R	Blue	Power Out 0/12/24/48 VDC+
5	PoE+	T	Blue–White	Power Out 0/12/24/48 VDC+
6	RXD–	R	Green	RX Data 10/100 BaseT
7	PoE–	T	Brown–White	Power Out 0/12/24/48 VDC–
8	PoE–	R	Brown	Power Out 0/12/24/48 VDC–



RJ45 port



RJ45 jack

4.1 Ethernet Cable Termination

If there is a need to re-terminate your Ethernet cable, it is important to ensure a properly terminated cable in order to effectively maintain power to the radio and network connectivity.

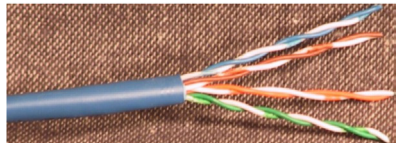
The following steps outline the correct procedure for terminating your Ethernet cable end.

4.1.1 Preparing your Ethernet Cable

The cable jacket offers not only physical protection, but in shielded cables, it offers RF shielding to minimize electro-magnetic interference effects. It is imperative that you do not strip back any more of the cable jacket than necessary for proper termination. This is typically ½” in length.

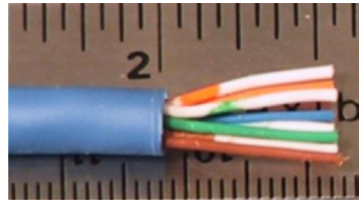
Step 1 – Cable Stripper

Using a cable stripper cut back the jacket of the Ethernet jacket exposing the twisted wire pairs inside. The pairs of wires that are inside will need to be unwound and remain un-stripped as shown below:



Step 2 – Lining the Colors

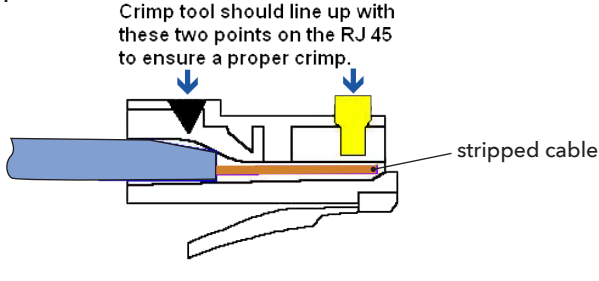
Using the chart (see the **Ethernet Cable Pin-outs** table, previous page), untwist the pairs of wires and line them up as shown on the pin-out chart. Trim the cables so that you maintain the ½" of exposed cable as stated in the previous page.



Step 3 – Terminating

Insert the lined up Ethernet wire pairs into the RJ45 jack making sure not to twist or misalign any of the colors in the process. The Ethernet cable should fit firmly into the jack with each of the cables firmly pushed forward all the way.

Insert the cable into the crimping tool making sure that pressure points on the crimper are lined up with the two points as shown below:



With a proper crimp completed, you will see the gold plated electrical contact pierce not only all eight wires but the insulation as well to complete the contact with the copper conductor. The rear of the RJ45 jack is being held in place with the strain relief action of the plastic gripper keeping the connectors intact.

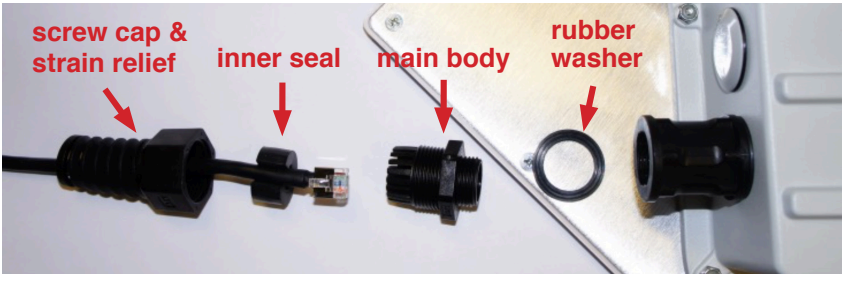
4.2 Weatherproofing Encom Broadband Radios

In order to ensure continued and uninterrupted wireless connectivity of your Encom integrated broadband radio network, the connection on your integrated units need to be verified and each external connection point properly weatherproofed.

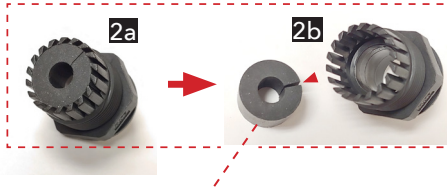
4.2.1 Broadband Radio IPON Connector Assembly

The IPON Connector assembly screws into the Ethernet port of the radio to offer structural security and a weatherproof connection point for the Ethernet cable. Locate the IPON connector assembly as shown by the photo below.

The IPON connector consists of the following four parts as shown below. All four components are necessary in order to form a weatherproof seal for the Ethernet cable. If you do not have all of these pieces please contact your local Encom dealer to obtain a replacement IPON connector.

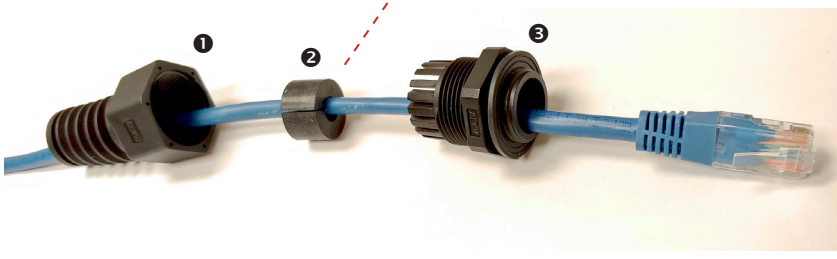


In order to properly weatherproof the Ethernet connection, ❶first slide the Ethernet cable through the screw cap/strain relief housing. ❷Next, locate the split in the inner seal, and wrap it around the Ethernet cable. ❸Next, slide the main body onto the Ethernet cable.



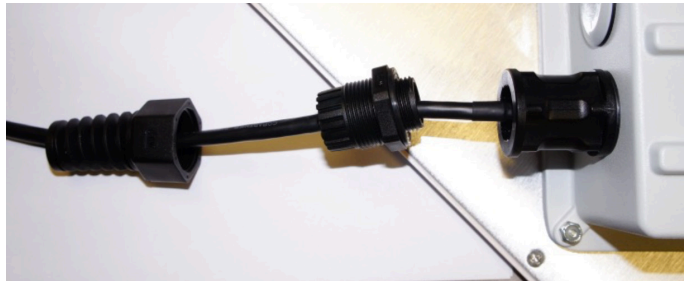
TIP

Push the inner seal out of the Main Body from the threaded side with a pen.

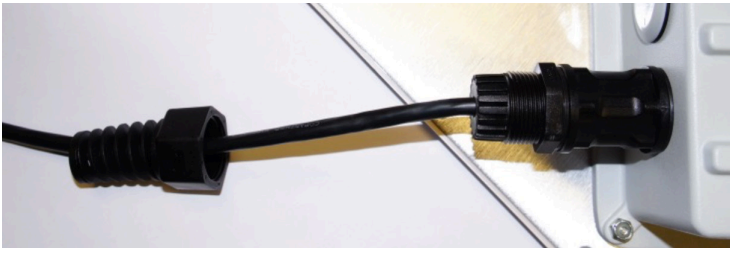


Next, push the inner seal back into the bottom of the main body.

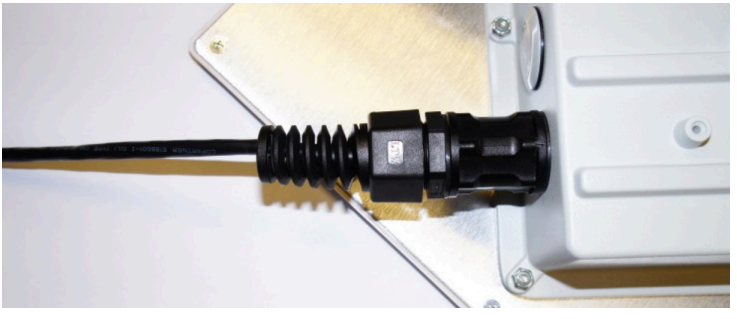
Next, connect the Ethernet cable to the Ethernet port on the bottom of the Encom broadband radio.



Next, screw the main body onto the Ethernet port on the bottom of the Encom broadband radio.



Next, screw the screw cap/strain relief onto the main body of the IPON connector, and **finger-tighten only**. Using any tools or overtightening would cause excessive pressure and damage the main body as temperatures change.



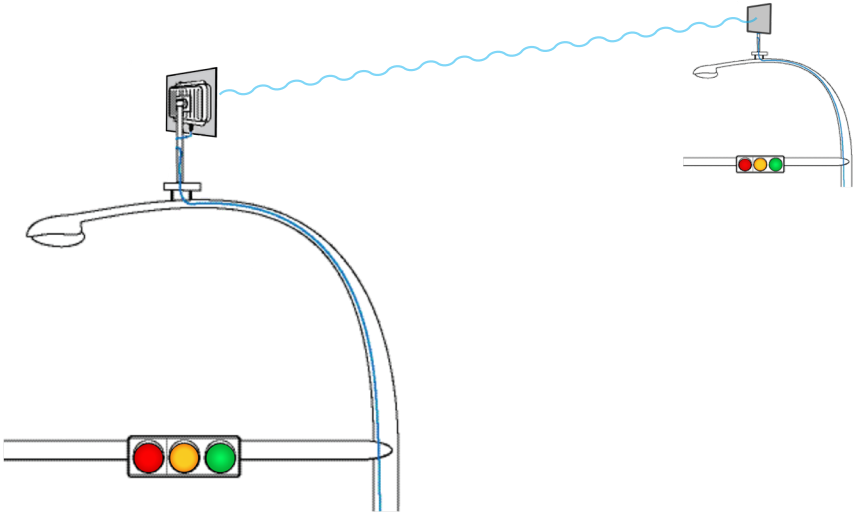
5.0 MOUNTING YOUR ENCOM BROADBAND RADIO

- Always mount your Encom broadband radio at the **highest available point** to achieve optimal line of site (LOS) and to help ensure good signal strength.
- Choose a **location with no obstacles between sites** to maximize the connection quality of the radio link.
- Make sure each Encom broadband radio is mounted so the **Ethernet port is pointing towards the ground** (see diagram in section 7.0).
- Always **seal any external connection points** on the broadband radio with a layer of vulcanizing rubber tape, and then a layer of electrical tape over the vulcanizing tape. **In highly humid regions**, it is highly recommended that this **same protection be applied** as well to **seal the IPON connector to Ethernet port connection** point.

6.0 PROPER INSTALLATION OF INTEGRATED BROADBAND RADIOS

The following pointers outline the correct installation for Encom integrated broadband radios. Our product warranty only applies when all prescribed installation steps in this guide are adhered to.

- ✓ Ensure clear **line of sight** between radio locations.
- ✓ Mount radios on **highest location** possible.
- ✓ Ensure prescribed **weatherproofing has been applied** to each radio. (see Section 4 of this guide)
- ✓ Ensure a distance of at least 12 ft between the antenna and any power line poles with high tension power lines as these also emit electomagnetic waves.

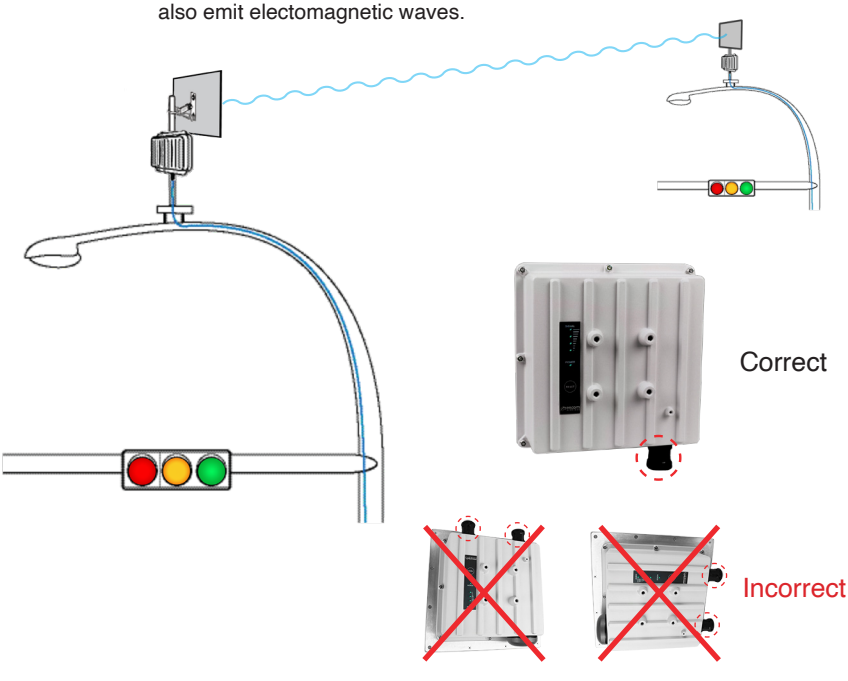


7.0 PROPER INSTALLATION OF NON-INTEGRATED BROADBAND RADIOS

- Always mount your radio at the **highest available point** to achieve optimal line of site (LOS) and to help improve signal strength.
- Choose a **location with no obstacles between sites** to maximize the connection quality of the radio link.
- Make sure each non-integrated antenna is **mounted as shown** in the diagram below.
- Always **seal any external connection points** on the integrated broadband radio with a layer of vulcanizing rubber tape, and then a layer of electrical tape over the rubber tape.

The following outlines the correct installation for the Encom non-integrated broadband radio.

- ✓ Ensure clear **line of sight** between radio locations
- ✓ Mount radios on **highest location** possible
- ✓ Ethernet **connectors are facing downward**
- ✓ Ensure a distance of at least 12 ft between the antenna and any power line poles with high tension power lines as these also emit electomagnetic waves.



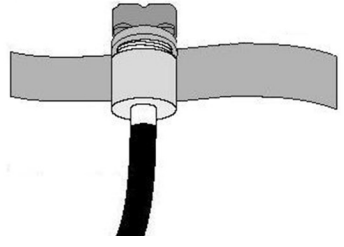
7.1 Weatherproofing Non-Integrated Broadband Radio

In order to ensure continued and uninterrupted wireless connectivity of your Encom non-integrated broadband radio network, the connection on your non-integrated units need to be verified and each external connection point properly weatherproofed.

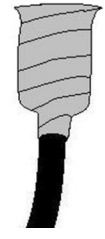
8.0 SEALING THE ANTENNA CONNECTION POINT

Each antenna connection point on the non-integrated radio must be properly sealed with a layer of vulcanizing rubber tape followed by a layer of electrical tape. The vulcanizing rubber tape offers protection against the weather elements while maintaining a dry internal connection. The electrical tape is to be applied over top of the vulcanizing rubber tape to prevent UV radiation degrading the rubber of the vulcanizing tape.

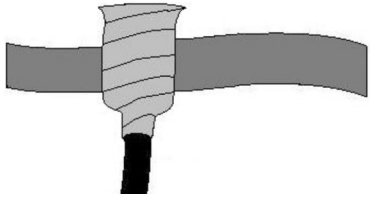
Exposed RF Connector on Encom broadband radio



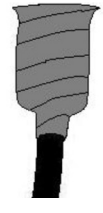
LMR antenna cable is wrench tightened. The **vulcanizing tape** is wrapped around the base, down the connector and down the LMR cable forming a complete seal.



A complete seal is formed from base of connector, connection and cable



A strip of **electrical tape** is wrapped around the exact same area as the vulcanizing tape such that **no vulcanizing tape is exposed**.



The electrical tape forms a protective seal against UV radiation exposure on the vulcanizing tape.

FAILURE TO CORRECTLY PROTECT YOUR ANTENNA PORT CONNECTIONS WILL VOID YOUR WARRANTY

9.0 PROPERLY SEALED RF ANTENNA PORT

The following picture shows a completed and properly sealed RF connection port on an Encom broadband radio using both vulcanizing and electrical tape.

There are no exposed points on the RF connector, LMR cable, or on the RF connection point on the radio.

For any questions or concerns regarding your Encom product, you can reach us in any one of the following ways:

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Notes:

ENCOM is a leading provider of reliable wireless data solutions to a broad range of municipal, industrial and commercial customers across North America. Our innovative and practical solutions enable our customers to CONNECT, VISUALIZE and MONITOR everything with advanced applications that reduce costs.

For more information on our products and services, please call:

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