

# Ethernet Radio Antenna Installation Guide

## Choosing a Location for the Antenna

- The key to the overall robustness of the radio link is the height of the antenna. In general, Ethernet radio units with a higher antenna placement will have a better communication link. An adjustment of as little as 2 feet in antenna placement can resolve some noise problems. Keep in mind, however, that an antenna can be placed too high.
- If the signal level is low (below 40) there may be a line-of-site issue with the antenna. The antenna may need to be redirected or increased in height.
- When using an external antenna, placement of that antenna is critical to a solid data link. Other antennas in close proximity are a potential source of interference. The Radio Statistics on the Status page of the FreeWave configuration interface can help identify potential problems. To access the configuration interface, refer to the Change Additional Radio Settings section in Baseline's Ethernet Radio Configuration Guide.
- When interference is excessively high (above 70) due to a pager or cellular telephone tower, a band-pass filter may help eliminate this out-of-band noise.
- Ensure as much vertical separation as possible between all antennas. Baseline recommends 10' of vertical separation from other 900MHz or other high power antennas.

## Antenna and Cable Guidelines

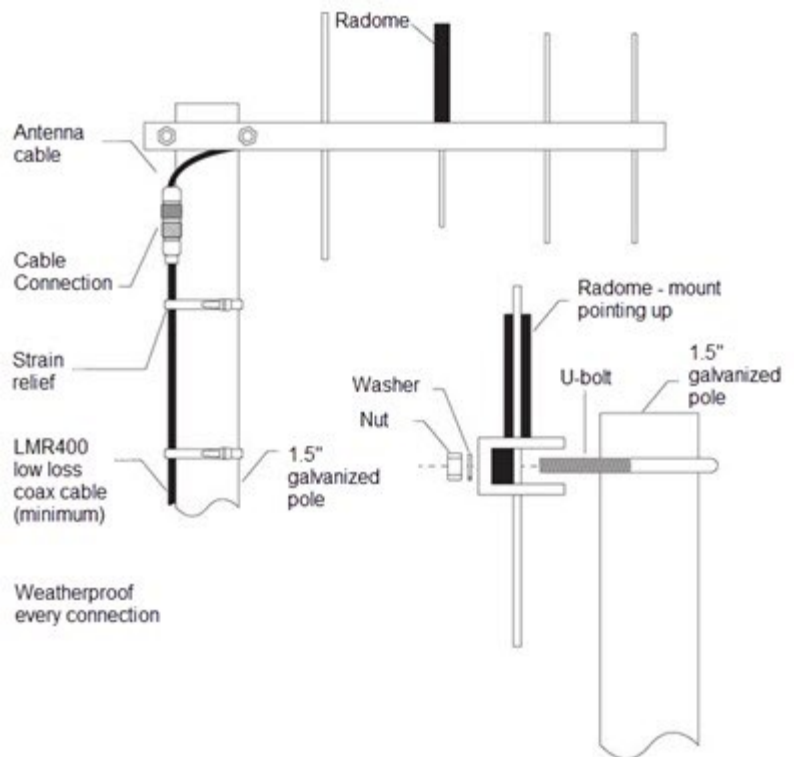
- Ensure the antenna is of proper characteristics for Ethernet radio network being installed. (For example, in a 900MHz network, the antenna being installed must be capable of covering the 902MHz to 928MHz bandwidth.)
- As energy travels through the cable between the antenna and the radio, some of that energy is lost. The longer the cable, the greater the loss. Ensure that the cable is of proper length to preserve the integrity of the signal.
- Always use LMR400 low loss cables or better. Baseline offers directional and omni-directional antennas with cable lengths ranging from 3 to 150 feet.
- Make sure the net gain of the antenna cable assembly is no less than 0dBm and no more than 6dBm.
- During installation, ensure all antenna cable connections are secure without over tightening.
- When coax connections will be exposed to the elements, take special care to weatherproof each connection.

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## Installing a Yagi Antenna

**Note:** The illustration below shows one example of antenna installation. Other installation methods are acceptable provided that they meet all criteria outlined in the following steps.

1. Mount the Yagi antenna so the length of the antenna is parallel to the ground and the elements are pointing to the ground and skyward.
2. Reference the results of the Radio Site Survey to set the location and position of the antenna.
3. Point the antenna in the direction of the next antenna. Make sure the antenna is securely connected to the mounting pole so the orientation does not change over time.
4. Connect the antenna cable to the antenna and seal the connection with shrink tubing or weatherproof tape.
5. Provide strain relief on all connections.
6. Baseline recommends running a ground wire along with the RF cable from the antenna to the lightning arrester.
7. Secure the cable to the mast or tower with tie-wraps.
8. Install a lightning arrester and ground appropriately following all manufacturer installation guidelines and precautions. Refer to the BL-CX-LA High Gain Antenna Lightning Arrester Installation Guide.
9. Connect the RF cable to the lightning arrester and seal with shrink tubing or weatherproof tape.
10. Connect the antenna cable to the radio module in the enclosure as described on page 4.

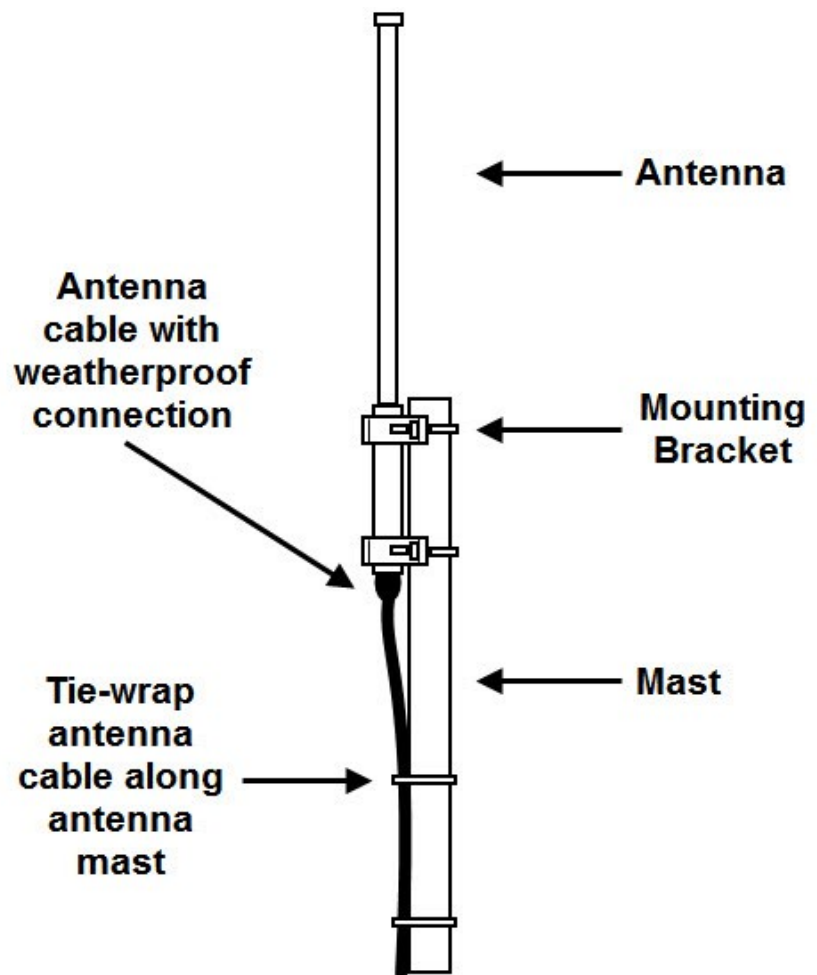


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## Installing an Omni-Directional Antenna

**Note:** The illustration below shows one example of antenna installation. Other installation methods are acceptable provided that they meet all criteria outlined in the following steps.

1. Mount the omni-directional antenna vertically on a mast or tower. Follow all manufacturer's installation guidelines and precautions.
2. Reference the results of the Radio Site Survey to set the location of the antenna.
3. Connect the antenna cable to the antenna and seal the connection with shrink tubing or weatherproof tape. Baseline recommends running a ground wire along with the antenna cable from the antenna to the lightning arrestor.
4. Provide strain relief on all connections.
5. Secure the cable to the mast or tower with tie wraps.
6. Install a lightning arrestor and ground appropriately following all manufacturer's installation guidelines and precautions. Refer to the BL-CX-LA High Gain Antenna Lightning Arrestor Installation Guide.
7. Connect the antenna cable to the lightning arrestor and seal the connection with shrink tubing or weatherproof tape.
8. Connect the antenna cable to the radio module in the enclosure as described on page 4.

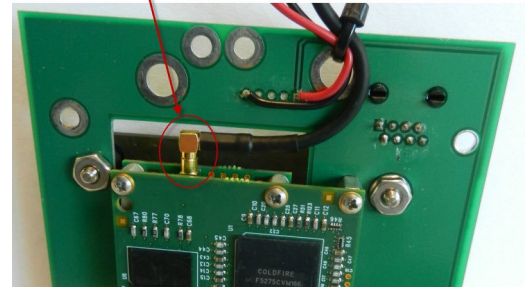


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## Connecting the Antenna Cable to the Radio Module in the Enclosure

1. Perform the antenna mounting steps in this document for the specific type of antenna.
2. Run the antenna cable to the Ethernet radio enclosure.
3. Disconnect the power to the Ethernet radio enclosure.
4. Remove the large knockout on the bottom of the enclosure, and then route the antenna cable into the enclosure.
5. Inspect the antenna cable connection on the back of the Ethernet radio unit to ensure that it is securely connected.

Antenna cable connector on the back of the Ethernet radio unit



6. Attach the coax cable connector to the bottom of the lightning arrester.
7. Attach the antenna connector from the radio module to the top of the lightning arrester.



**IMPORTANT!** Make sure the antenna cable remains securely attached to the connector on the Ethernet radio. If the radio is powered up with a loose or disconnected antenna, damage may occur to the circuitry. **This damage is not covered by warranty.**

8. Ground the antenna according to the instructions in the BL-CX-LA High Gain Antenna Lightning Arrester Installation Guide.

