

## 4.1 GPS Antenna Installation

The GPS antenna is installed with a standard antenna thread-mounted to an L-shaped bracket. The bracket can be strap-clamped to a roof mast or bolted to a flat surface.

Use an LMR-195 (or equivalent) coaxial cable to connect from the GPS antenna to the RDL-3000 GPS antenna port. The GPS antenna can be connected using up to 46 m (~150 ft) of high quality antenna cable.

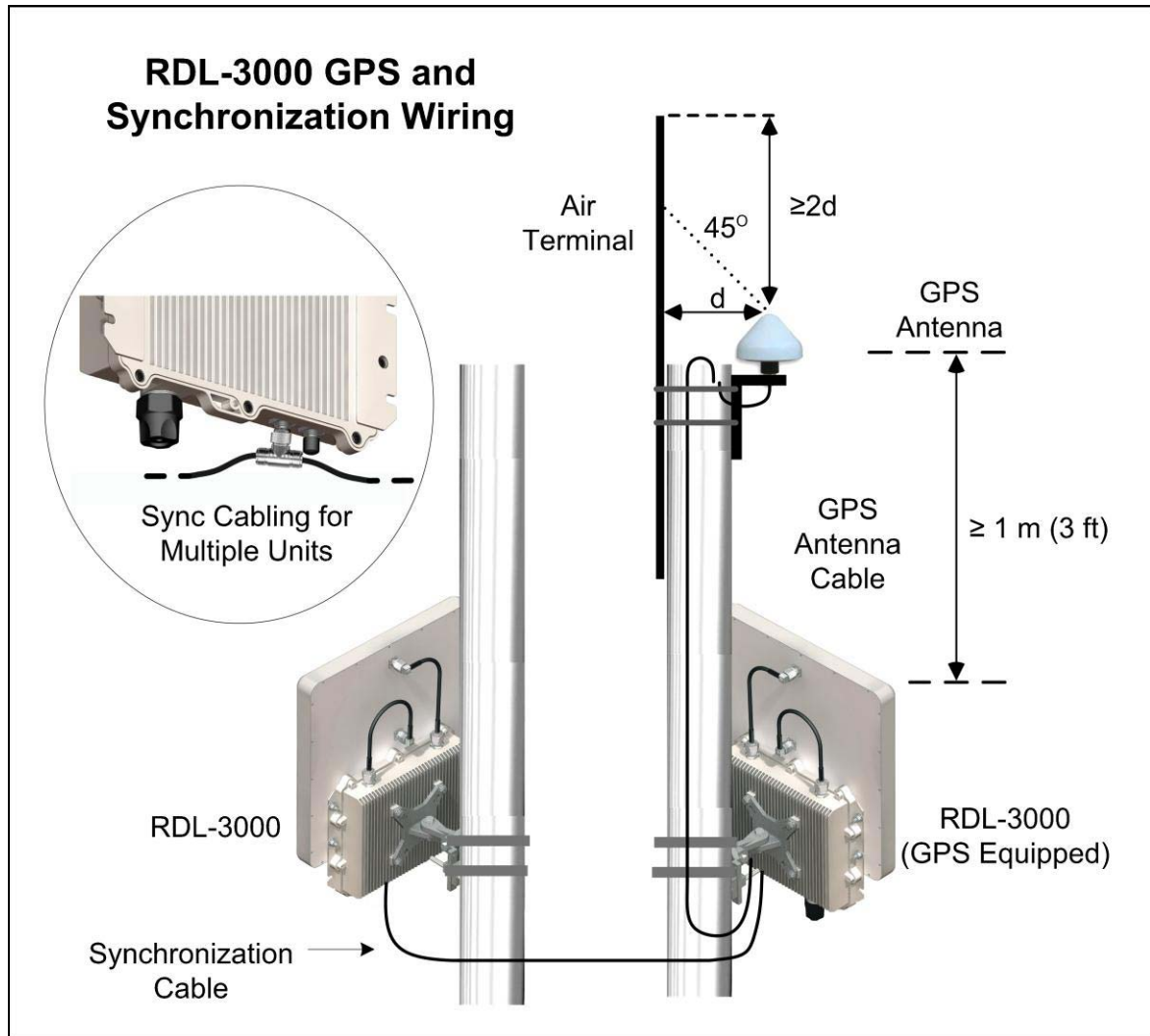


Figure 47 - Sync - Collocated RDL-3000 Units

### 4.1.1 Choosing the GPS Antenna Location

It is important to conduct a site survey before installing the GPS antenna. A poorly installed or badly located GPS antenna may not maintain accurate timing -- resulting in increased interference in the wireless network that may result in service outages.

Prior to installing the GPS equipment, it is recommended to use a small handheld GPS device to perform a survey for three to six hours. Check readings at regular intervals to confirm that a minimum of three satellites, each having signal levels above 36 dB (post correlation signal to noise (CNo)), are visible at all times.

To provide the best coverage, a GPS antenna should be installed at the highest point available at the site. If the GPS antenna is mounted on the same tower as the sector controller, the antenna must be located above the RDL-3000 wireless antenna.

The GPS antenna must have a clear view to approximately ten degrees of the horizon in all directions. Surrounding obstacles such as trees, buildings, etc should not exceed a 20 degree elevation angle. Blockage due to buildings, mountains, etc. should be less than 50% of the sky.

### RF Interference

To avoid the influence of reflected waves, the antenna must not be installed less than 2 m (~6.5 ft) away from metallic objects having dimensions greater than 0.2 m (~8 in). Grounded metal structures may block or reduce the signal from a satellite.

To minimize susceptibility to radio interference, the GPS antenna should generally be located at least 1 m (~3.25 ft) away from antenna systems for any another high frequency system (e.g., microwave, GSM, CDMA, 3G). Avoid mounting the GPS antenna within the main beamwidth of any active (radiating) antenna system.

#### 4.1.2 GPS Antenna Kit

The Redline GPS antenna kit is designed to accommodate most installations. This kit includes the following items:

- GPS Antenna
- 6 m (19.5 ft) LMR-195 50 ohm antenna cable with TNC / M connectors.
- Mounting Hardware

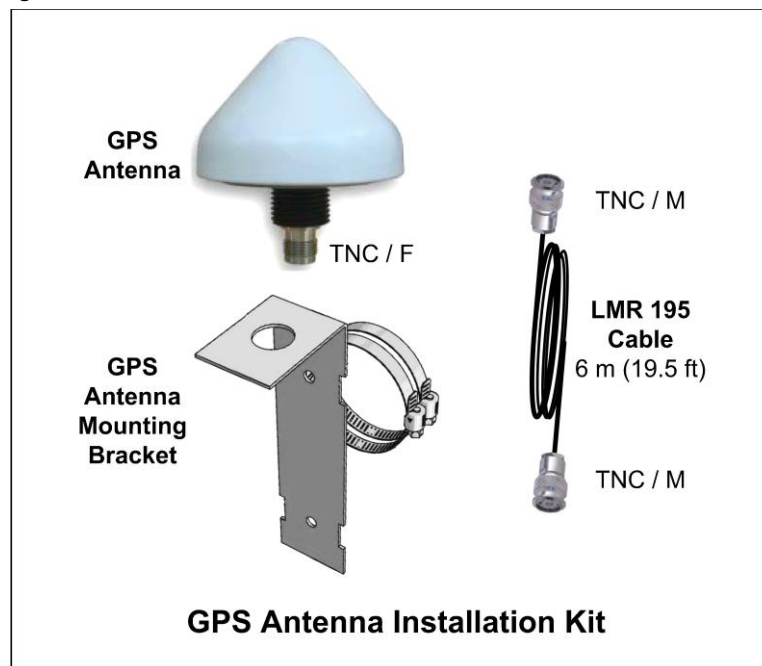


Figure 48 - Sync - GPS Antenna Installation Kit