

WARNING

The MDS INET is a Professional Installation Radio System and Must be Installed by Trained Professional Installers, or Factory Trained Technicians

This section is designed to aid the professional installer in the proper methods of maintaining compliance with the FCC part 15 limits and the +36 dBm or 4 Watts peak E.I.R.P. limit

5.1.4 Antenna & Feedline Selection

Antennas

The equipment can be used with a number of antennas. The exact style used depends on the physical size and layout of a system. Contact your MDS representative for specific recommendations on antenna types and hardware sources.

In general, an omnidirectional antenna is used at the Access Point station site. This provides equal coverage to all of the Remote Gateway sites.

NOTE: Antenna polarization is important. If the wrong polarization is used, a signal reduction of 20 dB or more will result. Most systems using a gain-type omnidirectional antenna at the Access Point station employ vertical polarization of the signal; therefore, the remote antenna(s) must also be vertically polarized (elements oriented perpendicular to the horizon).

When required, horizontally polarized omnidirectional antennas are also available. Contact your MDS representative for details.

Figure 5-4. Omnidirectional antennas for the MDS iNET 900

At Remote Gateway sites and units in point-to-point LANs, a directional Yagi antenna is generally recommended to minimize interference to and from other users. Antennas are available from MDS and our supplier partner MAXRAD

High-gain Type

Unity-gain Type

Figure 5-5. Typical Yagi antenna (mounted to mast)

Feedlines

The choice of feedline used with the antenna should be carefully considered. Poor-quality coaxial cables should be avoided, as they will degrade system performance for both transmission and reception. The cable should be kept as short as possible to minimize signal loss. For cable runs of less than 20 feet (6 meters), or for short range transmission, an inexpensive type such as Type RG-8A/U RG-214 may be acceptable. Otherwise, we recommend using a low-loss cable type suited for 900 MHz, such as Heliax®.

Table 5-1 lists several types of popular feedlines and indicates the signal losses (in dB) that result when using various lengths of cable at 900 MHz. The choice of cable will depend on the required length, cost considerations, and the amount of signal loss that can be tolerated.

Table 5-1. Length vs. loss in coaxial cables at 900 MHz

Cable Type	10 Feet(3.05 m)	50 Feet(15.24 m)	100 Feet(30.48 m)	500 Feet(152.4 m)
RG-214	.76dB	3.8dB	7.6dB	Unacceptable Loss
LMR-400	0.39 dB	1.95 dB	3.90 dB	Unacceptable Loss
1/2 inch HELIAX	0.23 dB	1.15 dB	2.29 dB	11.45 dB
7/8 inch HELIAX	0.13 dB	0.64 dB	1.28 dB	6.40 dB
1-1/4 inch HELIAX	0.10 dB	0.48 dB	0.95 dB	4.75 dB
1-5/8 inch HELIAX	0.08 dB	0.40 dB	0.80 dB	4.00 dB

Table 5-2 outlines the minimum lengths of RG-214 coaxial cable that must be used with common MDS omnidirectional antennas in order to maintain compliance with FCC maximum limit of +36 dBm.

Table 5-2. Minimum Feedline Length versus Antenna Gain

The authority to operate iNET900 may be void by FCC, if other antennas that are not approved by FCC, are used.

Antenna Gain (dBd)	Antenna Gain (dBi)	Minimum Feedline Length (Loss in dB)	E.I.R.P. Level @ Minimum Length	Notes * Maxrad Part #
Unity (0 dB)	2.15 dBi	3 meters (1.0 dB)	+31.15 dBm	Omni # MFB900
3 dBd	5.15 dBi	3 meters (1.0 dB)	+34.15 dBm	Omni # MFB900
5 dBd	7.15 dBi	3.1 meters (1.2 dB)	+35.95 dBm	Omni # MFB900
6 dBd	8.15 dBi	9.1 meters (2.2 dB)	+35.95 dBm	Yagi # BMOY8903

Note (1): As an alternate method, if shorter feedlines are used with the 6 dBd gain antenna's, the RF Output Power shall be reduced to the maximum of 27.4 dBm to ensure that the E.I.R.P is equal or less than the FCC Limit of 36 dBm as it is certified. This RF Output Power is only allowed to be adjusted by the Manufacturer or its sub-contracted PROFESSIONAL INSTALLER.