
Appendix G Antenna Guidelines

WARNING!



Antennas and associated transmission cable must be installed by qualified personnel, and external antennas must be properly grounded. Incorrect termination of the antenna port can permanently damage the EUM. WaveRider assumes no liability for failure to adhere to this recommendation or to recognized general safety precautions.

The CCU and EUM have been certified for use with Omni, Patch, Yagi, and Dipole Reflector antenna types, in addition to the WaveRider Diversity Antenna. [Table 55](#) includes examples of each of the recommended antenna types, as well as their associated maximum antenna gains.

Table 55 CCU, EUM Supported Antennas

Antenna Type	Maximum Antenna Gain
Omni	5.1dBi
Patch	8.5dBi
Yagi	13.0dBi
Panel	12.0dBi

Antenna system gain is the net gain of the system. In other words, it is the antenna gain minus the insertion loss due to cabling, connectors, filters, surge protectors, and other hardware components. During installation, you must verify that the antenna system does not exceed the maximum allowable certified antenna system gain, which is 8.8 dBi.

Calculate the antenna system gain by adding the value of the insertion loss for each component of the antenna system, excluding the antenna, and subtracting the total of that sum from the antenna gain. You can measure the insertion loss of the components, and the

antenna gain, at the frequency of interest, or obtain it by referencing the manufacturer's supplied literature.

WaveRider Guidelines for outdoor installation are:

- select a cable of type and length so that cable loss is 3.5dB, including connectors.
- use a surge protector, which has about 0.1 db loss,
- use a WaveRider jumper cable to connect the modem to the exterior cable or surge protector. The jumper cable has a loss of 1 dB.

For example, with a Yagi antenna system, 15m of cable, a surge protector, and a jumper cable (from modem to surge protector), you would calculate the following antenna system gain:

- Antenna Gain: 13.0dBi
- Insertion loss:
 - External Cable: - 3.5dB
 - Surge Protector: - 0.1dB
 - Jumper Cable: - 1.0dB

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- - 4.6dBi

The antenna gain (13.0dBi) minus the total insertion loss (4.6dBi), yields an antenna system gain of 8.4dBi, which is a valid antenna configuration, because the antenna system gain is lower than the maximum permissible value of 8.8 dBi.

WARNING!



To prevent equipment damage, you must use the WaveRider proprietary WCM connector to connect transmission line and antennas to the EUM3000.

WARNING!



Use of an outdoor antenna with the EUM requires professional installation, in accordance with FCC guidelines.

WARNING!



Antennas used with the EUM must not present a short to ground at the EUM antenna port. Contact the WaveRider Customer Support Centre for more information.