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# AIOM-00001-1

## Antenna Mounting Instructions

Antennas transmit and receive radio signals which are susceptible to many RF obstructions. These common sources of interference can reduce throughput and range of the device to which they are connected. Follow these guidelines to ensure the best possible performance:

- Install the antenna vertically and mount it with the cables pointing towards the ground.
- Keep the antenna away from metal obstructions such as HVAC ducts, large ceiling trusses, building superstructures, and major power cabling runs.
- The density of the materials used in a building's construction determines the number of walls the signal can pass through and still maintain adequate signal strength. Consider the following before choosing the location for your antenna:
  - ✓ Signals can penetrate paper and vinyl walls with minimal change to signal strength.
  - ✓ Signals can penetrate only one or maybe two solid and pre-cast concrete walls without attenuating signal strength.
  - ✓ Signals can penetrate three or four concrete and wood block walls without degrading signal strength.
  - ✓ Signals can penetrate five or six walls constructed of drywall or wood without degrading signal strength.
  - ✓ Signals will reflect off a thick metal wall and may not penetrate it at all.
  - ✓ Signals will can reflect off a chain link fence or wire mesh spaced between 1-1/2 in and smaller. The fence acts as a faraday cage that blocks the signal.

**Important!** *Install the antenna away other RF sources at or near the same frequency. These products can cause signal interference because they operate in the same frequency range as the device to which your antenna is connected.*

### Choosing a Mounting Location

The antenna should be mounted clear of any obstructions to the sides of the Antenna Body.

Generally, the higher an antenna is above the floor, the better it performs. When possible, find a mounting place directly above your wireless device to ensure the lead-in cable can be as short as possible. Cables introduce more loss.

### Installing the Antenna

You can install the antenna on any flat surface. When installing you must provide the appropriate hardware. Mounting antennas with the same frequency should be a minimum of 1 wave length apart but further is better. See recommended distances in Table "A"



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Table A

Frequency Range (Typ. Frequencies)	Distance from another Antenna or Obstruction, Metal Post, Beam etc.
400-450MHz (418MHz to 433MHz)	Minimum 28 inches or (71 CM)
800-950 MHz (868MHz and 914MHz)	Minimum 14 inches or (35.5 CM)
2.0GHz-3.0GHz (2.4GHz)	Minimum 5 inches or (12.7 CM)
5.0-5.5GHz (5GHz)	Minimum 3 inches or (7.6 CM)
5.50-6.0GHz (6GHz)	Minimum 2 inches or (5.2 CM)

### Notes:

- 1) Rain, snow and ice can reduce transmission distances. Ice buildup on an antenna can drastically reduce transmission distances.
- 2) On higher frequencies (over 950MHz) it is important to make sure that your transmitting and receiving devices are in a basic line of site. Trees, hills and buildings between the radio devices can affect signal and data quality.
- 3) Antenna range can also be affected by **mounting height and wattage of the radio and the sensitivity of the receiver**. Rule of thumb for a flat clear range (Line of site no obstructions and 900MHz +) for every foot above the ground you may pick up approximately an additional 1000 to 1500 feet in distance.
- 4) **Important:** The antenna is not a handle, On portable radio equipment you should pick up the equipment by the body or if supplied the handle/grip. Using the antenna as a handle could cause permanent damage to the antenna and the radio device.