

3M Building and Commercial Services Division
3M™ Wireless Communication System Model XT-1
Omni-Directional Digital Range Extender

Installation Instructions



3M™ Wireless Communications System Model XT-1 Omni-Directional Digital Range Extender
Installation Instructions
© 3M 2009. All rights reserved.
3M is a trademark of 3M.

Contents

FCC Notice.....	4
Purpose.....	5
Radiation pattern.....	5
When to use Omni-Directional Antenna and when to use the patch antenna.....	7
How to determine the proper location of the antenna.....	9
Equipment needed.....	9
Bill of materials.....	9
Installation with 3M™ Wireless Communication System Model XT-1 Wireless Base Station.....	10
3M Service phone numbers.....	11

FCC Notice

NOTE: This device has been tested and found to meet the requirements of FCC, Industry Canada and European CE regulations when used in conjunction with the 3M™ Wireless Communications System Model XT-1 only.



Dispose of all system components in accordance with federal, state & local requirements. If preferred, return these components to 3M Service Center for disposal.

The use of all radio equipment is subject to radio regulations in each country. It is the responsibility of the purchaser/installer/operator to insure that only approved equipment/systems are deployed. For the ISM band equipment manufactured, sold/or used in the USA, FCC Title 47, Part 15 governs the sale, lease, use and manufacture of equipment (wireless LAN cards, wireless Access points, amplifiers, etc.) and prohibits the same unless such equipment is used in the FCC-certified system configuration with which such equipment is authorized.

According to FCC rules, this equipment requires professional installation. This equipment must be purchased only from 3M authorized dealers. Installation must be controlled and done by 3M certified professionals. The installation of this equipment requires special training to ensure that placement and set up is done appropriately to meet the needs of individual customers and locations. Installation of this equipment also may require a trained electrician to ensure system components are installed in compliance with applicable building codes. This equipment is intended for use in industrial or commercial environments only, and is not intended for use by the general public.

PURPOSE

To enable extended coverage area for “outside order taking” or "fill in" areas of poor radio coverage due to blockage of the RF signal by large metal objects. Extends working distance from the digital system base station.

NOTE: DO NOT replace parts from this kit or alter parts in any way as you may void the regulatory compliance of the system (CE, FCC, etc.).

Radiation Pattern

The 3M™ Wireless Communication System Model XT-1 Omni-Directional Digital Range Extender has an Omni-Directional antenna, which means it radiates the radio signal in all directions in the horizontal plane, however its vertical plane radio coverage is very limited. The attached diagram shows its Radiation Pattern.

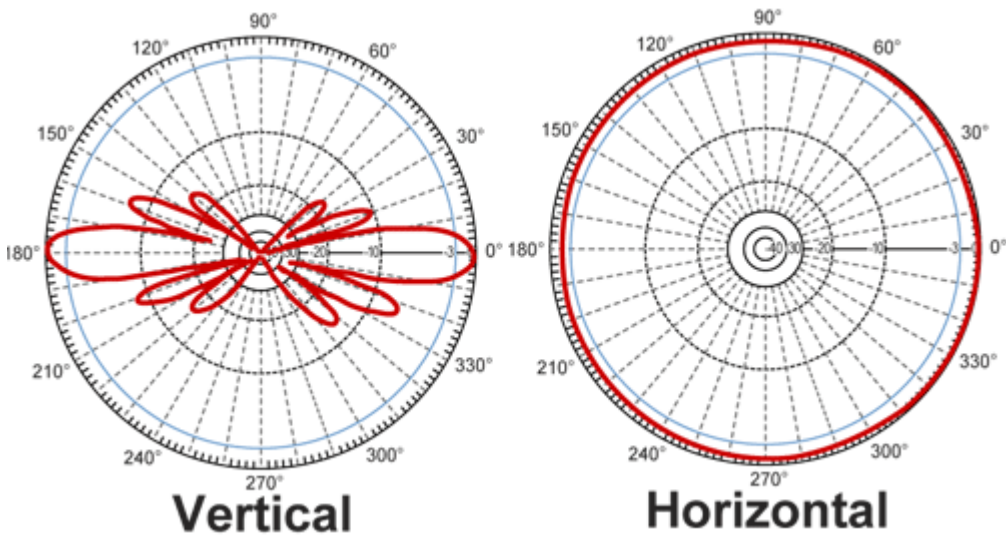


Figure 1. Antenna Radiation Pattern

Due to the antenna’s narrow radio transmission field in the vertical axis, the bottom of the antenna needs to be installed at around 5 feet (1.5 m). As you can see in Figure 2, the antenna vertical width, or coverage area increases with distance.

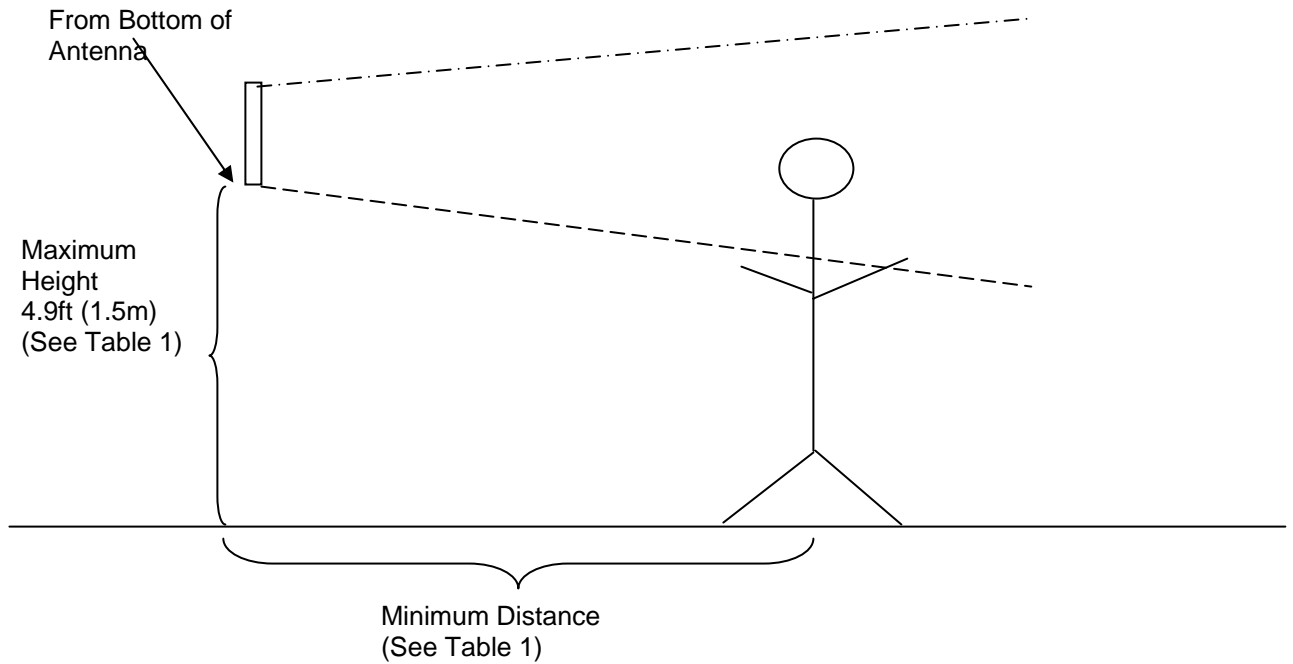


Figure 2. Antenna vertical width coverage

In order to take advantage of the antenna width increase, determine the minimum distance that a user will be from the antenna, then reference Table 1, and install the antenna as high as reasonable, but below the Maximum Antenna Height. The minimum antenna height is determined assuming a minimum person height of 4.8 feet or 4 feet 10 inches (1.47 meters).

Max Antenna Height	Min Distance from Antenna
4.9 ft (1.5 m)	3 ft (0.9 m)
5.3 ft (1.6 m)	6 ft (1.8 m)
5.7 ft (1.7 m)	9 ft (2.7 m)
6.1 ft (1.9 m)	12 ft (3.7 m)
6.5 ft (2.0 m)	15 ft (4.6 m)
6.9 ft (2.1 m)	18 ft (5.5 m)
7.3 ft (2.2 m)	21 ft (6.4 m)
7.7 ft (2.3 m)	24 ft (7.3 m)
8.1 ft (2.5 m)	27 ft (8.2 m)
8.4 ft (2.6 m)	30 ft (9.1 m)
8.8 ft (2.7 m)	33 ft (10.1 m)
9.2 ft (2.8 m)	36 ft (11.0 m)
9.6 ft (2.9 m)	39 ft (11.9 m)
10.0 ft (3.0 m)	42 ft (12.8 m)
10.4 ft (3.2 m)	45 ft (13.7 m)
10.8 ft (3.3 m)	48 ft (14.6 m)

Table 1. Height Distance requirements.

Example: Assuming the minimum distance a user would be from the antenna is 9 feet (2.7 meters) install the antenna at a maximum height of 5.7 feet or 5 feet 8 inches (1.7 meters).

When to use the Omni-Directional Antenna and when to use the patch antenna

3M recommends you use an Omni-Directional antenna if you need coverage in two adjacent areas, such as two sides of a building; 3M recommends the patch antenna if you require radio coverage in one area, such as one side of a building. An example of when 3M recommends the use of an Omni-Directional antenna is listed in Figure 3.

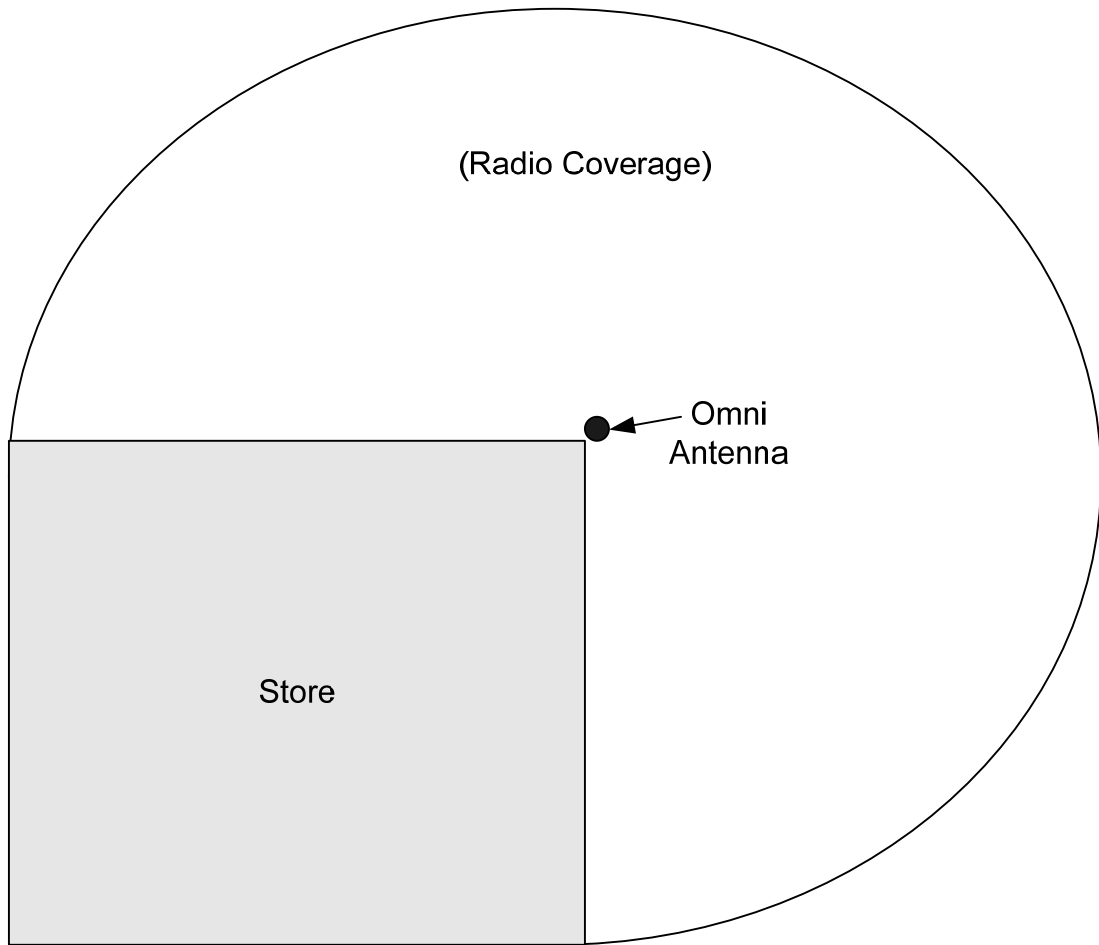


Figure 3. Recommended Omni-Directional antenna installation.

If you only want to fill a narrow area such as a side of a building 3M recommends you use a patch antenna. An example of when a patch antenna is recommended can be visualized in Figure 4.

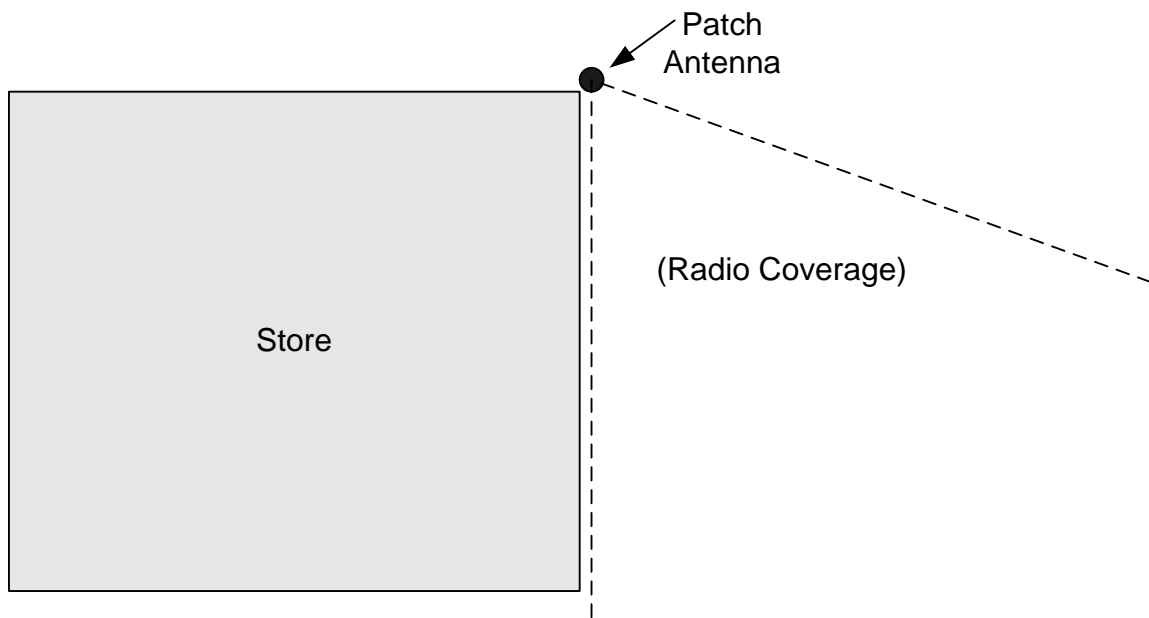


Figure 4. Recommended Patch Antenna installation.

How to determine the proper location of the antenna

You can visualize the horizontal radio coverage area of the 3M™ Omni Directional Digital Range Extender Model XT-1 as a circle with its center as the antenna. Locate the Antenna in the middle of the area where increased coverage is needed. An example on where to locate the antenna can be observed in Figure 3.

EQUIPMENT NEEDED

- Wire (18 Gauge recommended) to connect lightning arrestor to Earth Ground
- Mounting Hardware for antenna

BILL OF MATERIALS

- 78-8117-4334-9 – Pigtail - SMA Male to N Female Adaptor Cable (90deg.)
- 78-8117-4335-6 – Lightning Arrestor (N Male to N Female)
- 78-8117-4341-4 – 2.4 GHz 8 dBi Omni-directional Antenna (Female)
- 78-8117-4337-2 – Coax Cable (100 ft) w/ N Male Connectors

INSTALLATION WITH 3M™ WIRELESS COMMUNICATION SYSTEM MODEL XT-1 WIRELESS BASE STATION

1. Remove the Base Station cover
2. Disconnect power to the Base Station
3. Remove either the left or right base station antenna
4. Connect the pigtail to base station antenna connector, in spot where antenna was removed

NOTE: DO NOT use a tool to tighten the pigtail to the Base Station, leave the connection finger tight.

5. Connect coaxial cable to pigtail.
6. Locate the area in which enhanced radio coverage is desired

NOTE: Obstruction-free line of sight to headsets is required with no large solid metal objects between Remote Antenna and headset.

7. Pull the Coax Cable to desired antenna location.
8. Connect the lightning arrestor to Coax
9. Connect the lightning arrestor to antenna
10. Reconnect power to the Base Station
11. Attach the Base Station Cover.
12. Test the system range.
 - Have someone hold the antenna in the selected location
 - Verify antenna operation in required area
 - If necessary reposition or move the antenna in order to get desired coverage
13. Mount Antenna in location in order to get desired coverage
14. Mount the lightning arrestor
15. Run 18 Gauge wire from lightning arrestor to an Earth Ground
16. Test the system range.

3M Service phone numbers

In the United States	In Canada	In other countries
1-800-328-0033	651-575-5753	651-575-5753

Before you call...

Model Number:

Serial Number:



Building and Commercial Services Division
St. Paul, MN 55144-1000
1-800-698-4595
www.3M.com/foodservices