Outdoor Panel Antenna for WiMAX 1.8, 2.5, and 3.8 GHz

Overview

The Outdoor Panel Antenna for WiMAX is designed to cover frequencies from 1.8 to 3.x GHz and support the Cisco CGR 1240 and the 1120 routers. This section provides the antenna specifications and mounting instructions.

- WiMAX 1.8 GHz is designed to cover frequencies from 1.8 to 1.83GHz (ANT-1.8-PNL-OUT-N)
- WiMAX 2.5 GHz is designed to cover frequencies from 2.3 to 2.7 GHz (ANT-2.X-PNL-OUT-N)
- WiMAX 3.x GHz is designed to cover frequencies from 3.3 to 3.8 GHz (ANT-3.X-PNL-OUT-N)

Figure 1: Flat Panel WiMAX Antenna

WiMAX 1.8 GHz Technical Specifications

The WiMAX 1.8 GHz antenna features the following:

- Low profile
- Wall mount, pipe mount
- Indoor and outdoors
- Panel mounted type N female connector
- Adjustable mounting brackets for outdoor installations

This section lists the technical information for the Flat Panel Outdoor WiMAX Antenna.

RF Specifications

Specification	Description
Frequency	1.8 to 1.83 GHz
VSWR	< 1.5
Nominal gain	16 +/- 1 dBi
3 dB horizontal beamwidth	22'
3 dB vertical beamwidth	22'
F/B ratio total power	> 20 dB
Polarization	Dual linear (vertical and horizontal) or slant +/- 45 degrees
Nominal impedance	50 ohms
Radiation pattern	Directional

Mechanical Specifications

Specification	Description
Type	Directional panel
Polarization	Dual linear
Mount style	Wall or pipe mount (adjustable mount included)
Environment	Outdoor
Termination	N female (x2)
Antenna size	14.5 x 14.5 x 1.75 in. (36.8 x 36.8 x 4.4 cm)
Weight	3.5 lbs (1.6 kg)
Temperature range (operating)	-40 to 185-degrees F (-40 to 85-degrees C)
Maximum input power	20 Watts
Radome material	UL94-V0 ASA radome
Material substance compliance	ROHS compliant

WiMAX 2.5 GHz Technical Specifications

The WiMAX 2.5 antenna Panel Outdoor 3G directional panel antenna features the following:

- Low profile
- Wall mount, pipe mount
- Indoor and outdoors
- 2 x type N female connector

This section lists the technical information for the Flat Panel Outdoor WiMAX Antenna.

Specification	Description
Type	Directional panel
Frequency	2.3 to 2.7 GHz
Nominal gain	16 dBi, (2.3 to 2.4 GHz) 18 dBi (2.4 to 2.7 GHz)
Polarization	Dual linear (vertical and horizontal) or slant +/- 45 degrees
Maximum input power	25 Watts
Antenna	14.5 x 14.5 x 1.75 in. (36.8 x 36.8 x 4.4 cm)
Weight	3.5 lbs (1.6 kg)

Specification	Description
Connector	Dual type N female
Mount style	Wall or pipe mount
Environment	Outdoor
Temperature range (operating)	-40 to 185-degrees F (-40 to 85-degrees C)
Radiation pattern	Directional

Radiation Patterns

The Flat Panel Outdoor WiMAX Antenna has Azimuth radiation patterns:

Figure 2: Flat Panel WiMAX Antenna Radiation Patterns—Low Band
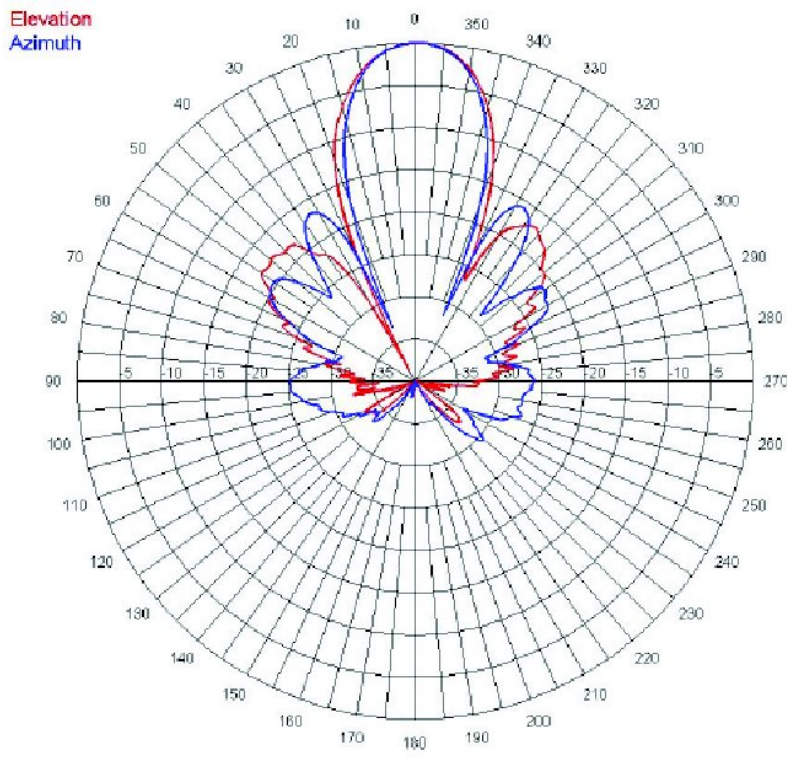
WiMAX 3.8 GHz Technical Specifications

The WiMAX 3.8 GHz antenna features the following:

- Low profile
- Wall mount, pipe mount
- Indoor and outdoors

• 2 x type N female connector

This section lists the technical information for the Flat Panel Outdoor WiMAX Antenna.

Specification	Description
Type	Directional panel
Frequency	3.3 to 3.8 GHz
Nominal gain	18 dBi
Polarization	Dual linear (vertical and horizontal) or slant +/- 45 degrees
Maximum input power	25 Watts
Antenna size	14.5 x 14.5 x 1.75 in. (36.8 x 36.8 x 4.4 cm)
Weight	3.5 lbs (1.6 kg)
Connector	Dual type N female
Mount Style	Wall or pipe mount
Environment	Outdoor
Temperature range (operating)	-40 to 185-degrees F (-40 to 85-degrees C)
Radiation pattern	Directional

General Safety Precautions

Warning   This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. **Statement 1071**

Warning   Do not work on the system or connect or disconnect cables during periods of lightning activity. **Statement 1001**

Warning   Do not locate the outdoor antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna, take extreme care not to come into contact with such circuits, as they may cause serious injury or death. For proper installation and grounding of the antenna, please refer to national and local codes (for example, U.S.:NFPA 70, National Electrical Code, Article 810, Canada:Canadian Electrical Code, Section 54). **Statement 1052**

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Warning In order to comply with FCC radio frequency (RF) exposure limits, antennas should be located at a minimum of 7.9 inches (20 cm) or more from the body of all persons. **Statement 332**

Each year hundreds of people are killed or injured when attempting to install an antenna. In many of these cases, the victim was aware of the danger of electrocution, but did not take adequate steps to avoid the hazard.

⚠

Warning For your safety, and to help you achieve a good installation, please read and follow these safety precautions. **They may save your life!**

For your safety, read and follow these safety precautions.

- If you are installing an antenna for the first time, for your own safety as well as others, seek professional assistance. Your Cisco sales representative can explain which mounting method to use for the size and type antenna you are about to install.
- Before you install an antenna, contact your Cisco account representative to explain which mounting method to use for the size and type of antenna that you are about to install.
- Find someone to help you—installing an antenna is often a two-person job.
- Select your installation site with safety, as well as performance, in mind. Remember that electric power lines and phone lines look alike. For your safety, assume that any overhead line can kill you.
- Contact your electric power company. Tell them your plans and ask them to come look at your proposed installation.
- Plan your installation carefully and completely before you begin. Each person involved in an installation should be assigned to a specific task, and should know what to do and when to do it. One person should be in charge of the operation to issue instructions and watch for signs of trouble.
- When installing your antenna, follow these guidelines:

  - Do not use a metal ladder.
  - Do not work on a wet or windy day.
  - Do dress properly—wear shoes with rubber soles and heels, rubber gloves, and a long-sleeved shirt or jacket.

- If the assembly starts to drop, move away from it and let it fall. Because the antenna, mast, cable, and metal guy wires are all excellent conductors of electrical current, even the slightest touch of any of these parts to a power line completes an electrical path through the antenna and the installer.
- If any part of the antenna system should come in contact with a power line, do not touch it or try to remove it yourself. Call your local power company to have it removed safely.
- If an accident should occur with the power lines, call for qualified emergency help immediately.

Antenna Installation

The antenna installation includes the following procedures:

Tools and Equipment Required

In addition to the parts included in the antenna kit, you must provide the following tool to install the antenna on the router:

- A flathead screwdriver
- 3/4 in. open-end wrench
- LMR-400-DB RF coaxial cable with N (m) to N (m) connectors
- Coax seal

Note   This list does not include the tools and equipment required to assemble and erect the tower, mast, or other structure you intend to mount your antenna on.

Installing the Antenna

Follow these instructions to install the antenna:

Step 1   Choose the mounting configuration that you prefer.

Note   Your connector type, location and quantity might differ from what is shown. In the following figure, item 1 shows the drain hole locations.
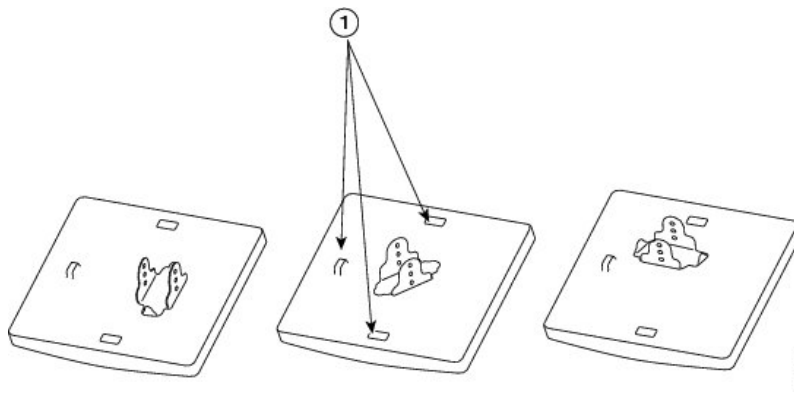
Step 2   Attach the antenna mount bracket to the back of the antenna by using two sets of flat washers, lock washers, and hex nuts. Tighten the nut to a torque rating of 55 in-lbf (6.2 Nm).
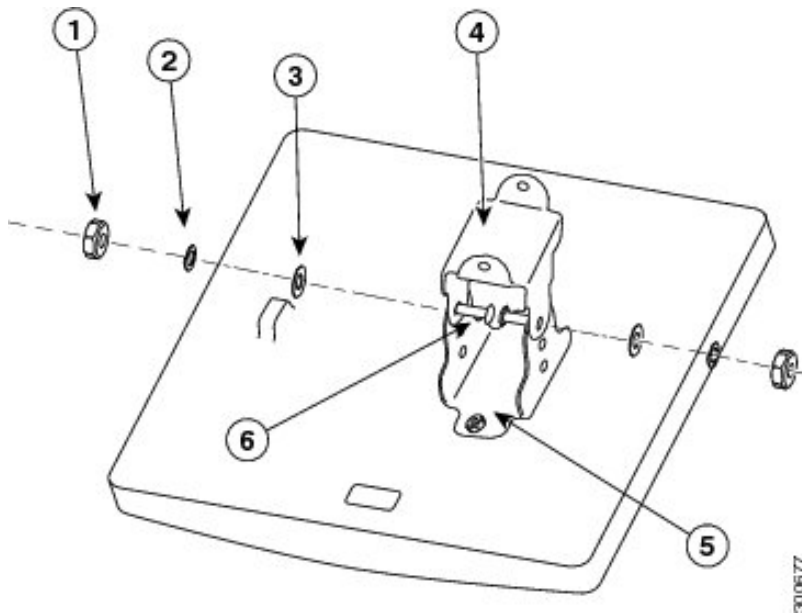
Figure 3: Antenna Detail
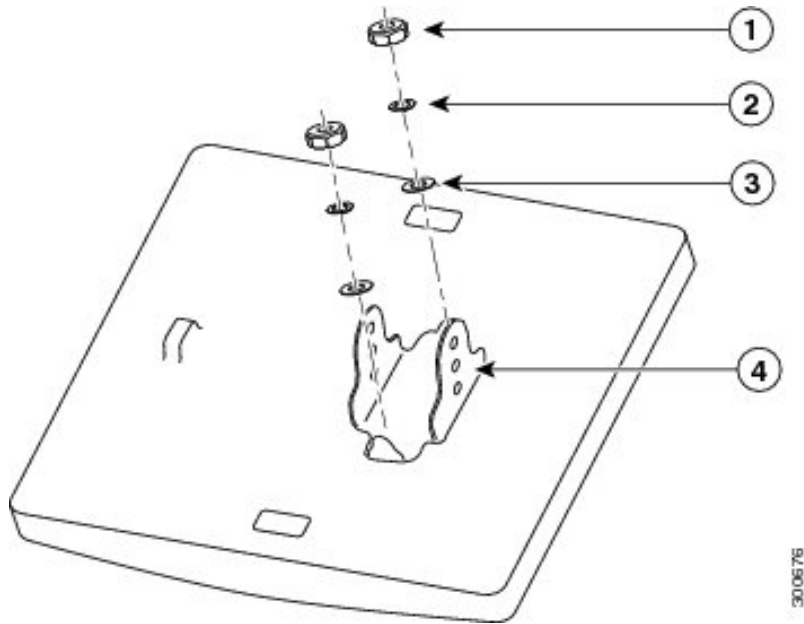
| 1	1/4"-20 hex nut
2	1/4"20 spring lock washer
3	1/4"-20 flat washer
4	Antenna mount bracket

Step 3 Attach the elevation adjustable bracket to the mount bracket using two sets of carriage bolts, washers, lock washers, and hex nuts. Position the bolts so the carriage bolt square holes are positioned on the inside. Do not tighten fully. Allow the bracket to move freely.

1	1/4"-20 hex nut
2	1/4"-20 spring lock washer
3	1/4"-20 flat washer
4	Elevation adjustable bracket
5	Antenna-mount bracket
6	1/4"-20x3/4 carriage bolt

Step 4 Position the azimuth adjustable (pipe) bracket to the pipe with the flanges away from the pipe. Secure each bracket to the pipe first by routing the band clamps around the pipe, then through the two holes. Tighten to a maximum torque rating.
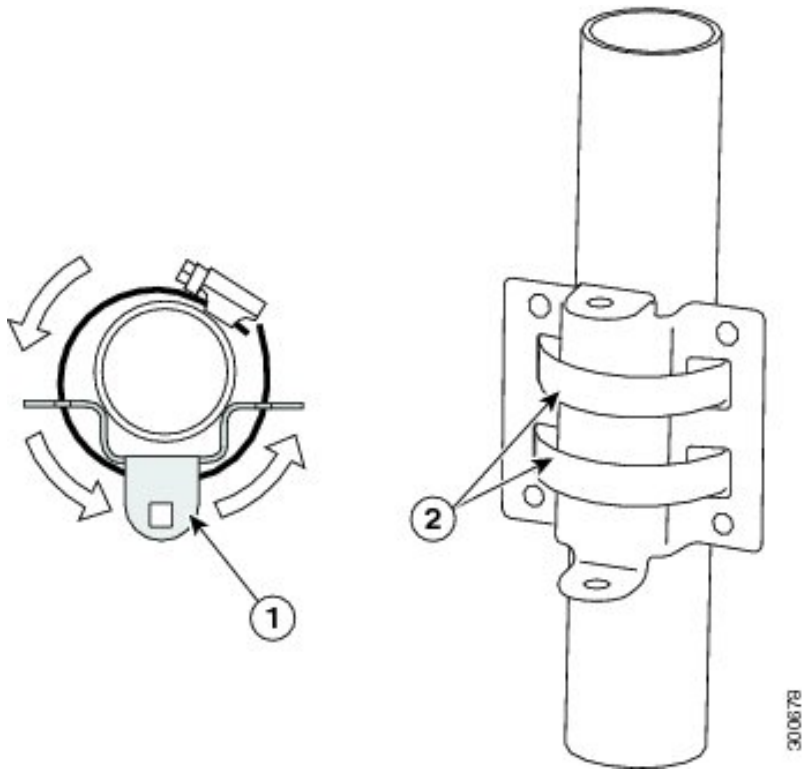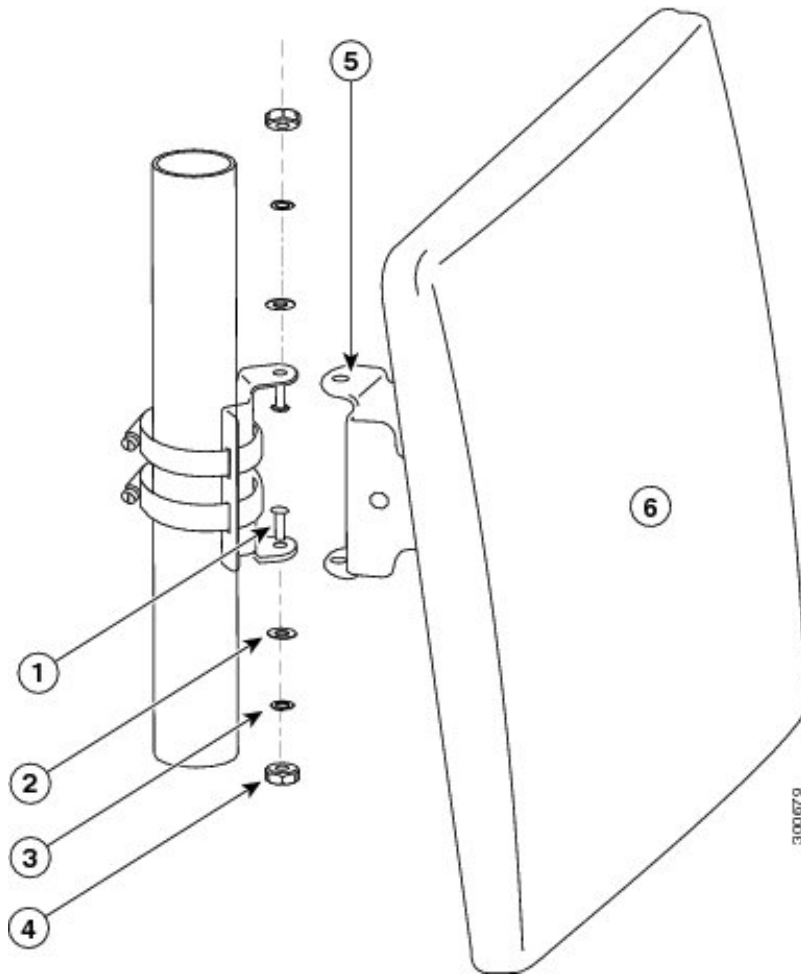
1	Azimuth adjustable bracket
2	Pipe clamps

Step 5   Attach the antenna assembly to the installed azimuth bracket. Position each of the two flanges on elevation adjustable bracket (on the antenna) over the flanges on the azimuth (pipe) bracket.

Figure 4: Attach Antenna

1	1/4"-20x3/4 carriage bolt
2	1/4"-20 spring lock washer
3	1/4"-20 flat washer
4	Elevation adjustable bracket
5	Elevation adjustable bracket
6	1/4"-20 hex nut

Step 6   Adjust to the desired azimuth and elevation angles. Tighten all nuts and bolts to a torque rating of 55 in-lbf.

Step 7   Attach the lightning arrestor to the router.

Step 8   Attach the two RF cables to the antenna by connecting the ends of the LMR-400 (male) cables to the two receptacles on the rear of the antenna panel.

Figure 5: Attach Cables
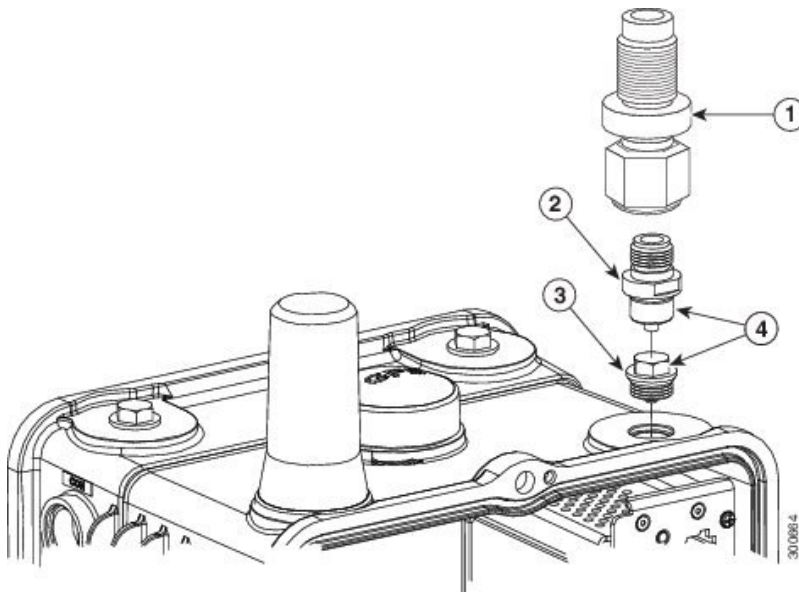
1	Lightning arrestor
2	N-connector: torque to 6 to 7 ft-lbs
3	Plug: torque to 6 to 7 ft-lbs
4	Ports must have either an antenna, connector, or plug installed.

Step 9   Seal the cable connections on the router and the back of the antenna by using weatherproof sealing tape (coax seal) at the connector junction. Start wrapping at the top of the antenna connector, wrap downward 3 times and end about 2 inches downward from the center of the connecter junction. Then wrap upwards another 3 times to reach the top of the antenna connector.

Step 10   Attach the router-end of the cable to your router.

Connecting the Antenna to the Router

To attach the router-end of the cable to your device, please refer to the appropriate Hardware Installation Procedures for the model of hardware you are installing.

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