Cisco Integrated 4G Low-profile Outdoor Saucer Antenna (ANT-4G-SR-OUT-TNC)

This document describes the Cisco Integrated 4G Low-profile Outdoor Saucer Antenna that is supported on the Cisco CGR 1000 Series routers. It supports frequencies of 698 to 960 MHz, 1575 MHz, and 1710 to 2700 MHz for the GSM, DCS, UMTS, and LTE/WiMAX frequency bands. In addition, this document provides the antenna specifications and mounting instructions of the antenna.

⚠ **Caution**   Read the information in Safety Precautions, page 1-15 before installing or replacing antennas.

This chapter covers the following topics:

- Technical Specifications, page 10-1
- Installation Requirements, page 10-5
- Safety Warnings, page 10-6
- Antenna Installation, page 10-7
- Obtaining Documentation and Submitting a Service Request, page 10-8

Technical Specifications

The Integrated 4G Low-profile Outdoor Saucer Antenna features the following:

- Applicable for both 3G and 4G solutions
- Domestic LTE 700 band and Global LTE 2600 band
- Domestic Cellular and Global GSM
- Weatherproof UV stable radome
- Performance optimized
- Excellent flame rating

Figure 10-1   Low-Profile Saucer Antenna

RF Specifications

| Specification	Description
Frequency range	• 698 to 960 MHz • 1710 to 2700 MHz
Peak gain w/1-ft cable	• 1.5 dBi (698 to 960 MHz) • 3.7 dBi (1710 to 2700 MHz)
Peak gain w/15 -ft cable	• 0.8 dBi (698 to 960 MHz) • 0.2 dBi (1710 to 2700 MHz)
Average efficiency w/1-ft cable	• 90 percent (698 to 960 MHz) • 82 percent (1710 to 2700 MHz)
Average efficiency w/15-ft cable	• 60 percent (698 to 960 MHz) • 40 percent (1710 to 2700 MHz)
Polarization	Linear, vertical
Nominal imedance	50 ohms
VSWR (maximum)	• 2.0:1 (698 to 960 MHz) • 2.0:1 (1710 to 2700 MHz)
H-plane (3 dB beamwidth)	Omnidirectional

Mechanical Specifications

Specification	Description
H-plane 3 dB beamwidth	Omnidirectional
Polarization	Linear, vertical
Nominal impedance	50 ohm
Power	3 watts
Cable	15 ft LMR 195
RF connector	Type N (f), TNC (m) available
Mount Style	Ceiling mount
Radome	PC/ABS, UV stable, black
Material substance compliance	RoHS compliant
Operational temperature	-22 to 158 degrees F (-30 to 70 degrees C)
Storage temperature	-40 to 185 degrees F (-40 to 85 degrees C)
Environment	Indoor
Dimensions (ht x OD)	3.4 inches x 7.9 inches (87 mm x 200 mm)

Radiation Patterns

The following graphics show the radiation patterns of the saucer antenna.

Figure 10-2   Low-profile Saucer Antenna Radiation Patterns
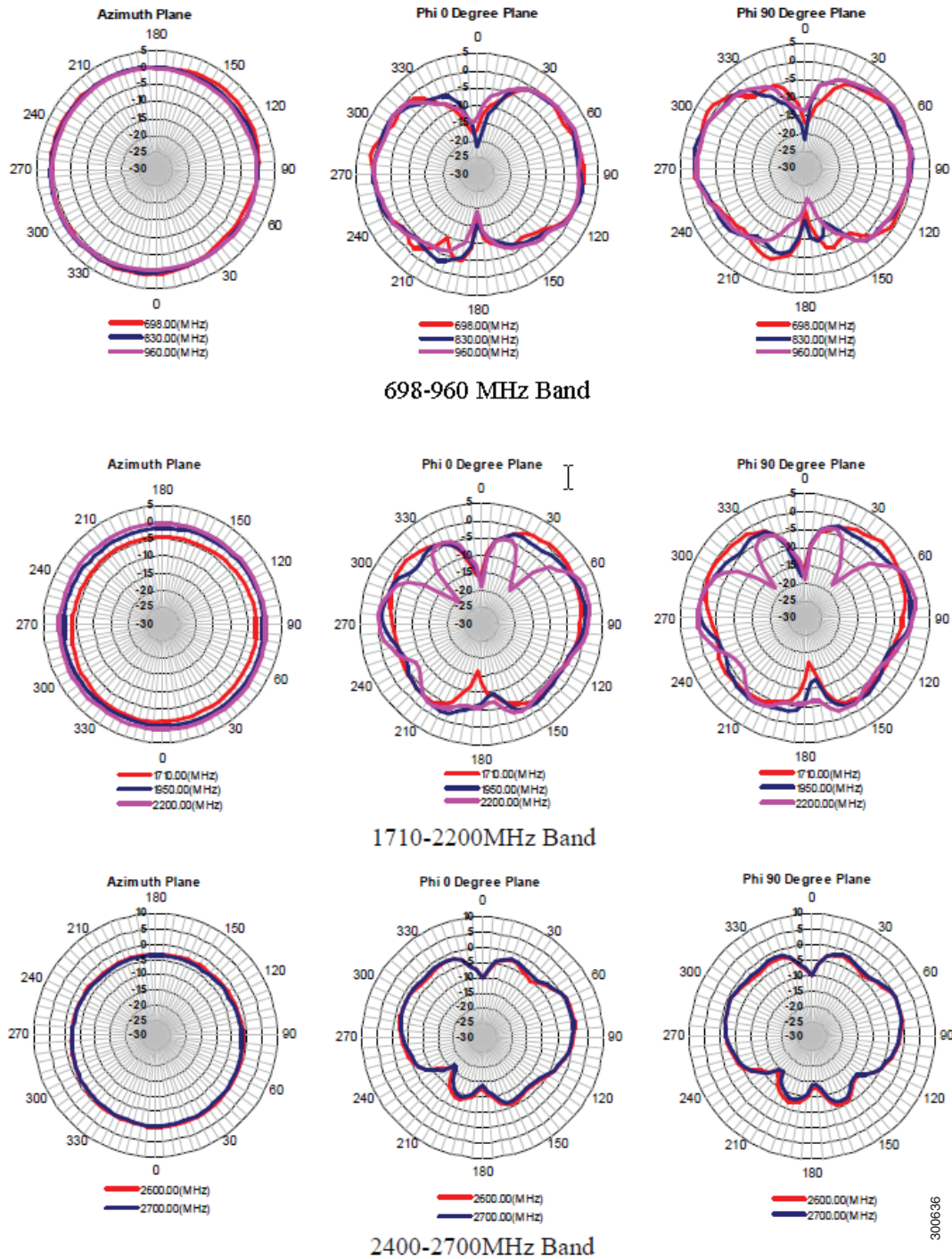
Installation Requirements

Antenna Connections

Before you install or replace antennas, make sure the router is:

- Powered off
- Disconnected from all power sources
- Disconnected from the Field Area Network (FAN)
- Removed from a pole-top installation

Optimum Performance

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

- Keep the antenna away from metal obstructions such as heating and air-conditioning ducts, large ceiling trusses, building superstructures, and major power cabling runs. If necessary, use a rigid conduit to lower the antenna away from these obstructions.

- The density of the materials used in surrounding buildings' construction impacts antenna signal strength. Consider the following

    - Signals penetrate paper and vinyl walls with little change to signal strength.

    - Signals penetrate only one or two solid and pre-cast concrete walls without degrading signal strength.

    - Signals penetrate three or four concrete and wood block walls without degrading signal strength.

    - Signals penetrate five or six walls constructed of drywall or wood without degrading signal strength.

    - Signals are likely to reflect off a thick metal wall and not penetrate it at all.

    - Signals are likely to reflect off a chain link fence or a wire mesh with spaces of 1 to 1-1/2 in. (2.5 to 3.8 cm). The fence acts as a harmonic reflector that blocks the signal.

- Microwave ovens and 2-GHz cordless phones can cause signal interference because they operate in the same frequency range as the device to which your antenna is connected.

- For instructions on installing or replacing a Cisco Connected Grid module, see the corresponding installation and configuration guide for each module.

- For detailed instructions on opening the door, see the installation guide of your router. Before installing the antenna according to the Installing the Antenna, you must complete these steps:

    - Open the router chassis door.

    - Remove any plug or connector that is installed in the antenna port.

    - Verify the correct antenna port for installation, based on the antenna model you are installing.

- See the installation document for your router regarding the correct antenna port location. Antennas must be installed in the correct antenna port for ease of installation and optimal performance.

Note   Ensure that you are able to access the antenna port from inside the router. If an installed module prevents you from reaching the antenna port, you might have to remove the module before installing the antenna, then reinstall the module. See the corresponding module installation and configuration guide for each module.

Safety Warnings

Warning   **Avoid using or servicing any equipment that has outdoor connections during an electrical storm. There may be a risk of electric shock from lightning.** Statement 1088

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

Warning   **This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.** Statement 1024

Warning   **Only trained and qualified personnel should be allowed to install, replace, or service this equipment.** Statement 1030

Warning   **To report a gas leak, do not use a telephone in the vicinity of the leak.** Statement 1039

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. **SAVE THESE INSTRUCTIONS.**

⚠️ **Warning**   **This product is not intended to be directly connected to the Cable Distribution System. Additional regulatory compliance and legal requirements may apply for direct connection to the Cable Distribution System. This product may connect to the Cable Distribution System ONLY through a device that is approved for direct connection.** Statement 1078

Safety Precautions

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.

- 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.

Antenna Installation

The antenna installation includes the following procedures:

- Tools and Equipment Required, page 10-7
- Installing the Antenna, page 10-7

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:

- Phillips screwdriver
- Open-end wrench
- Drill
- Marker or pencil

Installing the Antenna

Follow these instructions to install the antenna:

Step 1   Determine the installation location on the wall of the utility cabinet.

Step 2   Create the center hole to accommodate the threaded center rod and the three mounting holes of the saucer antenna. Secure the antenna onto the ceiling with the 3 screws using a Phillips #2 screwdriver.

Step 3   From inside the utility cabinet space, secure the antenna.
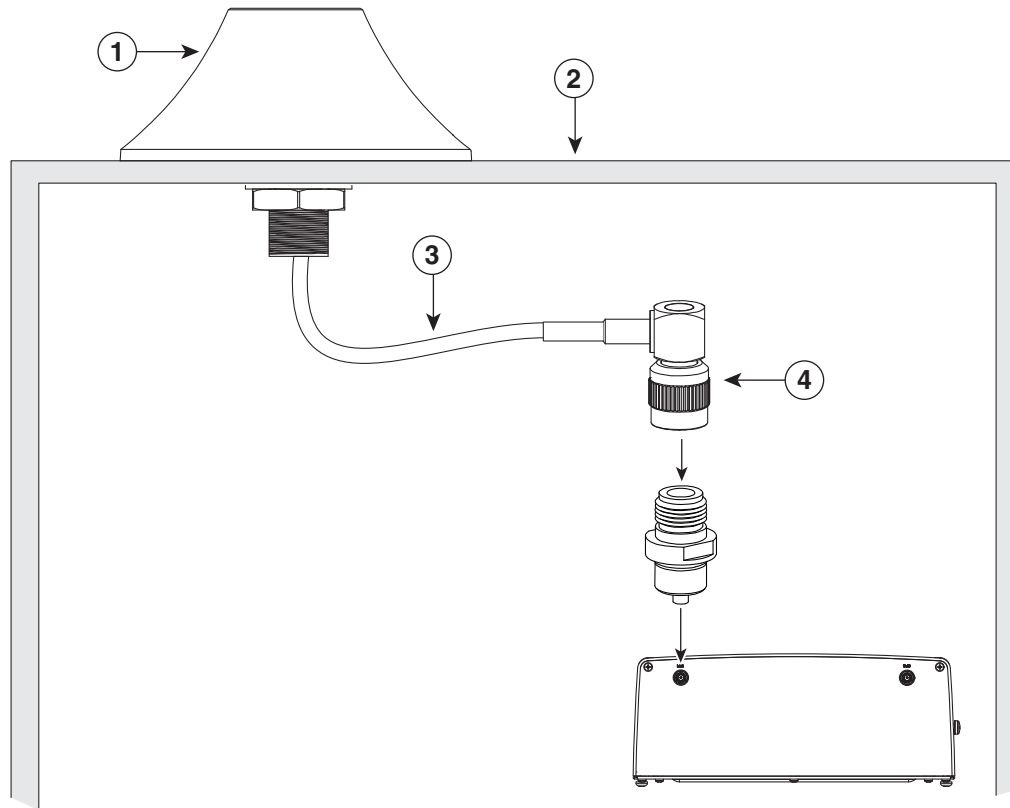
1	Saucer antenna	2	Wall of utility cabinet
3	LMR-100 cable	4	TNC (m) connector

Step 4   Connect the TNC (m) connector end of the antenna cable to the TNC(f)-to-QMA(m) connector adapter (ANT-ADPTR-Q-TNC).

Step 5   Attach the adapter to the QMA (f) connector of the CGR 1120 port. See Connecting the Antenna to the CGR 1120 in Chapter 1, "Cisco CGR 1000 and 2000 Series Connected Grid Antennas Overview".

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly What's New in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

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