



## Georgia Tech Upgrades Wi-Fi Service With TerraWave High-Density Antennas

### Executive Summary

#### Client:

Georgia Institute of Technology  
Atlanta, GA

#### Client Challenge:

To accommodate the explosion of wireless technology used on campus, the Georgia Institute of Technology needed to upgrade network service in several of its large auditoriums, lecture halls and classrooms.

#### Client Goals:

- Optimize wireless service to provide reliable network connectivity to support multiple mobile devices used by students today and in the future
- Reduce the RF footprint and limit the number of users per access point
- Minimize channel-to-channel interference

#### Product Solutions:

- Cisco 3602E Access Point
- TerraWave High-Density 2.4/5 GHz Quad Patch Antenna

#### Product Benefits:

The High-Density 2.4/5 GHz Quad Patch Antenna has a narrower beam pattern and the same gain at 5GHz as the 2.4 GHz. The antenna allows you to focus RF and limit the number of users per access point which means more bandwidth per user and improved quality of service.

Georgia Institute of Technology is one of the nation's top research universities, with a long-standing mission to improve the human condition through advanced science and technology. The faculty and students are focused on solving some of the world's most pressing challenges: clean and sustainable energy, disease diagnosis and treatment, national defense and security, and many others. Georgia Tech's undergraduate, master's and doctoral degree programs range from technology-focused business and liberal arts to science and engineering, and are consistently recognized among the best in preparing students for success in a world where technology touches every aspect of our daily lives.

#### Challenge

Naturally wireless technology is an integral part of campus life at Georgia Tech. Students regularly bring multiple wireless devices to class such as smartphones, tablets, and laptops, and expect to be able to use them to do research on the Internet, access email and view shared online classroom materials.

Georgia Tech's auditoriums typically seat between 200 and 300 students. With such large concentrations of wireless users attempting to access the network at once, they were increasingly having issues with interference and connectivity with the existing wireless system in these areas. "The problem is everyone has to share an access point," says Bill Lawrence, RCDD, NTS, WD, Georgia Tech IT project manager. "The more clients using each access point the less bandwidth is available to each user and less bandwidth means poorer quality of service. It's like sharing a pecan pie. If you have to share it with 12 people it won't be as good as if you only have to share it with four."

#### Solution

The solution was to reduce the radio frequency (RF) footprint and limit the number of users per access point. "We were looking for a high-density antenna that was compatible with the Cisco 3602E access point and had a narrower beam. Georgia Tech's existing omni directional antennas have a widespread beam, similar to an incandescent light bulb. The high-density patch antenna focuses a beam that is more like a flashlight."

Lawrence initiated the high-density upgrade in two lecture halls. The first step was to estimate how many user devices they were trying to support in each location. Then, working with Cisco engineers and using existing floor plans, they determined how they would distribute the access points. Twelve access points were used for 300 users. After the initial installation was complete, engineers did a signal strength test and made minor adjustments to antenna direction to minimize beam bounce.

"We accomplished our goals to reduce the RF footprint, limit the number of users per access point and improve service," said Lawrence. "We did similar upgrades in classroom buildings throughout the campus."

*See next page for detailed product data*



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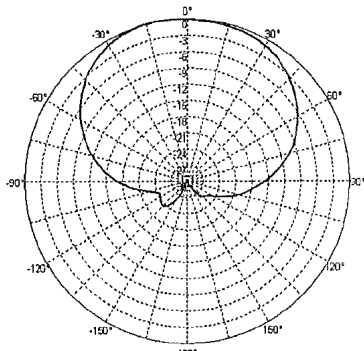
## Product Details

High-Density 2.4/5 GHz 6 dBi Quad Patch Antenna With RPTNC Plug Connector

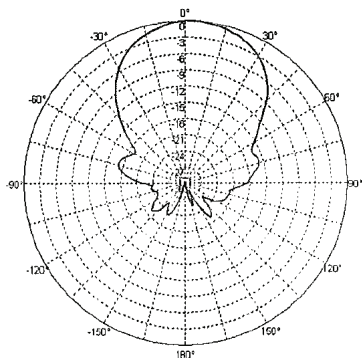
## Description

TerraWave's High-Density 2.4/5 GHz Quad Patch Antenna is designed to operate with many manufacturers' enterprise-class 802.11n MIMO access points (APs). The antenna comes with four RPTNC Plug connectors, 36" cables and an articulating mount. With dual-band leads, each cable supports both 2.4 and 5 GHz, making it an ideal antenna to support demanding indoor or outdoor applications in the next-generation IEEE 802.11n wireless communication system. The antenna radome is designed to withstand challenging environments where there is exposure to moisture and dust. The articulating mount allows for multiple mounting options on either a wall or a mast/pole.

## Specifications



2.4 GHz



5 GHz

MFG Part Number:	M6060060MP1D43602
TESSCO Order Info:	SKU: 349502 (www.tessco.com)
Weight:	2.65 lb/1.20 kg
Warranty:	2 Years
Unit of Measure:	1 Each
General Frequency:	2.4/5 GHz
Specific Frequency:	2.4-2.5/5.1-5.85 GHz
Compatible Access Points:	

	Cisco 2602E
	Cisco 3602E
Antenna Type:	MIMO Patch
Gain:	6 dBi
Horizontal Beamwidth:	80+-20
Vertical Beamwidth:	45+-20
Ports/Leads/Pigtails:	4, Dual Band
Connector:	RPTNC Plug (M, F)
Application:	Indoor/Outdoor
Mounting Style:	Wall and Mast/Pole, Articulating

For questions and to purchase products, contact a regional account executive at 210-375-8482, 800-851-4965 or sales@terrawave.com. Visit [www.terrawave.com](http://www.terrawave.com) for additional information.