NanoBeam™ **M**

High-Performance airMAX® Bridge

Models: NBE-M5-19, NBE-M5-16, NBE-M2-400, NBE-M5-400, NBE-M5-300

Uniform Beamwidth Improves Noise Immunity

More Efficient Footprint

Faster Processor Increases Performance

Easy Assembly and Installation

UBIQUITI
NETWORKS™

Overview

Starting with the first-generation NanoBridge®, Ubiquiti Networks™ pioneered the all-in-one design for an airMAX® product functioning as a CPE (Customer Premises Equipment). Now Ubiquiti Networks launches the latest generation of CPE, the NanoBeam™.

Improved Noise Immunity

The NanoBeam directs RF energy in a tighter beamwidth. With the focus in one direction, the NanoBeam blocks or spatially filters out noise, so noise immunity is improved. This feature is especially important in an area crowded with other RF signals of the same or similar frequency.

Integrated Design

The NanoBeam models are available in two form factors:

- **All-in-One Design** The Ubiquiti Research and Development team combined the radio and antenna to create a more efficient and compact CPE. The NanoBeam gets maximum gain out of the smallest footprint.
- **Dish Reflector Design** Ubiquiti's InnerFeed™ technology integrates the radio into the feedhorn of an antenna, so there is no need for a cable. This improves performance because it eliminates cable losses.

Providing increased performance from its faster processor and innovative mechanical design at a low cost, the NanoBeam is extremely versatile and cost-effective to deploy.

Utilize airMAX Technology

Unlike standard Wi-Fi protocol, Ubiquiti's Time Division Multiple Access (TDMA) airMAX protocol allows each client to send and receive data using pre-designated time slots scheduled by an intelligent AP controller.

This "time slot" method eliminates hidden node collisions and maximizes airtime efficiency. It provides significant performance improvements in latency, throughput, and scalability compared to all other outdoor systems in its class.

Intelligent QoS Priority is given to voice/video for seamless streaming.

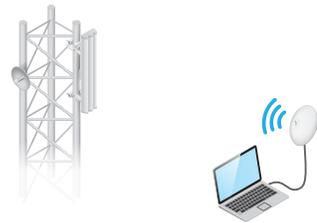**Scalability** High capacity and scalability.

Long Distance Capable of high-speed, carrier-class links.

Application Examples

PtMP Client Links
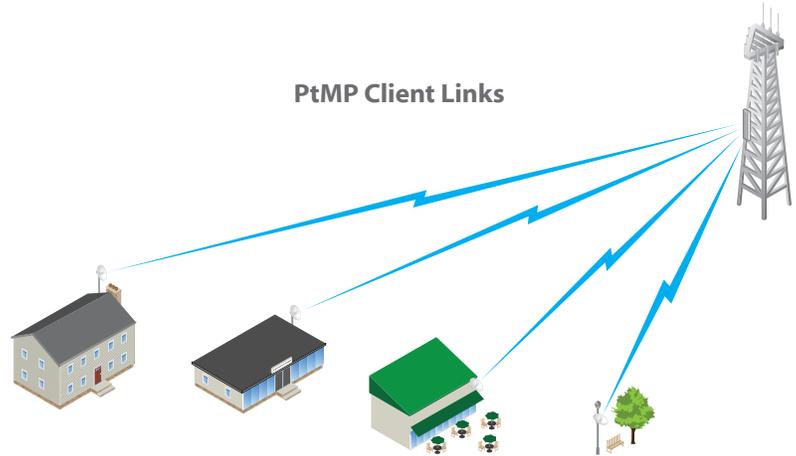
The NanoBeam used as a CPE device for each client in an airMAX PtMP network.

Wireless Client

PtP Link
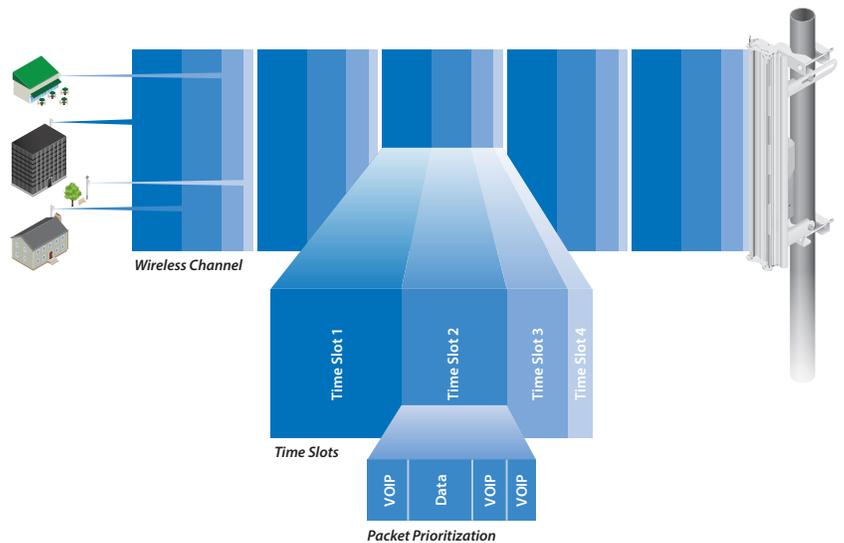

All-in-One Design *The NanoBeam as a powerful wireless client.*

Dish Reflector Design *Use a NanoBeam on each side of a PtP link.*

airMAX TDMA Technology

Wireless Channel

Time Slots

Time Slot 1 | Time Slot 2 | Time Slot 3 | Time Slot 4

VOIP | Data | VOIP | VOIP

Packet Prioritization

Up to 100 airMAX stations can be connected to an airMAX Sector; four airMAX stations are shown to illustrate the general concept.

Software

ẫïOS®

airOS® is an intuitive, versatile, highly developed Ubiquiti firmware technology. It is exceptionally intuitive and was designed to require no training to operate. Behind the user interface is a powerful firmware architecture, which enables high-performance, outdoor multi-point networking.

• Protocol Support
• Ubiquiti Channelization
• Spectral Width Adjustment
• ACK Auto-Timing
• AAP Technology
• Multi-Language Support
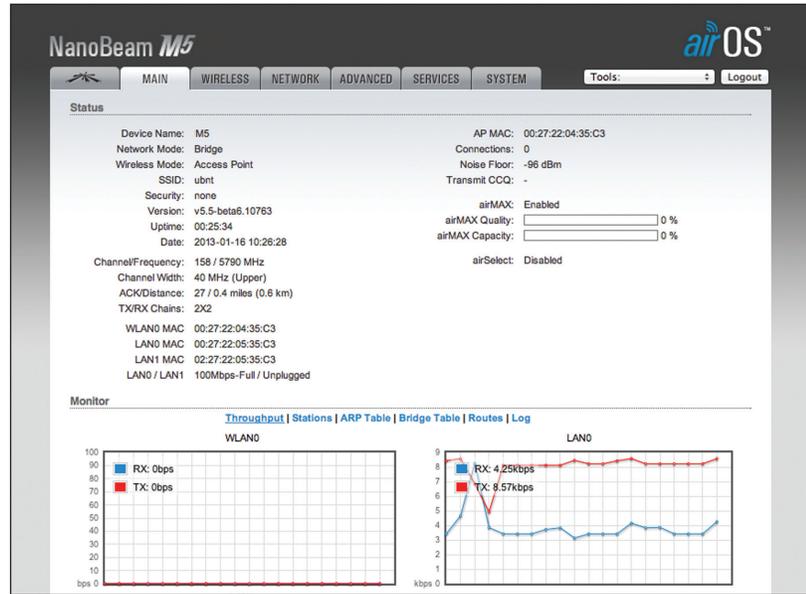
ẫïView®

Integrated on all Ubiquiti M products, airView® provides advanced spectrum analyzer functionality: waterfall, waveform, and real-time spectral views allow operators to identify noise signatures and plan their networks to minimize noise interference.

• **Waterfall** Aggregate energy over time for each frequency.
• **Waveform** Aggregate energy collected.
• **Real-time** Energy is shown in real time as a function of frequency.
• **Recording** Automate airView to record and report results.
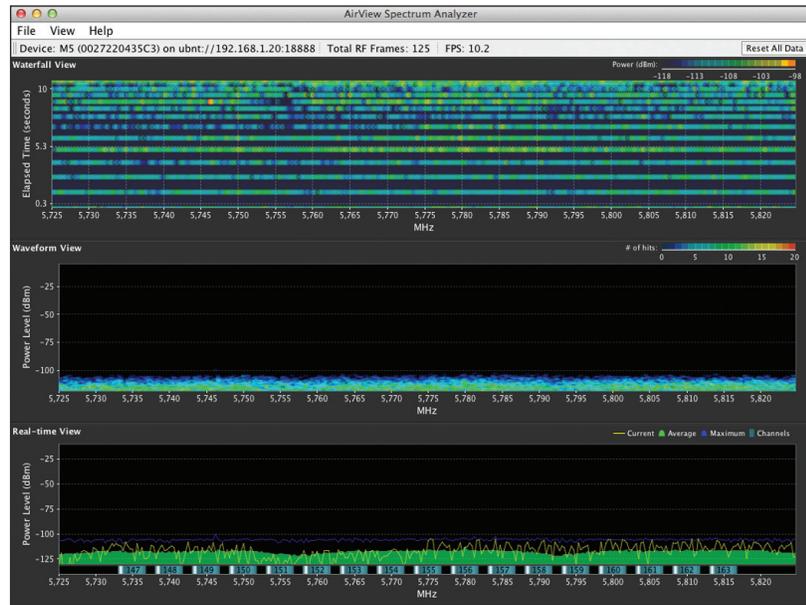
ẫïControl®

airControl® is a powerful and intuitive, web-based server network management application, which allows operators to centrally manage entire networks of Ubiquiti devices.

• Network Map
• Monitor Device Status
• Mass Firmware Upgrade
• Web UI Access
• Manage Groups of Devices
• Task Scheduling
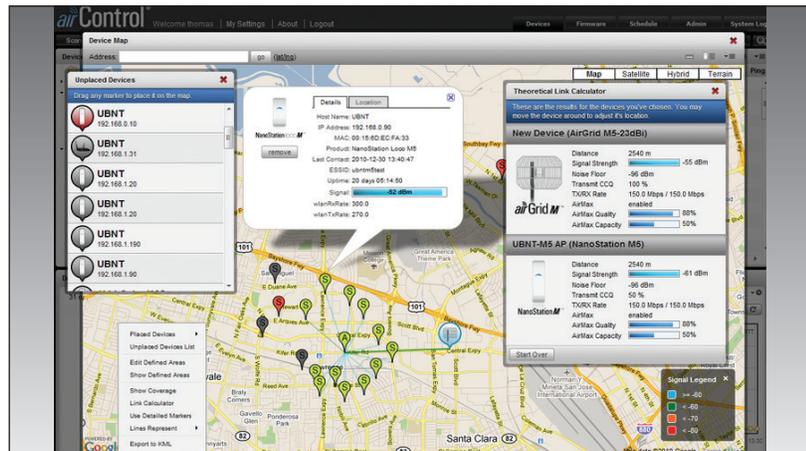
Hardware Overview – All-in-One Design

Innovative Mechanical Design

- **All-in-one design** The NanoBeam provides both the radio and antenna in the smallest possible footprint.
- **Quick and easy installation** No fasteners are required for pole-mounting, and a single wall fastener (not included) is required for wall-mounting.
- **Convenient alignment** The NanoBeam pivots on its ball joint for easy aiming.

Compact Form Factor

- **Efficient footprint** The radio and antenna are combined into a single body that takes up minimal space.
- **Versatile mounting** The NanoBeam can be mounted in almost any position needed for line of sight.
- **Aesthetics** The NanoBeam is small enough to blend discreetly into the background at a customer's location.

LEDs

Reset Button
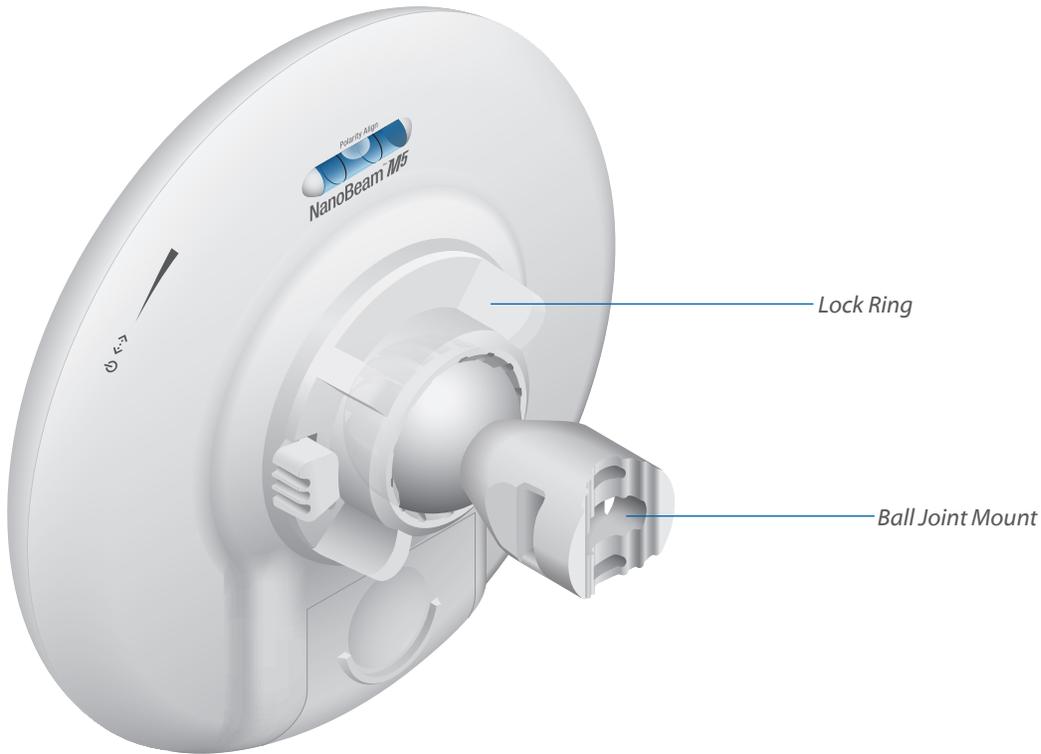
Ethernet Port

Port Cover
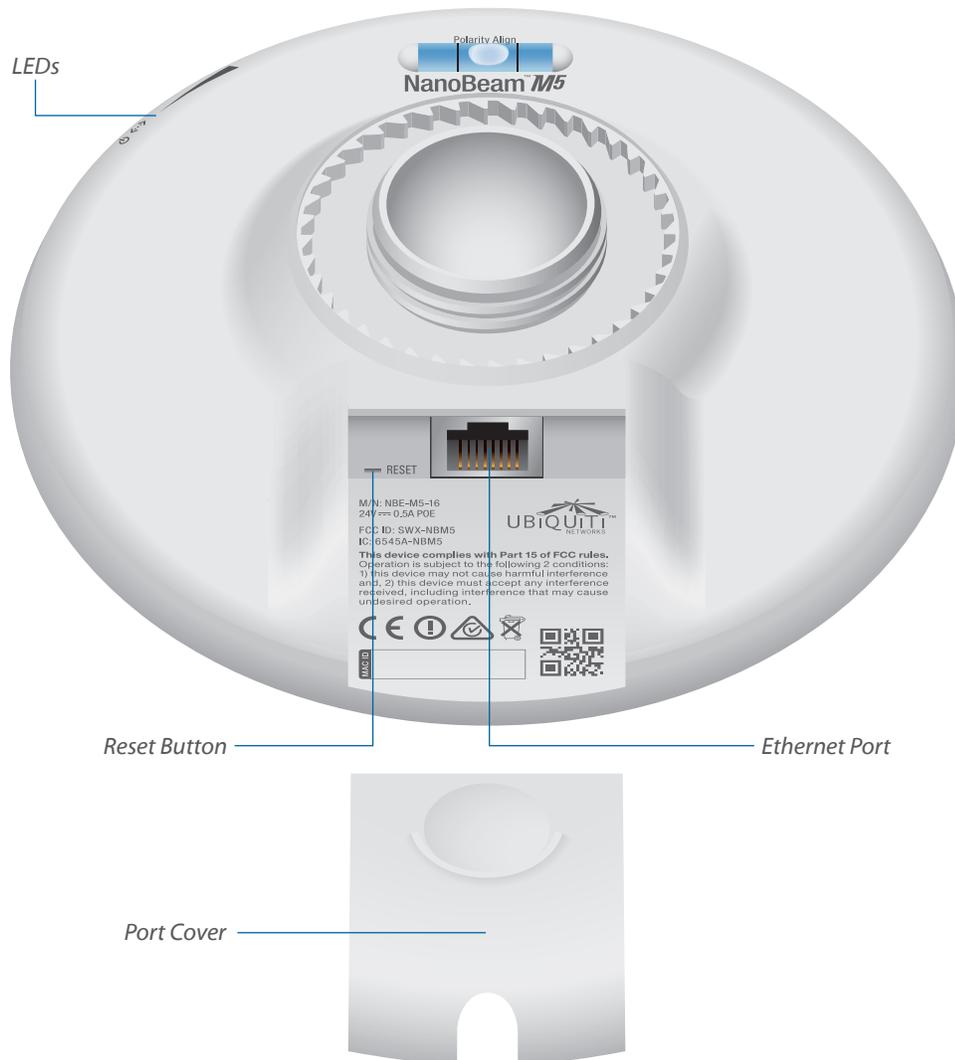
NBE-M5-16

Models

NanoBeam™ M5

Model	Frequency	Gain
NBE-M5-19	5 GHz	19 dBi

NanoBeam™ M5

Model	Frequency	Gain
NBE-M5-16	5 GHz	16 dBi

Lock Ring

Ball Joint Mount
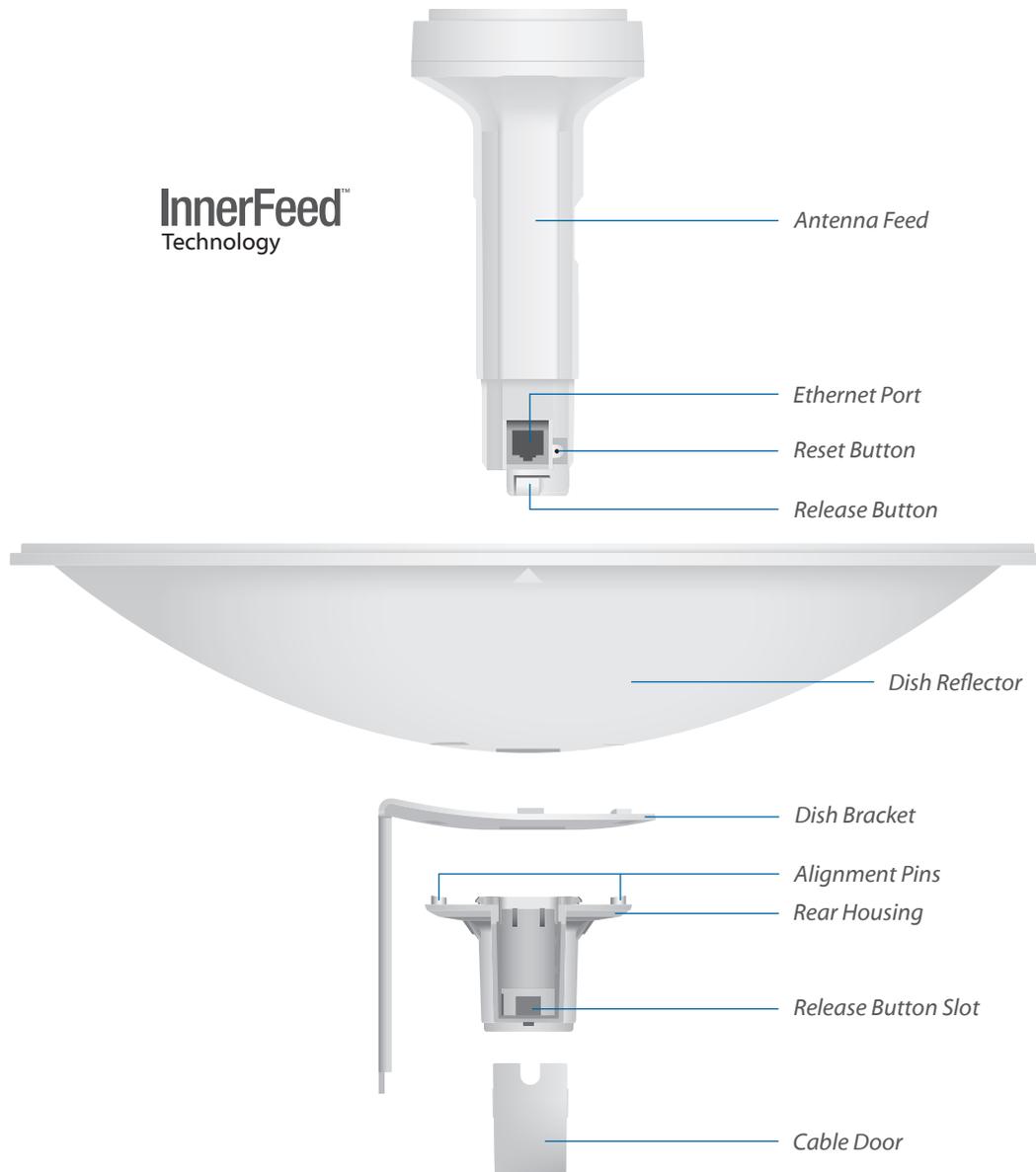
NBE-M5-16 with Mounting Hardware

Hardware Overview – Dish Reflector Design

Innovative Mechanical Design

- **Built-in mechanical tilt** The mounting bracket conveniently offers 20° of uptilt and up to 20° of downtilt.
- **Quick assembly** The number of fasteners was reduced to simplify assembly. Tools are required only when the technician mounts the NanoBeam on the pole.
- **Easy removal** The antenna feed can be detached with the push of a button.

Corrosion Resistance

- **Fasteners** GEOMET®-coated for improved corrosion resistance when compared with zinc-plated fasteners.
- **Dish and brackets** Made of galvanized steel that is powder-coated for superior corrosion resistance.

  Redesigned pole bracket for the 400 mm dish and fender washers for the 300 mm dish prevent paint from being removed from the metal brackets for improved corrosion resistance.

InnerFeed™
Technology

Antenna Feed

Ethernet Port

Reset Button

Release Button

Dish Reflector

Dish Bracket

Alignment Pins

Rear Housing

Release Button Slot

Cable Door

NBE-M2-400

Models

NanoBeam™ M2

Model	Frequency	Gain	Dish Reflector
NBE-M2-400	2.4 GHz	18 dBi	400 mm

NanoBeam™ M5

Model	Frequency	Gain	Dish Reflector
NBE-M5-400	5 GHz	25 dBi	400 mm

The NBE-M5-400 Antenna Feed has a thin gray ring around the center of the cap to differentiate it from the NBE-M5-300 Antenna Feed.

NanoBeam™ M5

Model	Frequency	Gain	Dish Reflector
NBE-M5-300	5 GHz	22 dBi	300 mm

NanoBeam™ M
400 mm Radome

Model	NBE-M2-400	NBE-M5-400	NBE-M5-300
NBE-RAD-400	✓	✓	N/A

A protective radome is available as an optional accessory for the NBE-M2-400 and NBE-M5-400.

Specifications

System Information		
Model	NBE-M5-19	NBE-M5-16
Processor Specs	Atheros MIPS 74KC, 560 MHz	Atheros MIPS 74KC, 560 MHz
Memory	64 MB DDR2, 8 MB Flash	64 MB DDR2, 8 MB Flash
Networking Interface	(1) 10/100/1000 Ethernet Port	(1) 10/100 Ethernet Port

Regulatory/Compliance Information		
Model	NBE-M5-19	NBE-M5-16
Wireless Approvals	FCC, IC, CE	
RoHS Compliance	Yes	

Physical/Electrical/Environmental		
Model	NBE-M5-19	NBE-M5-16
Dimensions (mm)	189 x 189 x 125	140 x 140 x 54
Weight	0.530 kg	0.320 kg
Power Supply	24V, 0.5A GigE PoE	24V, 0.5A PoE
Power Method	Passive PoE (Pairs 4, 5+; 7, 8 Return)	Passive PoE (Pairs 4, 5+; 7, 8 Return)
Max. Power Consumption	8 W	6 W
Gain	19 dBi	16 dBi
Wind Loading	10.2 lbf @ 125 mph	4.8 lbf @ 125 mph
Wind Survivability	125 mph	
LEDs	(1) Power, (1) LAN, (4) WLAN	
Signal Strength LEDs	Software-Adjustable to Correspond to Custom RSSI Levels	
Channel Sizes	5/8/10/20/30/40 MHz	
Polarization	Dual Linear	
Enclosure	Outdoor UV Stabilized Plastic	
Mounting	Pole-Mount (Kit Included), Wall-Mount	
ESD/EMP Protection	Air: ±24 kV, Contact:± 24 kV	
Operating Temperature	-40 to 70° C	
Operating Humidity	5 to 95% Non-Condensing	
Shock & Vibration	ETSI300-019-1.4	

Operating Frequency Summary (MHz)		
Model	NBE-M5-19	NBE-M5-16
Worldwide	5170 - 5875	
USA	5725 - 5850	

Specifications

System Information			
Model	NBE-M2-400	NBE-M5-400	NBE-M5-300
Processor Specs	Atheros MIPS 74KC, 560 MHz	Atheros MIPS 74KC, 560 MHz	Atheros MIPS 74KC, 560 MHz
Memory	64 MB DDR2, 8 MB Flash	64 MB DDR2, 8 MB Flash	64 MB DDR2, 8 MB Flash
Networking Interface	(1) 10/100 Ethernet Port	(1) 10/100/1000 Ethernet Port	(1) 10/100 Ethernet Port

Regulatory/Compliance Information			
Model	NBE-M2-400	NBE-M5-400	NBE-M5-300
Wireless Approvals	FCC, IC, CE		
RoHS Compliance	Yes		

Physical/Electrical/Environmental			
Model	NBE-M2-400	NBE-M5-400	NBE-M5-300
Dimensions (mm)	420 x 420 x 289	420 x 420 x 275	325 x 325 x 256
Weight	1.795 kg	1.753 kg	1.203 kg
Power Supply	24V, 0.5A PoE	24V, 0.5A GigE PoE	24V, 0.5A PoE
Power Method	Passive PoE (Pairs 4, 5+; 7, 8 Return)	Passive PoE (Pairs 4, 5+; 7, 8 Return)	Passive PoE (Pairs 4, 5+; 7, 8 Return)
Max. Power Consumption	6 W	8 W	6 W
Gain	18 dBi	25 dBi	22 dBi
Wind Loading	77 lbf @ 125 mph	77 lbf @ 125 mph	45 lbf @ 125 mph
Wind Survivability	125 mph		
LEDs	(1) Power, (1) LAN, (4) WLAN		
Signal Strength LEDs	Software-Adjustable to Correspond to Custom RSSI Levels		
Channel Sizes	5/8/10/20/30/40 MHz		
Polarization	Dual Linear		
Enclosure	Outdoor UV Stabilized Plastic		
Mounting	Pole-Mount Kit Included		
ESD/EMP Protection	Air: ±24 kV, Contact:± 24 kV		
Operating Temperature	-40 to 70° C		
Operating Humidity	5 to 95% Non-Condensing		
Shock & Vibration	ETSI300-019-1.4		

Operating Frequency Summary (MHz)			
Model	NBE-M2-400	NBE-M5-400	NBE-M5-300
Worldwide	2405 - 2475	5170 - 5875	
USA		5725 - 5850	

Specifications

NBE-M5-19 – Output Power: 26 dBm						
5 GHz TX POWER SPECIFICATIONS				5 GHz RX POWER SPECIFICATIONS		
	Data Rate	Avg. TX	Tolerance		Data Rate	Sensitivity	Tolerance
11a	6-24 Mbps	26 dBm	± 2 dB	11a	6-24 Mbps	-94 dBm	± 2 dB
	36 Mbps	25 dBm	± 2 dB		36 Mbps	-80 dBm	± 2 dB
	48 Mbps	24 dBm	± 2 dB		48 Mbps	-77 dBm	± 2 dB
	54 Mbps	23 dBm	± 2 dB		54 Mbps	-75 dBm	± 2 dB
11n/airMAX	MCS0	26 dBm	± 2 dB	11n/airMAX	MCS0	-96 dBm	± 2 dB
	MCS1	25 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	25 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	25 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	24 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	23 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
	MCS6	23 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
	MCS7	23 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
	MCS8	26 dBm	± 2 dB		MCS8	-95 dBm	± 2 dB
	MCS9	25 dBm	± 2 dB		MCS9	-93 dBm	± 2 dB
	MCS10	25 dBm	± 2 dB		MCS10	-90 dBm	± 2 dB
	MCS11	25 dBm	± 2 dB		MCS11	-87 dBm	± 2 dB
	MCS12	24 dBm	± 2 dB		MCS12	-84 dBm	± 2 dB
	MCS13	23 dBm	± 2 dB		MCS13	-79 dBm	± 2 dB
	MCS14	23 dBm	± 2 dB		MCS14	-78 dBm	± 2 dB
	MCS15	23 dBm	± 2 dB		MCS15	-75 dBm	± 2 dB

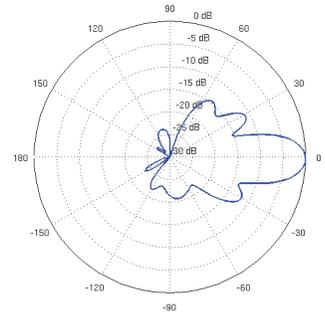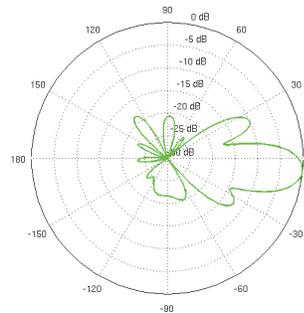| NBE-M5-19 Antenna Information	
Gain	19 dBi
Max. VSWR	1.5:1

Return Loss
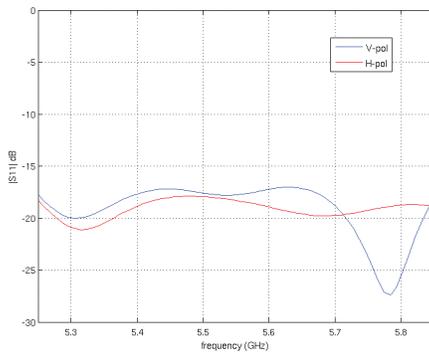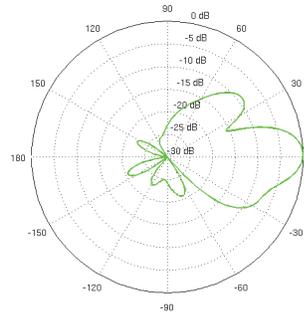
Vertical Azimuth

Vertical Elevation

Horizontal Azimuth

Horizontal Elevation
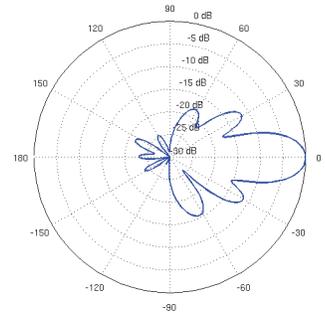
Specifications

NBE-M5-16 – Output Power: 26 dBm						
5 GHz TX POWER SPECIFICATIONS				5 GHz RX POWER SPECIFICATIONS		
	Data Rate	Avg. TX	Tolerance		Data Rate	Sensitivity	Tolerance
11a	6-24 Mbps	26 dBm	± 2 dB	11a	6-24 Mbps	-94 dBm	± 2 dB
	36 Mbps	25 dBm	± 2 dB		36 Mbps	-80 dBm	± 2 dB
	48 Mbps	24 dBm	± 2 dB		48 Mbps	-77 dBm	± 2 dB
	54 Mbps	23 dBm	± 2 dB		54 Mbps	-75 dBm	± 2 dB
11n/airMAX	MCS0	26 dBm	± 2 dB	11n/airMAX	MCS0	-96 dBm	± 2 dB
	MCS1	25 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	25 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	25 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	24 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	23 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
	MCS6	23 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
	MCS7	23 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
	MCS8	26 dBm	± 2 dB		MCS8	-95 dBm	± 2 dB
	MCS9	25 dBm	± 2 dB		MCS9	-93 dBm	± 2 dB
	MCS10	25 dBm	± 2 dB		MCS10	-90 dBm	± 2 dB
	MCS11	25 dBm	± 2 dB		MCS11	-87 dBm	± 2 dB
	MCS12	24 dBm	± 2 dB		MCS12	-84 dBm	± 2 dB
	MCS13	23 dBm	± 2 dB		MCS13	-79 dBm	± 2 dB
	MCS14	23 dBm	± 2 dB		MCS14	-78 dBm	± 2 dB
	MCS15	23 dBm	± 2 dB		MCS15	-75 dBm	± 2 dB

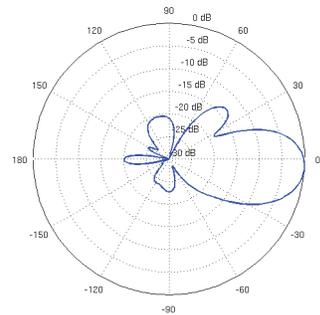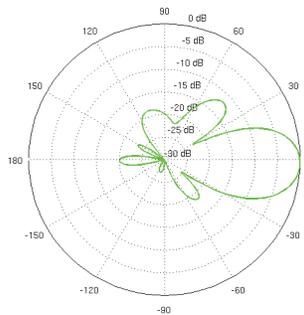| NBE-M5-16 Antenna Information	
Gain	16 dBi
Max. VSWR	1.5:1

Return Loss
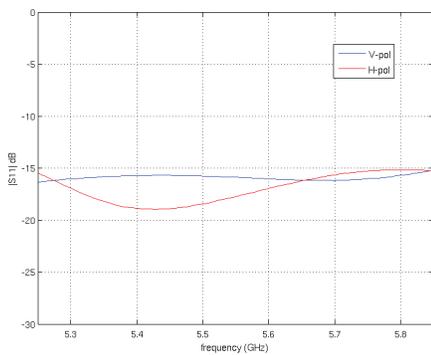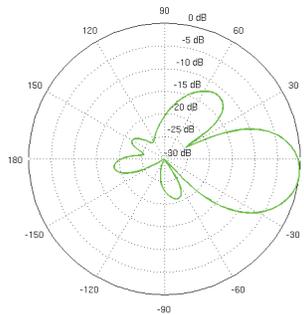
Vertical Azimuth

Vertical Elevation

Horizontal Azimuth

Horizontal Elevation
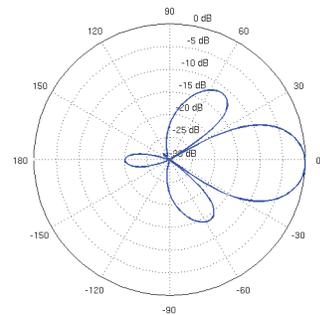
Specifications

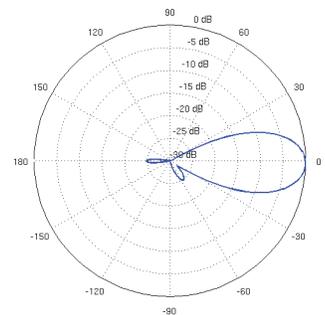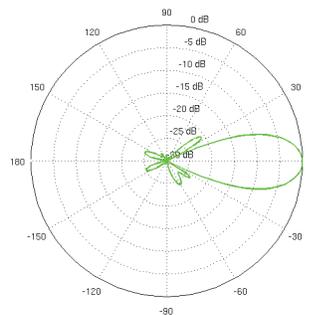| NBE-M2-400 – Output Power: 28 dBm						
2.4 GHz TX POWER SPECIFICATIONS				2.4 GHz RX POWER SPECIFICATIONS		
	Data Rate	Avg. TX	Tolerance		Data Rate	Sensitivity	Tolerance
11g	1-24 Mbps	28 dBm	± 2 dB	11g	1-24 Mbps	-97 dBm	± 2 dB
	36 Mbps	26 dBm	± 2 dB		36 Mbps	-80 dBm	± 2 dB
	48 Mbps	25 dBm	± 2 dB		48 Mbps	-77 dBm	± 2 dB
	54 Mbps	24 dBm	± 2 dB		54 Mbps	-75 dBm	± 2 dB
11n/airMAX	MCS0	28 dBm	± 2 dB	11n/airMAX	MCS0	-96 dBm	± 2 dB
	MCS1	28 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	28 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	28 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	27 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	25 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
	MCS6	23 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
	MCS7	22 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
	MCS8	28 dBm	± 2 dB		MCS8	-95 dBm	± 2 dB
	MCS9	28 dBm	± 2 dB		MCS9	-93 dBm	± 2 dB
	MCS10	28 dBm	± 2 dB		MCS10	-90 dBm	± 2 dB
	MCS11	28 dBm	± 2 dB		MCS11	-87 dBm	± 2 dB
	MCS12	27 dBm	± 2 dB		MCS12	-84 dBm	± 2 dB
	MCS13	25 dBm	± 2 dB		MCS13	-79 dBm	± 2 dB
	MCS14	23 dBm	± 2 dB		MCS14	-78 dBm	± 2 dB
	MCS15	22 dBm	± 2 dB		MCS15	-75 dBm	± 2 dB

NanoBeam NBE-M2-400 Antenna Information	
Gain	18 dBi
Max. VSWR	1.5:1
Built-In Mechanical Downtilt	+20° to -10°
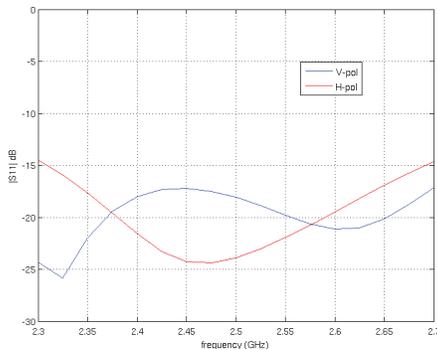
Return Loss
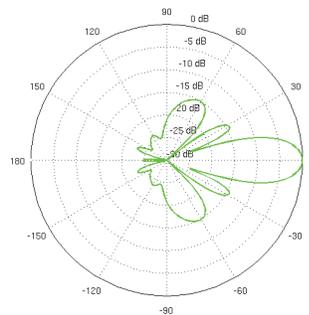
Vertical Azimuth

Vertical Elevation

Horizontal Azimuth

Horizontal Elevation
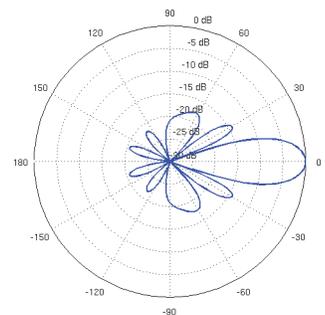
Specifications

NBE-M5-400 – Output Power: 26 dBm						
5 GHz TX POWER SPECIFICATIONS				5 GHz RX POWER SPECIFICATIONS		
	Data Rate	Avg. TX	Tolerance		Data Rate	Sensitivity	Tolerance
11a	6-24 Mbps	26 dBm	± 2 dB	11a	6-24 Mbps	-94 dBm	± 2 dB
	36 Mbps	25 dBm	± 2 dB		36 Mbps	-80 dBm	± 2 dB
	48 Mbps	24 dBm	± 2 dB		48 Mbps	-77 dBm	± 2 dB
	54 Mbps	23 dBm	± 2 dB		54 Mbps	-75 dBm	± 2 dB
11n/airMAX	MCS0	26 dBm	± 2 dB	11n/airMAX	MCS0	-96 dBm	± 2 dB
	MCS1	25 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	25 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	25 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	24 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	23 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
	MCS6	23 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
	MCS7	23 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
	MCS8	26 dBm	± 2 dB		MCS8	-95 dBm	± 2 dB
	MCS9	25 dBm	± 2 dB		MCS9	-93 dBm	± 2 dB
	MCS10	25 dBm	± 2 dB		MCS10	-90 dBm	± 2 dB
	MCS11	25 dBm	± 2 dB		MCS11	-87 dBm	± 2 dB
	MCS12	24 dBm	± 2 dB		MCS12	-84 dBm	± 2 dB
	MCS13	23 dBm	± 2 dB		MCS13	-79 dBm	± 2 dB
	MCS14	23 dBm	± 2 dB		MCS14	-78 dBm	± 2 dB
	MCS15	23 dBm	± 2 dB		MCS15	-75 dBm	± 2 dB

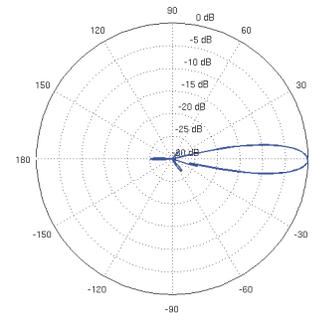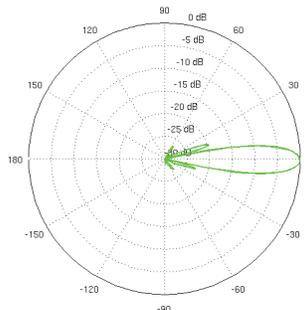| NBE-M5-400 Antenna Information	
Gain	25 dBi
Max. VSWR	2:1
Built-In Mechanical Downtilt	+20° to -10°
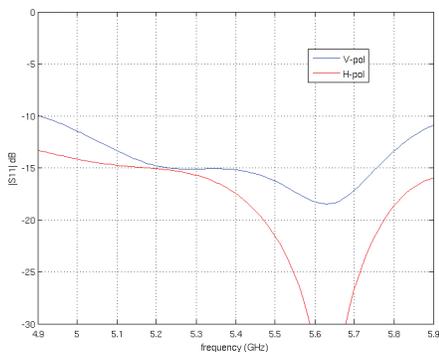
Return Loss
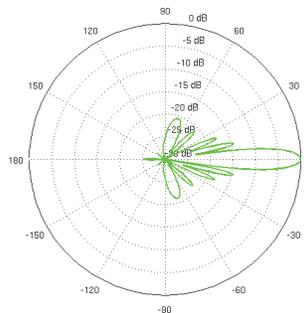
Vertical Azimuth

Vertical Elevation

Horizontal Azimuth

Horizontal Elevation
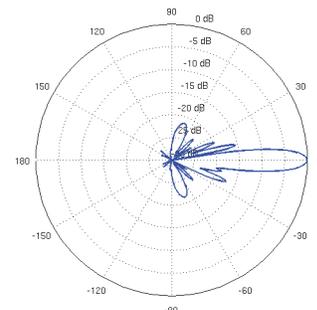
Specifications

NBE-M5-300 – Output Power: 26 dBm						
5 GHz TX POWER SPECIFICATIONS				**5 GHz RX POWER SPECIFICATIONS**		
	Data Rate	Avg. TX	Tolerance		Data Rate	Sensitivity	Tolerance
11a	6-24 Mbps	26 dBm	± 2 dB	11a	6-24 Mbps	-94 dBm	± 2 dB
	36 Mbps	25 dBm	± 2 dB		36 Mbps	-80 dBm	± 2 dB
	48 Mbps	24 dBm	± 2 dB		48 Mbps	-77 dBm	± 2 dB
	54 Mbps	23 dBm	± 2 dB		54 Mbps	-75 dBm	± 2 dB
11n/airMAX	MCS0	26 dBm	± 2 dB	11n/airMAX	MCS0	-96 dBm	± 2 dB
	MCS1	25 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	25 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	25 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	24 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	23 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
	MCS6	23 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
	MCS7	23 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
	MCS8	26 dBm	± 2 dB		MCS8	-95 dBm	± 2 dB
	MCS9	25 dBm	± 2 dB		MCS9	-93 dBm	± 2 dB
	MCS10	25 dBm	± 2 dB		MCS10	-90 dBm	± 2 dB
	MCS11	25 dBm	± 2 dB		MCS11	-87 dBm	± 2 dB
	MCS12	24 dBm	± 2 dB		MCS12	-84 dBm	± 2 dB
	MCS13	23 dBm	± 2 dB		MCS13	-79 dBm	± 2 dB
	MCS14	23 dBm	± 2 dB		MCS14	-78 dBm	± 2 dB
	MCS15	23 dBm	± 2 dB		MCS15	-75 dBm	± 2 dB

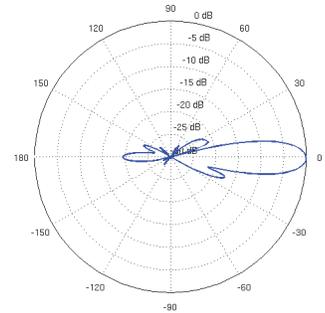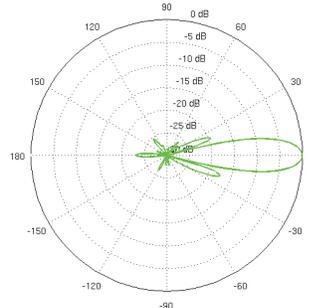| NBE-M5-300 Antenna Information	
Gain	22 dBi
Max. VSWR	1.5:1
Built-In Mechanical Downtilt	+20°

Return Loss
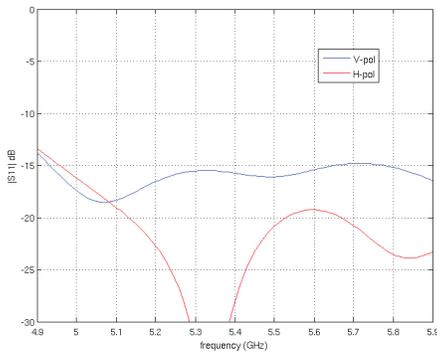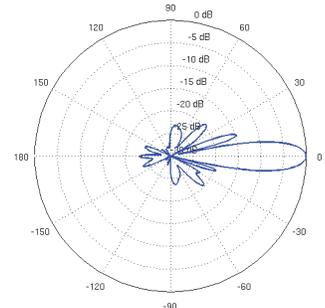

Vertical Azimuth
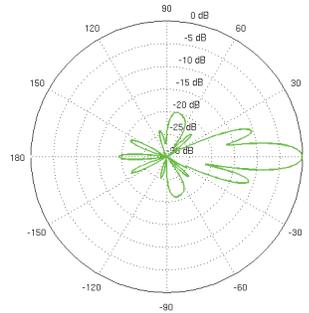
Vertical Elevation

Horizontal Azimuth

Horizontal Elevation

TOUGHCable™
OUTDOOR CARRIER CLASS SHIELDED

Protect your networks from the most brutal environments with Ubiquiti Networks' industrial-grade, shielded Ethernet cable, TOUGHCable.

Increase Performance
Dramatically improve your Ethernet link states, speeds, and overall performance with Ubiquiti TOUGHCables.

Extreme Weatherproof
Designed for outdoor use, TOUGHCables have been built to perform even in the harshest weather and environments.

ESD Damage Protection
Protect your networks from devastating electrostatic discharge (ESD) attacks.

Extended Cable Support
TOUGHCables have been developed to increase power handling performance for extended cable run lengths.

TOUGHCable Connectors

Specifically designed for use with Ubiquiti TOUGHCables, TOUGHCable Connectors protect against ESD attacks and Ethernet hardware damage, while allowing rapid field deployment without soldering. The standard TOUGHCable Connectors are available in 100-pc. bags, while the TC-GND versions include ground wires and are available in 20-pc. bags.

TOUGHSwitch™ PoE

Advanced Gigabit PoE Managed Switch

Introducing the Advanced Power over Ethernet Controllers, TOUGHSwitch™ PoE from Ubiquiti Networks. TOUGHSwitch PoE delivers reliable passive PoE and fast 10/100/1000 Mbps connectivity to attached Ubiquiti devices and other devices that support passive PoE.

To connect your PoE devices, simply enable PoE in the easy-to-use TOUGHSwitch Configuration Interface. Each port can be individually configured to provide PoE, so both PoE and non-PoE devices can be connected.

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