



# PowerBeam® ac

2.4 GHz High-Performance  
airMAX® ac Bridge with  
Dedicated Wi-Fi Management

Model: PBE-2AC-400

Highly Efficient Antenna Beam Performance

Custom Ubiquiti® airMAX® ac Processor

Dedicated Wi-Fi Radio for Management



Ubiquiti Networks launches the latest generation of airMAX® CPE (Customer Premises Equipment), the PowerBeam® 2AC, with dedicated Wi-Fi management.

The PowerBeam 2AC directs RF energy in a tighter beamwidth. With the focus in one direction, the PowerBeam 2AC 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.

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.

Featuring high performance and innovative design, the PowerBeam 2AC is versatile and cost-effective to deploy.

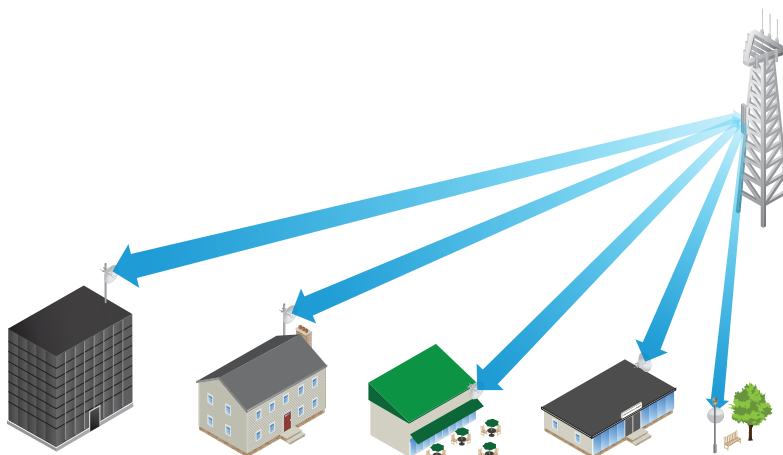
**airOS® 8**

airOS® 8 is the revolutionary operating system for Ubiquiti® airMAX ac products.

- High-performance airMAX ac CPE
- airMAX ac Protocol Support
- Long-Range Point-to-Point (PtP) Link Mode
- Selectable Channel Width
  - PtP: 10/20/40 MHz
  - PtMP: 10/20/40 MHz
- Automatic Channel Selection
- Transmit Power Control: Automatic/Manual
- Automatic Distance Selection (ACK Timing)
- Strongest WPA2 Security

- airMagic® Channel Selection Tool
- Redesigned User Interface
- Dynamic Configuration Changes
- Instant Input Validation
- HTML5 Technology
- Optimization for Mobile Devices
- Detailed Device Statistics
- Comprehensive Array of Diagnostic Tools, including RF Diagnostics and airView® Spectrum Analyzer

## PtMP Client Links



*The PowerBeam 2AC used as a CPE device for each client in an airMAX PtMP network.*

*Use a PowerBeam 2AC on each side of a PtP link.*



## Advanced RF Analytics

airMAX ac devices feature a multi-radio architecture to power a revolutionary RF analytics engine.

An independent processor on the PCBA powers a second, dedicated radio, which persistently analyzes the full 2.4 GHz spectrum and every received symbol to provide you with the most advanced RF analytics in the industry.

## Real-Time Reporting

airOS 8 displays the following RF information:

- Persistent RF Error Vector Magnitude (EVM) constellation diagrams
- Signal, Noise, and Interference (SNI) diagrams
- Carrier to Interference-plus-Noise Ratio (CINR) histograms

## Spectral Analysis

airView allows you to identify noise signatures and plan your networks to minimize noise interference. airView performs the following functions:

- Constantly monitors environmental noise
- Collects energy data points in real-time spectral views
- Helps optimize channel selection, network design, and wireless performance

In airView, there are three spectral views, each of which represents different data: waveform, waterfall, and ambient noise level.

airView provides powerful spectrum analyzer functionality, eliminating the need to rent or purchase additional equipment for conducting site surveys.

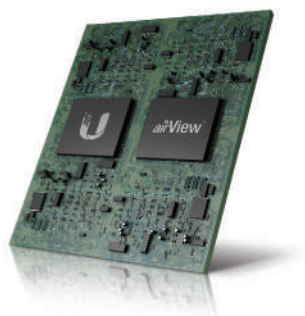
## UNMS App

The PowerBeam 2AC integrates a separate Wi-Fi radio for fast and easy setup using your mobile device.

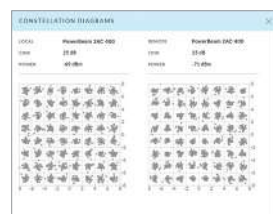
### Accessing airOS via Wi-Fi

The UNMS™ App provides instant accessibility to the airOS configuration interface and can be downloaded from the App Store (iOS) or Google Play™ (Android). UNMS allows you to set up, configure, and manage the PowerBeam 2AC and offers various configuration options once you're connected or logged in.

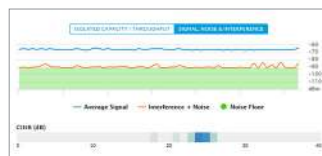
## Multi-Radio Architecture



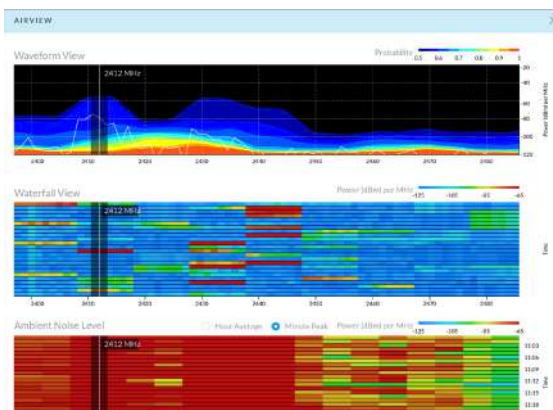
## Constellation Diagrams



## SNI Diagram and CINR Histogram



## Dedicated Spectral Analysis



## UNMS Configuration Screen



# 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, so airMAX technology provides performance improvements in latency, noise immunity, scalability, and throughput compared to other outdoor systems in its class.

**Intelligent QoS** Priority assigned to voice/video for seamless streaming.

**Scalability** High capacity and scalability.

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

## Superior Performance

The next-generation airMAX ac technology boosts the advantages of our proprietary TDMA protocol.

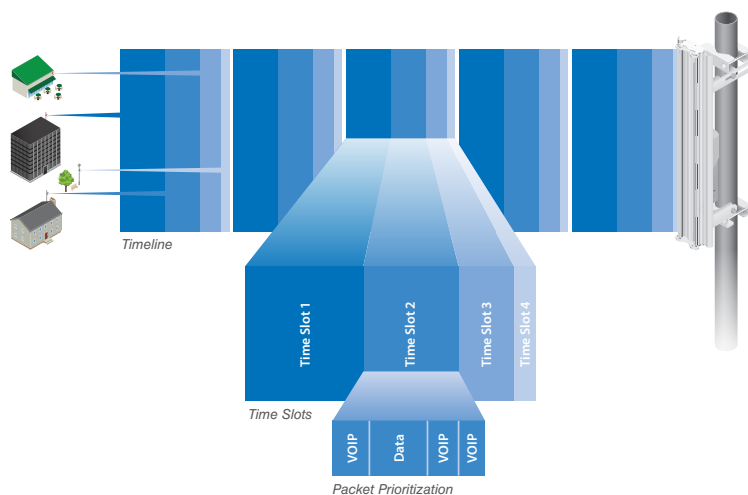
Ubiquiti's airMAX engine with custom IC dramatically improves TDMA latency and network scalability. The custom silicon provides hardware acceleration capabilities to the airMAX scheduler, to support the high data rates and dense modulation used in airMAX ac technology.

## Throughput Breakthrough

airMAX ac supports high data rates, which require dense modulation: 256QAM – a significant increase from 64QAM, which is used in airMAX.

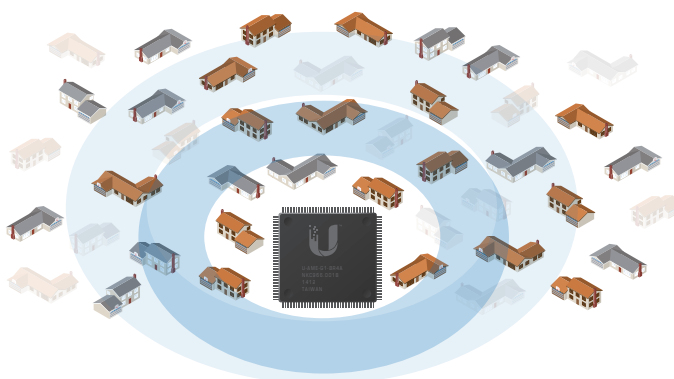
With their use of proprietary airMAX ac technology, 2.4 GHz airMAX ac products support up to 330+ Mbps real TCP/IP throughput – more than double the throughput of standard airMAX products.

## airMAX ac TDMA Technology

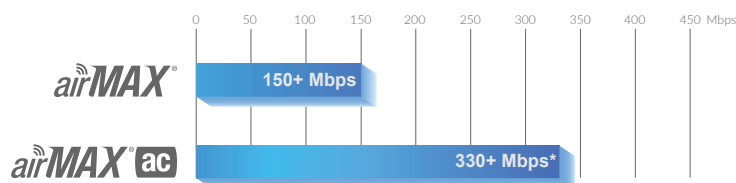


Up to 100 airMAX ac stations can be connected to an airMAX ac Sector; four airMAX ac stations are shown to illustrate the general concept.

## airMAX Network Scalability



## Superior Throughput Performance



\* The 330+ Mbps throughput value is specific to 2.4 GHz airMAX ac products.

# Hardware Overview

## Innovative Mechanical Design

- **Convenient pole-mounting** Only a single wrench is needed to mount the PowerBeam 2AC on a pole.
- **Easy removal** The antenna feed can be detached with the push of a button.
- **Built-in mechanical tilt** The mounting bracket offers elevation adjustments of up to  $\pm 20^\circ$ .

## Industrial-Strength Construction

- **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.
- **Optional support** In high-wind environments, you can enhance support with additional hardware (not included).



### PowerBeam® 400 mm Radome

| Model       | Frequency | PBE2AC-400 | Dish Reflector |
|-------------|-----------|------------|----------------|
| PBE-RAD-400 | 2.4 GHz   | ✓          | 400 mm         |

A protective radome is available as an optional accessory for the PBE-2AC-400.



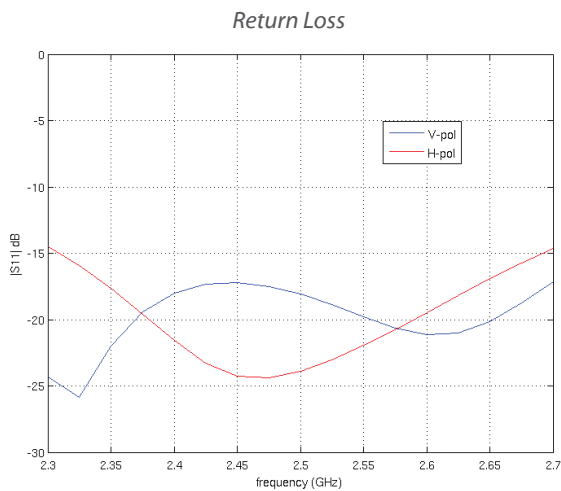
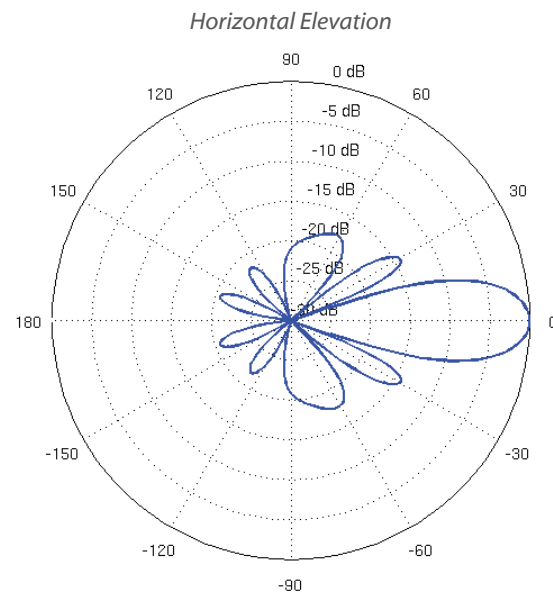
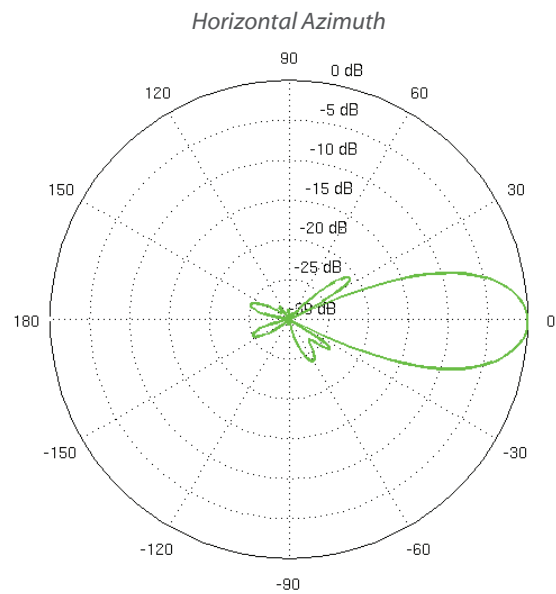
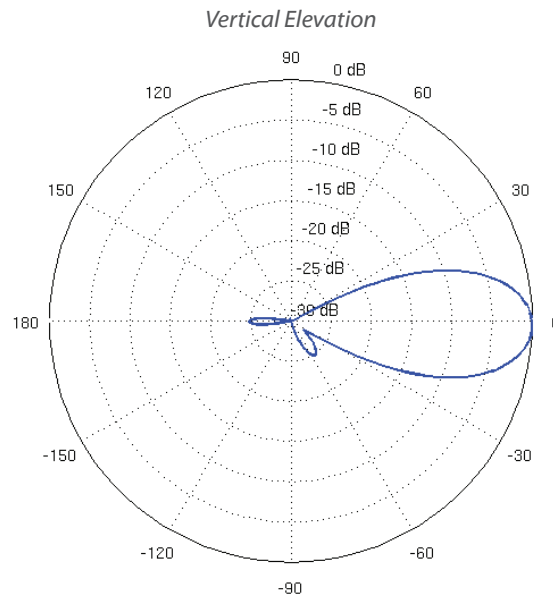
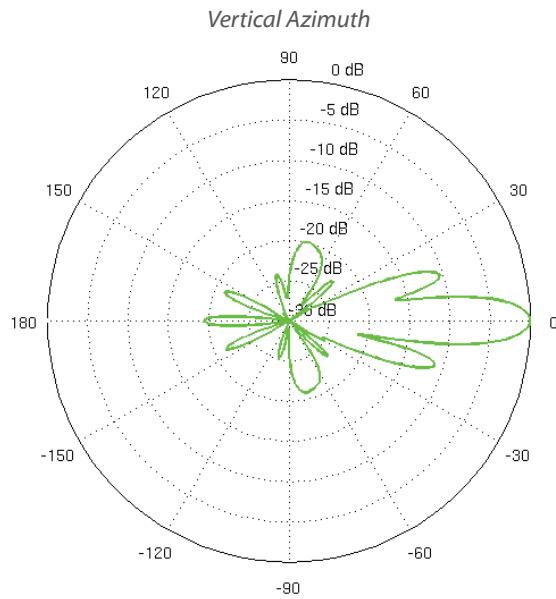
# Specifications

| PBE-2AC-400               |                                                                 |                    |
|---------------------------|-----------------------------------------------------------------|--------------------|
| Dimensions with Radome    | 420 x 420 x 289 mm (16.54 x 16.54 x 11.38")                     |                    |
| Weight (Mount Included)   | 1.795 kg (4.809 lbs)                                            |                    |
| Power Supply              | 24V, 0.5A Gigabit PoE Adapter (Included)                        |                    |
| Max. Power Consumption    | 7.5W                                                            |                    |
| Power Method              | Passive PoE (Pairs 4, 5+; 7, 8 Return)                          |                    |
| Supported Voltage Range   | 22 to 26VDC                                                     |                    |
| Gain                      | 18 dBi                                                          |                    |
| Networking Interface      | (1) 10/100/1000 Ethernet Port                                   |                    |
| Processor Specs           | MIPS 74Kc                                                       |                    |
| Memory                    | 64 MB                                                           |                    |
| LEDs                      | Power, Ethernet, (4) Signal Strength                            |                    |
| Channel Sizes             | PtP Mode                                                        | PtMP Mode          |
|                           | 10/20/40 MHz                                                    | 10/20/40 MHz       |
|                           | Antenna Feed                                                    | Dish Reflector     |
| Enclosure Characteristics | Outdoor UV Stabilized Plastic                                   | Powder-Coated SPCC |
|                           |                                                                 |                    |
| Mounting                  | Pole-Mounting Kit (Included)                                    |                    |
| Wind Loading              | 342.5 N @ 200 km/h (77 lbf @ 125 mph)                           |                    |
| Wind Survivability        | 200 km/h (125 mph)                                              |                    |
| ESD/EMP Protection        | Air: ± 24 kV, Contact: ± 24 kV                                  |                    |
| Operating Temperature     | -40 to 70° C (-40 to 158° F)                                    |                    |
| Operating Humidity        | 5 to 95% Noncondensing                                          |                    |
| RoHS Compliance           | Yes                                                             |                    |
| Salt Fog Test             | IEC 68-2-11 (ASTM B117), Equivalent: MIL-STD-810 G Method 509.5 |                    |
| Vibration Test            | IEC 68-2-6                                                      |                    |
| Temperature Shock Test    | IEC 68-2-14                                                     |                    |
| UV Test                   | IEC 68-2-5 at 40° C (104° F), Equivalent: ETS 300 019-1-4       |                    |
| Wind-Driven Rain Test     | ETS 300 019-1-4, Equivalent: MIL-STD-810 G Method 506.5         |                    |
| Certifications            | CE, FCC, IC                                                     |                    |

| Operating Frequency (MHz) |           |
|---------------------------|-----------|
| Worldwide                 | 2412-2472 |
| USA                       | 2412-2462 |

| Management Radio (MHz) |                    |
|------------------------|--------------------|
| Worldwide              | 5150-5250          |
| USA                    | U-NII-3: 5725-5850 |

| PBE-2AC-400 Output Power: 27 dBm |               |         |           |                         |               |             |           |
|----------------------------------|---------------|---------|-----------|-------------------------|---------------|-------------|-----------|
| TX Power Specifications          |               |         |           | RX Power Specifications |               |             |           |
| Modulation                       | Data Rate     | Avg. TX | Tolerance | Modulation              | Data Rate     | Sensitivity | Tolerance |
| airMAX ac                        | 1x BPSK (½)   | 27 dBm  | ± 2 dB    | airMAX ac               | 1x BPSK (½)   | -92 dBm     | ± 2 dB    |
|                                  | 2x QPSK (½)   | 27 dBm  | ± 2 dB    |                         | 2x QPSK (½)   | -92 dBm     | ± 2 dB    |
|                                  | 2x QPSK (¾)   | 27 dBm  | ± 2 dB    |                         | 2x QPSK (¾)   | -90 dBm     | ± 2 dB    |
|                                  | 4x 16QAM (½)  | 27 dBm  | ± 2 dB    |                         | 4x 16QAM (½)  | -86 dBm     | ± 2 dB    |
|                                  | 4x 16QAM (¾)  | 27 dBm  | ± 2 dB    |                         | 4x 16QAM (¾)  | -82 dBm     | ± 2 dB    |
|                                  | 6x 64QAM (⅔)  | 27 dBm  | ± 2 dB    |                         | 6x 64QAM (⅔)  | -78 dBm     | ± 2 dB    |
|                                  | 6x 64QAM (¾)  | 26 dBm  | ± 2 dB    |                         | 6x 64QAM (¾)  | -76 dBm     | ± 2 dB    |
|                                  | 6x 64QAM (⅘)  | 24 dBm  | ± 2 dB    |                         | 6x 64QAM (⅘)  | -75 dBm     | ± 2 dB    |
|                                  | 8x 256QAM (¾) | 23 dBm  | ± 2 dB    |                         | 8x 256QAM (¾) | -71 dBm     | ± 2 dB    |
|                                  | 8x 256QAM (⅘) | 22 dBm  | ± 2 dB    |                         | 8x 256QAM (⅘) | -67 dBm     | ± 2 dB    |



Specifications are subject to change. Ubiquiti products are sold with a limited warranty described at: [www.ubnt.com/support/warranty](http://www.ubnt.com/support/warranty)  
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