Cochise County

Development Services
Planning Division

Public Programs...Personal Service
www.cochise.az.gov

APPLICATION FOR A SPECIAL USE

Applicant's Name: Merlin G Hinrichs DBA Integrated Elements Ultd. . .

Name of All Property Owner(s): Fenn, Alvah F & Barbara H

Applicant Mailing Address:

769 E Country Club Dr Benson AZ 85602

Street # Town State Zip code

Subject Property Address (if different than mailing address):

1018 E Pomerene Rd Benson AZ 85602

Street # Town State Zip code

Email Address: acctp@ieudev.net

Phone Number: 520-589-0091

Tax Parcel Number: 20847045S

Current Zoning Designation: R-18

Comprehensive Plan Land Use Category/Growth Area: No Use Plans N/A

Comprehensive Plan Land Use Designation: No Use Plans N/A

Area Plan Designation (if applicable): No Use Plans N/A

Size of Property (in acreage or square feet): 23.13

How many acres will be cleared and developed? No Clearing approx 400sqft used

Describe your relationship to this application. (Select one)

☐ I am the property owner

☑ I am an authorized agent for the property owner

Bisbee Office
1415 Melody Lane, Building F
Bisbee, Arizona 85603
520-432-9300
520-432-9278 fax
planningandzoning@cochise.az.gov

If the applicant is not the property owner, please attach a notarized letter of authorization to this application.

The Purpose of a Special Use

Special Uses include uses or activities with a greater potential for impacts on neighboring properties than the permitted uses in a Zoning District. Examples of Special Uses are manufacturing, RV Parks, guest ranches, hospitals and schools. These more intense uses must be carefully reviewed to decide if they could make good neighbors to the existing uses. For this reason, a Special Use Permit requires a public hearing and approval by the Planning and Zoning Commission before it is allowed.

What is the Process?

1. Pre-application meeting with County planning staff.
2. Citizen Review Process – the applicant must send notice to all property owners within a radius of no less than 300 feet of the subject parcel(s), as shown on the most recent available records of the last property tax assessment. The County Zoning Inspector may expand the mailed notification area to greater than a 300-foot radius at time of application acceptance if there are compatibility concerns associated with the request.
3. Application Submittal
4. Technical review by relevant internal staff and external agencies
5. Public Hearing – Planning and Zoning Commission (Approval/Denial)

Appeals

The Commission action can be appealed to the Board of Supervisors by anyone who disagrees with the outcome. Appeals must be filed within fifteen (15) calendar days of the Commission action.
The applications are available online "Appeal: Board of Supervisors."

Required Submittals

1. This application
2. Citizen Review Report
3. Site plan -drawn to scale showing the existing and proposed District boundaries and an accurate legal description of the area being petitioned for amendment. See "concept plan instructions for special uses" (included in this application). Please see our website for an example plan: https://www.cochise.az.gov/development-services/special-uses
4. Letter of Authorization (for authorized agents, if applicable)
5. Hazardous or polluting materials attachment (only if hazardous materials are proposed, if applicable)
6. Deed restrictions (if applicable)
7. Outdoor lighting, manufacturers specifications (if applicable)
8. Processing Fee

Concept Plan Instructions for Special Uses

Sometimes, an applicant will seek approval for a particular special use or uses on a piece of property well ahead of actual construction or operation of that use. Often the exact dimensions of structures or configuration of uses on the property are not known yet until the uses have been approved and the applicant has invested resources into site planning. The Zoning Regulations allow for the submittal of a "Concept Plan" in lieu of a site plan in the case of phased special uses on one property or a special use where construction is not anticipated within one year. However, if the use(s) are approved by the Planning and Zoning Commission, then a detailed site plan meeting the requirements of the Zoning Regulations will be required for each use or phase and shall be in substantial conformance with the approved special use. If the site plan is not within substantial conformance with the approved use and concept plan, then the special use will need to be reviewed, in a public hearing, by the Commission once again to modify the original proposal. **Note: any**

anticipated waivers of site development standards such as setbacks, screening, landscaping or parking spaces must be requested, justified, and approved by the Commission prior to the issuance of a building permit.

In order to adequately review the proposed special use(s) on a piece of property, a Concept Plan must include at a minimum the following information:

- Parcel boundaries and adjacent roads;
- The general location, size and height of all structures and uses (existing and proposed), including minimum setbacks from parcel boundaries, washes and roads;
- The general location and minimum number of parking spaces to be provided, including proposed surface and width of driveways;
- Proposed screening and landscaping;
- Any significant topographical features (washes, hills, rock outcroppings, wetlands) and cultural features of the property and adjacent parcels;
- If applicable, project phasing (approximate schedule of uses and construction) and any other information deemed necessary to effectively review the Special Use.

Please state the reason for this request and why it should be supported.

Installation of pipe pole no more than 20ft higher than ground level including guy wires and supporting solar array to power microwave equipment. There is microwave communications gear attached to the pole to support requested services of broadband communications to owner of property, general area including property owner associates in immediate and distant communities. Use is to provide adequate, reliable broadband to rural communities under 1996 Telecommunications Act at the request of the property owner. Installation also provides microwave bridging to support broadband to J6/Mescal, Benson, Pomerene and rural areas north of Pomerene in the San Pedro River Valley. Installation has existed approaching 1.5

Identify the utility company/service provider for each of the following services and state if additional provisions or future connections are required in the space below.

Service Provider	**Service Provider**	**Additional Provisions Required**
Water/Well	N/A	
Sewer/Septic	N/A	
Electricity	N/A	
Natural Gas	N/A	
Telephone	N/A	
Fire Protection	N/A	
Waste Disposal	N/A	

Is this request consistent with all deed restrictions or private covenants in effect for this property? If applicable, please include a copy of these restrictions/covenants with this application.

☐ Yes ☐ No ☑ Not applicable (no deed restrictions or covenants)

Describe all **existing** structures/uses present on the subject parcel. Note: the size and location of existing structures must be shown on the accompanying site plan.

See Attached GIS and Photos/pdf's

Describe all **proposed** structures/uses on the parcel that to be placed on the parcel. Note: the size and location of proposed structures must be shown on the accompanying site plan.

See Attached GIS and Photos/pdf's

Is the proposed special use consistent with stated purpose of the current zoning district? Explain.

Yes, as stated in FCC 1996 Telecommunications Act to Provide Broadband to Rural Communities Documents provided the zoning admin and attached to this application any potential user of communications under the act can have both individual use and relay equipment installed on their property to provide such communications to the principle with interest in the property and surrounding areas without local permits.

Describe all intermediate and final products/services that will be produced/offered/sold, if applicable.

This installation provides broadband access to communications which may be acquired by the principle interest holder of the property. It may also be acquired by any area potential subscriber, which is provided secure access visa vi Integrated Elements Ultd wifi Div. No unauthorized use is permitted and prevented by encryption and other security measures.

What materials will be used to construct the new building(s)? (Note, for an existing building(s), please also list the construction type(s), i.e., factory-built building, wood, block, metal).

No buildings required. Structure currently is 18ft pipe pole secured by guy wires anchored in the ground with attached microwave gear and a solar array with secured battery storage at the base of the pole. Pipe Pole is a minimum of 6ft in the ground with an ancillary 10ft copper grounding rod. Pipe Pole is stabilized by guy wires reducing movement to less than 1/4 inch horizontally for stable azimuth alignment to additional distant CPE's at subscriber sites..

Will the project be constructed/completed within one year or phased?

☐ One year

☑ Phased

If this is a phased project, describe the phases here and physically depict them on the site plan.

Installation was completed going on 1.5 years ago in about 2 weeks. As technology changes the equipment on the pole will be replaced. Our experience shows that equipment gets smaller and less wind resistant through time. We may extend the pole for additional equipment in the future. The equipment is very low powered microwave gear broadcasting at less than 3/4 of a watt per unit so 100's to 1000's of times less power than a cell tower. The technology is commonly referred to as "WIFI" and is considered safe from and RF & EMF saturation as per FCC Regulations which are fixed internally in the equipment. This equipment is more than 1500ft from any buildings.

What are the days and hours of operation (if applicable)?

Days of the week: 7/24/365

12 AM to 2359 PM

Number of employees (if applicable):

Initially 3 Future: 10

Total average daily traffic generated (non-residential uses):

How many vehicles will be entering and leaving the site (per day)? no activity generally per

Total trucks (e.g., by type, number of wheels, or weight)? requires hiking up hill

Estimate which direction(s) and on which road(s) the traffic will travel from the site.

North and South on property owners dirt driveway connected to east Pomerene Rd

If more than one direction, estimate the percentage that travel in each direction.

50/50

At what time of day, day of week and season (if applicable) is traffic the heaviest?

on property owners drive way there is no way of telling but minimal. Pomerene Rd vari

Water Use:

Estimate the total gallons of water needed for the proposed use: per day 0 per year 0

Please indicate your water source none n/a God Almighty

If your property is served by a private well, show the existing or proposed location on the site plan.

List any strategies you will employ, on site, to minimize water use, recycle water, and/or enhance onsite natural recharge.

site is on top of a foothill so all water runs down the hill.

Will your property be served by a septic system? ☐ Yes ☑ No

If yes, show the septic tank, leach field and 100% expansion area on the site plan, and indicate whether the system is existing or proposed.

Does your parcel have permanent legal access*? If no, what steps are you taking to obtain such access? (*Our Zoning Regulations state that no building permit for a nonresidential use shall be issued unless a site has permanent and direct access to a publicly maintained street or street where a private maintenance agreement is in place. Said access shall be not less than twenty (20) feet wide throughout its entire length and shall adjoin the site for a minimum distance of twenty (20) feet. If access is from a private road or easement provide documentation of your right to use this road or easement and a private maintenance agreement.)

Not a building structure. No permanent access necessary. If property owner decides they no longer want service nor the equipment on the hill, we have to find a different location based on our service agreement with the property owner, which states a minimum of 30days notice for sites serving as relays.

Which streets or easements will be used for traffic entering or exiting the property? (Please label on the accompanying plan)

Already stated above. East Pomerene Rd Hwy not residential street.

What impact will this have on the traffic volume of roads serving this subject property?

negligible

How many driveway cuts are proposed along streets or easements to allow site access? State whether this is an increase/decrease and whether any existing cuts will need relocation.

N/A

Does the subject parcel have site access onto a major road?

☑ Yes ☐ No

Are you requesting any modifications or waivers from site development standards? If yes, explain.

This should be totally unnecessary based on use. This would be the same as putting an antenna on your house or in your yard. Not some gigantic tower or even small building.

Is the subject property within Sierra Vista Sub-Watershed Overlay Zone? If so, please indicate this, and that you understand that it may be subject to additional plan reviews and inspections whenever a building permit is required.

☐ Yes, and I understand the permitting requirements ☑ No, it's outside the boundaries

Please describe your citizen review process (if applicable). Specifically, state whether you received any responses to your mailed notice or public meeting. Explain how your special use application has incorporated the feedback you received.

We did not mail anything since this whole issue was instigated by an erroneous complaint from someone 3.5 miles away trying to use bandwidth in an already established (over 20 years) microwave bridge serving the area. He deemed it a nuisance because he cannot legally crash into and knock down a preexisting microwave bridge operating in compliance with FCC Regulations and/or FTC (Federal Trade Commission) Regulations. The pole and equipment is not even visible from the complainants location. Signal is always visible valley wide when using high gain antennas like the complainant's equipment on a pole higher than his house. The property owner where the equipment nor none of her neighbors find it a public nuisance.

Describe any outdoor activity associated with your special use proposal, if applicable.

All communications antennas and solar arrays are outside activity but do not generally require any special use permits so we don't see this as a special use situation. It is not defined as such in any legal documents concerning individual use of antennas to receive and/or transmit signal for personal or relay use or to their friends or associates.

Will outdoor storage of equipment, materials or products be needed? If yes, show the location on the site plan. Describe any measures to be taken to screen this storage from neighboring properties.

Solar array and battery storage facilities are no more than 2 ft above ground at base of pole. Hiding solar panels would preclude the use of them. No sun no power. Shrubs around base of installation subdues ground based equipment for all practical purposes unless you are several blocks away and not obnoxious then.

Will any noise or vibrations be produced that can be heard or felt on neighboring properties on a regular basis? if yes; describe the level and duration of this noise. What measures are you proposing to prevent this noise from being heard on neighboring properties?

No

Will odors be created? If yes, what measures will be taken to prevent these odors from escaping onto neighboring properties?

No

Will any on-site activities attract pests, such as flies or mice? If yes, what measures will be taken to prevent a nuisance on neighboring properties?

No

Will additional dust be created on a regular basis? If yes, what measures will be taken to prevent this dust from escaping onto neighboring properties or roadways?

No

Is outdoor lighting proposed? If yes, show the location(s) on the site plan. Indicate how neighboring properties and roadways will be shielded from light spillover. Please submit manufacturer's specifications for all light fixtures.

☐ Yes ☑ No

Will you be performing any off-site construction (e.g., access aprons, driveways, and culverts)? If yes, show details on the site plan. Note: The County may require off-site improvements reasonably related to the impacts of the use such as road or drainage improvements.

☐ Yes ☑ No

Show on-site drainage flow on the site plan. Will drainage patterns on site be changed? If so, please indicate on the site plan and describe below.

No changes. Just same natural drainage as before installation

If more than one acre is to be cleared, describe the proposed dust and erosion control measures to be used and show on site plan, if appropriate.

N/A

Do you anticipate the use of any hazardous or dangerous materials? If yes, please complete a "Hazardous or Polluting Materials Attachment" and attach it to this application.

☐ Yes ☑ No

I hereby certify that I am the owner or duly authorized owner's agent and all information in this questionnaire, in the Joint Permit Application and on the site plan is accurate. I understand that if any information is false, it may be grounds for revocation of the Commercial Use/ Building/ Special Use Permit. In addition, I hereby request all inspections necessary to process this application, and if the permit is issued, I request all inspections necessary to monitor progress, and document completion, at all stages of the work related to this permit. Failure to obtain permits may result in fines or other penalties.

Applicant Signature

11/15/2023
Date

ArcGIS Web Map

DATASHEET

LiteAP™ ac

5 GHz airMAX® AC AP

Models: LAP-120, LAP-GPS

High-Performance Sector AP

Up To 450+ Mbps Real TCP/IP Throughput

Lightweight, Low-Cost Solution

UBIQUITI®
NETWORKS

DATASHEET

LiteBeam®

5 GHz, 23 dBi airMAX® CPE with InnerFeed Technology

Models: LBE-M5-23, LBE-5AC-23

Lightweight, Low-Cost Solution

Full Adjustment Flexibility

Quick Assembly and Installation

UBIQUITI® NETWORKS

LiteBeam®

The LiteBeam® is the latest evolution of a lightweight and compact, outdoor wireless broadband product from Ubiquiti Networks. Each of these models was designed to be an affordable cost/performance solution for long-distance, wireless broadband bridging. It operates in the worldwide, license-free 5 GHz frequency range with high-performance speeds.

The LiteBeam combines proprietary hardware and software technologies to deliver its breakthrough combination of throughput and range with cost-effective value.

The InnerFeed® technology integrates the entire radio system into the antenna feed, and our revolutionary airMAX TDMA protocol enhances network performance and scalability.

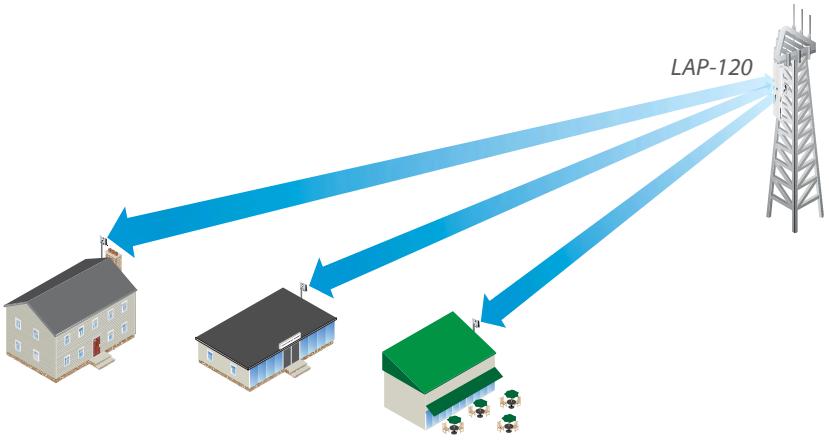
Integrated airMAX Technology

Unlike standard Wi-Fi protocol, the exclusive Ubiquiti Networks® airMAX Time Division Multiple Access (TDMA) protocol allows each client to send and receive data using pre-designated time slots managed by an intelligent AP controller. This "time slot" method eliminates hidden node collisions and maximizes airtime efficiency.

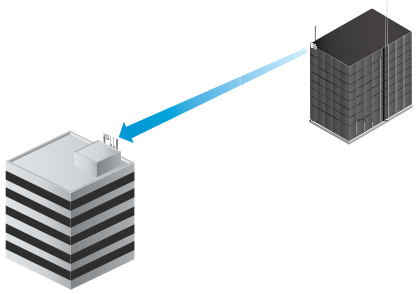
Compared to other systems in its class, the LiteBeam products deliver superior performance in reduced latency, throughput, and scalability.

- **Intelligent QoS** Priority is given to voice/video for seamless access.
- **Scalability** High capacity and scalability.
- **Long Distance** Capable of high-speed, 30+ km links.

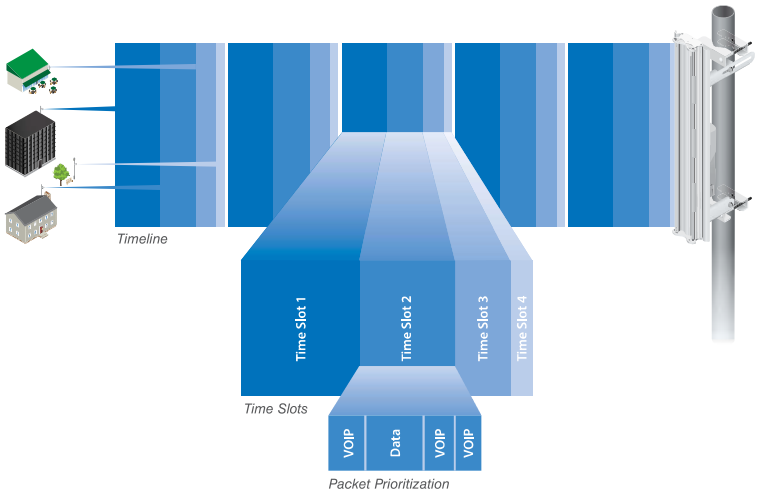
Application Examples



In a cost-effective WISP deployment, the LiteBeam acts as a CPE in an airMAX Point-to-Multipoint network.



A LiteBeam on each side of a Point-to-Point link.



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

Hardware Overview

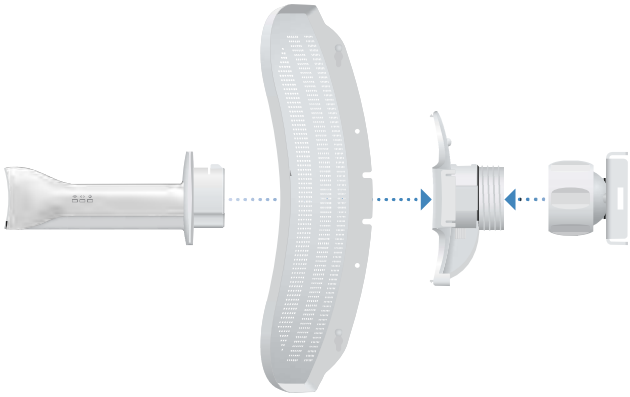
Full Adjustment Flexibility

The LiteBeam features a unique ball joint mount that provides adjustment flexibility along three axes for versatile mounting options. The mounting system, coupled with the built-in bubble level, enables quick and easy alignment.

LBE-5AC-23

Quick, Snap-and-Lock Assembly

The all-new mechanical design makes assembling the LiteBeam – literally – a snap. No tools are required. Simply snap the feed, antenna panels, rear housing, and ball joint mount together for a secure, solid assembly.



LBE-M5-23

Model Comparison

	LBE-M5-23	LBE-5AC-23
Frequency Band	5 GHz	5 GHz
Antenna Gain	23 dBi	23 dBi
Antenna Type	1x1 SISO	2x2 MIMO
Polarization	Vertical	Vertical + Horizontal
airMAX ac		✓
Gigabit Ethernet		✓
Point-to-Point Functionality	✓	✓

SISO Versus MIMO Functionality

LiteBeam® M5

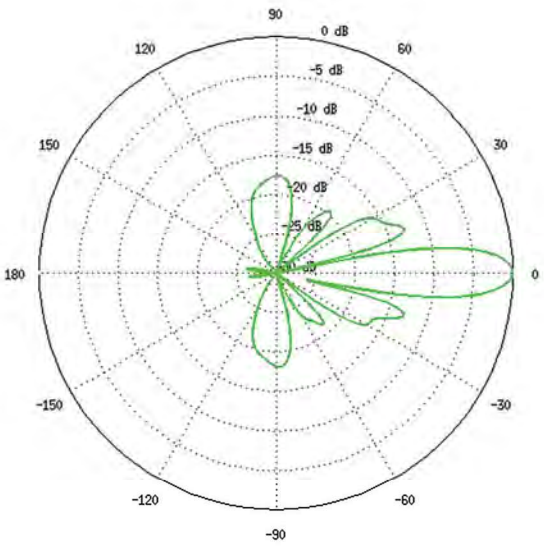
LiteBeam® ac

LBE-M5-23 Specifications

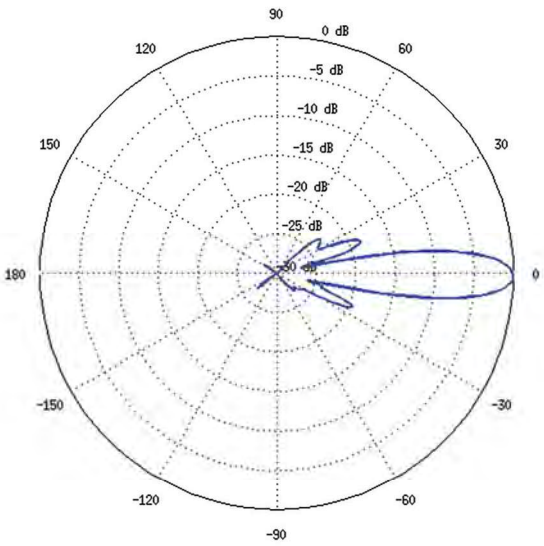
LBE-M5-23	
Dimensions (No Mount)	362 x 267 x 184 mm (14.25 x 10.51 x 7.24")
Weight (No Mount)	750 g (24.11 oz)
Mounting Kit	Pole Mounting Kit (Included)
Networking Interface	(1) 10/100 Ethernet Port
Memory	64 MB
Max. Power Consumption	4W
Max. TX Power	25 dBm
Antenna Gain	23 dBi
Operating Frequency	Worldwide: 5150 - 5875 MHz USA: 5150 - 5850 MHz
Power Supply	24V, 0.2A PoE Adapter (Included)
Power Method	Passive PoE (Pairs 4, 5+; 7, 8 Return)
Processor Specs	Atheros MIPS 74Kc, 533 MHz
Operating Temperature	-40 to 70° C (-40 to 158° F)
Operating Humidity	5 to 95% Noncondensing
Shock and Vibration	ETSI300-019-1.4
ETSI Specification	EN 302 326 DN2
ESD/EMP Protection	± 24 kV Contact / Air
Certifications	FCC, IC, CE

Output Power: 25 dBm							
TX Power Specifications				**RX Power Specifications**			
Modulation	Data Rate	Avg. TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
802.11n/airMAX	MCS0	25 dBm	± 2 dB	**802.11n/airMAX**	MCS0	-97 dBm	± 2 dB
	MCS1	25 dBm	± 2 dB		MCS1	-96 dBm	± 2 dB
	MCS2	25 dBm	± 2 dB		MCS2	-93 dBm	± 2 dB
	MCS3	24 dBm	± 2 dB		MCS3	-91 dBm	± 2 dB
	MCS4	23 dBm	± 2 dB		MCS4	-87 dBm	± 2 dB
	MCS5	22 dBm	± 2 dB		MCS5	-84 dBm	± 2 dB
	MCS6	21 dBm	± 2 dB		MCS6	-78 dBm	± 2 dB
	MCS7	19 dBm	± 2 dB		MCS7	-75 dBm	± 2 dB

Vertical Azimuth



Vertical Elevation

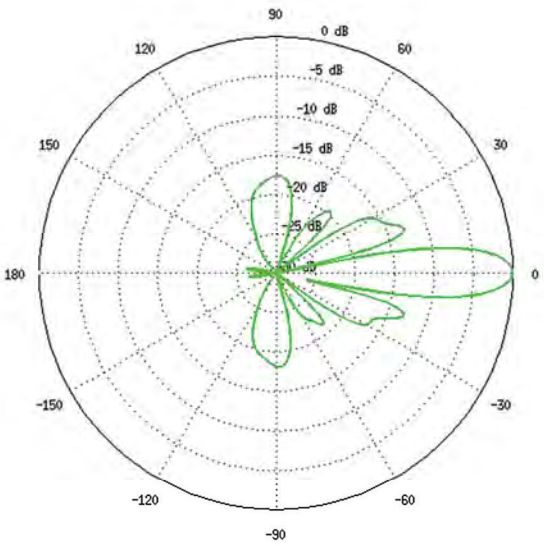


LBE-5AC-23 Specifications

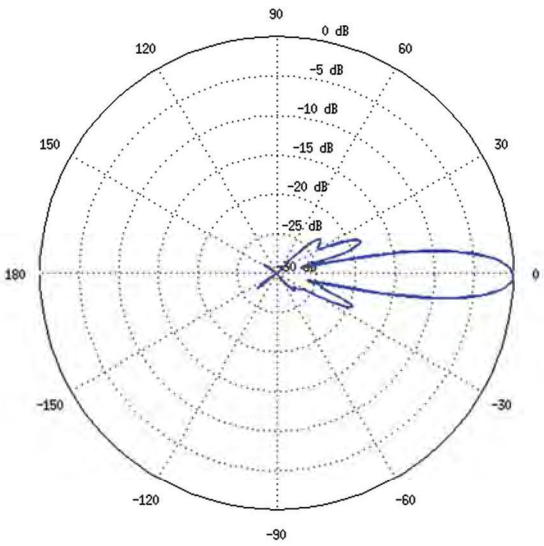
LBE-5AC-23	
Dimensions (No Mount)	362 x 273 x 203 mm (14.25 x 10.75 x 7.99")
Weight (No Mount)	907 g (2.00 lbs)
Mounting Kit	Pole Mounting Kit (Included)
Networking Interface	(1) 10/100/1000 Ethernet Port
Memory	64 MB
Max. Power Consumption	7W
Max. TX Power	24 dBm
Antenna Gain	23 dBi
Operating Frequency	Worldwide: 5150 - 5875 MHz USA: 5150 - 5850 MHz
Power Supply	24V, 0.3A Gigabit PoE Adapter (Included)
Power Method	Passive PoE (Pairs 4, 5+; 7, 8 Return)
Processor Specs	Atheros MIPS 74Kc, 533 MHz
Operating Temperature	-40 to 70° C (-40 to 158° F)
Operating Humidity	5 to 95% Noncondensing
Shock and Vibration	ETSI300-019-1.4
ETSI Specification	EN 302 326 DN2
ESD/EMP Protection	± 24 kV Contact / Air
Certifications	FCC, IC, CE

Output Power: 24 dBm							
TX Power Specifications				**RX Power Specifications**			
Modulation	Data Rate	Avg. TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
airMAX ac	1x BPSK (½)	24 dBm	± 2 dB	**airMAX ac**	1x BPSK (½)	-96 dBm	± 2 dB
	2x QPSK (½)	24 dBm	± 2 dB		2x QPSK (½)	-95 dBm	± 2 dB
	2x QPSK (¾)	24 dBm	± 2 dB		2x QPSK (¾)	-92 dBm	± 2 dB
	4x 16QAM (½)	24 dBm	± 2 dB		4x 16QAM (½)	-90 dBm	± 2 dB
	4x 16QAM (¾)	24 dBm	± 2 dB		4x 16QAM (¾)	-86 dBm	± 2 dB
	6x 64QAM (⅔)	23 dBm	± 2 dB		6x 64QAM (⅔)	-83 dBm	± 2 dB
	6x 64QAM (¾)	22 dBm	± 2 dB		6x 64QAM (¾)	-77 dBm	± 2 dB
	6x 64QAM (⅚)	21 dBm	± 2 dB		6x 64QAM (⅚)	-74 dBm	± 2 dB
	8x 256QAM (¾)	20 dBm	± 2 dB		8x 256QAM (¾)	-69 dBm	± 2 dB
	8x 256QAM (⅚)	19 dBm	± 2 dB		8x 256QAM (⅚)	-65 dBm	± 2 dB

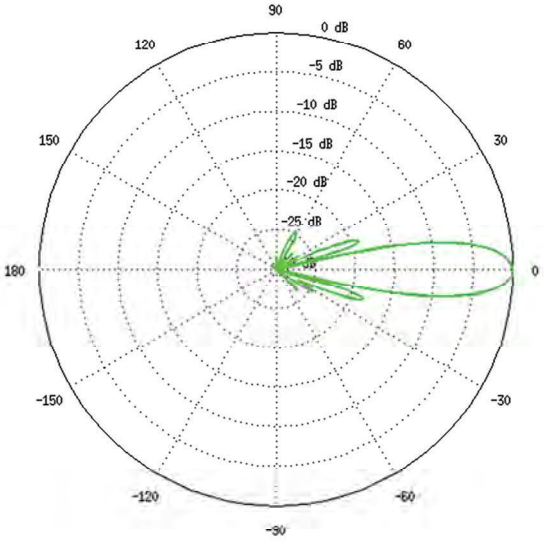
Vertical Azimuth



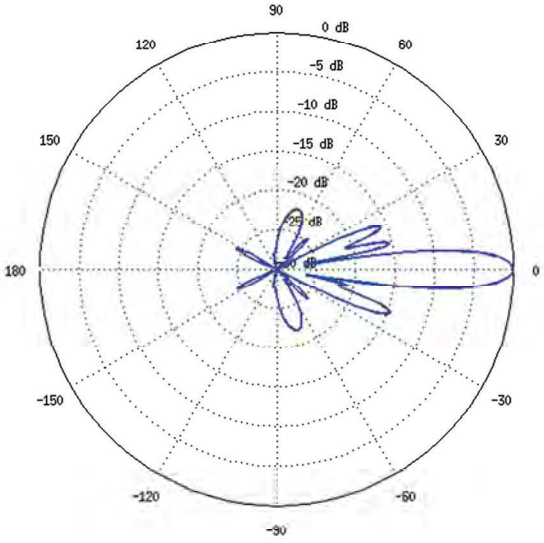
Vertical Elevation



Horizontal Azimuth



Horizontal Elevation



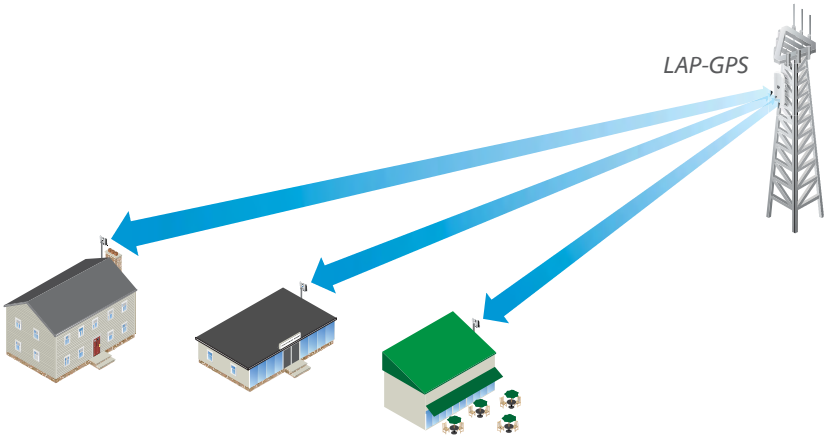
www.ubnt.com

LiteAP ac

Introducing the airMAX® LiteAP™ AC, the latest high-performance access point with disruptive pricing from Ubiquiti Networks. Featuring an ultra-lightweight form factor, the LiteAP AC was designed to be an affordable cost/performance solution for long-distance, wireless broadband bridging. Each of these models operates in the worldwide, license-free 5 GHz frequency range with high-performance speeds.

The LiteAP AC combines proprietary hardware and software technologies to deliver its breakthrough combination of throughput and range with cost-effective value.

Application Examples



In a cost-effective WISP deployment, the LAP-GPS is used as an Access Point in an airMAX ac Point-to-MultiPoint network.

Software

airOS 8

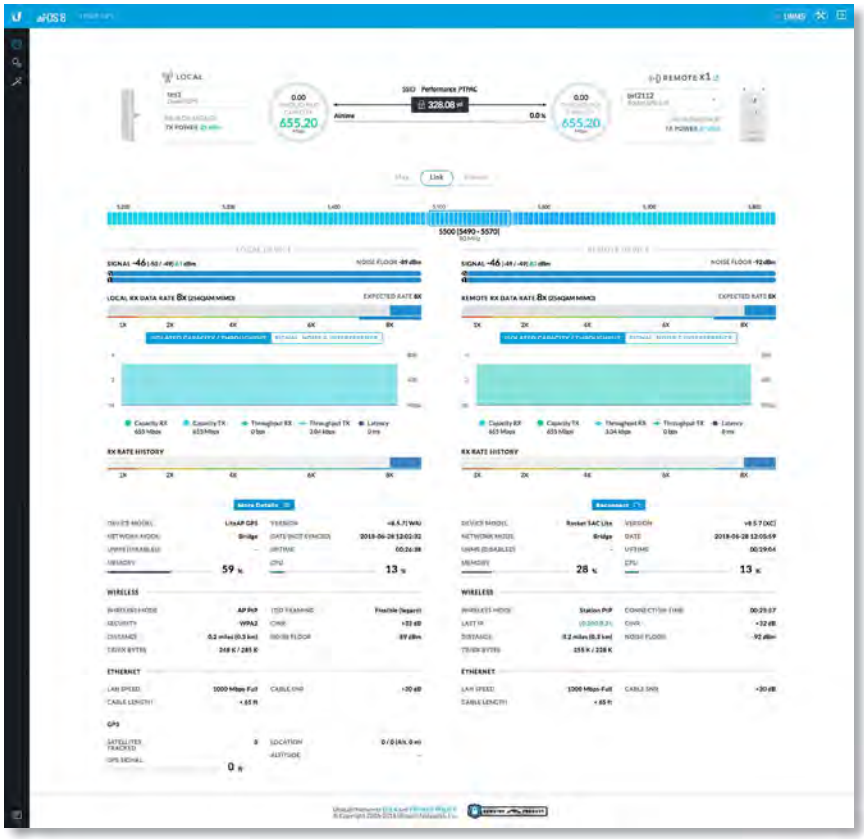
airOS® v8 is the revolutionary operating system for Ubiquiti® airMAX ac products.

Powerful Wireless Features

- Access Point PtMP airMAX Mixed Mode
- airMAX ac Protocol Support
- Long-Range Point-to-Point (PtP) Link Mode
- Selectable Channel Width
  - PtP: 10/20/30/40/50/60/80 MHz
  - PtMP: 10/20/30/40 MHz
- Automatic Channel Selection
- Transmit Power Control: Automatic/Manual
- Automatic Distance Selection (ACK Timing)
- Strongest WPA2 Security

Usability Enhancements

- 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



Hardware Overview

The LiteAP AC delivers up to 450+ Mbps real TCP/IP throughput and features an efficient form factor.

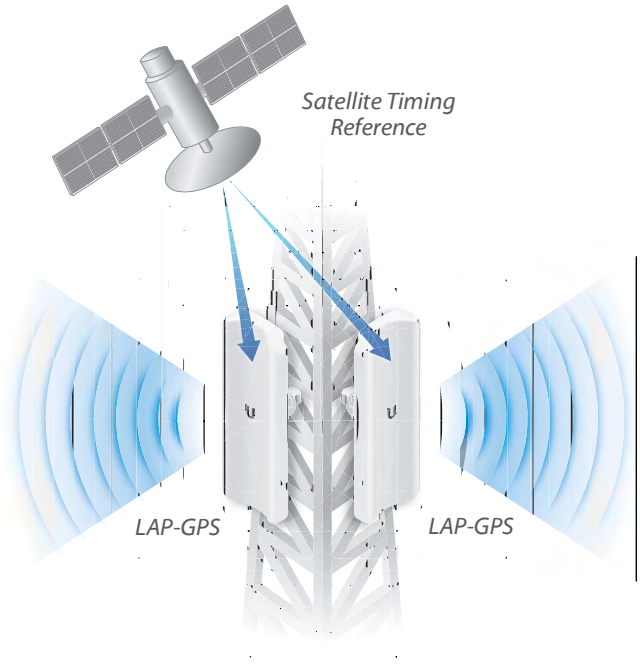
Quick Installation Minimal fasteners simplify installation. No tools are needed; only a single wrench is required for pole-mounting.

Versatile Mounting The ball-joint mount of the LiteAP AC provides adjustment flexibility for versatile mounting options.

Efficient Design The LiteAP AC features a lightweight antenna with an integrated radio in a sleek design.

Gigabit Ethernet The LiteAP AC delivers high throughput over its wired connection.

LAP-120 mounted on a pole



Two LAP-GPS devices transmitting simultaneously

GPS Sync Support

Precise GPS frame synchronization enables co-located LAP-GPS devices to transmit and receive data without interfering with each other, allowing for better frequency reuse and increased network stability.

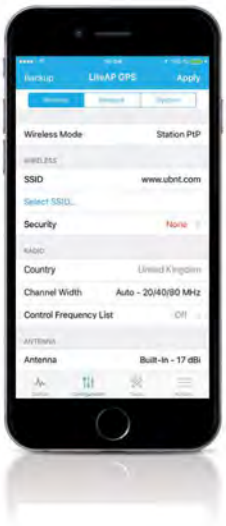
Mobile App Support

The LAP-GPS integrates a separate Wi-Fi radio for fast and easy setup using your mobile device.

Accessing airOS via Wi-Fi

The Ubiquiti Network Management System (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 your device, and offers various configuration options once you're connected or logged in.

* *UNMS app support for the LAP-120 requires the U-Installer, sold separately.*



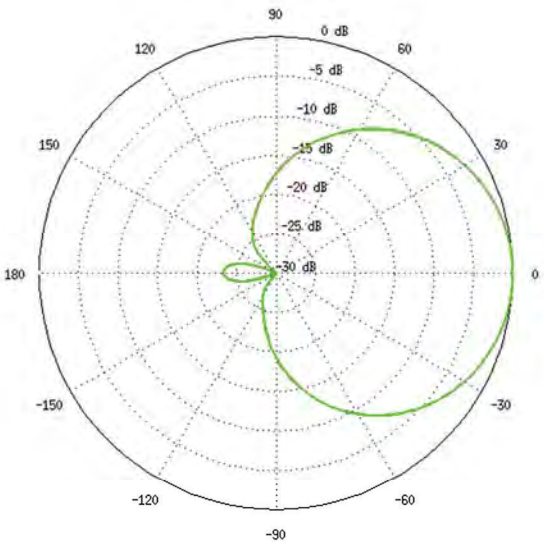
LiteAP ac

LAP-120	
Dimensions (Mount Not Included)	452.3 x 78.7 x 54.4 mm (17.81 x 3.10 x 2.14")
Weight (No Mount)	420 g (14.82 oz)
Mounting Kit	Pole Mounting Kit (Included)
Networking Interface	(1) 10/100/1000 Ethernet Port
Memory	64 MB
Max. Power Consumption	7W
Max. TX Power	25 dBm
Antenna Gain	16 dBi
Power Supply	24V, 0.5A Gigabit PoE Adapter (Included)
Power Method	Passive PoE (Pairs 4, 5+; 7, 8 Return)
Processor Specs	Atheros MIPS 74Kc, 533 MHz
Shock and Vibration	ETSI300-019-1.4
ETSI Specification	EN 302 326 DN2
ESD/EMP Protection	± 24 kV Contact / Air
RoHS Compliance	Yes
Operating Temperature	-40 to 70° C (-40 to 158° F)
Operating Humidity	5 to 95% Noncondensing
Certifications	FCC, IC, CE

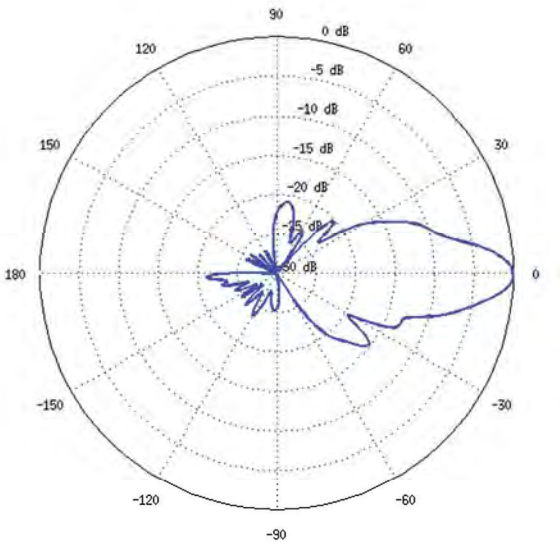
Output Power: 25 dBm							
TX Power Specifications				**RX Power Specifications**			
Modulation	Data Rate	Avg. TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
airMAX ac	1x BPSK (½)	25 dBm	± 2 dB	**airMAX ac**	1x BPSK (½)	-96 dBm	± 2 dB
	2x QPSK (½)	25 dBm	± 2 dB		2x QPSK (½)	-95 dBm	± 2 dB
	2x QPSK (¾)	25 dBm	± 2 dB		2x QPSK (¾)	-92 dBm	± 2 dB
	4x 16QAM (½)	25 dBm	± 2 dB		4x 16QAM (½)	-90 dBm	± 2 dB
	4x 16QAM (¾)	25 dBm	± 2 dB		4x 16QAM (¾)	-86 dBm	± 2 dB
	6x 64QAM (⅔)	25 dBm	± 2 dB		6x 64QAM (⅔)	-83 dBm	± 2 dB
	6x 64QAM (¾)	24 dBm	± 2 dB		6x 64QAM (¾)	-77 dBm	± 2 dB
	6x 64QAM (⅚)	23 dBm	± 2 dB		6x 64QAM (⅚)	-74 dBm	± 2 dB
	8x 256QAM (¾)	21 dBm	± 2 dB		8x 256QAM (¾)	-69 dBm	± 2 dB
	8x 256QAM (⅚)	21 dBm	± 2 dB		8x 256QAM (⅚)	-65 dBm	± 2 dB

Operating Frequency (MHz)	
Worldwide	5150 - 5875
USA	5150 - 5850

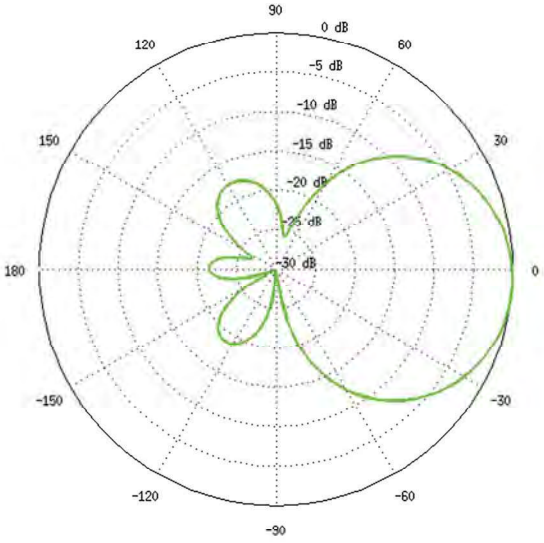
Vertical Azimuth



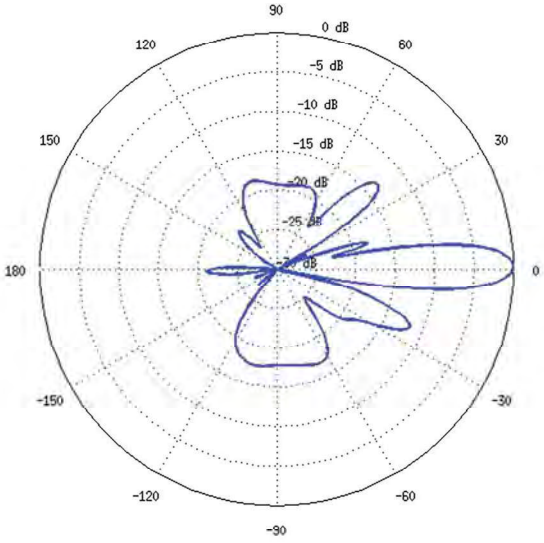
Vertical Elevation



Horizontal Azimuth



Horizontal Elevation



LiteAP GPS

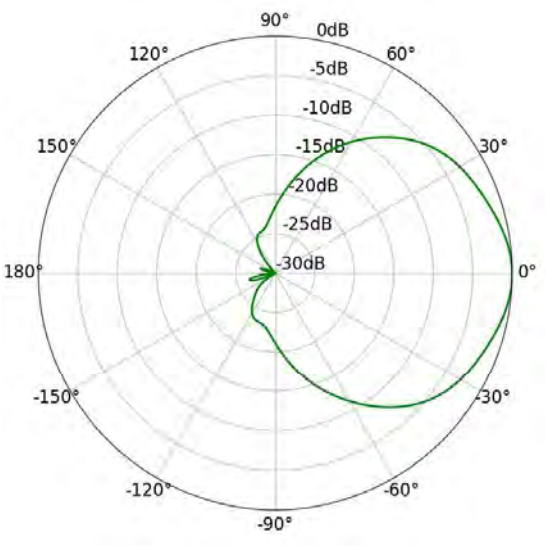
LAP-GPS	
Dimensions (Mount Not Included)	360.98 x 124.57 x 71.28 mm (14.21 x 4.90 x 2.81")
Weight (No Mount)	752 g (1.66 lb)
Mounting Kit	Pole Mounting Kit (Included)
Networking Interface	(1) 10/100/1000 Ethernet Port
Memory	DDR2 64 MB
Max. Power Consumption	7.1W
Max. TX Power	25 dBm
Antenna Gain	17 dBi
Power Supply	24V, 0.3A PoE Adapter (Included)
Power Method	Passive PoE (Pairs 4, 5+; 7, 8 Return)
Processor Specs	Atheros MIPS 74Kc, 533 MHz
Shock and Vibration	ETSI300-019-1.4
ETSI Specification	EN 302 326 DN2
ESD/EMP Protection	± 24 kV Contact / Air
RoHS Compliance	Yes
Operating Temperature	-40 to 70° C (-40 to 158° F)
Operating Humidity	5 to 95% Noncondensing
Certifications	FCC, IC, CE

Output Power: 25 dBm							
TX Power Specifications				**RX Power Specifications**			
Modulation	Data Rate	Avg. TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
airMAX ac	1x BPSK (½)	25 dBm	± 2 dB	airMAX ac	1x BPSK (½)	-96 dBm	± 2 dB
	2x QPSK (½)	25 dBm	± 2 dB		2x QPSK (½)	-95 dBm	± 2 dB
	2x QPSK (¾)	25 dBm	± 2 dB		2x QPSK (¾)	-92 dBm	± 2 dB
	4x 16QAM (½)	25 dBm	± 2 dB		4x 16QAM (½)	-90 dBm	± 2 dB
	4x 16QAM (¾)	25 dBm	± 2 dB		4x 16QAM (¾)	-86 dBm	± 2 dB
	6x 64QAM (⅔)	25 dBm	± 2 dB		6x 64QAM (⅔)	-83 dBm	± 2 dB
	6x 64QAM (¾)	24 dBm	± 2 dB		6x 64QAM (¾)	-77 dBm	± 2 dB
	6x 64QAM (⅚)	23 dBm	± 2 dB		6x 64QAM (⅚)	-74 dBm	± 2 dB
	8x 256QAM (¾)	21 dBm	± 2 dB		8x 256QAM (¾)	-69 dBm	± 2 dB
	8x 256QAM (⅚)	21 dBm	± 2 dB		8x 256QAM (⅚)	-65 dBm	± 2 dB

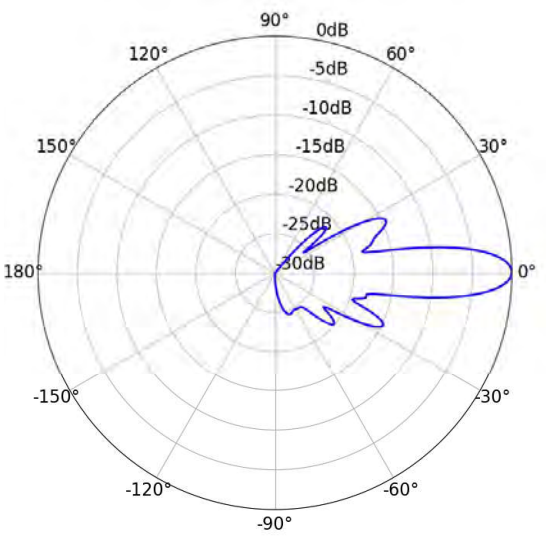
Operating Frequency (MHz)		
Worldwide	5150 - 5875	
USA	U-NII-1 5150 - 5250	U-NII-3 5725 - 5850

Management Radio (MHz)	
Worldwide	2412 - 2472
USA	2412 - 2462

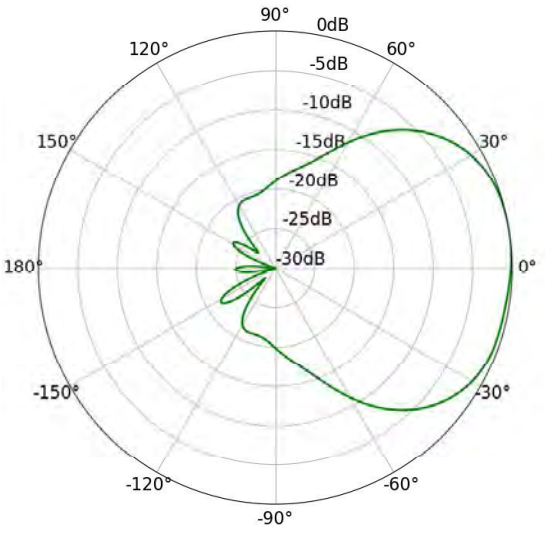
Vertical Azimuth



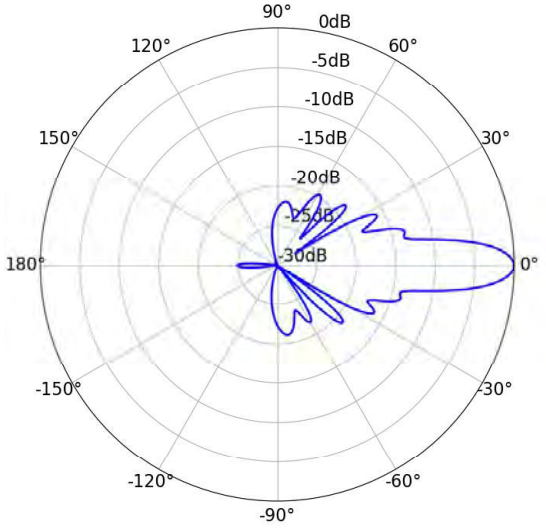
Vertical Elevation



Horizontal Azimuth



Horizontal Elevation



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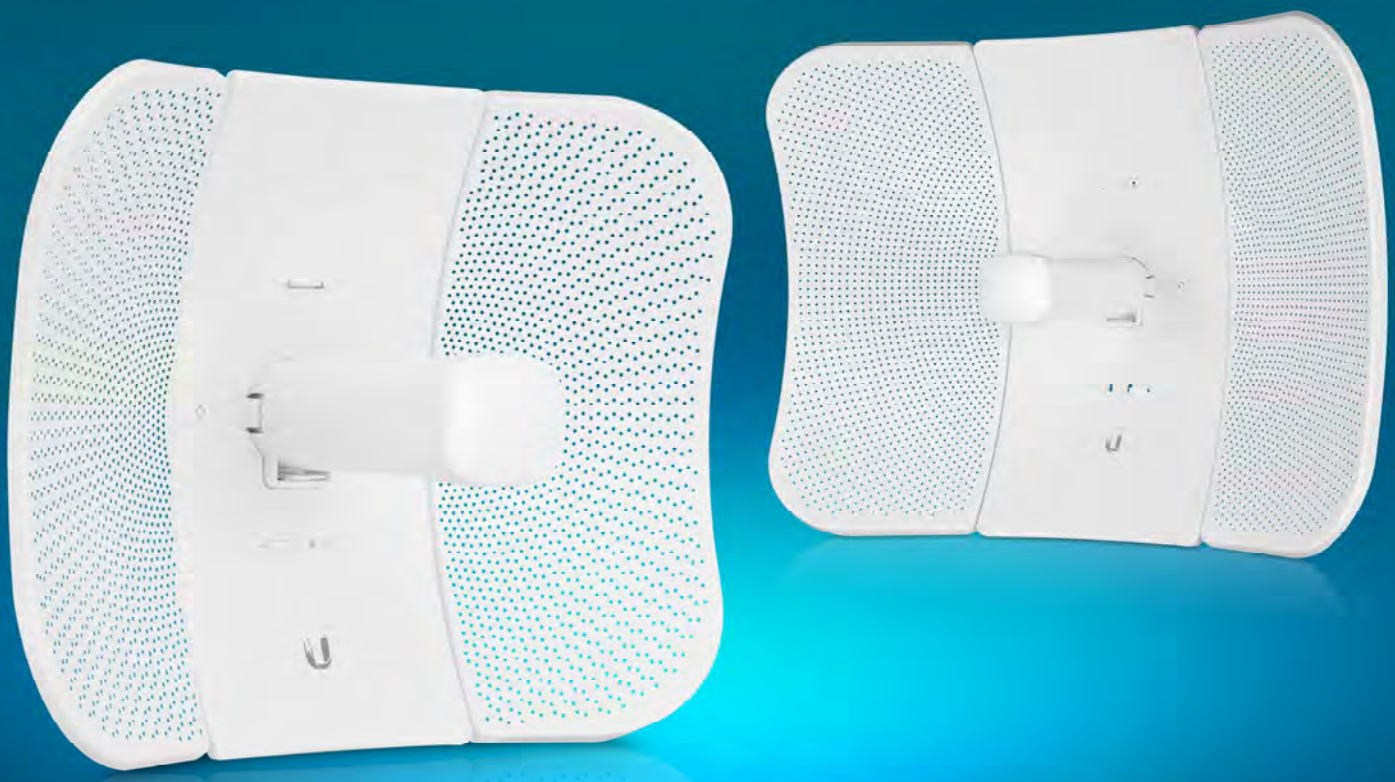
DATASHEET



LiteBeam® AC GEN2

airMAX® ac CPE with Dedicated Management Radio

Model: LBE-5AC-Gen2, LBE-5AC-LR

Lightweight, Low-Cost Solution

Full Adjustment Flexibility

Quick Assembly and Installation

UBIQUITI® NETWORKS

Overview

Ubiquiti Networks launches the latest generation of airMAX® CPE (Customer Premises Equipment), the LiteBeam® 5AC Gen 2, with dedicated Wi-Fi management.

Improved Noise Immunity

The LiteBeam 5AC Gen 2 directs RF energy in a tighter beamwidth. With the focus in one direction, the LiteBeam 5AC Gen 2 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.

Innovative 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.

Featuring high performance and innovative mechanical design, the LiteBeam 5AC Gen 2 is versatile and cost-effective to deploy.

Software

airOS®8

airOS® v8 is the revolutionary operating system for Ubiquiti® airMAX ac products.

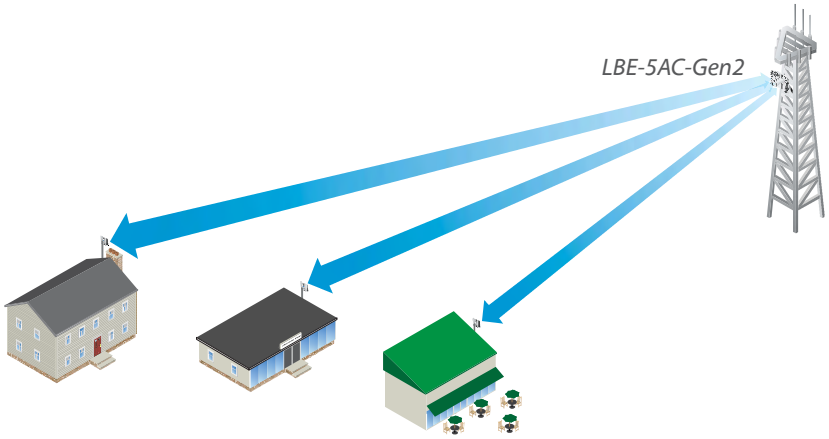
Powerful Wireless Features

- Access Point PtMP airMAX Mixed Mode
- airMAX ac Protocol Support
- Long-Range Point-to-Point (PtP) Link Mode
- Selectable Channel Width
  - PtP: 10/20/30/40/50/60/80 MHz
  - PtMP: 10/20/30/40 MHz
- Automatic Channel Selection
- Transmit Power Control: Automatic/Manual
- Automatic Distance Selection (ACK Timing)
- Strongest WPA2 Security

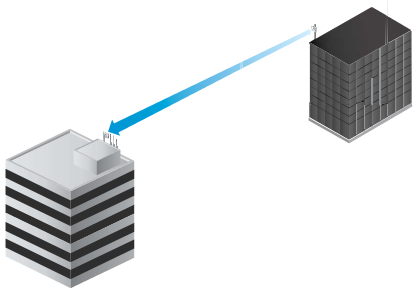
Usability Enhancements

- 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

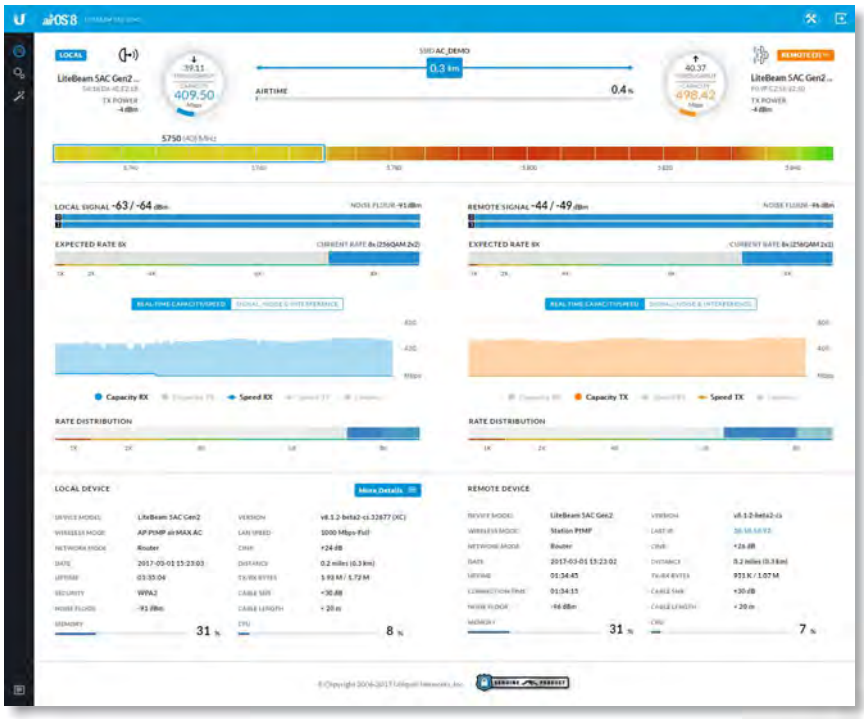
Application Examples



LiteBeam as a cost-effective WISP deployment in an airMAX ac Point-to-MultiPoint network.



A LiteBeam on each side of a Point-to-Point link.



UNMS App

The LiteBeam 5AC Gen 2 integrates a separate Wi-Fi radio for fast and easy setup using your mobile device.

Accessing airOS via Wi-Fi

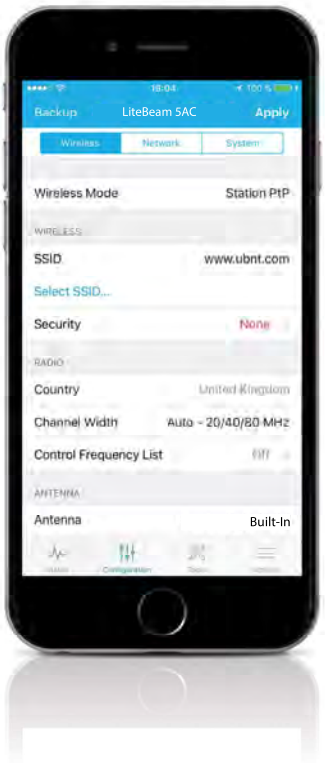
The UNMS™ app provides instant accessibility to the airOS configuration interface and can be downloaded from the App Store (iOS) or Google Play™ (Android). UNMS allows you to set up, configure, and manage the LiteBeam 5AC Gen 2. It offers the following options once you're connected or logged in to the device:

Status Check link status information or the basic configuration settings of the LiteBeam 5AC Gen 2.

Configuration Change or update the existing configuration of the LiteBeam 5AC Gen 2.

Tools Access tools for initial installation and configuration of the LiteBeam 5AC Gen 2.

Actions Back up or update the configuration, upload new firmware, reboot the device, reset the device to factory defaults, access the airOS UI in the web browser, or disconnect from the LiteBeam 5AC Gen 2.



Models

The LiteBeam 5AC Gen 2 offers quick and easy alignment and enhanced protection against power surges. There are two models available:

LiteBeam® AC GEN2

Model: LBE-5AC-Gen2

The LBE-5AC-Gen2 features a robust mount with separate azimuth and elevation adjustments.

LiteBeam® AC LR

Model: LBE-5AC-LR

Designed for long-range applications, the LBE-5AC-LR features a larger reflector size and elevation adjustment (azimuth is adjusted by rotation around the pole).

Specifications

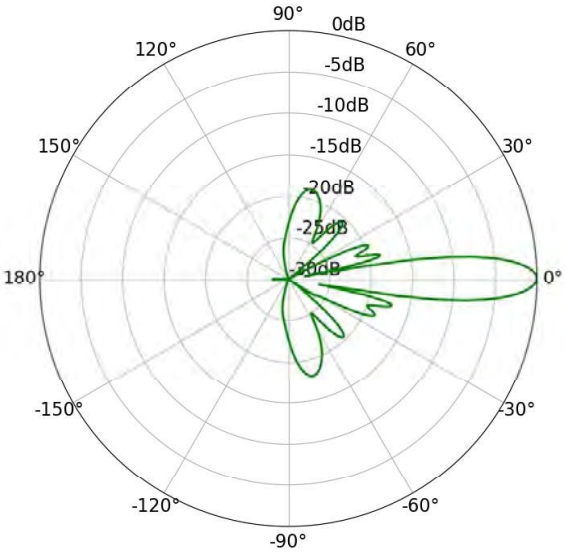
LBE-5AC-Gen2		
Dimensions	358 x 271.95 x 272.5 mm (14.09 x 10.71 x 10.73")	
Weight Without Mount With Mount	 800 g (1.76 lb) 980 g (2.16 lb)	
Power Supply	24V, 0.3A Gigabit PoE Adapter (Included)	
Max. Power Consumption	7W	
Power Method	Passive PoE (Pairs 4, 5+; 7, 8 Return)	
Supported Voltage Range	24V ± 10%	
Gain	23 dBi	
Networking Interface	(1) 10/100/1000 Ethernet Port	
Processor Specs	MIPS 74Kc	
Memory	64 MB DDR2	
LEDs	Power, Ethernet	
Channel Sizes	PtP Mode	PtMP Mode
	10/20/30/40/50/60/80 MHz	10/20/30/40 MHz
Enclosure Characteristics	Reflector (SGCC 0.6T) / Plastic: PC	
Mounting	Pole-Mounting Kit (Included)	
Wind Loading	275 N @ 200 km/h (61.8 lbf @ 125 mph)	
Wind Survivability	200 km/h (125 mph)	
ESD/EMP Protection	± 24 kV Contact / Air	
Operating Temperature	-40 to 70° C (-40 to 158° F)	
Operating Humidity	5 to 95% Noncondensing	
Certifications	CE, FCC, IC	

Operating Frequency (MHz)				
Worldwide	5150 - 5875			
US/CA	U-NII-1: 5150 - 5250	U-NII-2A: 5250 - 5350 MHz	U-NII-2C: 5470 - 5725 MHz	U-NII-3: 5725 - 5850

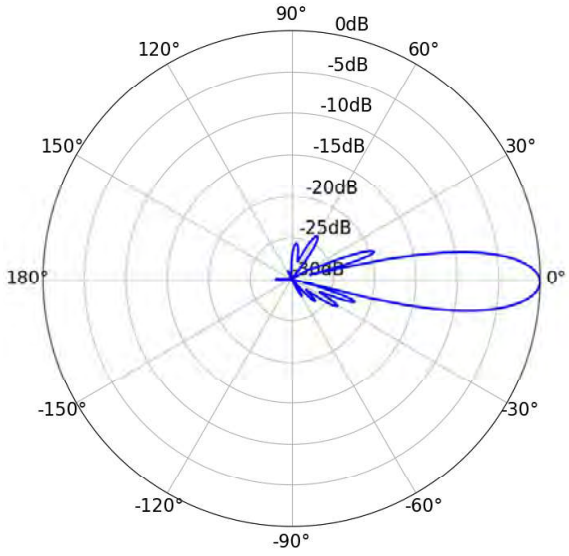
Management Radio (MHz)	
Worldwide	2412 - 2472
US/CA	2412 - 2462

LBE-5AC-Gen2 Output Power: 25 dBm							
TX Power Specifications				**RX Power Specifications**			
Modulation	Data Rate	Avg. TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
airMAX ac	1x BPSK (½)	25 dBm	± 2 dB	**airMAX ac**	1x BPSK (½)	-96 dBm Min.	± 2 dB
	2x QPSK (½)	25 dBm	± 2 dB		2x QPSK (½)	-95 dBm	± 2 dB
	2x QPSK (¾)	25 dBm	± 2 dB		2x QPSK (¾)	-92 dBm	± 2 dB
	4x 16QAM (½)	25 dBm	± 2 dB		4x 16QAM (½)	-90 dBm	± 2 dB
	4x 16QAM (¾)	25 dBm	± 2 dB		4x 16QAM (¾)	-86 dBm	± 2 dB
	6x 64QAM (⅔)	25 dBm	± 2 dB		6x 64QAM (⅔)	-83 dBm	± 2 dB
	6x 64QAM (¾)	24 dBm	± 2 dB		6x 64QAM (¾)	-77 dBm	± 2 dB
	6x 64QAM (⅚)	23 dBm	± 2 dB		6x 64QAM (⅚)	-74 dBm	± 2 dB
	8x 256QAM (¾)	21 dBm	± 2 dB		8x 256QAM (¾)	-69 dBm	± 2 dB
	8x 256QAM (⅚)	21 dBm	± 2 dB		8x 256QAM (⅚)	-65 dBm	± 2 dB

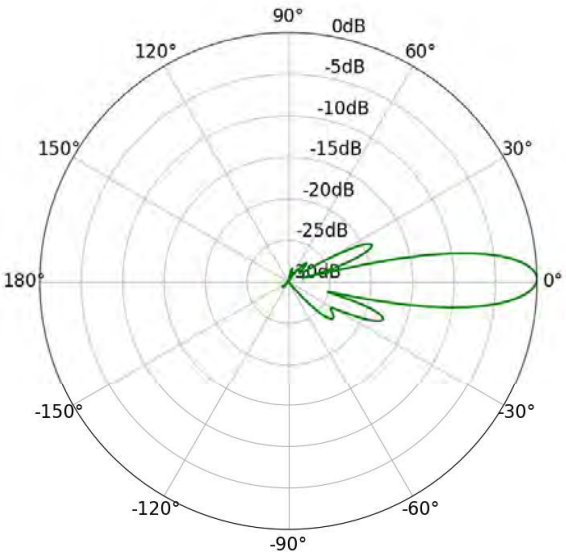
Vertical Azimuth



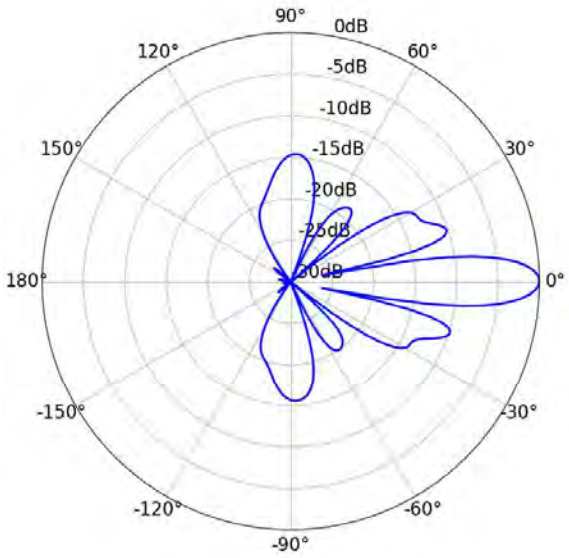
Vertical Elevation



Horizontal Azimuth



Horizontal Elevation



Specifications

LBE-5AC-LR		
Dimensions	512.5 x 385.75 x 258.3 mm (20.18 x 15.19 x 10.17")	
Weight Without Mount With Mount	 1.360 kg (2.998 lb) 1.735 kg (3.825 lb)	
Power Supply	24V, 0.3A Gigabit PoE Adapter (Included)	
Max. Power Consumption	7W	
Power Method	Passive PoE (Pairs 4, 5+; 7, 8 Return)	
Supported Voltage Range	24V ± 10%	
Gain	26 dBi	
Networking Interface	(1) 10/100/1000 Ethernet Port	
Processor Specs	MIPS 74Kc	
Memory	64 MB DDR2	
LEDs	Power, Ethernet	
Channel Sizes	PtP Mode	PtMP Mode
	10/20/30/40/50/60/80 MHz	10/20/30/40 MHz
Enclosure Characteristics	Reflector (Aluminum) / Plastic: PC	
Mounting	Pole-Mounting Kit (Included)	
Wind Loading	550 N @ 200 km/h (123.6 lbf @ 125 mph)	
Wind Survivability	200 km/h (125 mph)	
ESD/EMP Protection	± 24 kV Contact / Air	
Operating Temperature	-40 to 70° C (-40 to 158° F)	
Operating Humidity	5 to 95% Noncondensing	
Certifications	CE, FCC, IC	

Operating Frequency (MHz)				
Worldwide	5150 - 5875			
US/CA	U-NII-1: 5150 - 5250	U-NII-2A: 5250 - 5350 MHz	U-NII-2C: 5470 - 5725 MHz	U-NII-3: 5725 - 5850

Management Radio (MHz)	
Worldwide	2412 - 2472
US/CA	2412 - 2462

LBE-5AC-LR Output Power: 25 dBm							
TX Power Specifications				**RX Power Specifications**			
Modulation	Data Rate	Avg. TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
airMAX ac	1x BPSK (½)	25 dBm	± 2 dB	**airMAX ac**	1x BPSK (½)	-96 dBm Min.	± 2 dB
	2x QPSK (½)	25 dBm	± 2 dB		2x QPSK (½)	-95 dBm	± 2 dB
	2x QPSK (¾)	25 dBm	± 2 dB		2x QPSK (¾)	-92 dBm	± 2 dB
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	6x 64QAM (¾)	24 dBm	± 2 dB		6x 64QAM (¾)	-77 dBm	± 2 dB
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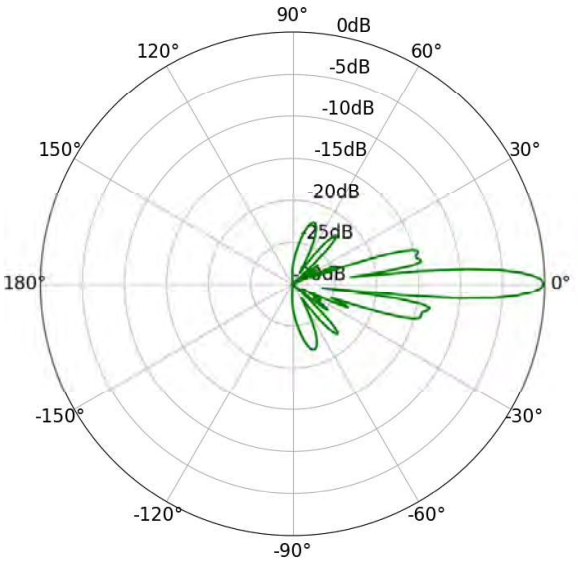
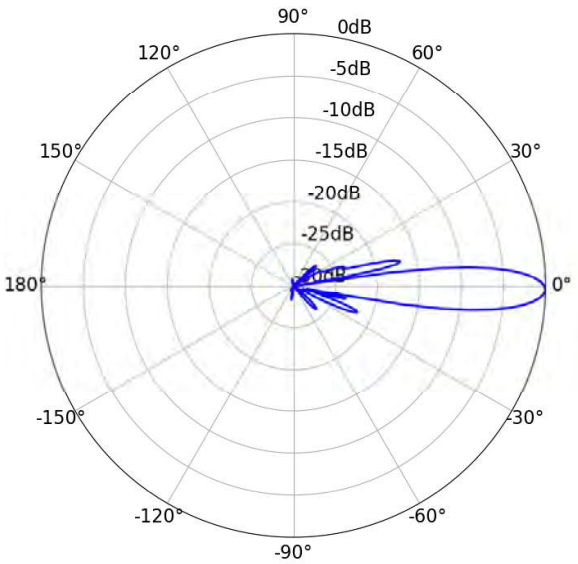
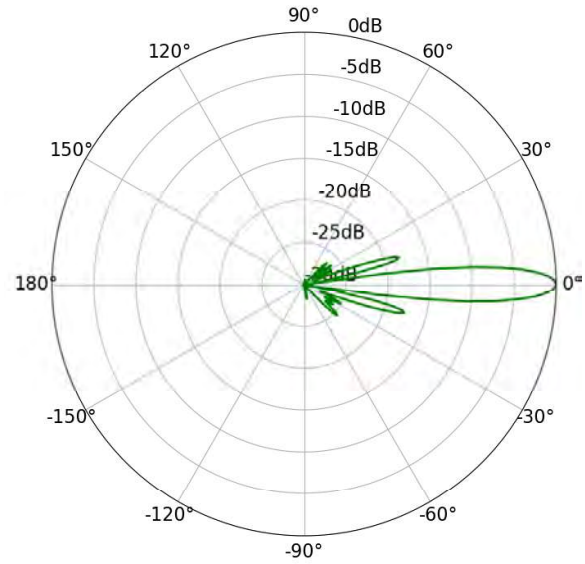
Vertical Azimuth



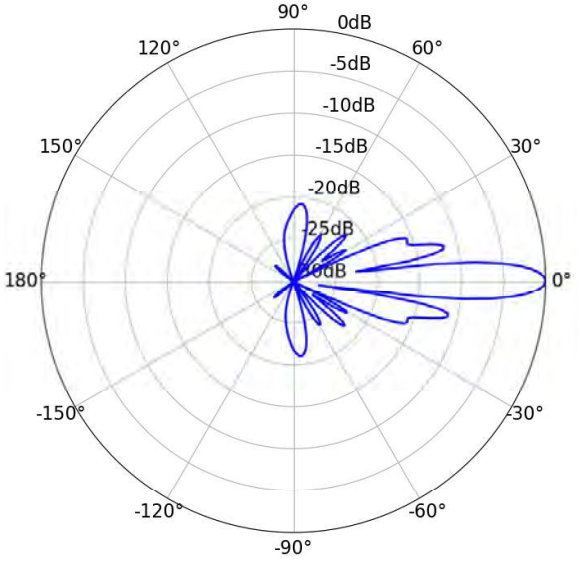
Vertical Elevation



Horizontal Azimuth



Horizontal Elevation



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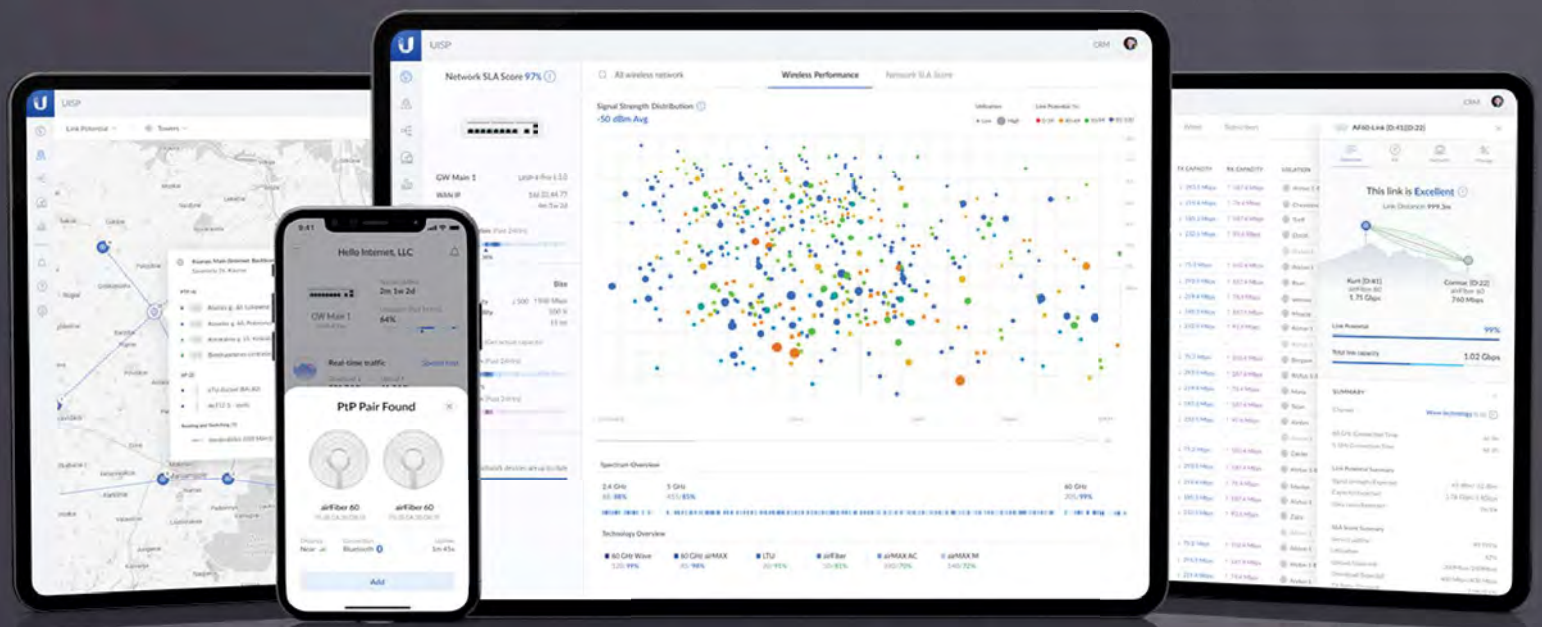
airFiber® 60 LR

Datasheet
AF60-LR

UISP



airFiber 60 LR

60 GHz point-to-point (PtP) radio system with a 1.9 Gbps maximum throughput rate and a 12+ kilometer link range.

The airFiber 60 GHz Long-range Radio (AF60 LR) is a PtP system that uses Wave Technology to establish long-distance, true-duplex Gigabit links. Equipped with a high-gain dish antenna, the AF60 LR can reach a 1.9 Gbps maximum throughput rate and sustain its links over 12 km. It also has a dedicated Bluetooth management radio so it can be set up quickly and fully configured with the UISP® application (web/mobile). It can also be seamlessly integrated into an existing deployment with Ubiquiti's dedicated link planning platform and tracked from anywhere with its built-in GPS antenna.

Mechanical

Dimensions	Ø413 x 360 mm (Ø16.3 x 14.2")
Weight	Without mount: 1.5 kg (3.3 lb) With mount: 2.7 kg (6 lb)
Enclosure materials	Aluminum, UV stabilized polycarbonate
Mount material	Galvanized steel
Mounting	Precision Alignment Kit (included) Pole compatibility: Ø25.4-76.2 mm (Ø1-3")
Wind loading	420 N at 200 km/h (94.4 lbf at 125 mph)

Hardware

Processor	Quad-Core ARM® Cortex® A7
Memory	256 MB DDR3
Networking interface	GbE RJ45 port
RF connections	Internal
Max. power consumption	18W
Power method	Passive PoE 4-pairs (1, 2+; 3, 6-) (4, 5+; 7, 8-) or 2-pairs (4, 5+; 7, 8-)
Power supply	48VDC, 0.65A gigabit PoE adapter (included)
Supported voltage range	48VDC ± 10%
ESD/EMP protection	Air/contact: ± 24kV
Operating temperature	-40 to 60° C (-40 to 140° F)
Operating humidity	5 to 95% noncondensing
Certifications	FCC, IC, CE

LEDs

Power	Flashing white: bootup in progress White: not connected to UISP™ console Blue: connected to UISP console
Ethernet	Flashing blue: ethernet activity
GPS	Blue: receiving at least (4) GPS satellite signals
60G	Blue: active connection

Software

OS	airOS®
Operating mode	PtP only
Ubiquiti specific features	Integrated 60 GHz radio, discovery protocol, Wave technology
Network	Bridge mode
Services	UISP, ping watchdog, NTP client, device discovery
Tools	Antenna alignment, discovery utility, ping, trace route, speed test
Software management	Bluetooth management for easy setup over UISP app WEB UI
Minimum software requirements	Any modern WEB browser/iOS or Android based smartphone

System

Maximum throughput	1.95 Gbps
Maximum range	12+ km
Encryption	WPA2-PSK (AES)

RF

Operating Frequency*	57~71 GHz *Depends on regulatory region.
GPS	Yes
Channel Bandwidth	2160, 1080 MHz

TECHNOLOGY DATASHEET

UBIQUITI NETWORKS

AIRMAX TDMA SYSTEM

- Schedule Time Slots to Eliminate Collisions
- Maximize Airtime Efficiency
- Assign Priority Access for Voice and Video

Optimize Wireless Performance for Outdoor Installations

Ubiquiti Networks™ introduced the airMAX® platform to out-perform traditional, 802.11 Wi-Fi based, Point-to-MultiPoint (PtMP), outdoor networks. The core of the airMAX platform is the Ubiquiti TDMA (Time Division Multiple Access) protocol, which provides high performance, capacity, and scalability for high-speed, carrier-class links. The TDMA protocol dynamically allocates time to active clients and provides greater noise immunity performance when compared to the conventional 802.11 CSMA/CA (Carrier Sense Multiple Access / Collision Avoidance) protocol.

The CSMA/CA protocol was designed for use in indoor applications; wireless devices can sense each other and coordinate wireless access. However, in outdoor environments, wireless devices called stations use highly directional antennas to connect to the AP (Access Point) from distances that can span several kilometers. Because the stations cannot sense each other, they become "hidden nodes" and cannot coordinate access to the wireless channel. Thus the AP experiences frequent collisions from stations transmitting simultaneously. As the network scales, these collisions build up exponentially, increasing latency and lowering throughput.

Schedule Time Slots to Eliminate Collisions

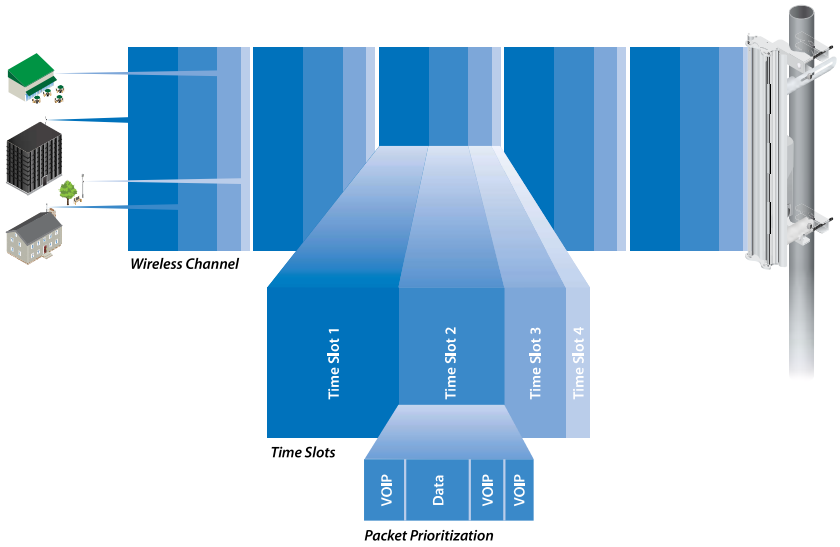
Designed for outdoor applications, the TDMA protocol solves the "hidden-node" problem. The AP divides the wireless channel into time slots and assigns a pre-determined time slot to each connected station. This essentially removes the possibility of stations transmitting at the same time, thus eliminating receive collisions at the AP.

Maximize Airtime Efficiency

The TDMA protocol keeps track of which stations are active and splits up the available airtime to those stations. For example, idle stations may have dedicated time on the AP and not use it; the TDMA protocol redistributes the dedicated time to active stations so that airtime is not wasted.

Assign Priority Access for Voice and Video

The AP can control the scheduling of the time slots so that it can give priority access to stations in a voice or video session. It does this automatically with no configuration necessary on the clients themselves. Intelligent QoS (Quality of Service) priority for voice and video ensures seamless streaming with lower latency.



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

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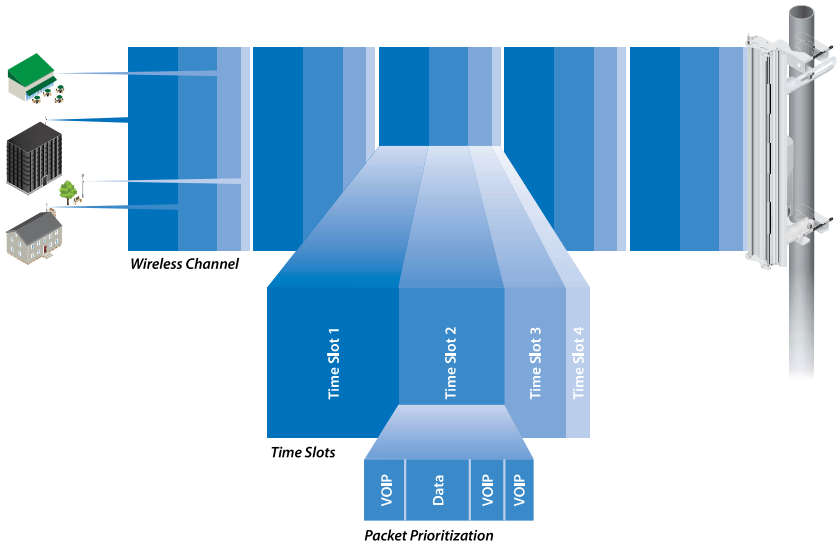

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