rocket®5AC
PRISM

airMAX® ac BaseStation
with airPrism® Technology

Model: R5AC-PRISM

Worldwide, Full-Band 5 GHz Coverage

airMAX ac Technology for up to 500+ Mbps Throughput

Revolutionary airPrism Active RF Filtering Technology

UBIQUITI®
N E T W O R K S

Overview

Ubiquiti Networks has designed airMAX ac radios with high performance and ease of installation in mind. The Rocket®5ac Prism features both airMAX ac and airPrism technologies for maximum wireless performance in high-density areas.

Pair the Rocket ac with airMAX ac antennas for optimal performance:

- **PtP backhaul** RocketDish™ ac Antenna
- **PtMP links** airMAX ac Sector

Worldwide 5 GHz Coverage

Deploy the Rocket5ac Prism anywhere in the world. It delivers complete coverage of the 5 GHz spectrum with a single radio. The Rocket5ac Prism allows for flexibility in configuring channel bandwidths (subject to local country regulations).

Software

Sporting an all-new design for improved usability, airOS® v7 is the revolutionary operating system for Ubiquiti® airMAX ac products.
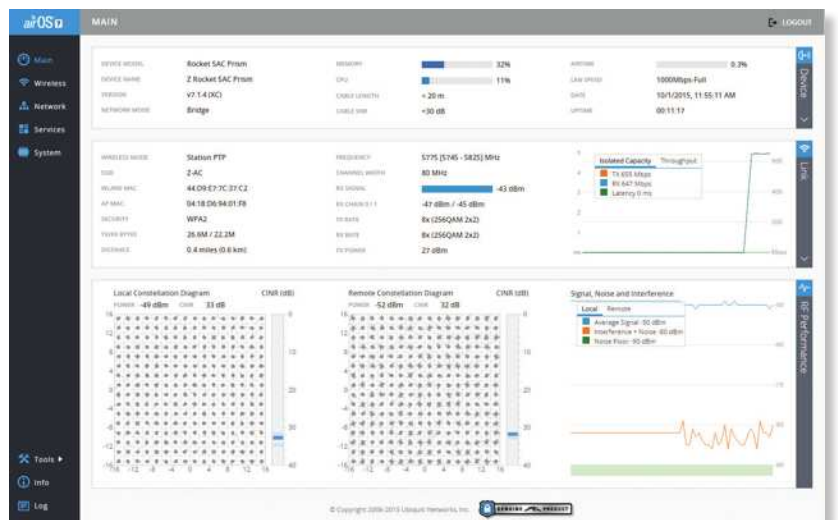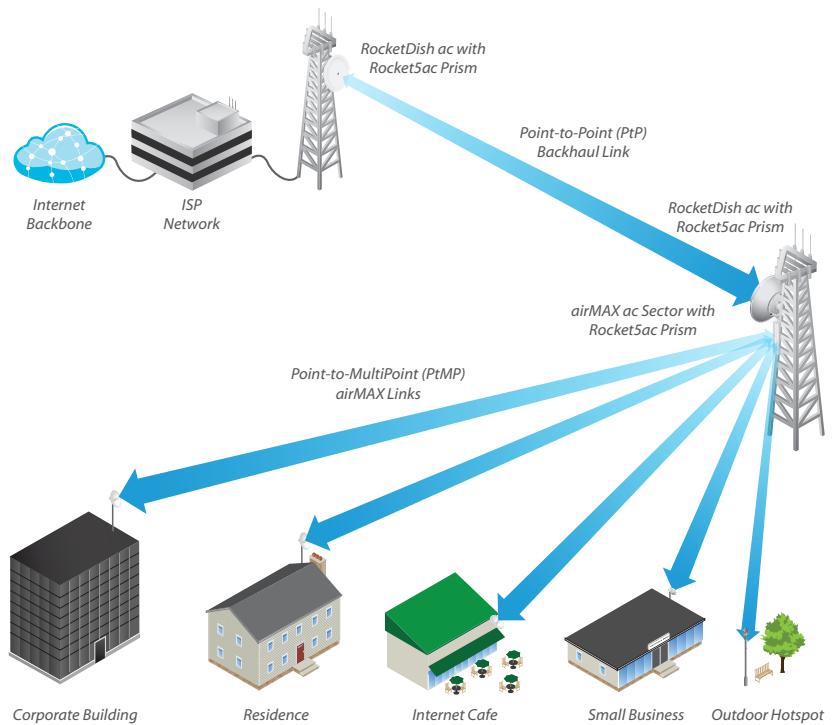
Powerful Wireless Features

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

Usability Enhancements

- Dynamic Configuration Changes
- Instant Input Validation
- HTML5 Technology
- Optimization for Mobile Devices
- Detailed Device Statistics
- Diagnostic Tools, including Ethernet Cabling Test, RF Diagnostics, and airView® Spectrum Analyzer

Application Example

Internet Backbone

ISP Network

RocketDish ac with Rocket5ac Prism

Point-to-Point (PtP) Backhaul Link

RocketDish ac with Rocket5ac Prism

airMAX ac Sector with Rocket5ac Prism

Point-to-MultiPoint (PtMP) airMAX Links

Corporate Building

Residence

Internet Cafe

Small Business

Outdoor Hotspot

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 5 GHz spectrum and every received symbol to provide you with the most advanced RF analytics in the industry.

Data from the spectrum analysis and RF performance monitoring is displayed on the *Main* tab and airView Spectrum Analyzer.

Real-Time Reporting

The *Main* tab displays the following RF information:

- Persistent RF Error Vector Magnitude (EVM) constellation diagrams
- Carrier to Interference-plus-Noise Ratio (CINR) histograms
- Signal-to-Noise Ratio (SNR) time series plots

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

airView runs in the background without disabling the wireless link, so there is no disruption to the network.

In airView, there are three spectral views, each of which represents different data.

- **Waterfall** Aggregate energy collected for each frequency
- **Waveform** Aggregate energy collected
- **Ambient Noise Level** Background noise energy shown as a function of frequency

airView provides powerful spectrum analyzer functionality, eliminating the need to rent or purchase additional equipment for conducting site surveys.
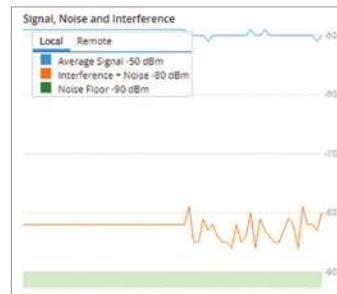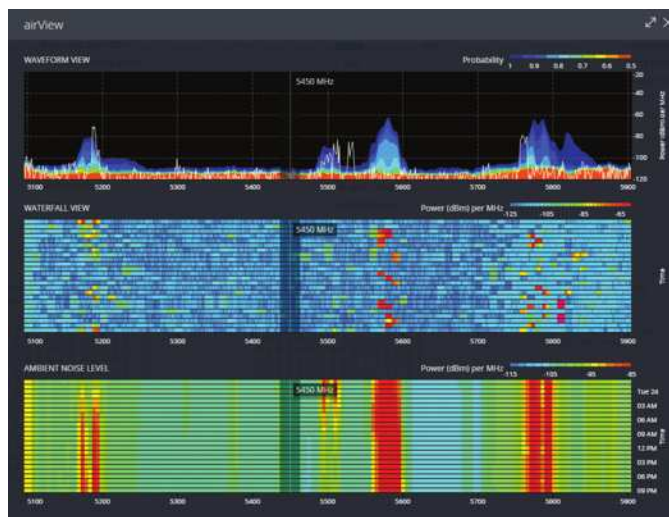
Multi-Radio Architecture
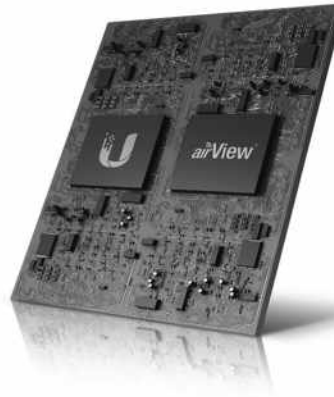
Constellation Diagrams and CINR Histograms
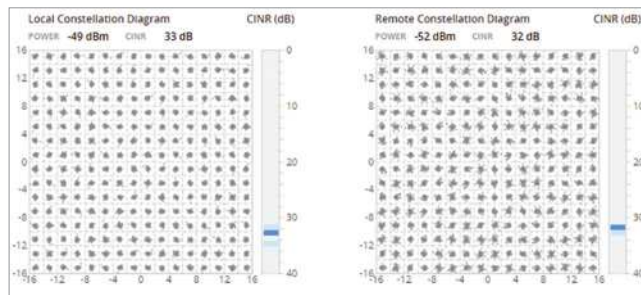
SNR Time Series Plots

Dedicated Spectral Analysis

Rock**et**® 5AC PRISM

Technology

airMAX® ac

Unlike standard Wi-Fi protocol, Ubiquiti's Time Division Multiple Access (TDMA) airMAX ac 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 ac 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, airMAX ac products supports up to 500+ Mbps* (maximum 80 MHz channel width) real TCP/IP throughput – up to triple the throughput of standard airMAX products.
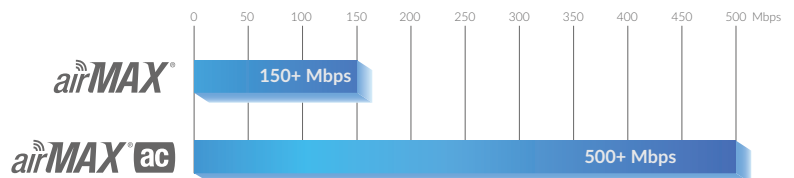
airMAX ac TDMA Technology
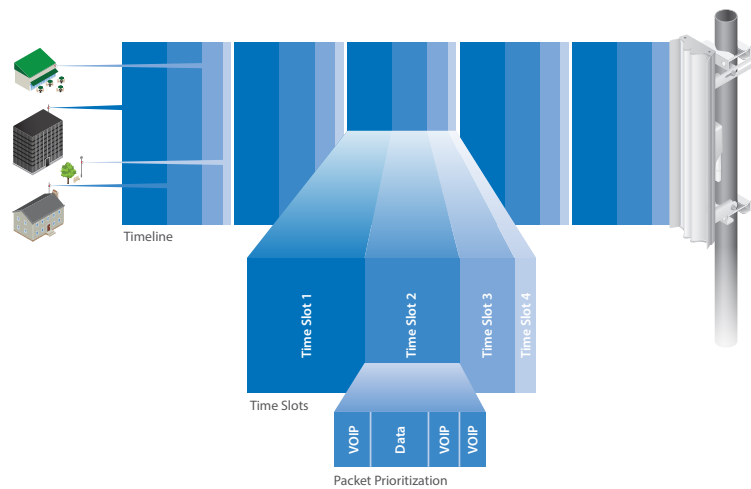
Up to 100 airMAX ac stations can be connected to an airMAX ac Sector; four airMAX ac stations are shown to illustrate the general concept.

airMAX ac Network Scalability

Superior Throughput Performance

*   Up to 330+ Mbps (maximum 40 MHz channel width) for PtMP links.

Technology

airPRISM®

To enhance airMAX ac performance, Ubiquiti Networks introduces our patented airPrism technology, which is featured on the Rocket5ac Prism, model R5AC-PRISM.

Improves SNR

High data rates require a high Signal-to-Noise Ratio (SNR), which is challenging to achieve, especially in noisy, high-density areas.

Integrated into Ubiquiti's custom silicon, airPrism technology creates a high SNR by isolating signals within the operating channel and rejecting interference using specialized circuitry, the High-Selectivity Receiver (HSR).

Removes Interference

Depending on the product model and operating mode, available channel widths may include 10, 20, 30, 40, 50, 60, and/or 80 MHz.

Theoretically APs operate on different channels; however, because of the wider channel bandwidths, there can be overlap in spectrum usage.

airPrism technology removes up to an additional 30+ dB of adjacent channel interference through the active filtering design, so an airMAX ac AP with airPrism technology can provide significantly greater performance than a typical AP.

Facilitates AP Co-Location

Co-location is vital in many scenarios. For example, a WISP may have limited tower space, so it must co-locate all APs within that allotted footprint. Shielding and other means can lessen interference but may be impractical.

By deploying airMAX ac APs with airPrism technology, you can co-locate APs and enhance the overall performance of your wireless network.
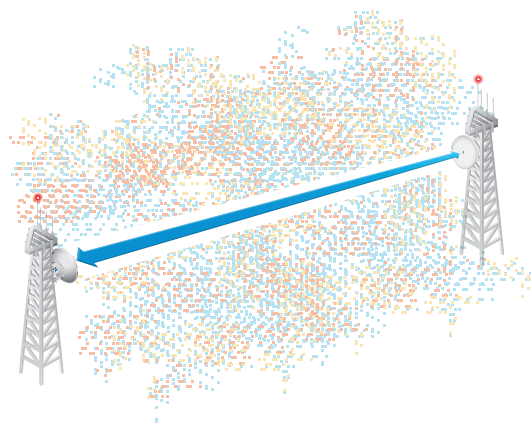
Number of APs	Channel Width
4	80 MHz*
8	40 MHz
16	20 MHz

* PtP only

Active Radio Frequency Filtering

5 GHz Environment

5 GHz with airPrism

airPRISM®

What the Radio Sees
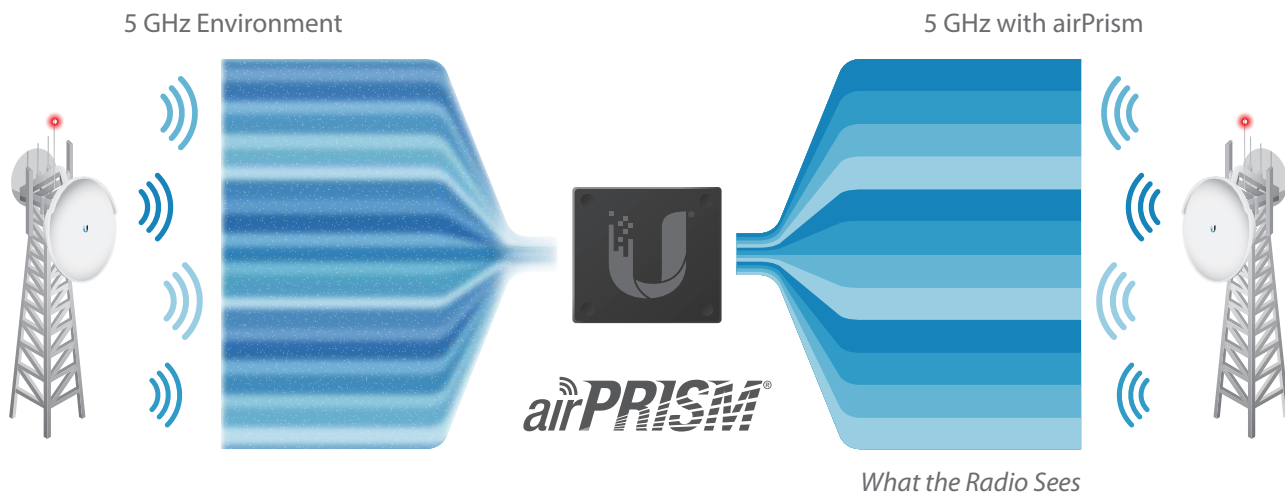
Improved Latency and Noise Immunity

rocket®5AC
PRISM

The Rocket5ac Prism is designed to deliver maximum spectral efficiency and throughput.

Features

5 GHz Frequency Band With plenty of available spectrum, this unlicensed band works well for long-distance links. The Rocket5ac Prism features full-band 5 GHz coverage and maximizes output power for the US market, meeting strict OOBE requirements.

airView Use the real-time spectrum analyzer so you can identify noise signatures and design your wireless links to minimize noise interference.

High Performance To take full advantage of its design and capabilities, deploy the Rocket5ac Prism for PtP or PtMP links in high RF noise environments.

airPrism Sector Antenna You can mount three Rocket5ac Prism radios on the airPrism 5 GHz 3x30° HD Sector Antenna, model AP-5AC-90-HD, for PtMP links. Each Rocket radio corresponds with a specific 30° beamwidth and independently transmits and receives.

EMI-Shielded Metal Housing Helps protect the Rocket5ac Prism against electromagnetic interference.

Gigabit Ethernet Delivers high throughput over its wired connection.

Passive Power over Ethernet (PoE) 24V Passive PoE functionality is included. Both power and data are carried over a single Ethernet cable to the Rocket ac. Use the included PoE Adapter or an optional PoE switch.

Plug and Play Integration Every airMAX antenna has a built-in Rocket mount, so no tools are needed to install the Rocket5ac Prism. (airMAX ac antennas are recommended for optimal performance.)

Specifications

R5AC-PRISM				
Dimensions	88 x 40 x 230 mm (3.47 x 1.58 x 9.06")			
Weight	400 g (14.11 oz)			
Power Supply	24V, 0.5A Gigabit PoE			
Max. Power Consumption	8.5W			
Power Method	Passive PoE (Pairs 4, 5+; 7, 8 Return)			
Supported Voltage Range	18-26VDC			
Operating Frequency	Worldwide	USA: U-NII-1	USA: U-NII-2A	USA: U-NII-2C	USA: U-NII-3
	5150 - 5875 MHz	5150 - 5250 MHz*	5250 - 5350 MHz*	5470 - 5725 MHz*	5725 - 5850 MHz*
Networking Interface	(1) 10/100/1000 Ethernet Port			
RF Connectors	(2) RP-SMA (Waterproof), (1) GPS (Waterproof)			
Processor Specs	Atheros MIPS 74Kc, 720 MHz			
Memory	128 MB DDR2 SDRAM, 16 MB NOR Flash			
LEDs	Power, LAN, GPS, (4) Signal Strength			
Signal Strength LEDs	Software-Adjustable to Correspond to Custom RSSI Levels			
Channel Sizes	PtP Mode		PtMP Mode	
	10/20/30/40/50/60/80 MHz		10/20/30/40 MHz	
Enclosure Characteristics	Die-Cast Aluminum with White Powder Coating			
ESD/EMP Protection	Air: ± 24 kV, Contact: ± 24 kV			
Operating Temperature	-40 to 80° C (-40 to 176° F)			
Operating Humidity	5 to 95% Noncondensing			
Wireless Approvals	FCC, IC, CE			
RoHS Compliance	Yes			
Shock and Vibration	ETSI300-019-1.4			
Modes	Access Point, Station			
Services	Web Server, SNMP, SSH Server, Telnet , Ping Watchdog, DHCP, NAT, Bridging, Routing			
Utilities	Antenna Alignment Tool, Discovery Utility, Site Survey, Ping, Traceroute, Speed Test			
Distance Adjustment	Dynamic Ack and Ackless Mode			
Power Adjustment	Software Adjustable UI or CLI			
Security	WPA2 AES Only			
QoS	Supports Packet Level Classification WMM and User Customer Level: High/Medium/Low			
Statistical Reporting	Up Time, Packet Errors, Data Rates, Wireless Distance, Ethernet Link Rate			
Other	Remote Reset Support, Software Enabled/Disabled, VLAN Support, 256QAM, GPS, TX Filter			
Ubiquiti Specific Features	30/50/60 MHz Channels, airMAX ac Mode, Traffic Shaping with Burst Support, Discovery Protocol, Frequency Band Offset, Ackless Mode			

R5AC-PRISM 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)	-96 dBm	± 2 dB
	2x QPSK (½)	27 dBm	± 2 dB		2x QPSK (½)	-95 dBm	± 2 dB
	2x QPSK (¾)	27 dBm	± 2 dB		2x QPSK (¾)	-92 dBm	± 2 dB
	4x 16QAM (½)	27 dBm	± 2 dB		4x 16QAM (½)	-90 dBm	± 2 dB
	4x 16QAM (¾)	27 dBm	± 2 dB		4x 16QAM (¾)	-86 dBm	± 2 dB
	6x 64QAM (⅔)	27 dBm	± 2 dB		6x 64QAM (⅔)	-83 dBm	± 2 dB
	6x 64QAM (¾)	26 dBm	± 2 dB		6x 64QAM (¾)	-77 dBm	± 2 dB
	6x 64QAM (⅚)	25 dBm	± 2 dB		6x 64QAM (⅚)	-74 dBm	± 2 dB
	8x 256QAM (¾)	23 dBm	± 2 dB		8x 256QAM (¾)	-69 dBm	± 2 dB
	8x 256QAM (⅚)	22 dBm	± 2 dB		8x 256QAM (⅚)	-65 dBm	± 2 dB

* Some frequencies may require activation; visit: **https://www.ubnt.com/fcclabelrequest**

Plug and Play Integration

Rocket radios and airMAX antennas have been designed to seamlessly work together. Every airMAX antenna has a built-in Rocket mount, so installation requires no special tools.

Antenna Compatibility

Rocket5ac Prism

Frequency Band	
5 GHz	
Sector	AM-5AC21-60
	AM-5AC22-45
	AM-V5G-Ti
	AM-M-V5G-Ti
	AM-5G16-120
	AM-5G17-90
	AM-5G19-120
	AM-5G20-90
	AP-5AC-90-HD
Rocket Dish	RD-5G31-AC
	RD-5G30-LW
	RD-5G30
	RD-5G34

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