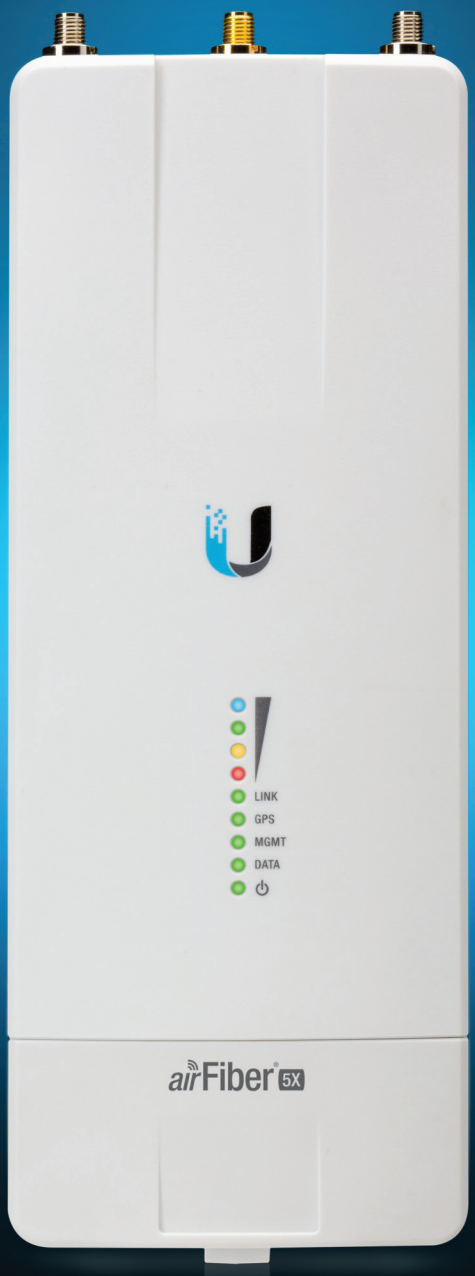
DATASHEET



airFiber® X

5 GHz Carrier Backhaul Radio

Model: AF-5X

Up to 500+ Mbps Real Throughput, Up to 200+ km Range

Full-Band Certification including DFS

Ubiquiti's INVICTUS™ Custom Silicon

UBIQUITI® NETWORKS

Overview

Ubiquiti Networks continues to disrupt the wireless broadband market with revolutionary technology at breakthrough pricing by introducing airFiber® X, a modular airFiber radio system that will serve a wide range of frequencies and is designed to be compatible with a variety of Ubiquiti® antennas.

Building upon the proven design of the airMAX® Rocket™ system, airFiber X allows you to customize airFiber backhaul links or upgrade existing Rocket Point-to-Point (PtP) links. The first airFiber X model is the AF-5X model for use in the 5 GHz frequency band.

Engineered for Performance

Ubiquiti's INVICTUS™ custom silicon and proprietary radio architecture are designed specifically for long-distance, outdoor wireless applications.

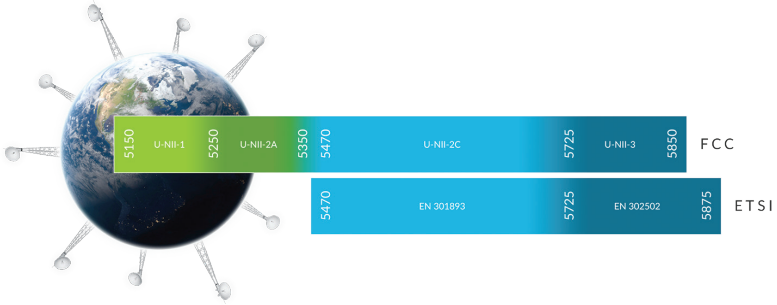
Our INVICTUS core communications processing engine surpasses all of the limitations inherent to generic Wi-Fi chips to provide superior performance, long-range capability, DFS flexibility, and power output.

The AF-5X features industry-leading 10.6 bps/Hz spectral efficiency, line-rate data packet processing for up to 500+ Mbps of real data throughput, and innovative xtreme Range Technology (xRT™) for up to 200+ km in range.

5 GHz Backhaul

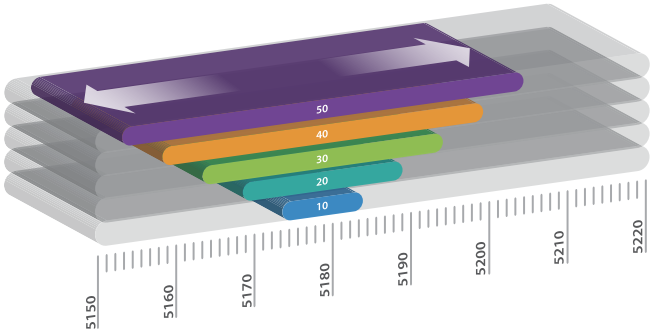
Full-Band Certification with DFS

The AF-5X covers the entire, license-free, 5 GHz spectrum and includes DFS approval. Anyone around the world can deploy and operate the AF-5X in the 5 GHz range practically anywhere they choose (subject to local country regulations).



Optimal Operation in Unlicensed Bands

Channel width flexibility (10/20/30/40/50 MHz) allows independent TX and RX channel frequency configurations anywhere within the radio band to avoid local interference, and the channel centers are selectable in 1 MHz increments. You also have the ability to program different uplink and downlink duty cycles to support asymmetric traffic requirements.



Ultra-Low Latency with HDD Technology

The AF-5X is designed to provide the highest TDD throughput available and is engineered with proprietary Hybrid Division Duplexing (HDD) technology.

In a backhaul link, two AF-5X radios use patent-pending HDD technology to calculate the propagation delay and know when each radio can transmit and receive, so they send packets in precise synchronization. Packet transmission latency is virtually eliminated.

Co-Location

Co-location is vital in many scenarios. For example, a WISP may have limited tower space, so it must co-locate all equipment within that allotted footprint.

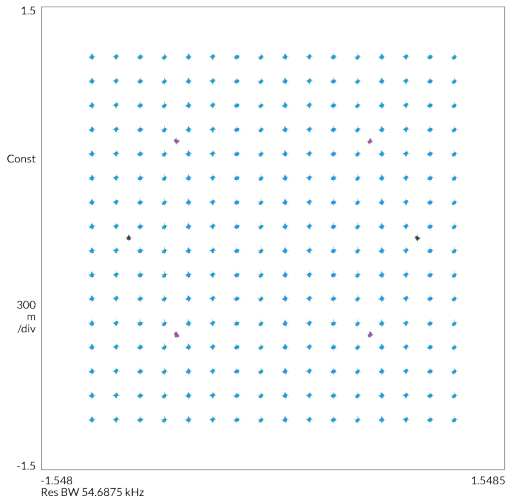
GPS Synchronization

Precise GPS frame synchronization frees the AF-5X from interference for superior co-location capability. GPS enables the concurrency of TX and RX frames so you can co-locate the AF-5X radios and enhance the overall performance of your backhaul links.

Clean Power Output

Using digital pre-distortion compensation and multi-IFFT processing, the innovative RF design delivers ultra-clean power output that improves noise immunity and co-location performance. This reduces the potential impact on the RF noise environment and allows for the use of higher-order modulation, such as 256QAM.

CONSTELLATION PLOT | 256QAM



Deployment Flexibility

The AF-5X supports ± 45° slant polarization for improved noise immunity and Signal-to-Noise Ratio (SNR). It is compatible with multiple Ubiquiti antennas offering gain of 23 to 34 dBi. The compact form factor of the AF-5X allows it to fit into the radio mount of Ubiquiti antennas, so installation requires no special tools.

The airFiber X antennas are purpose-built with 45° slant polarity for seamless integration with the AF-5X. Pair the AF-5X with one of the following airFiber X antennas:

airFiber X Antenna

Model	Frequency	Gain
AF-5G23-S45	5 GHz	23 dBi

The AF-5G23-S45 offers 23 dBi of gain in a 378-mm diameter size.

Model	Frequency	Gain
AF-5G30-S45	5 GHz	30 dBi

The AF-5G30-S45 offers 30 dBi of gain in a 650-mm diameter size.

Model	Frequency	Gain
AF-5G34-S45	5 GHz	34 dBi

The AF-5G34-S45 offers 34 dBi of gain in a 1050-mm diameter size.

RocketDish™

You can also pair the AF-5X with one of the following RocketDish™ antennas by using a kit to convert the RocketDish to 45° slant polarity.

Model	Frequency	Gain
RD-5G30	5 GHz	30 dBi

The RD-5G30 offers 30 dBi of gain in a 650-mm diameter size.

Model	Frequency	Gain
RD-5G34	5 GHz	34 dBi

The RD-5G34 offers 34 dBi of gain in a 1050-mm diameter size.

Conversion Kit

The 5 GHz RocketDish to airFiber Antenna Conversion Kit converts the RocketDish RD-5G30 or RD-5G34 antenna for use with the AF-5X.

Model	RD-5G30	RD-5G34
AF-5G-OMT-S45	✓	✓

Specifications

airFiber AF-5X	
Dimensions	224 x 82 x 48 mm (8.82 x 3.23 x 1.89")
Weight	0.35 kg (0.77 lb)
RF Connectors	(2) RP-SMA Weatherproof (CH0, CH1) (1) SMA Weatherproof (GPS)
GPS Antenna	External, Magnetic Base
Power Supply	24V, 1A PoE Gigabit Adapter (Included)
Power Method	Passive Power over Ethernet Pins 1, 2, 4, 5 (+) and Pins 7, 8, 3, 6 (-)
Max. Power Consumption	12W
Supported Voltage Range	19-29VDC
Mounting	airFiber X Mount (Rocket Mount Compatible) GPS Pole Mount (Included)
Certifications	CE, FCC, IC
Operating Temperature	-40 to 55° C (-40 to 131° F)

Networking Interface	
Data Port	(1) 10/100/1000 Ethernet Port
Management Port	(1) 10/100 Ethernet Port

System	
Processor	INVICTUS IC
Maximum Throughput	500+ Mbps[1]
Maximum Range	200+ km[1]
Encryption	128-bit AES
OS	airOS F
Wireless Modes	Master/Slave

Radio	
Frequency Range FCC 15.407 IC RSS-210 ETSI EN 301 893, EN 302 502 Other Regions	 5150 - 5350 MHz, 5470 - 5850 MHz 5470 - 5600 MHz, 5650 - 5850 MHz 5470 - 5875 MHz 5150 - 5950 MHz[2]
Max. Conducted TX Power	26 dBm[2] (Dependent on Regulatory Region)
Frequency Accuracy	± 2.5 ppm without GPS Synchronization ± 0.2 ppm with GPS Synchronization
Channel Bandwidth	10/20/30/40/50 MHz Selectable Programmable Uplink and Downlink Duty Cycles

[1] Throughput and range values may vary depending on the environmental conditions.

[2] For region-specific details, refer to the *Compliance* chapter of the airFiber5X User Guide at **downloads.ubnt.com/airfiber**

Suggested Max. TX Power	
8x	19 - 20 dBm
6x	21 - 22 dBm
4x	23 - 24 dBm
½x	26 dBm
¼x	26 dBm

Receive Sensitivity						
Spatial Streams	Modulation	Sensitivity (10 MHz)	Sensitivity (20 MHz)	Sensitivity (30 MHz)	Sensitivity (40 MHz)	Sensitivity (50 MHz)
8x	256QAM	-66 dBm	-64 dBm	-62 dBm	-61 dBm	-60 dBm
6x	64QAM	-74 dBm	-71 dBm	-69 dBm	-68 dBm	-67 dBm
4x	16QAM MIMO	-81 dBm	-78 dBm	-76 dBm	-75 dBm	-74 dBm
2x	QPSK MIMO	-88 dBm	-85 dBm	-83 dBm	-82 dBm	-81 dBm
1x	½ Rate QPSK xRT	-90 dBm	-87 dBm	-85 dBm	-84 dBm	-83 dBm