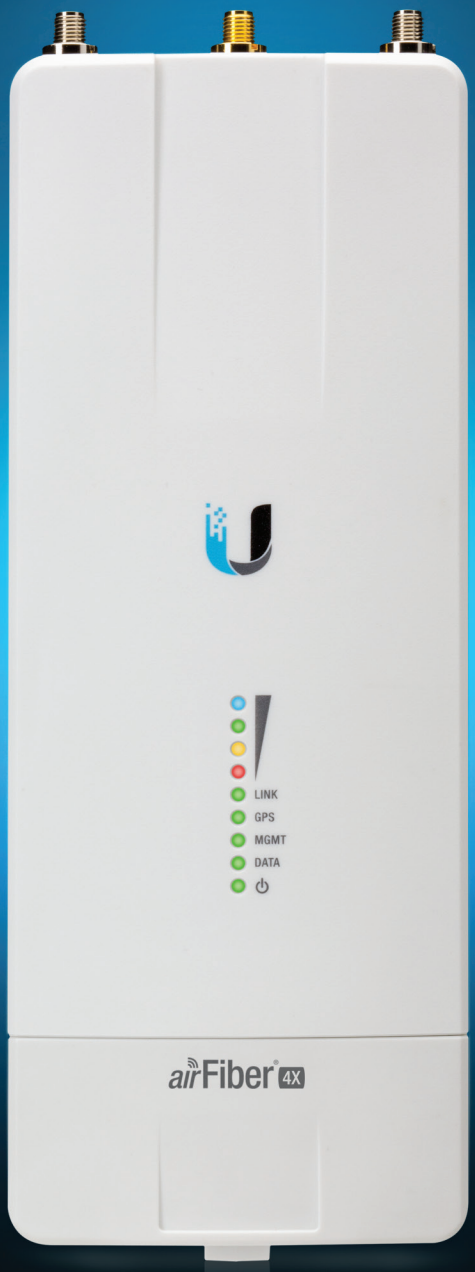
DATASHEET



airFiber X

Licensed Backhaul Radio

Model: AF-4X

Up to 687 Mbps Real Throughput, Up to 200+ km Range

Optimal Use of 4.9 GHz Radio Band for Public Safety Sector

Ubiquiti's INVICTUS™ Custom Silicon

UBIQUITI NETWORKS

Overview

Ubiquiti Networks introduces the airFiber® AF-4X, Ubiquiti's first licensed spectrum radio designed for the public safety sector. It meets the growing need of broadband capacity and optimizes use of the 4.9 GHz radio band with its industry-leading spectral efficiency and TDD throughput.

The AF-4X allows you to customize airFiber backhaul links or upgrade existing Rocket® Point-to-Point (PtP) links.

Designed for the Public Safety Market

Deploy the high-performance and reliable AF-4X for municipal applications, including police, fire, and emergency medical services.

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, and higher delivered throughput.

The airFiber X features industry-leading spectral efficiency of up to 17.1 Mbps/MHz, line-rate data packet processing of up to 687 Mbps of real data throughput, and innovative xtreme Range Technology (xRT™) for up to 200+ km in range.

4 GHz Backhaul

Mission-Critical Communications

The AF-4X covers the 4.9 GHz spectrum for public safety. Additional frequencies, from 4.7 GHz to 4.9 GHz, are supported in Europe and other regions (subject to local country regulations).

The AF-4X uses a proprietary radio communications protocol with AES-128 encryption to help ensure communication channels are secure.

Ultra-Low Latency with HDD Technology

The AF-4X is designed to provide the highest TDD throughput and lowest latency available using proprietary Hybrid Division Duplexing (HDD) technology.

Optimal Operation and Channel Configuration

The AF-4X supports up to 11 different channel width sizes* to suit your deployment needs. You can configure independent TX and RX channel frequencies and place them anywhere within the radio band, 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.

* Channel widths may vary according to country/region regulations.

Co-Location

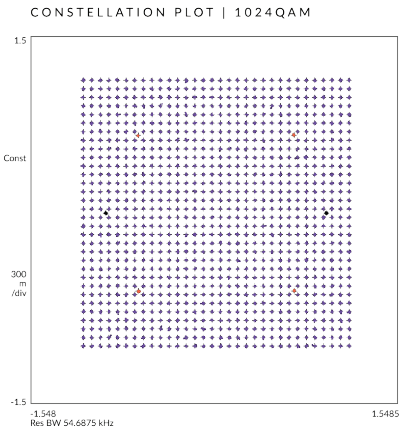
With space at a premium, the importance of being able to co-locate equipment is becoming an essential attribute for modern wireless networks. The AF-4X is engineered to permit multiple radios to operate side by side, allowing maximum spectral efficiency.

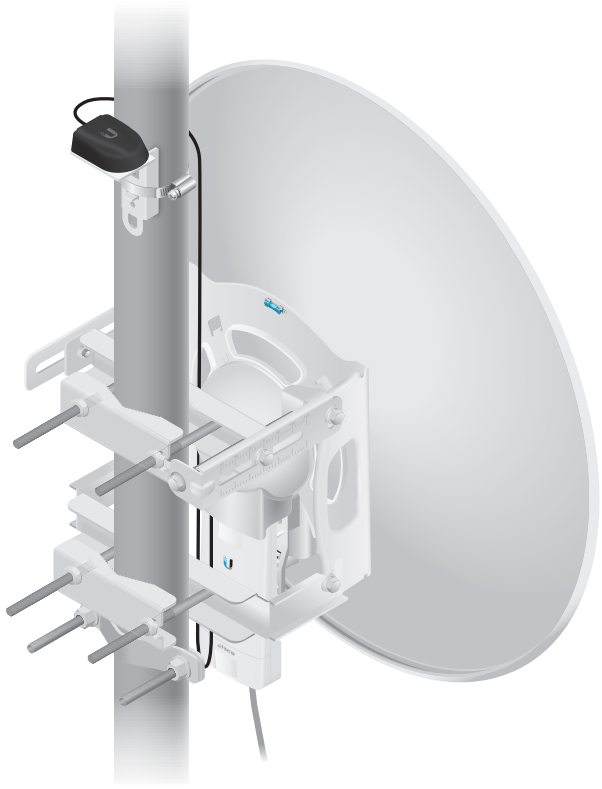
GPS Synchronization

Precise GPS frame synchronization enables co-located AF-4X radios to transmit and receive data without interfering with each other, enabling better frequency reuse and increased network stability.

Clean Power Output

Using advanced digital signal processing, the innovative AF-4X radio design has an ultra-clean transmitter output, reducing broadband noise, facilitating co-location, and enabling higher-order modulations like 1024QAM for greater throughput.





Deployment Flexibility

The AF-4X supports ± 45° slant polarization for improved noise immunity and Signal-to-Noise Ratio (SNR). The compact form factor of the airFiber X 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 airFiber AF-4X.

airFiber X Antenna

Model	Frequency	Diameter Size
AF-5G30-S45	4 - 5 GHz	650 mm

The AF-5G30-S45 offers 30 dBi of gain in a 650-mm diameter size. It is compatible with the IsoBeam™ (model ISO-BEAM-620), an optional isolator radome that delivers superior noise immunity in co-location deployments.

Model	Frequency	Diameter Size
AF-5G34-S45	4 - 5 GHz	1050 mm

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

RocketDish™

You can also pair the AF-4X with one of the following RocketDish™ antennas by using a kit to convert the RocketDish to 45° slant polarity.

Model	Frequency	Diameter Size
RD-5G30	4 - 5 GHz	650 mm

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

Model	Frequency	Diameter Size
RD-5G34	4 - 5 GHz	1050 mm

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

Conversion Kit

The RocketDish to airFiber Antenna Conversion Kit converts the RocketDish RD-5G30 or RD-5G34 antenna to 45° slant polarity for use with the AF-4X.

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

Specifications

AF-4X	
Dimensions Radio Box	 224 x 82 x 48 mm (8.82 x 3.23 x 1.89") 261 x 107 x 107 mm (10.28 x 4.21 x 4.21")
Weight Radio Box	 0.35 kg (0.77 lb) 1.1 kg (2.43 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	15W @ Max. Power/Duty Cycle
Supported Voltage Range	+18 to +54VDC[1]
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)

AF-4X Networking Interface	
Data Port	(1) 10/100/1000 Ethernet Port
Management Port	(1) 10/100 Ethernet Port

AF-4X System	
Processor	INVICTUS IC
Maximum Throughput	687 Mbps[2]
Maximum Range	200+ km[2]
Encryption	128-bit AES
OS	airOS® F
Wireless Modes	Master/Slave
Latency Half Duplex Mode	 < 2 ms at Full Throughput
MTU (Maximum Transmission Unit)	Up to 9600

[1] Full range depends on Ethernet cable length.

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

AF-4X Radio	
Frequency Range FCC IC ETSI Other Regions	 4940 - 4990 MHz 4940 - 4990 MHz 4700 - 4990 MHz[2] 4700 - 4990 MHz[2]
Max. Conducted TX Power	29 dBm[2] (Dependent on Regulatory Region)
Frequency Accuracy	± 2.5 ppm without GPS Synchronization ± 0.2 ppm with GPS Synchronization
Channel Bandwidth	3.5/5/7/10/14/20/28/30/40/50/56 MHz Selectable[3] Programmable Uplink and Downlink Duty Cycles

[3] For region-specific details, refer to the *Compliance* chapter of the airFiber X User Guide at www.ubnt.com/download/airfiber

[4] Channel widths may vary according to country/region regulations.

AF-4X Suggested Max. TX Power	
8x	21 - 22 dBm
6x	23 - 24 dBm
4x	25 - 26 dBm
2x	29 dBm
1x	29 dBm

AF-4X Capacity (Mbps)												
		Channel Width (MHz)										
Rate	Modulation	3.5	5	7	10	14	20	28	30	40	50	56
10x	1024 QAM MIMO	38.4	60.8	86.4	128.0	182.4	259.2	361.6	384.0	502.4	617.6	687.9
8x	256 QAM MIMO	30.7	48.7	69.1	102.4	145.9	207.3	289.3	307.2	401.8	494.1	550.4
6x	64 QAM MIMO	23.0	36.5	51.8	76.8	109.4	155.5	216.9	230.4	301.4	370.6	412.8
4x	16 QAM MIMO	15.4	24.3	34.6	51.2	72.9	103.7	144.6	153.6	200.9	247.0	275.2
2x	QPSK MIMO	7.7	12.1	17.3	25.6	36.5	51.8	72.3	76.8	100.4	123.5	137.6
1x	½ Rate QPSK xRT	3.8	6.1	8.6	12.8	18.2	25.9	36.2	38.4	50.2	61.8	68.8

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