



**airFiber<sup>®</sup>**

Carrier Class Point-to-Point  
Gigabit Radio

Models: AF24, AF5, AF5U

High Performance Wireless Backhaul

Extreme, Long-Range Links

Worldwide License-Free Operation



# airFiber®

## Revolutionary Wireless Technology

Introducing airFiber®, a truly revolutionary Point-to-Point wireless platform from Ubiquiti Networks™. Housed in a compact, highly efficient form factor, airFiber delivers amazing wireless gigabit+ performance, low latency, and long range. airFiber ushers in a new era in price-disruptive wireless technology ideal for carrier backhaul, building-to-building enterprise use, or public safety applications.

## Efficient by Design

Every detail of airFiber was designed and engineered by the Ubiquiti R&D Team. From the silicon chip up to the innovative split-antenna architecture, the Ubiquiti R&D Team created airFiber to deliver superior throughput with efficiency. airFiber was purpose-built to create a high performance backhaul.

## Plug and Play Deployment

Based on Ubiquiti's innovative and intuitive airOS®, the airFiber Configuration Interface enables quick deployment. With installation efficiency in mind, the mechanical design allows easy installation by one person. A two-person installation crew can effectively install and align an airFiber link.

To fine-tune the alignment, the received signal levels can be conveniently accessed via any of these methods:

- airFiber LED display
- airFiber Configuration Interface
- Audio tone feature

## Designed for Freedom

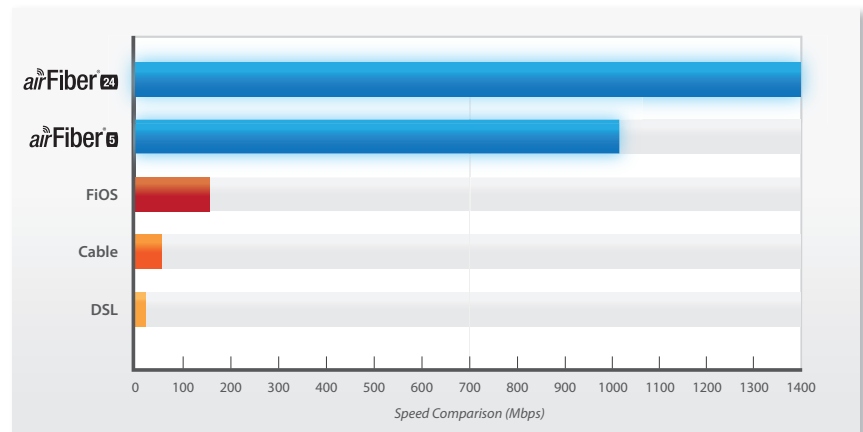
airFiber operates in worldwide, **license-free**, 24 or 5 GHz frequencies. Anyone around the world can purchase and operate airFiber without any special permits, paperwork, or added licensing costs. Users are free to locate, deploy, and operate airFiber practically anywhere they choose (subject to local country regulations).

| Model | Description                          | Operating Frequency* |
|-------|--------------------------------------|----------------------|
| AF5   | Supports mid-band 5 GHz frequencies  | 5470 - 5950 MHz      |
| AF5U  | Supports high-band 5 GHz frequencies | 5725 - 6200 MHz      |
| AF24  | Supports 24 GHz frequencies          | 24.05 - 24.25 GHz    |

\* Refer to the *Specifications* section for more information.

## Built for Speed and Range

airFiber delivers gigabit performance at 1.0+ Gbps for airFiber AF5/AF5U and 1.4+ Gbps for airFiber AF24. To put this in perspective, airFiber can transmit a 100 MB file in less than a second. Rivaling common broadband providers, airFiber download speed is up to 100x faster. With speed and throughput surpassing conventional wired backhails, airFiber prevails over expensive and labor-intensive wired infrastructures.



airFiber is built for long-range use: up to 13+ km for airFiber AF24 and up to 100+ km for airFiber AF5/AF5U, which launches the innovative xtreme Range Technology (xRT™) feature.



airFiber backhails do not share the security risks associated with wired backhails. The long distances of wired backhails are vulnerable to copper theft, fiber optic damage, vandalism, and accidental breakage. With airFiber, only the installation points of the airFiber links need to be secured.

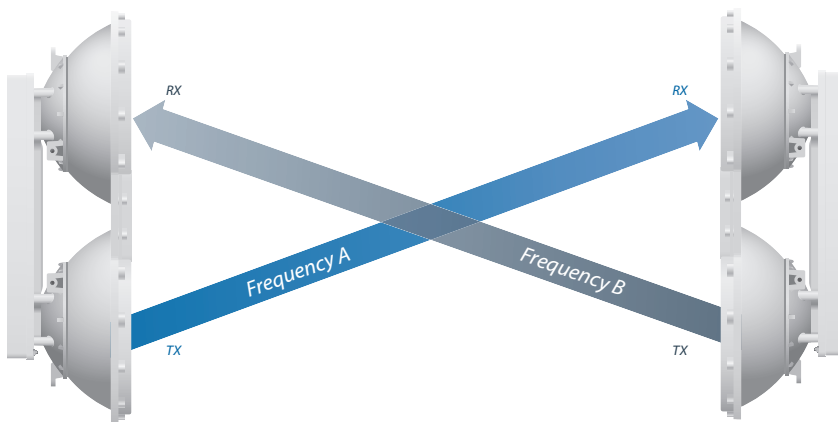
## Innovative Proprietary Modem Technology

Ubiquiti's innovative proprietary modem technology was purpose-built to address the specific challenges of outdoor, PtP (Point-to-Point) bridging and high-performance network backhubs. Every aspect of the radio has been carefully simulated and designed to optimize range, speed, and latency performance in the harshest RF noise environments.

## Synchronous Data Transmission and Reception

Conventional wireless standards impose a latency by having to receive a packet before a packet is transmitted. airFiber can transmit data synchronously without any wait time. airFiber features traditional TDD and FDD modes of operation in addition to the proprietary Hybrid Division Duplexing (HDD) mode, which provides a breakthrough in range and spectral efficiency performance.

Based on the ranging algorithm built into the air protocol, the airFiber 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.



*airFiber AF5/AF5U Radios in Full-Duplex Mode*

## Innovative Dual-Antenna Architecture

airFiber features a dual-independent, 2x2 MIMO, high-gain reflector antenna system. Separate transmit (TX) and receive (RX) antennas help extend link budgets by eliminating the extra RF losses caused by the switches or duplexers required in systems with common TX/RX antennas.

Each airFiber radio has two complete antenna systems and a mechanical back-plane that are constructed as a one-piece "monocoque" molding – a radical departure from industry practice. "Monocoque" means that the exterior skin supports the structural load of airFiber hardware. Due to its single-piece, injection-molded architecture, airFiber adds lightness in weight and affordability to its list of advantages.

## Network Management

airFiber supports a variety of features to help you manage your network:

- **Network management options** A choice between the greater security of out-of-band management and the convenience of in-band management.
- **SNMP support** Full SNMP support to aid in network management.
- **Local and remote airFiber status information** Available on the Main tab of the airFiber Configuration Interface.



*airFiber AF5/AF5U*

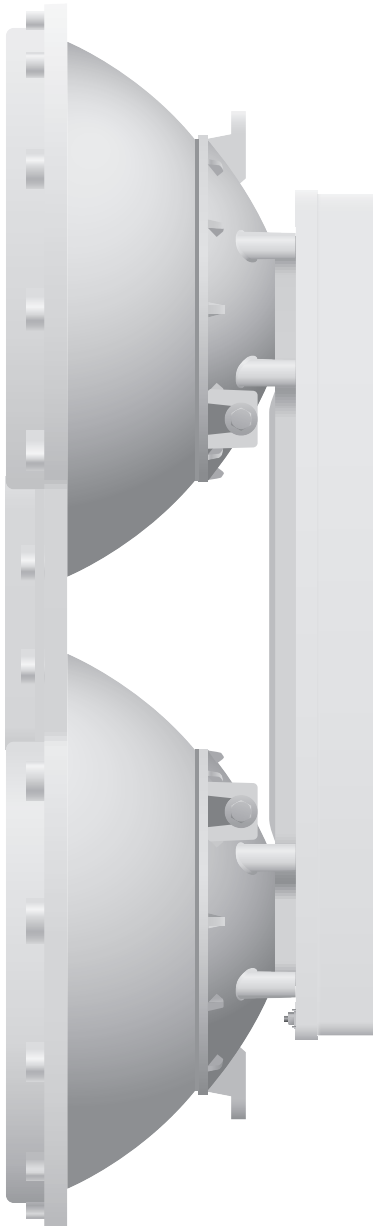


*airFiber AF24 shown without radome*

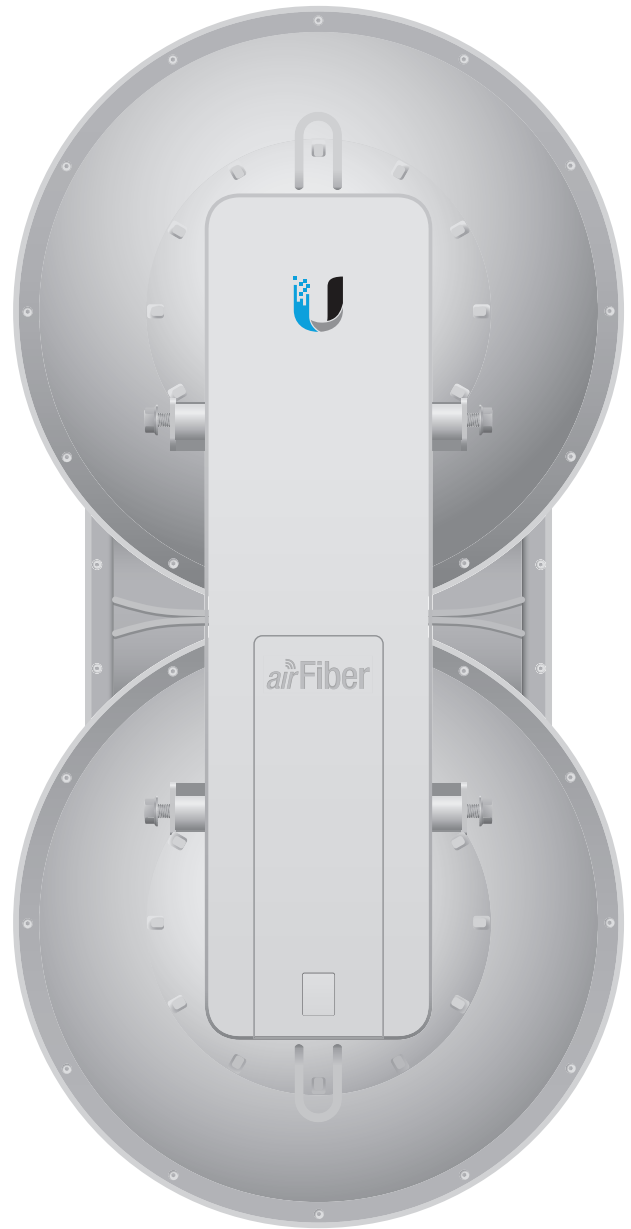
# airFiber® 5

# airFiber® 5U

There are two airFiber models available for the 5 GHz spectrum. The model, AF5, features the popular mid-band frequencies, which are freely used in many parts of the world. The high-band model, AF5U, which can operate in the 5.7 - 6.2 GHz bands, has robust filtering to enable co-location with devices operating in the lower 5 GHz bands while allowing operation at a higher output power in many areas of the world.



Side



Back

**1.0+ Gbps**

*Real Data Throughput*

5 GHz

**100+ km**

xRT  
xtreme Range Technology

**HDD**  
TDD FDD

## Superior Processing

Ubiquiti Networks introduces our proprietary INVICTUS™ core communications processing engine. The speed, power, and efficiency of this integrated circuit enhances the performance of airFiber AF5/AF5U.

## Efficient Use of 5 GHz Band

airFiber AF5/AF5U features 1 MHz center channel resolution with market-leading Power Envelope Tracking technology. airFiber AF5/AF5U accurately and continuously controls transmit power relative to the band edge. The power level automatically tracks to optimize performance near band edges, allowing you to choose the part of the band with the least interference.

## Long-Range Links

Newly developed for airFiber AF5/AF5U, the patent-pending xRT feature uses an innovative, adaptive multi-channel coding scheme to enhance radio transceiver performance, thereby maximizing your link budget and spectrum utilization – while still maintaining regulatory compliance. This results in links that can span distances from 10 m up to 100+ km.

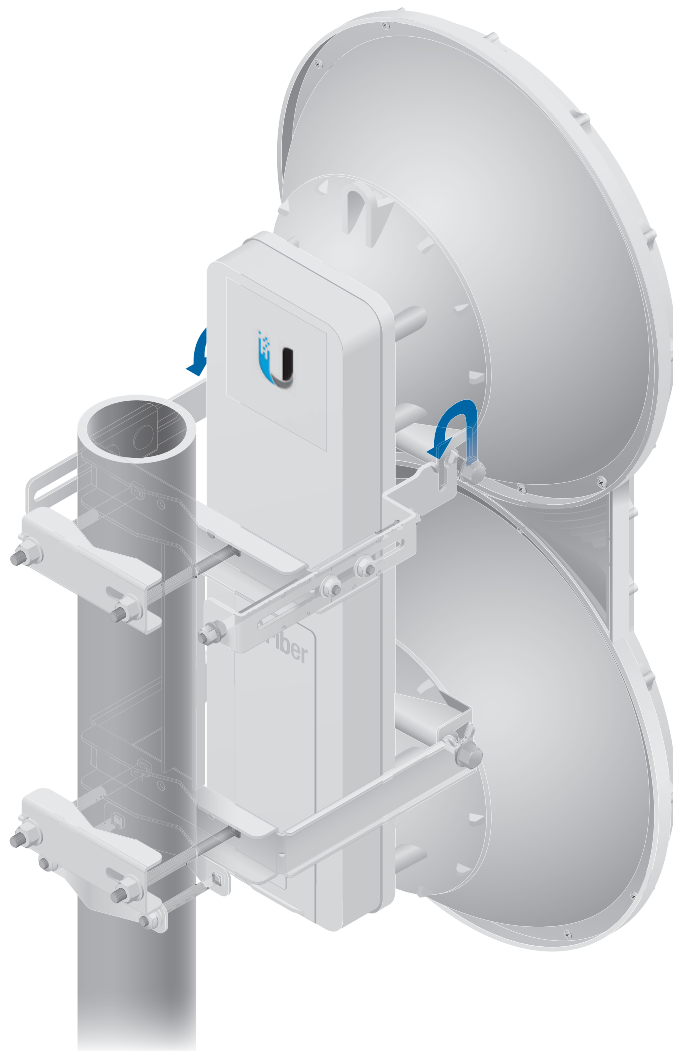
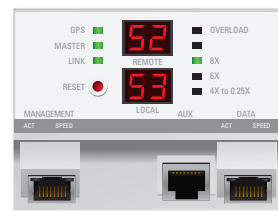
## Quick and Easy Installation

The unique sliding-clamp design of airFiber AF5/AF5U allows mounting hardware to be pre-assembled prior to installation – no more dropped screws at the top of the tower. As an added convenience, the drop-in cradle mount design allows the installer to attach mounting hardware to the pole without having to support the weight of the airFiber radio during installation.

## Radio Alignment Display

Newly designed for the airFiber AF5/AF5U, the Radio Alignment Display (RAD) makes aiming quicker and easier. The dual, calibrated signal strength indicators display the actual signal strength on the local and remote airFiber radios in real time. The comprehensive array of radio status indicators display the following:

- GPS synchronization status
- Master/slave mode
- RF link status
- RF overload warning
- Current modulation mode
- Link activity and speed for wired management and data ports





# Specifications

| airFiber AF5/AF5U   |  |
|---|--|
| Dimensions  | 938.4 x 468.4 x 281.4 mm (36.94 x 18.44 x 11.08 in)  |
| Weight  | 16 kg (35.27 lb) Mount Included  |
| Max. Power Consumption  | 40 W   |
| Power Supply  | 50V, 1.2A PoE GigE Adapter (Included)  |
| Power Method  | Passive Power over Ethernet (42-58VDC)   |
| Certifications  | CE, FCC, IC  |
| Mounting  | Pole Mount Kit (Included)  |
| Wind Loading  | 863 N @ 200 km/hr (194 lbf @ 125 mph)  |
| Wind Survivability  | 200 km/hr (125 mph)  |
| Operating Temperature   | -40 to 55° C (-40 to 131°F)  |
| LEDs  | (12) Status LEDs:<br>Data Port Link/Activity<br>Data Port Speed<br>Management Port Link/Activity<br>Management Port Speed<br>GPS Synchronization<br>Master/Slave<br>Link Status<br>Modulation Mode 0.25x to 4x, 6x, 8x, Overload<br>Remote and Local Displays (Calibrated Signal Strength) |
| Operating Frequency   |  |
| AF5<br>FCC 15.247, 15.407, IC RSS 210<br>ETSI EN 301 893, EN 302 502<br>Other Regions | 5470 - 5600 MHz, 5650 - 5850 MHz<br>5470 - 5875 MHz<br>5470 - 5950 MHz   |
| AF5U<br>FCC 15.247, IC RSS 21<br>ETSI EN 302 502<br>Other Regions                     | 5725 - 5850 MHz<br>5725 - 5875 MHz<br>5725 - 6200 MHz  |
| Interface   |  |
| Data Port   | (1) 10/100/1000 Ethernet Port  |
| Management Port   | (1) 10/100 Ethernet Port   |
| Auxiliary Port  | (1) RJ-12, Alignment Tone Port   |
| System  |  |
| Maximum Throughput  | 1.0+ Gbps  |
| Maximum Range   | 100+ km (Dependent on Regulatory Region)   |
| Packets per Second  | 1+ Million   |
| Encryption  | 128-Bit AES  |
| Forward Error Correction  | 164/205  |
| Cyclic Prefix   | 1/16 Fixed   |
| Uplink/Downlink Ratio   | 50% Fixed  |
| Radio Frame Synchronization   | GPS  |
| Dynamic Frequency Selection<br>AF5<br>AF5U  | CE, FCC/IC<br>CE, (FCC/IC Not Applicable)  |

| airFiber AF5/AF5U Receive Sensitivity |                 |                      |                      |                      |                      |               |               |
|---------------------------------------|-----------------|----------------------|----------------------|----------------------|----------------------|---------------|---------------|
| Spatial Streams                       | Modulation      | Sensitivity (10 MHz) | Sensitivity (20 MHz) | Sensitivity (40 MHz) | Sensitivity (50 MHz) | FDD Capacity* | TDD Capacity* |
| 8x                                    | 256QAM          | -70 dBm              | -67 dBm              | -65 dBm              | -64 dBm              | 1024 Mbps     | 512 Mbps      |
| 6x                                    | 64QAM           | -77 dBm              | -74 dBm              | -72 dBm              | -71 dBm              | 768 Mbps      | 384 Mbps      |
| 4x                                    | 16QAM MIMO      | -84 dBm              | -81 dBm              | -79 dBm              | -78 dBm              | 512 Mbps      | 256 Mbps      |
| 2x                                    | QPSK MIMO       | -90 dBm              | -87 dBm              | -85 dBm              | -84 dBm              | 256 Mbps      | 128 Mbps      |
| 1x                                    | ½ Rate QPSK xRT | -93 dBm              | -90 dBm              | -88 dBm              | -87 dBm              | 128 Mbps      | 64 Mbps       |
| ¼x                                    | ¼x QPSK xRT     | -95 dBm              | -93 dBm              | -92 dBm              | -91 dBm              | 32 Mbps       | 16 Mbps       |

\* FDD = (2) 50 MHz channels and TDD = (1) 50 MHz channel

| airFiber AF5/AF5U Radio Frequency |  |
|-----------------------------------|--|
| GPS                               | GPS Clock Synchronization  |
| Transceiver                       |  |
| EIRP                              | ~50 dBm (Dependent on Regulatory Region and Frequency Band)                                |
| Frequency Accuracy                | ±2.5 ppm without GPS Synchronization<br>±0.2 ppm with GPS Synchronization                  |
| Channel Bandwidth                 | 10/20/40/50 MHz  |
| Modulation                        | 256QAM MIMO<br>64QAM MIMO<br>16QAM MIMO<br>QPSK MIMO<br>½ Rate QPSK xRT<br>¼ Rate QPSK xRT |
| Integrated Split Antenna          |  |
| TX Gain                           | 23 dBi   |
| RX Gain                           | 23 dBi   |
| Beamwidth                         | 6°   |
| Front-to-Back Ratio               | 70 dB  |
| Polarity                          | Dual-Slant Polarization  |
| Cross-Polarity Isolation          | > 28 dB  |

