UBIQUITI NETWORKS

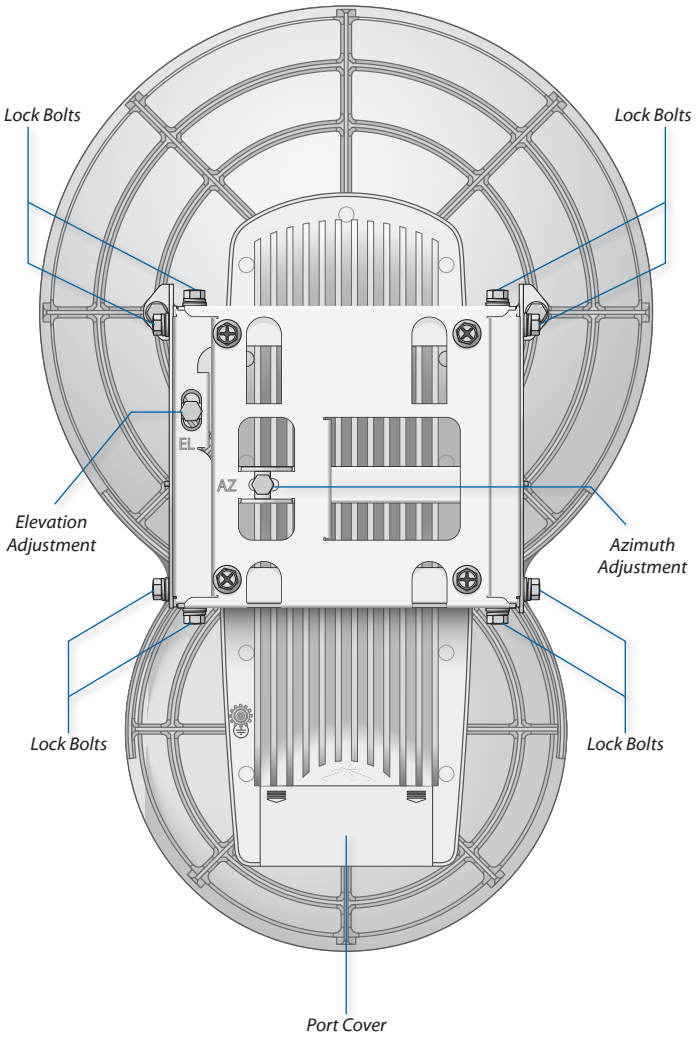
airFiber 24

24 GHz Point to Point
1.0+ Gbps Radio

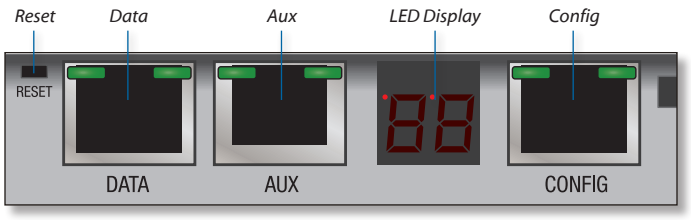
Model: AF24

User Guide

Back

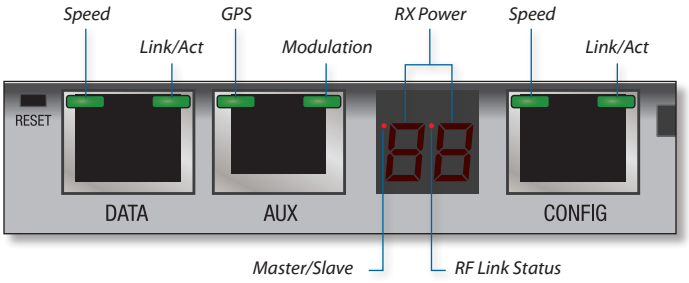


Interfaces



Interface	Description
Reset	To reset to factory defaults, press and hold the Reset button for more than five seconds while the unit is already powered on.
Data	10/100/1000 Mbps port handles all user traffic.
Aux	Port for audio tone aiming. See **"Using the Audio Tone" on page 14** for more details.
LED Display	Digital display used for power, status, and mode information.
Config	10/100 Mbps, secured port for configuration. By default, this is the only port that can monitor, configure, and/or update firmware.

LEDs



LED		State	Status
Data	Speed	Off	10/100 Mbps
		On	1000 Mbps
	Link/Act	Off	No Ethernet Link
		On	Ethernet Link Established
		Random Flashing	Ethernet Activity
Aux	GPS	Off	No GPS Synchronization
		On	Operational (Strong Signal)
		Normal Flash*	Operational (Weak Signal)
	Modulation	Off	¼x or 1x (QPSK SISO)
		Short Flash*	2x (QPSK MIMO)
		Normal Flash*	4x (16QAM MIMO)
		Long Flash*	6x (64QAM MIMO)
LED Display	RX Power (-dBm)	Number	Decodable RX Signal
		Flashing Number	Undecodable RX Signal
		oL	Overload Condition
	Master/ Slave	Off	Slave Mode
		On	Master Mode
	RF Link Status	Off	RF Off
		Short Flash*	Syncing
		Normal Flash*	Beaconing
		Long Flash*	Registering
		On	Operational
Config	Speed	Off	10 Mbps
		On	100 Mbps
	Link/Act	Off	No Ethernet Link
		On	Ethernet Link Established
		Random Flashing	Ethernet Activity

*Short Flash (1:3 on/off cycle)
Normal Flash (1:1 on/off cycle)
Long Flash (3:1 on/off cycle)

Chapter 2: Installation

Link Planning

Before you install the airFiber AF24, there are a few items to consider:

- Humidity and rain
- Point-to-Point (PtP), daisy chain, or ring configuration
- Co-Location

Humidity and Rain

Consider the impact of humidity and rain on your link. Radio waves in the 24 GHz band encounter additional atmospheric attenuation beyond that which is expected in free space due to water absorption, including rain fade. A general guideline is an additional loss of 1 to 3 dB per kilometer. The amount of additional atmospheric attenuation will vary, depending on your specific installation environment (the world has a variety of rainfall zones).

Here is a hypothetical example: if your link is exposed to a 25 mm/hr (0.98 in/hr) rate of rainfall, it may have an additional loss of up to 4 dB/km (6.45 dB/mi).

The table below illustrates the estimated additional attenuation at various rainfall rates and distances. This information was derived from **FCC Office of Engineering and Technology Bulletin #70**.

Estimated Additional Attenuation at Various Rain Rates and Distances

Distance	1.25 mm/hr (0.05 in/hr)	5 mm/hr (0.20 in/hr)	25 mm/hr (0.98 in/hr)
1 km (0.62 mi)	0.2 dB	0.7 dB	4 dB
2 km (1.2 mi)	0.4 dB	1.4 dB	8 dB
3 km (1.9 mi)	0.6 dB	2.1 dB	12 dB
4 km (2.5 mi)	0.8 dB	2.8 dB	16 dB
5 km (3.1 mi)	1 dB	3.5 dB	20 dB

There are a variety of software programs available to help calculate rain attenuation. For more information about rain attenuation and rainfall zones, here are a couple of resources:

- The rain attenuation model described in ITU-R Recommendation P.530, *Propagation data and prediction methods required for the design of terrestrial line-of-sight systems*, which is available at: **www.itu.int/rec/R-REC-P.530/en**
- The rainfall zones described in ITU-R Recommendation P.837, *Characteristics of precipitation for propagation modelling*, which is available at: **http://www.itu.int/rec/R-REC-P.837/en**

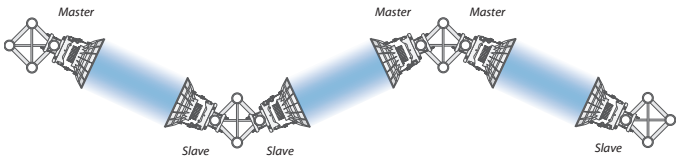
Configuration

There are three typical configurations:

- **PtP backhaul** Uses two airFiber radios, one configured as *Master* and the other configured as *Slave*.

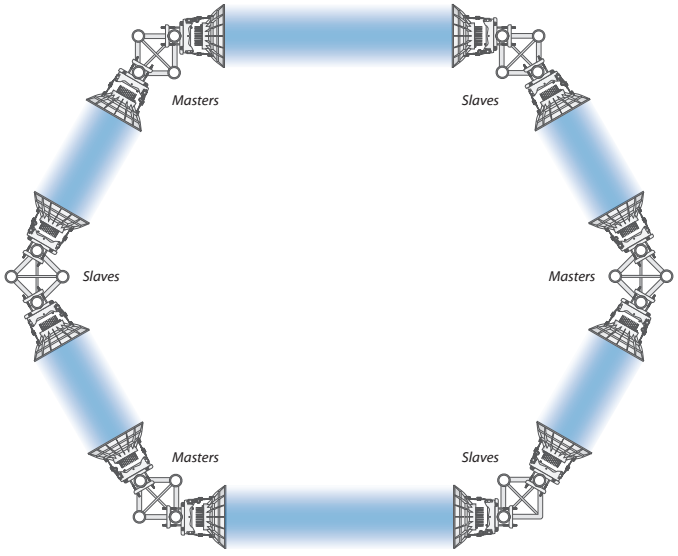
Point-to-Point Backhaul

- **Daisy chain** Uses multiple airFiber radios to extend the distance of a link, like a relay from point to point to point. The airFiber radios in the same node must use the same *Wireless Mode* (*Master* or *Slave*).



Daisy Chain Configuration

- **Ring** Uses multiple airFiber radios to form redundant paths. If one link goes down, the other links have an alternate route available. For each link, configure one airFiber radio as *Master*, and configure the other as *Slave*.



Ring Configuration

Co-Location

In most cases, co-location interference is not a concern because the beamwidth is narrow. You can co-locate multiple airFiber radios if they are pointed in different directions. Co-located airFiber radios must use the same *Wireless Mode* (*Master* or *Slave*). Back-to-back airFiber radios can use the same frequency. We recommend that you use different frequencies for adjacent airFiber radios; however, this is not a strict requirement.

Installation Requirements

- 17 mm (11⁄16") wrench
- 13 mm (½") socket wrench or driver
- Clear line of sight between airFiber radios
- Clear view of the sky for proper GPS operation
- Mounting location with < 0.5° displacement due to twist and sway under wind loading
- Mounting point:
  - At least 1 m (3.28 ft) below the highest point on the structure
  - For tower installations, at least 3 m (9.84 ft) below the top of the tower
- Ground wires – min. 8 AWG (10 mm^2) and max. length: 1 m (3.28 ft). As a safety precaution, ground the airFiber radios to grounded masts, poles, towers, or grounding bars.

  WARNING: Failure to properly ground your airFiber units will void your warranty.
- (Recommended) 2 Outdoor GigE PoE surge protectors

  Note: For guidelines about grounding and lightning protection, follow your local electrical regulatory codes.
- Outdoor, shielded Category 5e (or above) cabling and shielded RJ-45 connectors should be used for all wired Ethernet connections. Category 6 is required for installations with long cable runs (up to 100 m).

  We recommend that you protect your networks from the most brutal environments and devastating ESD attacks with industrial-grade shielded Ethernet cable and shielded RJ-45 connectors from Ubiquiti Networks. For more details, visit **www.ubnt.com/toughcable**

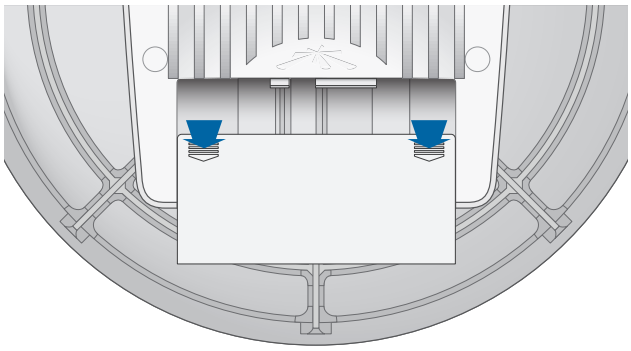
Installation Overview

We recommend that you configure your paired airFiber radios before mounting. Below is an overview of the installation with specific details on the following pages:

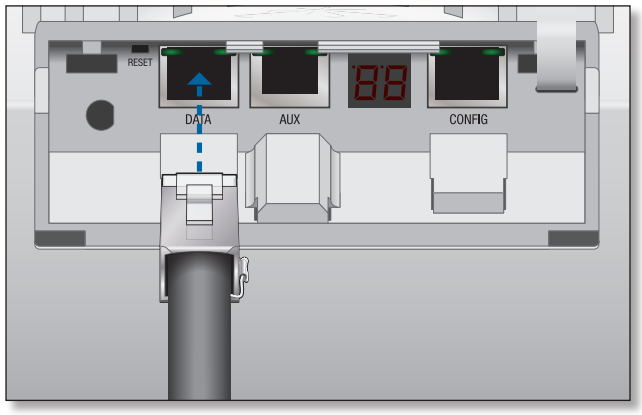
- Connect Power over Ethernet to the Data port, and connect an Ethernet cable between your computer and the Config port.
- Configure the device settings in the airFiber Configuration Interface.
- Once configuration is complete, disconnect the cables to move the airFiber radios.
- Reconnect at the site.
- After you have mounted the airFiber radios, establish and optimize the RF link.

Connecting Power over Ethernet

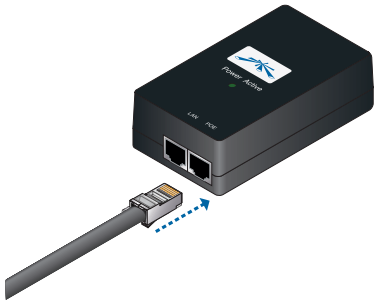
1. Press down on the indicator arrows and slide the *Port Cover* off.



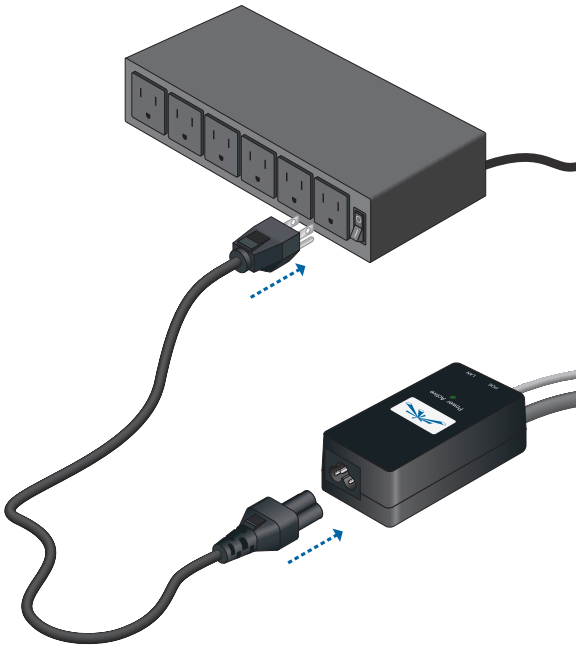
2. Connect an Ethernet cable to the *Data* port.



3. Connect the other end of the Ethernet cable from the *Data* port to the Ethernet port labeled **POE** on the PoE Adapter.



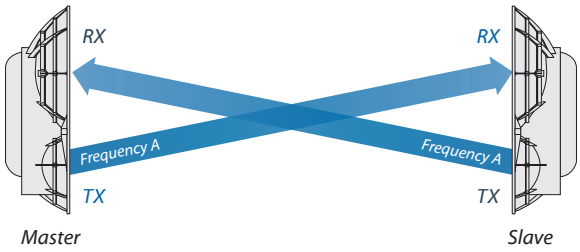
4. Connect the *Power Cord* to the power port on the *PoE Adapter*. Connect the other end of the *Power Cord* to a power source.



airFiber Configuration

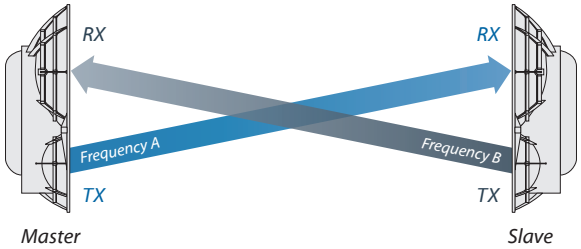
The instructions in this section explain how to access the airFiber Configuration Interface and configure the following settings:

- **Wireless Mode** Configure one airFiber AF24 as the *Master* and the other as the *Slave*.
- **Duplex** The airFiber AF24 supports both half-duplex and full-duplex operation. Half-duplex operation provides more frequency planning options at the cost of higher latency and throughput. Full-duplex operation provides the highest throughput and lowest latency; however, you have fewer frequency management options.
  - **Half Duplex (default)** The *TX* and *RX Frequencies* can be the same or different to suit local interference.



Half-Duplex Diagram

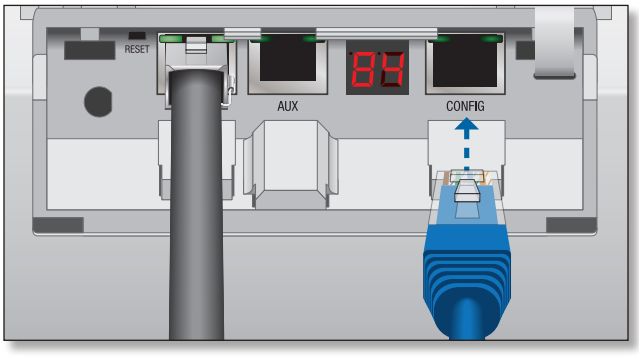
  - **Full Duplex** The *TX* and *RX Frequencies* should be different.



Full-Duplex Diagram

- **TX and RX Frequencies** The *TX Frequency* on the Master must match the RX *Frequency* on the Slave, and vice versa.

1. Connect an Ethernet cable from your computer to the *Config* port on the airFiber AF24.

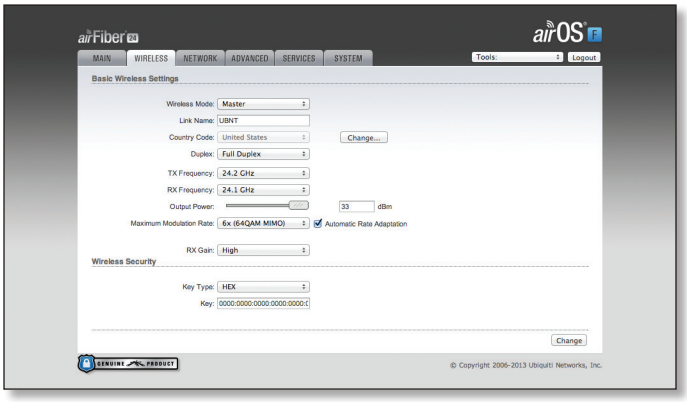


2. Configure the Ethernet adapter on your computer with a static IP address on the 192.168.1.x subnet (for example, 192.168.1.100).
3. Launch your web browser. Type **http://192.168.1.20** in the address field and press **enter** (PC) or **return** (Mac).

4. The login screen will appear. Enter **ubnt** in the *Username* and *Password* fields. Select your *Country* and *Language*. You must agree to the *Terms of Use* to use the product. Click **Login**.

Note: U.S. product versions are locked to the U.S. Country Code to ensure compliance with FCC regulations.

5. Click the **Wireless** tab.



6. Enter the *Basic Wireless Settings*:

a. For one airFiber AF24, select **Master** from the *Wireless Mode* drop-down. For the other airFiber AF24, keep the default, *Slave*.

b. Enter a name in the *Link Name* field. This should be the same on both the Master and the Slave.

c. For the *Duplex* drop-down:

- **Half Duplex** The default mode. The *TX* and *RX Frequencies* can be the same or different to suit local interference.
- **Full Duplex** The *TX* and *RX Frequencies* should be different.

d. Select a *TX Frequency*. This must match the *RX Frequency* on your other airFiber AF24.

e. Select a *RX Frequency*. This must match the *TX Frequency* of your other airFiber AF24.

f. If needed, change the *Output Power*, *Maximum Modulation Rate*, and/or *RX Gain* settings.

7. Configure the *Wireless Security*:

a. Select the AES *Key Type*, **HEX** or **ASCII**.

b. For the *Key* field:

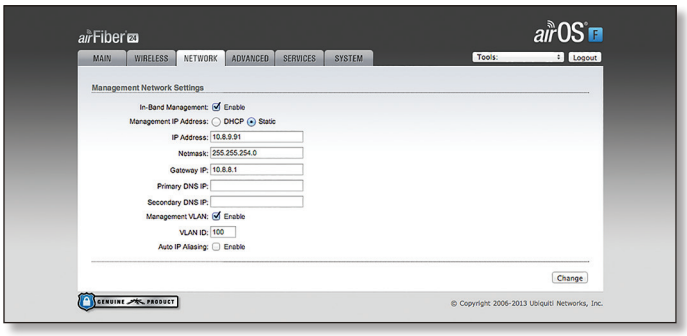
- **HEX** Enter 16 bytes (eight, 16-bit HEX values: 0-9, A-F, or a-f). You can omit zeroes and use colons, similar to the IPv6 format.

Note: The airFiber Configuration Interface supports IPv6 formats excluding dotted quad and "::" (double-colon) notation.

- **ASCII** Enter a combination of alphanumeric characters (0-9, A-Z, or a-z).

8. Click **Change** and then click **Apply**.

9. *In-Band Management* is enabled by default, so each airFiber radio must have a unique *IP Address*. (If the airFiber radios use the same *IP Address*, then you may lose access to the airFiber radios via the Data ports.) To change the network settings, click the **Network** tab.



a. For the Management IP address option:

- **DHCP** Keep the default, *DHCP*, to use DHCP reservation on your router to assign a unique *IP Address*.
- **Static** Change the *IP Address*, *Netmask*, and other settings to make them compatible with your network.

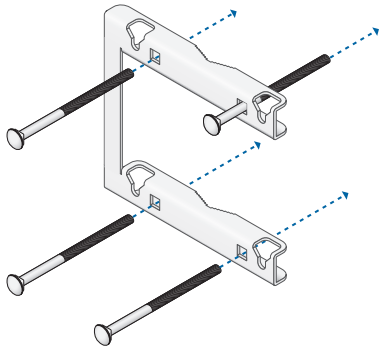
b. Click **Change** and then click **Apply**.

Repeat the instructions in the *airFiber Configuration* section on your other airFiber radio. After you have configured the airFiber radios, disconnect them and move them to your installation site.

Hardware Installation

To install the airFiber AF24:

1. Insert the four *M10x150 Carriage Bolts* into the *Pole Mount Bracket*.



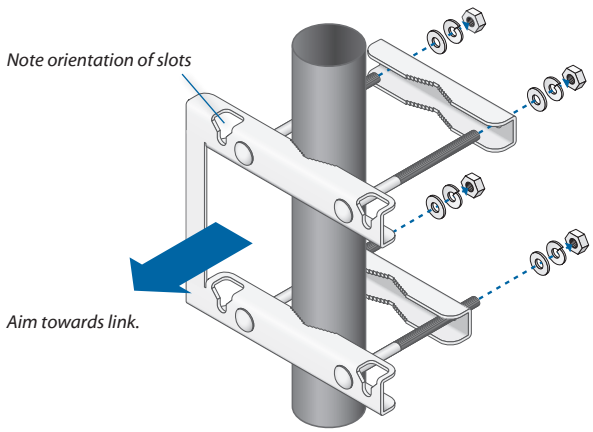
2. Attach the *Pole Mount Bracket* to a pole.

Note: The mounting assembly can accommodate a Ø 51 - 102 mm (2.0" - 4.0") pole.

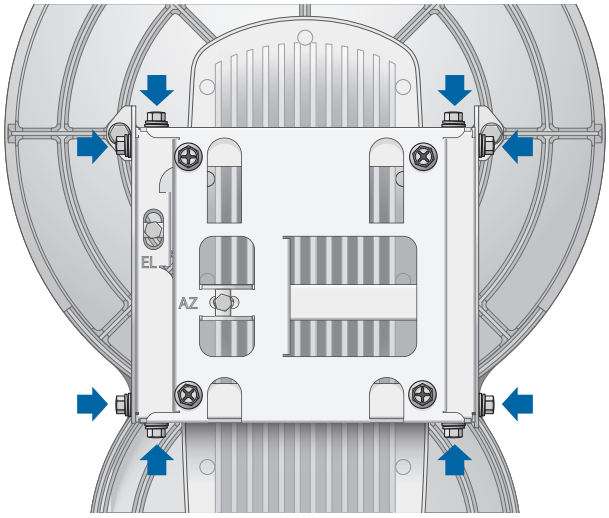
a. Orient the *Pole Mount Bracket* around the pole so it is aimed in the direction of the other airFiber AF24.

b. Insert the *M10x150 Carriage Bolts* into the *Pole Clamps*.

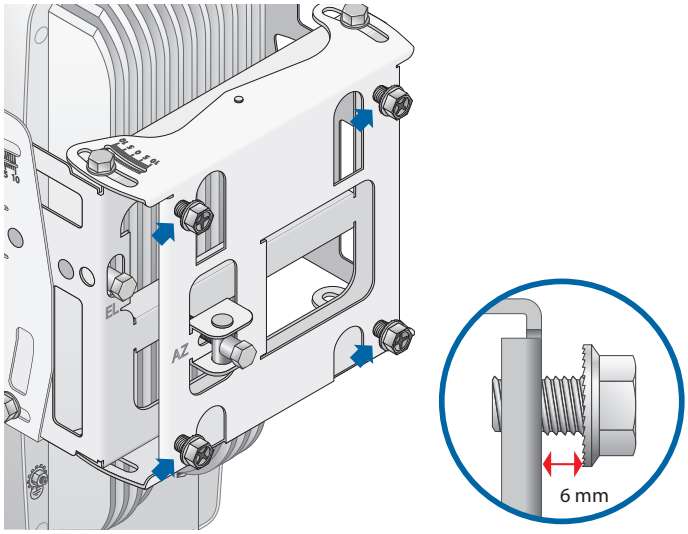
c. Secure the clamps with the *M10 Flat Washers, Split Lock Washers,* and *Hex Nuts.*



3. Loosen, but do NOT remove the eight *Lock Bolts* located on the *Alignment Bracket*.

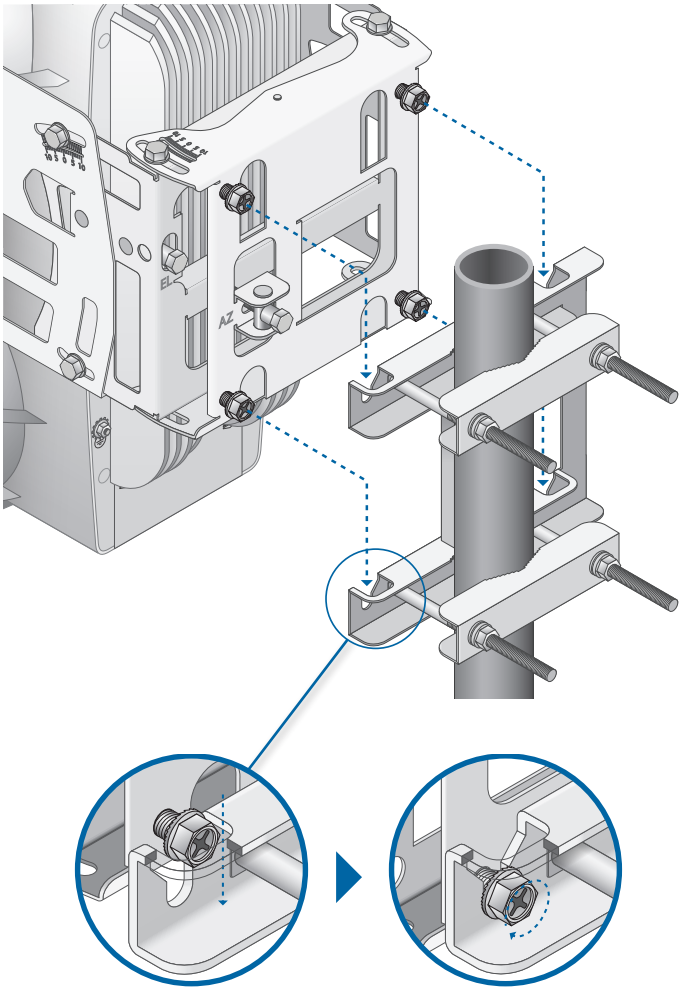


4. Ensure that there is a 6 mm (0.24 in) gap between the head of each *M8x14 Serrated Flange Screw* and the *Alignment Bracket*.



5. Lift the airFiber AF24 and align the four *M8x16 Serrated Flange Screws* with the slots on the *Pole Mount Bracket*. Seat the screws in the slots. Securely tighten the screws.

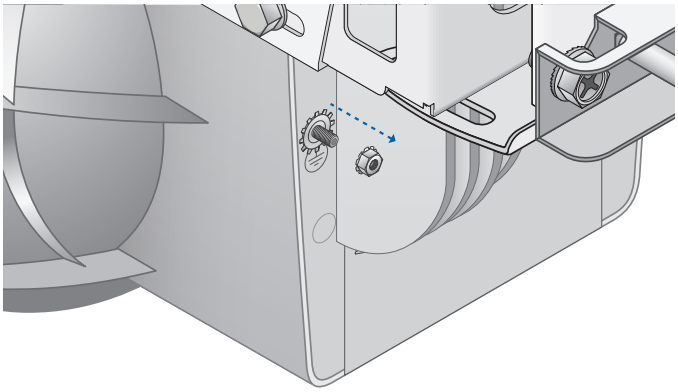
WARNING: To prevent injury, ensure that all four screws are seated and fully tightened.



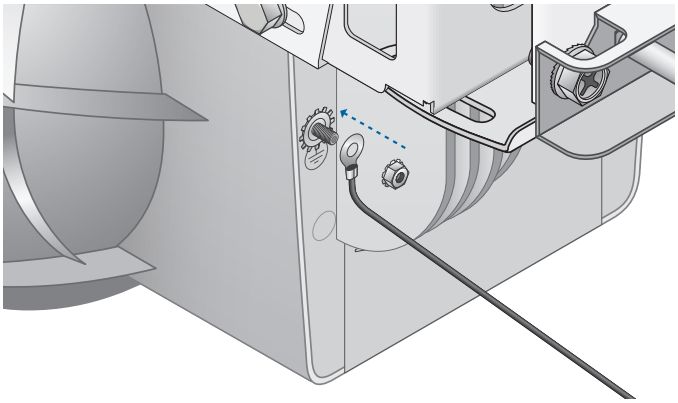
Grounding

To attach a ground wire:

1. Remove the nut from the *Ground Bonding Point*.



2. Attach a ground wire (min. 8 AWG or 10 mm^2) to the lug and replace the nut to secure the wire.

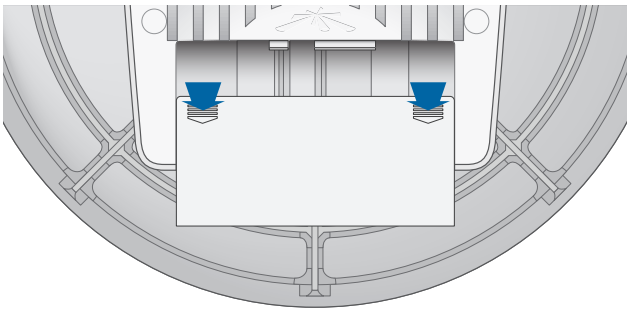


3. Secure the other end of the ground wire to a grounded mast, pole, tower, or grounding bar.

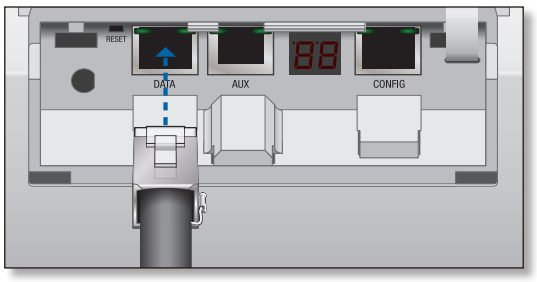
Note: The grounding wire should be as short as possible and no longer than 1 meter (3.28 ft) in length.

Connecting Ethernet

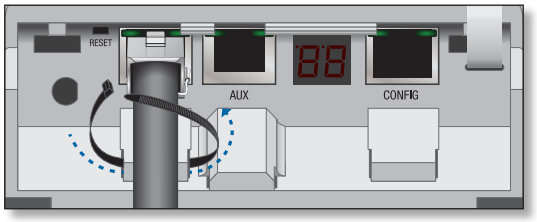
1. Press down on the indicator arrows and slide the *Port Cover* off.



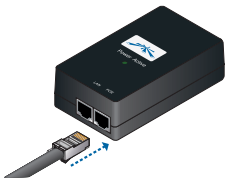
2. Connect a TOUGHCable or other outdoor, shielded CAT5e/6 cable to the *Data* port.



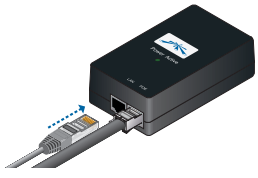
3. Create a strain relief for the Ethernet cable by feeding a cable tie through the tie slot under the cable. Then wrap the cable tie around the cable and tighten.



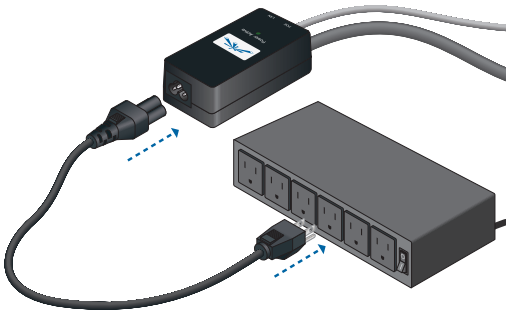
4. Connect the other end of the Ethernet cable from the *Data* port to the Ethernet port labeled **POE** on the PoE Adapter.



5. Connect an Ethernet cable from your network to the Ethernet port labeled **LAN** on the *PoE Adapter.*

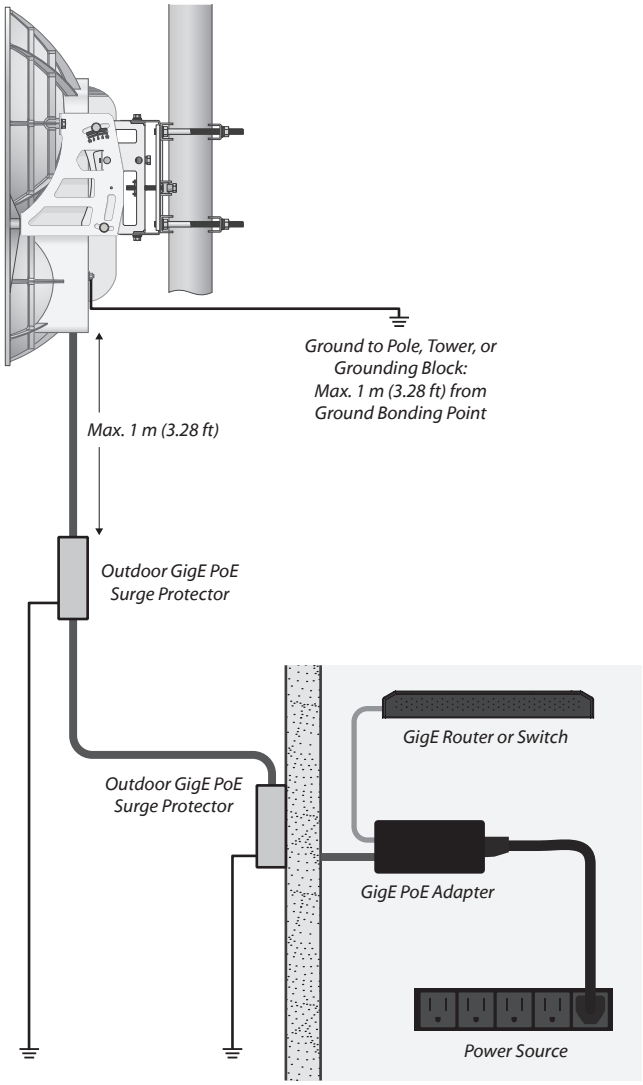


6. Connect the *Power Cord* to the power port on the *PoE Adapter.* Connect the other end of the *Power Cord* to a power source.



Note: For added protection, we recommend installing two GigE PoE surge protectors. Install the first surge protector within one meter of the airFiber *Data* port, and install the second surge protector at the ingress point of the location housing the wired network equipment.

Below is a diagram of a finished installation with recommended surge protectors installed.



Alignment

Tips

- We recommend using a pair of installers in constant communication because in the fine-tuning stage, one installer makes azimuth and elevation adjustments on one airFiber radio while the other installer reports the received signal level at the other airFiber radio. (Fine-tuning is necessary because the main lobe of the receiver is more narrow than that of the transmitter, in both azimuth and elevation.)
- To accurately align the airFiber radios for best performance, you MUST align only one end of the link at a time.
- For more convenient alignment, you may consider using long-range scopes (not included) temporarily attached to your airFiber radios.
- You may need to use additional hardware to compensate for issues such as the improper orientation of a mounting pole or significant elevation differences between the airFiber radios.

Determining the Received Signal Level

There are three methods for determining the received signal level:

- LED Display (See the next column.)
- airFiber Configuration Interface (See **"Using the airFiber Configuration Interface" on page 12**.)
- Audio tone (Optional equipment required. See **"Using the Audio Tone" on page 14**.)

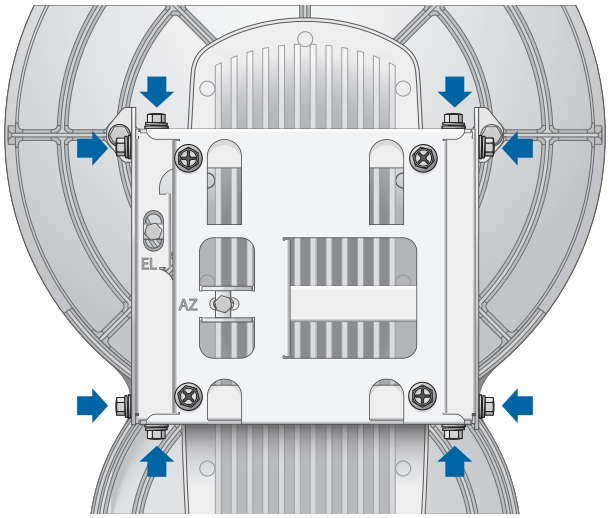
Using the LED Display

Establishing a Preliminary Link

Adjust the positions of the *Master* and the *Slave* to establish a preliminary link. This requires the *Master* and *Slave* to be within a few degrees of the line of sight between the airFiber radios.

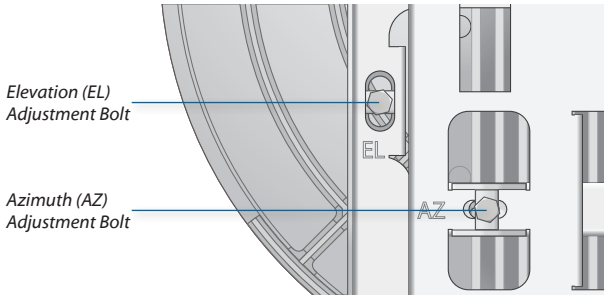
Note: The *Master* must be aimed first at the *Slave* because the *Slave* does not transmit any RF signal until it detects transmissions from the *Master*.

1. For the *Master* and *Slave*, ensure the eight *Lock Bolts* on the *Alignment Bracket* are sufficiently loose by spinning each washer by hand.



WARNING: All *Lock Bolts* MUST be loose to avoid damage to the airFiber housing.

2. For the *Master* and *Slave*, ensure the *Azimuth (AZ)* and *Elevation (EL) Adjustment Bolts* are in the middle of their adjustment ranges.

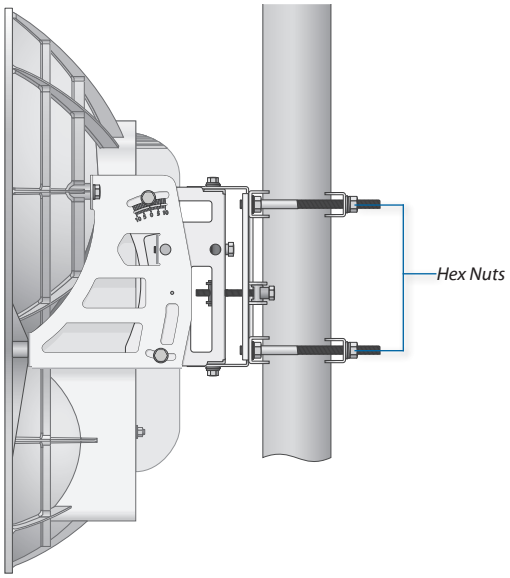


3. Master Aim the *Master* at the *Slave*. If necessary, adjust the *Master*'s position on the pole:

a. Loosen the *Hex Nuts*.

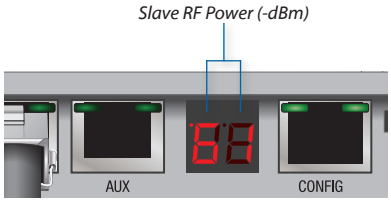
b. Adjust the *Pole Mount Bracket* and *Pole Clamps*.

c. Tighten the *Hex Nuts*.



Master

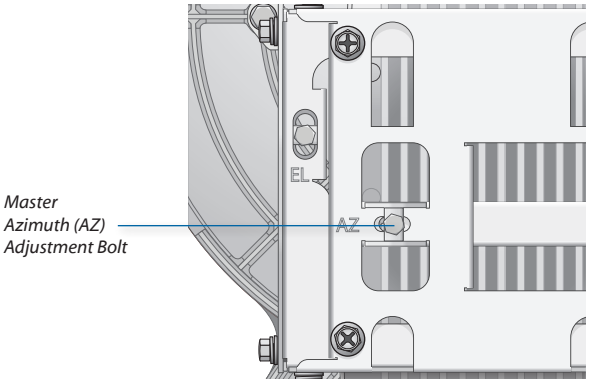
4. Slave Aim the *Slave* at the *Master* to achieve the strongest received signal level on the *Slave*'s numeric LED Display, which is located next to the *Config* port. If necessary, adjust the *Slave*'s position on the pole.



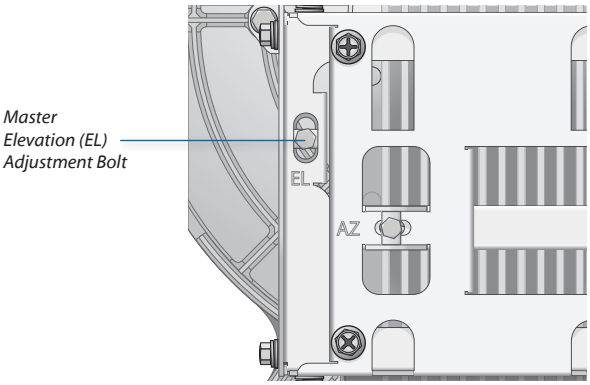
Note: Values on the LED Display are displayed in negative (-) dBm. For example, 61 represents a received signal level of -61 dBm. Lower values indicate stronger received signal levels.

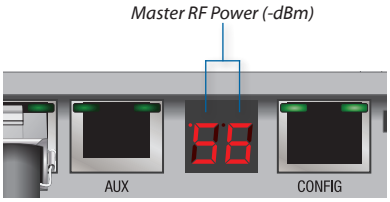
5. Master Adjust the azimuth and elevation of the *Master* until the strongest received signal level is displayed on the LED Display of the *Master*.

a. Sweep the *Azimuth (AZ) Adjustment Bolt* of the *Master* through its adjustment range.



b. Sweep the *Elevation (EL) Adjustment Bolt* of the *Master* through its adjustment range.





Note: : If the LED Display indicates an overload condition , see **"RX Gain" on page 24** for more details about *RX Gain* and overload condition.

Fine-Tuning the Link

The *Azimuth (AZ)* and *Elevation (EL) Adjustment Bolts* of the *Alignment Bracket* adjust the azimuth and elevation within a range of ±10°. For accurate alignment, make adjustments on one end of the link while the other installer reports the received signal level at the other end of the link. Do NOT make simultaneous adjustments on the *Master* and *Slave*.

1. Slave Adjust the azimuth and elevation of the *Slave* until the other installer sees the strongest received signal level displayed on the LED Display of the *Master*.
2. Master Adjust the azimuth and elevation of the *Master* until the other installer sees the strongest received signal level displayed on the LED Display of the *Slave*.
3. Repeat steps 1 and 2 until you achieve a symmetric link, with the received signal levels within 1 dB of each other. This ensures the best possible data rate between the airFiber radios.
4. Lock the alignment on both airFiber radios by tightening all eight *Lock Bolts* on the *Alignment Bracket*.

Observe the LED Display on each airFiber AF24 to ensure that the value remains constant while tightening the *Lock Bolts*. If the LED value changes during the locking process, loosen the *Lock Bolts*, finalize the alignment of each airFiber AF24 again, and retighten the *Lock Bolts*.

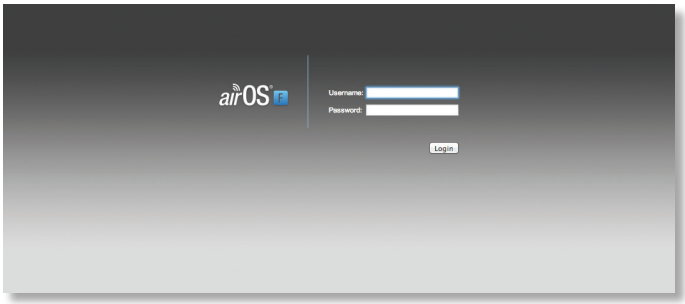
Using the airFiber Configuration Interface

Before You Begin

To access the airFiber Configuration Interface:

1. Make sure that your computer that is connected to the *Config* port on the airFiber AF24.
2. Configure the Ethernet adapter on your computer with a static IP address on the 192.168.1.x subnet (for example, 192.168.1.100).
3. Launch your web browser. Type **http://192.168.1.20** in the address field and press **enter** (PC) or **return** (Mac).

4. Enter **ubnt** in the *Username* and *Password* fields, and click **Login**.



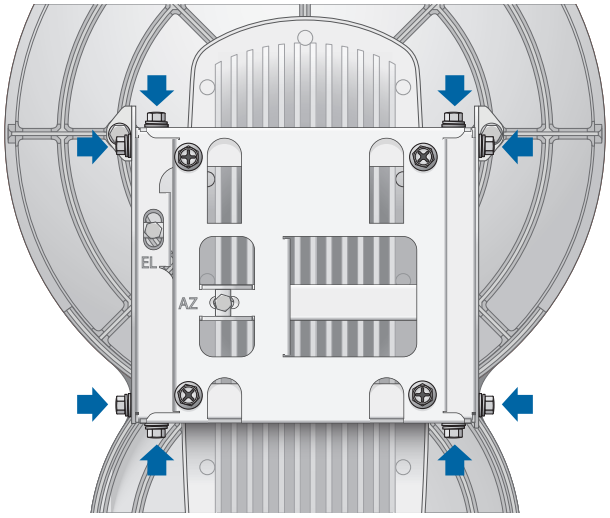
5. The *Main* tab of the airFiber Configuration Interface appears. Click the **Tools** drop-down list at the top right corner of the page.
6. Click **Align Antenna**. You will use the *Align Antenna* tool to point and optimize the antenna in the direction of maximum link signal. (The *Antenna Alignment* window is designed to refresh every 250 milliseconds. See **"Align Antenna" on page 37** for more details.)
7. The *Antenna Alignment* window appears, displaying the *Signal Strengths* for both airFiber radios. The *Chain Signal Strength* bar graphs display the *Signal Strengths* for the airFiber AF24 you have accessed, while the *Remote Signal Strength* bar graphs display the *Signal Strengths* for the other airFiber AF24.

Establishing a Preliminary Link

Adjust the positions of the *Master* and the *Slave* to establish a preliminary link. This requires the *Master* and *Slave* to be within a few degrees of the line of sight between the airFiber radios.

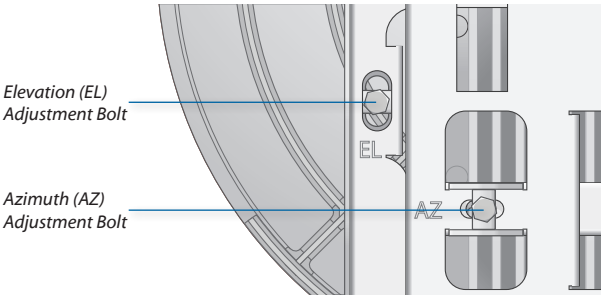
Note: The *Master* must be aimed first at the *Slave* because the *Slave* does not transmit any RF signal until it detects transmissions from the *Master*.

1. For the *Master* and *Slave*, ensure the eight *Lock Bolts* on the *Alignment Bracket* are sufficiently loose by spinning each washer by hand.



WARNING: All *Lock Bolts* MUST be loose to avoid damage to the airFiber housing.

2. For the *Master* and *Slave*, ensure the *Azimuth (AZ)* and *Elevation (EL) Adjustment Bolts* are in the middle of their adjustment ranges.

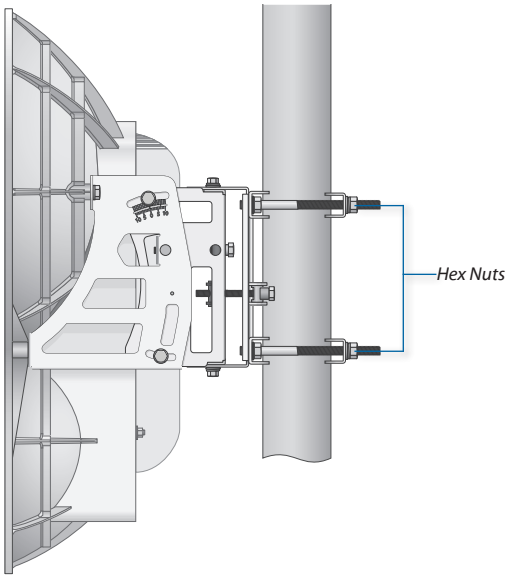


3. Master Aim the *Master* at the *Slave*. If necessary, adjust the *Master*'s position on the pole:

a. Loosen the *Hex Nuts*.

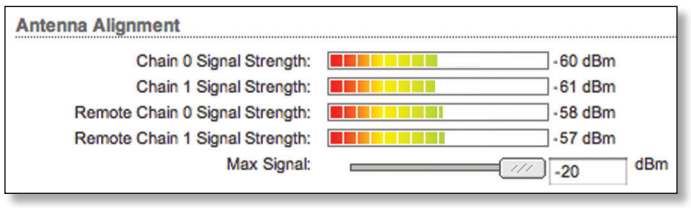
b. Adjust the *Pole Mount Bracket* and *Pole Clamps*.

c. Tighten the *Hex Nuts*.



Master

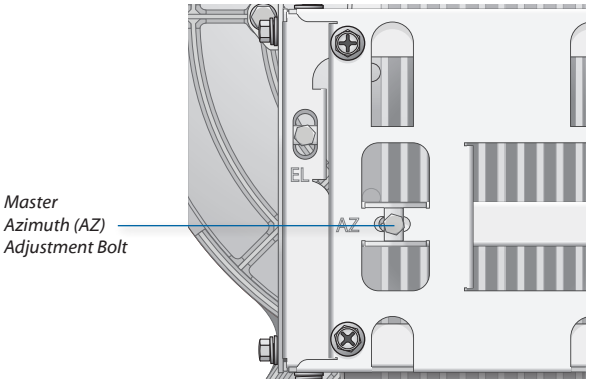
4. Slave Aim the *Slave* at the *Master* to achieve the strongest *Signal Strengths* for the *Slave*. If necessary, adjust the *Slave*'s position on the pole.



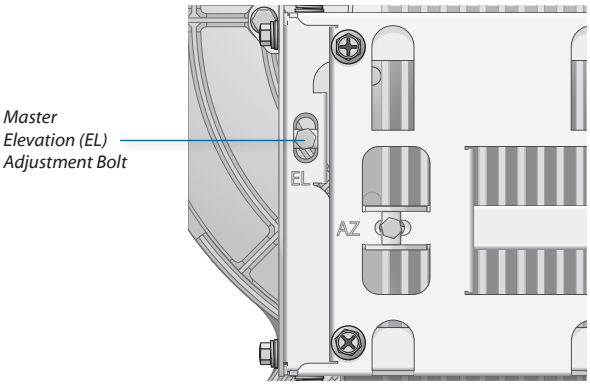
Note: The *Signal Strength* bar graphs display the absolute power level (in dBm) of the received signal for each chain. Lower values indicate stronger received signal levels.

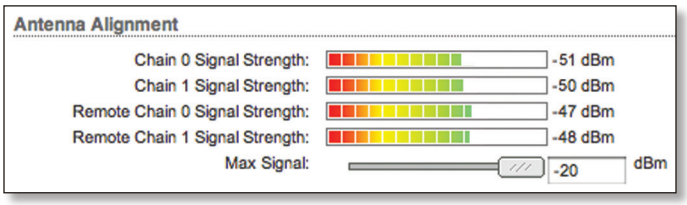
5. Master Adjust the azimuth and elevation of the *Master* until the strongest *Signal Strengths* are displayed for the *Master*.

a. Sweep the *Azimuth (AZ) Adjustment Bolt* of the *Master* through its adjustment range.



b. Sweep the *Elevation (EL) Adjustment Bolt* of the *Master* through its adjustment range.





Note: If the *Antenna Alignment* window displays "Overload" to indicate overload condition, see **"RX Gain" on page 24** for more details about *RX Gain* and overload condition.

Fine-Tuning the Link

The *Azimuth (AZ)* and *Elevation (EL) Adjustment Bolts* of the *Alignment Bracket* adjust the azimuth and elevation within a range of ±10°. For accurate alignment, make adjustments on one end of the link using the *Signal Strengths* for the airFiber radio at the other end of the link. Do NOT make simultaneous adjustments on the *Master* and *Slave*.

1. Slave Adjust the azimuth and elevation of the *Slave* until the other installer sees the strongest *Signal Strengths* for the *Master*.
2. Master Adjust the azimuth and elevation of the *Master* until the other installer sees the strongest *Signal Strengths* for the *Slave*.
3. Repeat steps 1 and 2 until you achieve a symmetric link, with the *Signal Strengths* within 1 dB of each other. This ensures the best possible data rate between the airFiber radios.
4. Lock the alignment on both airFiber radios by tightening all eight *Lock Bolts* on the *Alignment Bracket*.

Observe the *Antenna Alignment* window to ensure that the values remain constant while tightening the *Lock Bolts*. If the values change during the locking process, loosen the *Lock Bolts*, finalize the alignment of each airFiber AF24 again, and retighten the *Lock Bolts*.

Using the Audio Tone

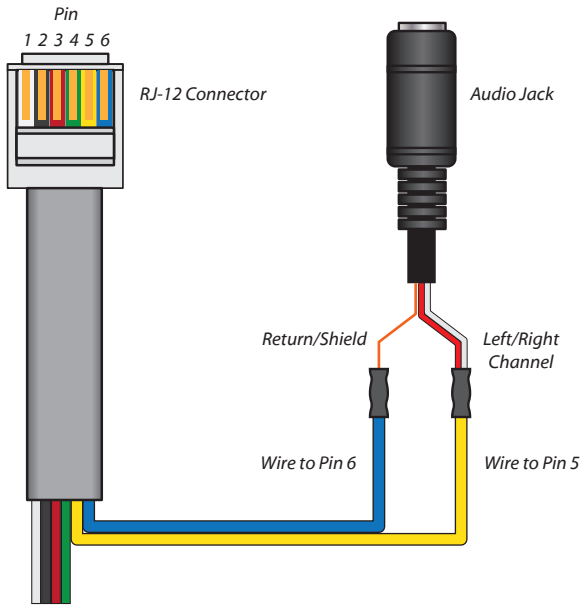
Before You Begin

Create your own cable adapter to connect the *AUX* port to your headphones or other listening device. The cable adapter requires two items:

- An RJ-12 cable with an RJ-12 connector
- A cable with a 3.5 mm, female, stereo phono jack (mono jack is acceptable)

1. Attach the wire from pin 6 of the RJ-12 cable to the return or shield wire of the 3.5 mm jack.
2. Attach the wire from pin 5 of the RJ-12 cable to both the left and right channel wires of the 3.5 mm stereo phono jack.

Note: For a mono jack, connect the wire from pin 5 to the + wire of the mono jack.



Pinouts from RJ-12 to 3.5 mm Stereo Phono Jack

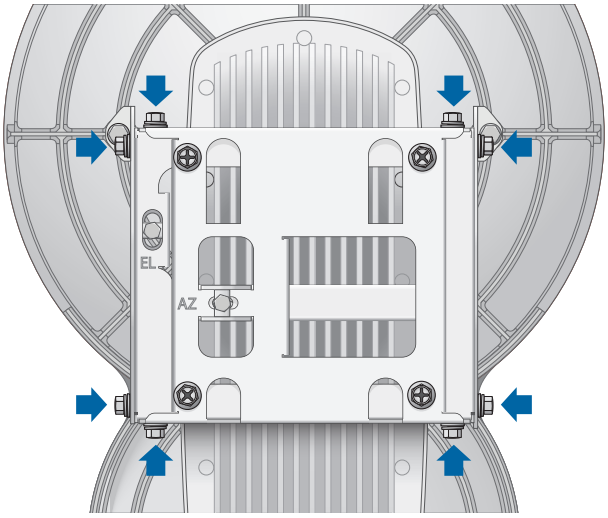
Note: Wire colors may vary on RJ-12 cables.

Establishing a Preliminary Link

Adjust the positions of the *Master* and the *Slave* to establish a preliminary link. This requires the *Master* and *Slave* to be within a few degrees of the line of sight between the airFiber radios.

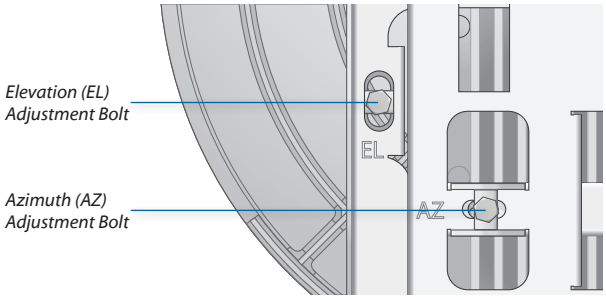
Note: The *Master* must be aimed first at the *Slave* because the *Slave* does not transmit any RF signal until it detects transmissions from the *Master*.

1. For the *Master* and *Slave*, ensure the eight *Lock Bolts* on the *Alignment Bracket* are sufficiently loose by spinning each washer by hand.



WARNING: All *Lock Bolts* MUST be loose to avoid damage to the airFiber housing.

2. For the *Master* and *Slave*, ensure the *Azimuth (AZ)* and *Elevation (EL) Adjustment Bolts* are in the middle of their adjustment ranges.

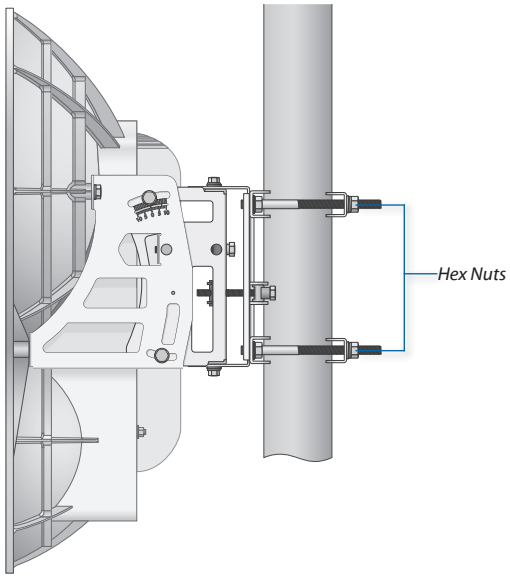


3. Master Aim the *Master* at the *Slave*. If necessary, adjust the *Master*'s position on the pole:

a. Loosen the *Hex Nuts*.

b. Adjust the *Pole Mount Bracket* and *Pole Clamps*.

c. Tighten the *Hex Nuts*.

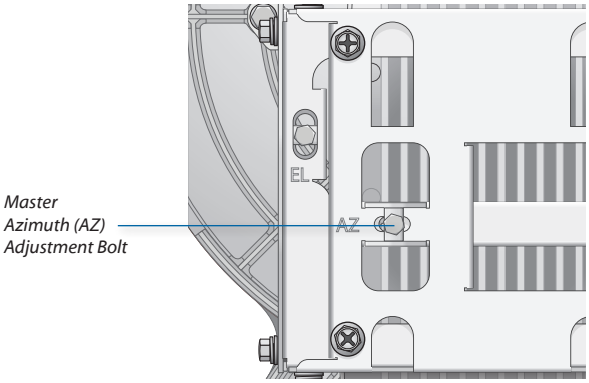


Master

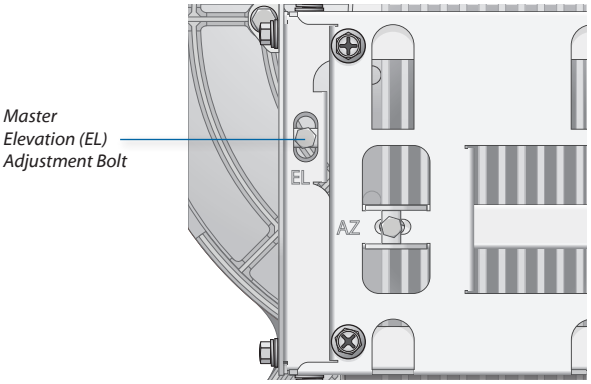
4. Slave Listen to the audio tone of the *Slave* – the higher the pitch, the stronger the signal strength. Aim the *Slave* at the *Master* to achieve the strongest signal strength. If necessary, adjust the *Slave*'s position on the pole.

5. Master Adjust the azimuth and elevation of the *Master* until you hear the highest pitch for the *Master*.

a. Sweep the *Azimuth (AZ) Adjustment Bolt* of the *Master* through its adjustment range.



b. Sweep the *Elevation (EL) Adjustment Bolt* of the *Master* through its adjustment range.



Fine-Tuning the Link

The *Azimuth (AZ)* and *Elevation (EL) Adjustment Bolts* of the *Alignment Bracket* adjust the azimuth and elevation within a range of ±10°. For accurate alignment, make adjustments on one end of the link while the other installer listens to the audio tone at the other end of the link. Do NOT make simultaneous adjustments on the *Master* and *Slave*.

1. Slave Adjust the azimuth and elevation of the *Slave* until the other installer hears the highest pitch for the *Master*.
2. Master Adjust the azimuth and elevation of the *Master* until the other installer hears the highest pitch for the *Slave*.
3. Repeat steps 1 and 2 until you achieve a symmetric link, with the received signal levels within 1 dB of each other. This ensures the best possible data rate between the airFiber radios.

Note: If you have difficulty discerning whether the link is symmetric, you can use one of the following methods to determine more precise received signal level readings.

- LED Display (See **"Using the LED Display" on page 10**.)
- airFiber Configuration Interface (See **"Using the airFiber Configuration Interface" on page 12**.)

4. Lock the alignment on both airFiber radios by tightening all eight *Lock Bolts* on the *Alignment Bracket*.

Listen to the audio tone for each airFiber AF24 to ensure that the value remains constant while tightening the *Lock Bolts*. If the audio tones change during the locking process, loosen the *Lock Bolts*, finalize the alignment of each airFiber AF24 again, and retighten the *Lock Bolts*.

Chapter 3: Navigation

The airFiber Configuration Interface is an advanced operating system capable of powerful wireless and routing features, built upon a simple and intuitive user interface foundation.

The airFiber AF24 uses the airFiber Configuration Interface for easy configuration and management via a web browser.

There are two ways to access the airFiber Configuration Interface:

- **Config Port** Enabled by default. Use a direct connection to the *Config* port for out-of-band management.
- **In-Band Management** Enabled by default. In-band management is available through the local *Data* port or the *Data* port at the other end of the link. You can disable it on the *Network* tab. (See **"Management Network Settings" on page 25** for more details.)

Accessing the airFiber Configuration Interface

Connect to the airFiber Configuration Interface.

1. Make sure that your host machine is connected to the LAN that is connected to the *Config* port on the airFiber AF24.
2. Configure the Ethernet adapter on your host system with a static IP address on the 192.168.1.x subnet (for example, 192.168.1.100).
3. Launch your web browser. Type **http://192.168.1.20** in the address field and press **enter** (PC) or **return** (Mac).

4. Upon initial login, the *Terms of Use* appear on the login screen. Enter **ubnt** in the *Username* and *Password* fields, and select the appropriate choices from the *Country* and *Language* drop-down lists. Check the box next to *I agree to these terms of use*, and click **Login**.

Note: U.S. product versions are locked to the U.S. Country Code to ensure compliance with FCC regulations.

5. The airFiber Configuration Interface will appear, allowing you to customize your settings as needed.

Product Verification

The airFiber Configuration Interface will verify whether a product is genuine or counterfeit.

For a genuine airFiber AF24, the airFiber Configuration Interface will display a Genuine Product logo in the lower left corner of the screen.

For any product that is not an official Ubiquiti product, the airFiber Configuration Interface will display a counterfeit warning. Please contact Ubiquiti at **support@ubnt.com** regarding this product.

Note: For product models introduced prior to 2012, the airFiber Configuration Interface will NOT display any logo in the lower left corner of the screen.

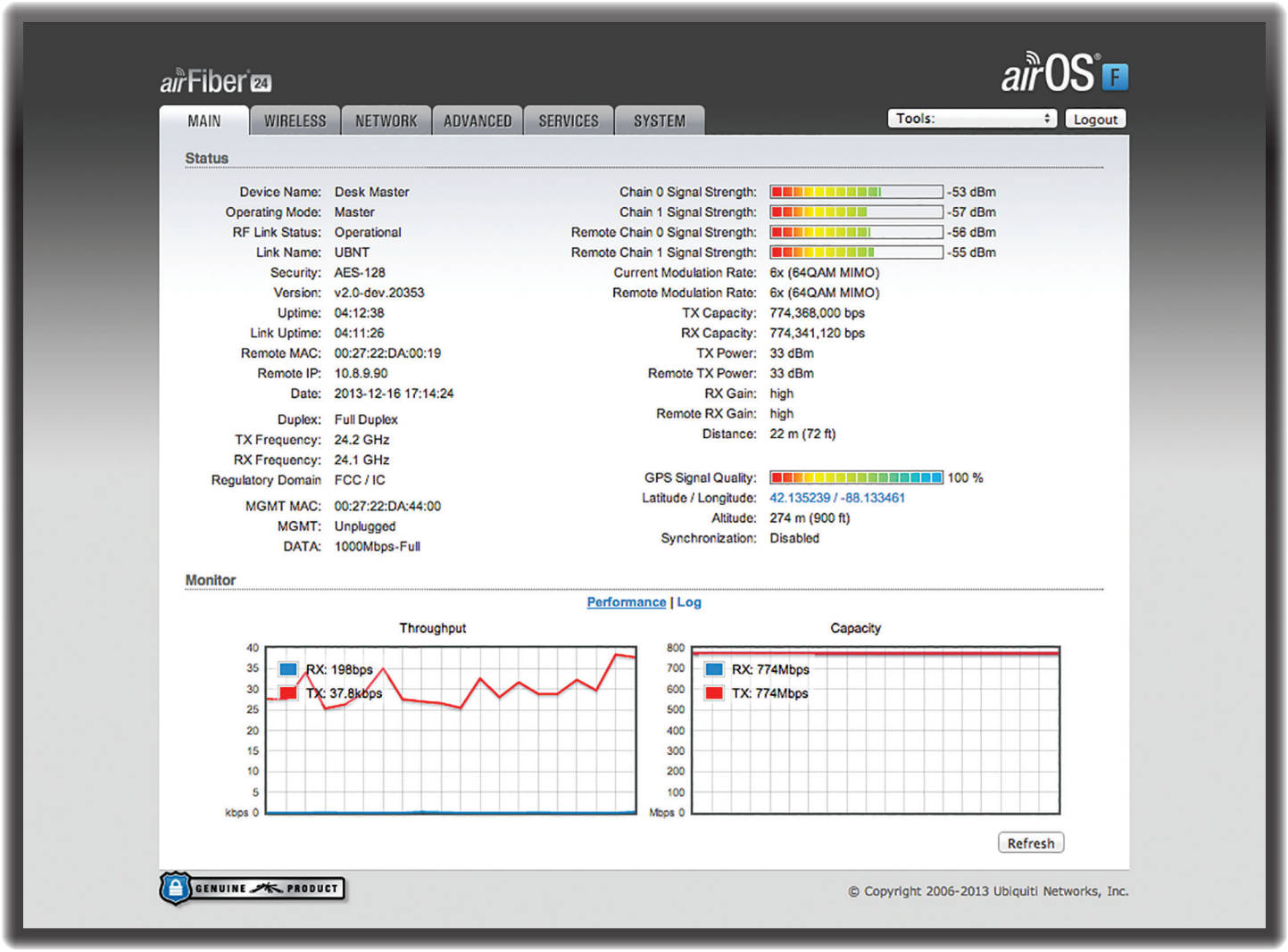
Interface Tabs

The airFiber Configuration Interface contains six main tabs, each of which provides a web-based management page to configure a specific aspect of the airFiber AF24. This User Guide covers each tab with a chapter. For details on a specific tab, refer to the appropriate chapter.

- **Main** The **"Main Tab" on page 19** displays device status, statistics, and network monitoring links.
- **Wireless** The **"Wireless Tab" on page 22** configures basic wireless settings, including the wireless mode, link name, frequency, output power, speed, RX gain, and wireless security.
- **Network** The **"Network Tab" on page 25** configures the management network settings, Internet Protocol (IP) settings, management VLAN, and automatic IP aliasing.
- **Advanced** The **"Advanced Tab" on page 27** provides more precise wireless interface controls, including advanced wireless settings and advanced Ethernet settings.
- **Services** The **"Services Tab" on page 30** configures system management services: Ping Watchdog, Simple Network Management Protocol (SNMP), servers (web, SSH, telnet), Network Time Protocol (NTP) client, Dynamic Domain Name System (DDNS) client, system log, and device discovery.
- **System** The **"System Tab" on page 34** controls system maintenance routines, administrator account management, location management, device customization, firmware update, and configuration backup. You can also change the language of the web management interface.

Each page also contains network administration and monitoring tools:

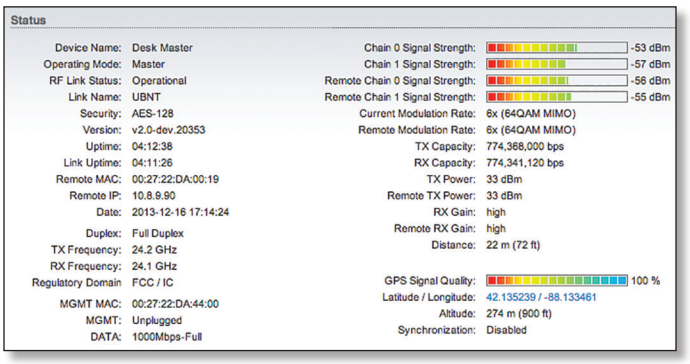
- **"Align Antenna" on page 37**
- **"Discovery" on page 38**
- **"Ping" on page 38**
- **"Traceroute" on page 38**



Chapter 4: Main Tab

The *Main* tab displays a summary of the link status information, current values of the basic configuration settings, network settings and information, and traffic statistics.

Status



Device Name Displays the customizable name or identifier of the device. The Device Name (also known as host name) is displayed in registration screens and discovery tools.

Operating Mode Displays the mode of the airFiber AF24: *Slave*, *Master*, or *Reset*.

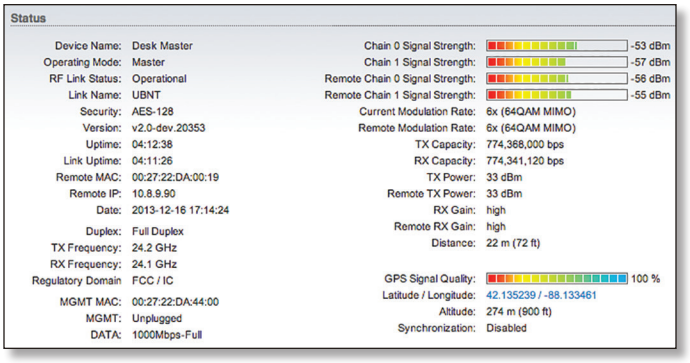
RF Link Status Displays the status of the airFiber AF24: *RF Off*, *Syncing*, *Beaconing*, *Registering*, *Enabling*, *Listening*, or *Operational*.

Note: Most of the RF Link Statuses map to specific flash rates of the *RF Link Status* LED (See **"LEDs" on page 2** for more details.)

Status	Flash Rate of LED
RF Off	Off
Syncing	Short Flash (1:3 on/off cycle)
Beaconing	Normal Flash (1:1 on/off cycle)
Registering	Long Flash (3:1 on/off cycle)
Operational	On

Link Name Displays the name of your link.

Security AES-128 is enabled at all times.



Version Displays the airFiber Configuration Interface software version.

Uptime This is the total time the device has been running since the latest reboot (when the device was powered up) or software upgrade. The time is displayed in days, hours, minutes, and seconds.

Link Uptime This is the total time the airFiber link has been continuously operational. The time is displayed in days, hours, minutes, and seconds.

Remote MAC Displays the Management Ethernet MAC address of the remote airFiber AF24.

Remote IP Dislays the Management Ethernet IP address of the remote airFiber AF24.

Date Displays the current system date and time. The date and time are displayed in YEAR-MONTH-DAY HOURS:MINUTES:SECONDS format. The system date and time is retrieved from the Internet using NTP (Network Time Protocol). The NTP Client is enabled by default on the *Services* tab. The airFiber AF24 doesn't have an internal clock, and the date and time may be inaccurate if the NTP Client is disabled or the device isn't connected to the Internet.

Duplex Displays *Full Duplex* or *Half Duplex*. Full-duplex mode allows communication in both directions simultaneously. Half-duplex mode allows communication in one direction at a time, alternating between transmission and reception.

TX Frequency Displays the current transmit frequency. The airFiber AF24 uses the radio frequency specified to transmit data.

RX Frequency Displays the current receive frequency. The airFiber AF24 uses the radio frequency specified to receive data.

Regulatory Domain Displays the regulatory domain (*FCC/IC*, *ETSI*, or *Other*), as determined by country selection.

MGMT MAC Displays the MAC address of the *Config* port.

MGMT Displays the speed and duplex of the *Config* port.

DATA Displays the speed and duplex of the *Data* port.

Chain 0/1 Signal Strength Displays the absolute power level (in dBm) of the received signal for each chain.

Changing the *RX Gain* on the *Wireless* tab does not affect the *Signal Strength* values displayed on the *Main* tab. However, if "Overload" is displayed to indicate overload condition, decrease the *RX Gain*. See **"RX Gain" on page 24** for more details about *RX Gain* and overload condition.

Remote Chain 0/1 Signal Strength Displays the absolute power level (in dBm) of the received signal for each chain of the remote airFiber AF24.

Current Modulation Rate Displays the modulation rate:

- 6x (64QAM MIMO)
- 4x (16QAM MIMO)
- 2x (QPSK MIMO)
- 1x (QPSK SISO)
- ¼x (QPSK SISO)

If *Automatic Rate Adaptation* is enabled on the *Wireless* tab, then *Current Modulation Rate* displays the current speed in use and depends on the *Maximum Modulation Rate* specified on the *Wireless* tab and current link conditions. (See **"RX Gain" on page 24** for more details about *RX Gain* and overload condition.)

Remote Modulation Rate Displays the modulation rate of the remote airFiber AF24:

- 6x (64QAM MIMO)
- 4x (16QAM MIMO)
- 2x (QPSK MIMO)
- 1x (QPSK SISO)
- ¼x (QPSK SISO)

TX Capacity Displays the potential TX throughput, how much the airFiber AF24 can send, after accounting for the modulation and error rates.

RX Capacity Displays the potential RX throughput, how much the airFiber AF24 can receive, after accounting for the modulation and error rates.

TX Power Displays the maximum average transmit output power (in dBm) of the airFiber AF24.

Remote TX Power Displays the maximum average transmit output power (in dBm) of the remote airFiber AF24.

RX Gain Displays the gain for the RX antenna of the airFiber AF24.

Remote RX Gain Displays the gain for the RX antenna the remote airFiber AF24.

Distance Displays the distance between the airFiber radios.

GPS Signal Quality Displays Global Positioning System (GPS) signal quality as a percentage value on a scale of 0-100%.

Latitude/Longitude Based on GPS tracking, reports the device's current latitude and longitude. Clicking the link opens the reported latitude and longitude in a browser using Google Maps™ (**http://maps.google.com**).

Altitude Based on GPS tracking, reports the device's current altitude relative to sea level.

Synchronization airFiber uses GPS to synchronize the timing of its transmissions. By default, this option is disabled.

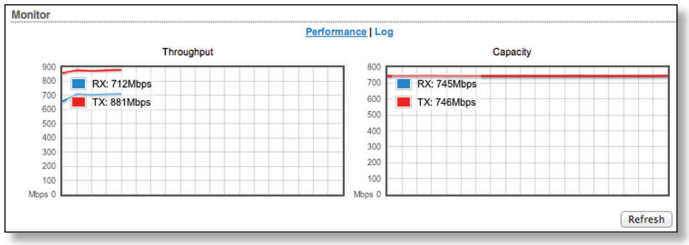
Monitor

There are two monitoring tools accessible via the links on the *Main* tab. The default is *Performance*, which is displayed when you first open the *Main* tab.

Performance

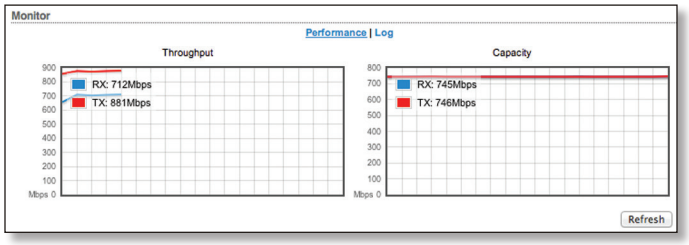
Throughput and *Capacity* charts display the current and potential data traffic.

Throughput



Throughput displays the current data traffic on the *DATA* port in both graphical and numerical form. The chart scale and throughput dimension (Bps, Kbps, Mbps) change dynamically depending on the mean throughput value. The statistics are updated automatically.

Capacity

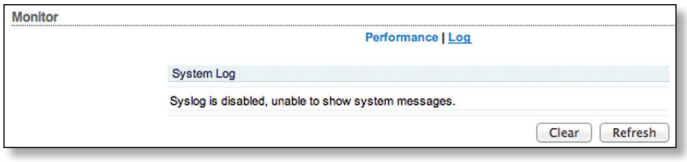


Capacity displays the potential data traffic on the *DATA* port in both graphical and numerical form. The chart scale and throughput dimension (Bps, Kbps, Mbps) change dynamically depending on the mean throughput value. The statistics are updated automatically.

Refresh If there is a delay in the automatic update, click **Refresh** to manually update the statistics.

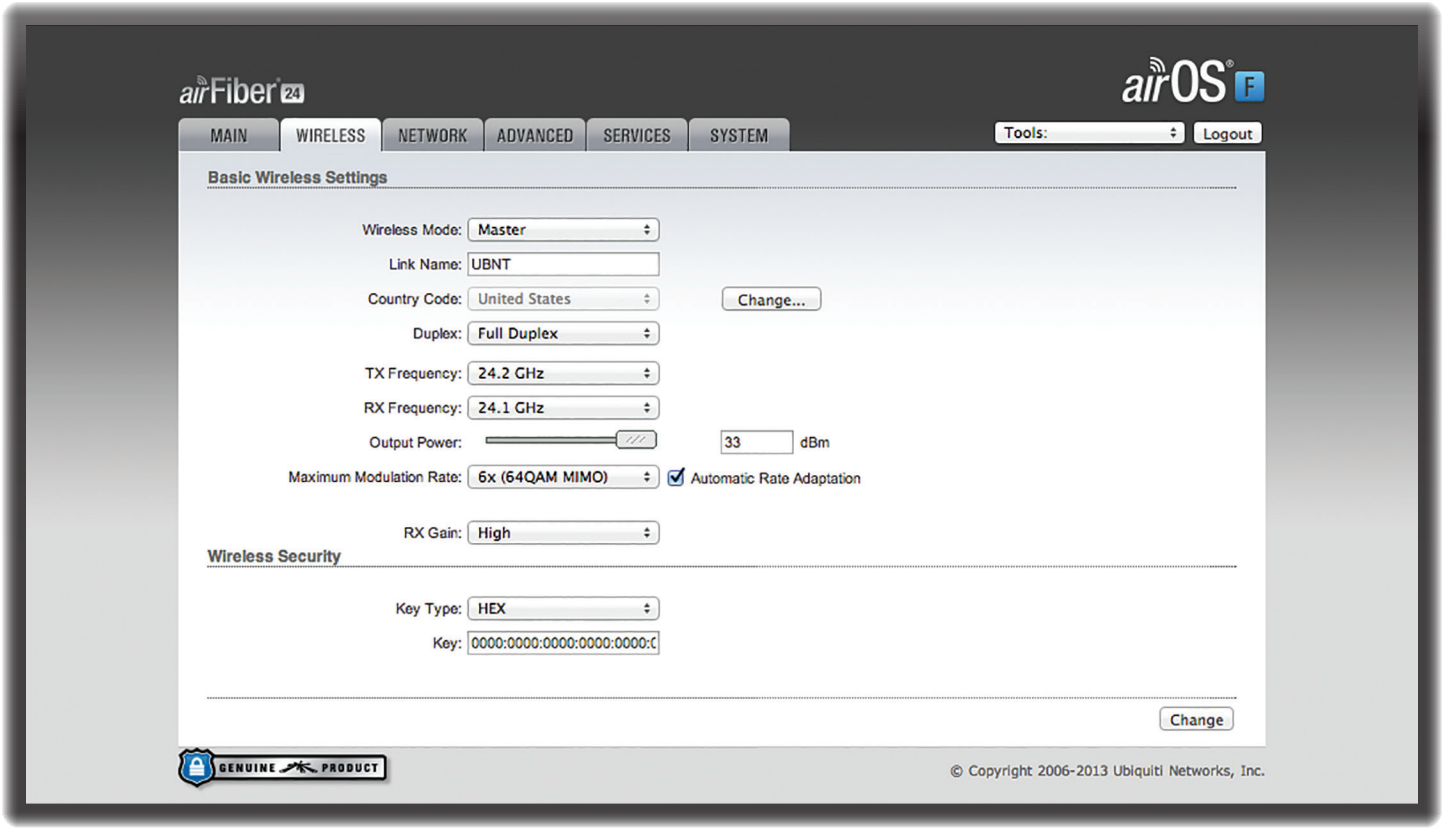
Log

When logging is enabled (see **"System Log" on page 33** to enable logging), this option lists all registered system events. By default, logging is not enabled.



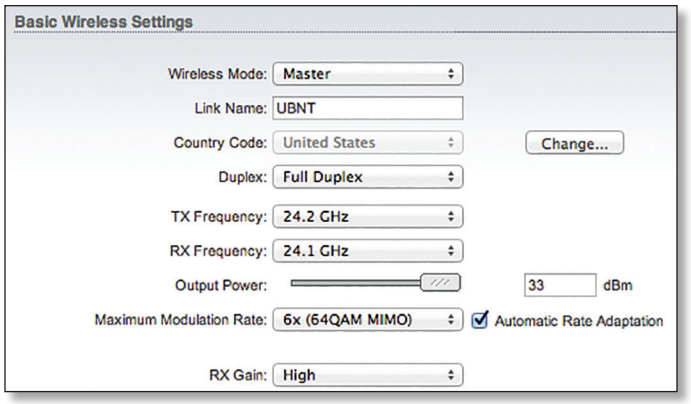
Clear To delete all entries in the system log, click **Clear**.

Refresh To update the log content, click **Refresh**.



Chapter 5: Wireless Tab

The *Wireless* tab contains everything needed to set up the wireless part of the link. This includes wireless mode, link name, frequencies, output power, speed, gain, and wireless security.



Change To save or test your changes, click **Change**.

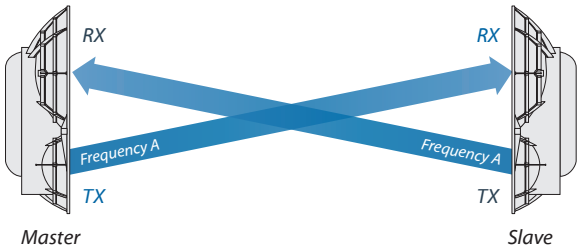
A new message appears. You have three options:

- **Apply** To immediately save your changes, click **Apply**.
- **Test** To try the changes without saving them, click **Test**. To keep the changes, click **Apply**. If you do not click *Apply* within 180 seconds (the countdown is displayed), the airFiber AF24 times out and resumes its earlier configuration.
- **Discard** To cancel your changes, click **Discard**.

Write down the settings you configure on the *Wireless* tab. You will need to enter the same settings on the airFiber AF24 at the other end of your PtP link. The exceptions are as follows:

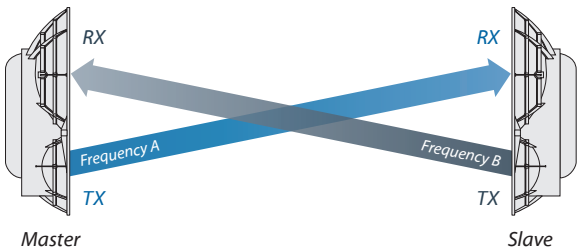
- **Wireless Mode** Configure one airFiber AF24 as the *Master* and the other as the *Slave*.
- **TX and RX Frequencies** The *TX Frequency* on the Master should be used as the *RX Frequency* on the Slave, and vice versa.

For *Half Duplex* mode (default), the *TX* and *RX Frequencies* can be the same or different to suit local interference.



Half-Duplex Diagram

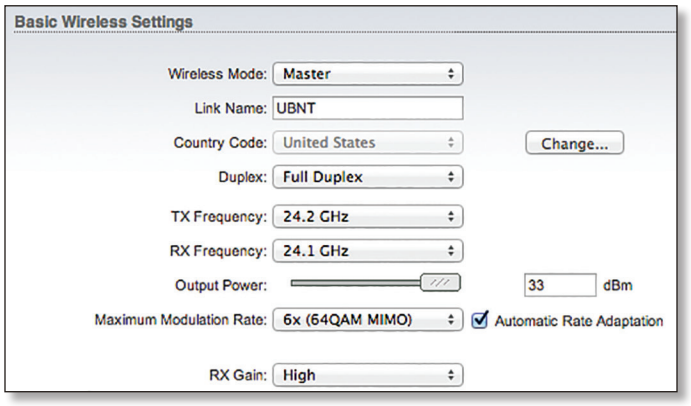
For *Full Duplex* mode, the *TX* and *RX Frequencies* should be different.



Full-Duplex Diagram

Basic Wireless Settings

In this section, configure the basic wireless settings, such as wireless mode, link name, country code, frequencies, output power, speed, and gain.



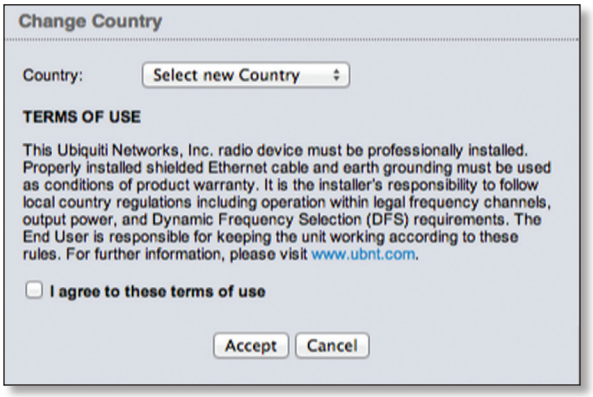
Wireless Mode By default, the Wireless Mode is *Slave*. You must configure one airFiber AF24 to **Master** because each PtP link must have one *Master*.

Link Name Enter a name for your PtP link.

Country Code Each country has their own power level and frequency regulations. *To ensure the airFiber AF24 operates under the necessary regulatory compliance rules, you must select the country where your device will be used*. The frequency settings and output power limits will be tuned according to the regulations of the selected country.

- **Change** To select a new country, click **Change**.

  Note: U.S. product versions are locked to the U.S. Country Code to ensure compliance with FCC regulations.



  - **Country** Select the new country.
  - **I agree to these terms of use** Check this box; you must agree to the *Terms of Use* to use the product.
  - **Accept** Saves your change.
  - **Cancel** Discards your change.

Duplex Select **Half Duplex** or **Full Duplex**. Half-duplex operation provides more frequency planning options at the cost of higher latency and throughput. (Half-duplex mode allows communication in one direction at a time, alternating between transmission and reception.) Full-duplex operation provides the highest throughput and lowest latency; however, you have fewer frequency management options. (Full-duplex mode allows communication in both directions simultaneously.)

Note: For *Half Duplex* mode (default), the *TX* and *RX Frequencies* on the same airFiber AF24 can be the same or different to suit local interference. For *Full Duplex* mode, the *TX* and *RX Frequencies* on the same airFiber AF24 should be different.

TX Frequency Select a transmit frequency.

Note: The *TX Frequency* on the Master should be used as the *RX Frequency* on the Slave, and vice versa.

RX Frequency Select a receive frequency.

Output Power Defines the maximum average transmit output power (in dBm) of the airFiber AF24. To specify the output power, use the slider or manually enter the output power value. The transmit power level maximum is limited according to country regulations.

Maximum Modulation Rate or Modulation Rate Higher modulations support greater throughput but generally require stronger RF signals and a higher Signal-to-Noise Ratio (SNR). By default, *Automatic Rate Adaptation* is enabled, and *Maximum Modulation Rate* is displayed. This allows the airFiber AF24 to automatically adjust the modulation rate to changing RF signal conditions. Under certain conditions, you may prefer to lock the *Maximum Modulation Rate* to a lower setting to improve link performance.

When *Automatic Rate Adaptation* is disabled, *Modulation Rate* is displayed. Lock the *Modulation Rate* to the setting of your choice.

Select one of the available modulation rates:

- **6x (64QAM MIMO)**
- **4x (16QAM MIMO)**
- **2x (QPSK MIMO)**
- **1x (QPSK SISO)**
- **¼x (QPSK SISO)**

RX Gain Select the appropriate gain for your RX antenna: **High** (default) or **Low**. If the link is very short or being tested, select **Low**, so your signal does not get distorted.

Note: Minimum link distance is approximately 100 m (328 ft).

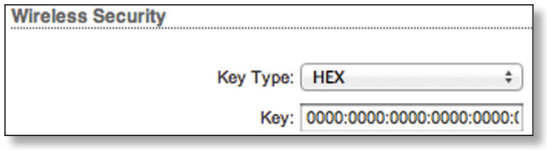
For links between 100 m (328 ft) and 800 m (2,625 ft):

- Target -40 dBm.
- Decrease *RX Gain* to overcome overload condition (OL).
- For short ranges or strong signal conditions, adjust the power to be 3-5 dB below overload condition (OL).
- Decrease *RX Gain* first.
- Never mitigate overload condition (OL) by misaligning antennas.

Link Distance	RX Gain Setting	Approximate TX Power Setting
d > 1 km (d > 3,281 ft)	High	> 25 dBm
0.5 km < d < 1 km (1,640 ft < d < 3,281 ft)	Low	19-25 dBm
0.25 km < d < 0.5 km (820 ft < d < 1,640 ft)	Low	12-18 dBm
0.1 km < d < 0.25 km (328 ft < d < 820 ft)	Low	3-11 dBm

Wireless Security

airFiber uses 128-bit, AES (Advanced Encryption Standard) encryption at all times.



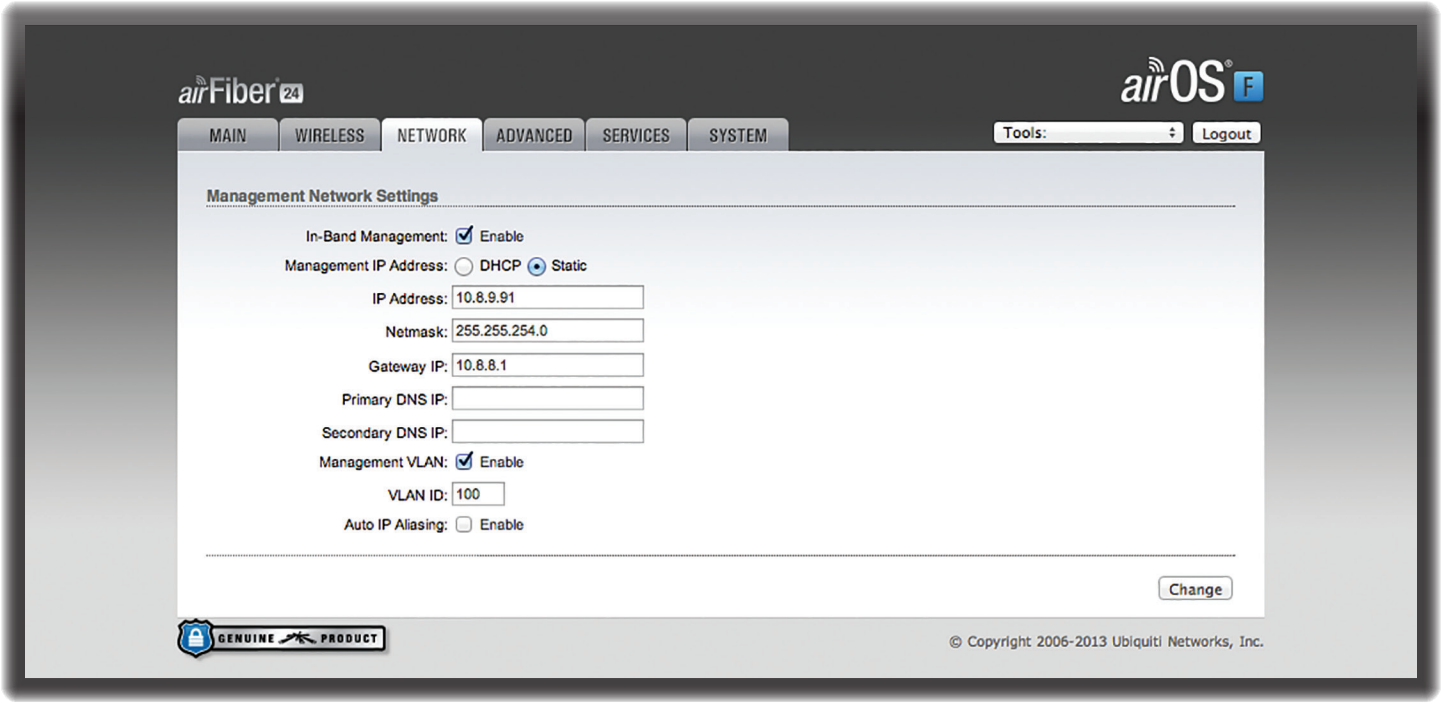
Key Type Specifies the character format.

- **HEX** By default, this option uses hexadecimal characters. 0-9, A-F, or a-f are valid characters.
- **ASCII** ASCII uses the standard English alphabet and numeric characters (0-9, A-Z, or a-z).

Key Select the format of the MAC address.

- **HEX** Enter 16 bytes (eight, 16-bit HEX values). You can omit zeroes and use colons, similar to the IPv6 format. The default is: **0000:0000:0000:0000:0000:0000:0000:0000**.

  Note: The airFiber Configuration Interface supports IPv6 formats excluding dotted quad and "::" (double-colon) notation.
- **ASCII** Enter a combination of alphanumeric characters. Using 128-bit, SHA1 (Secure Hash Algorithm 1), airFiber AF24 hashes the ASCII key to create a 128-bit key for AES.



Chapter 6: Network Tab

The *Network* tab allows you to configure settings for the management network.

There are two ways to access the airFiber Configuration Interface:

- **Config Port** Enabled by default. Use a direct connection to the *Config* port for out-of-band management.
- **In-Band Management** Enabled by default. In-band management is available through the local *Data* port or the *Data* port at the other end of the link.

The *Config* port and in-band management share the default IP address of *192.168.1.20*.

Change To save or test your changes, click **Change**.

A new message appears. You have three options:

- **Apply** To immediately save your changes, click **Apply**.
- **Test** To try the changes without saving them, click **Test**. To keep the changes, click **Apply**. If you do not click *Apply* within 180 seconds (the countdown is displayed), the airFiber AF24 times out and resumes its earlier configuration.
- **Discard** To cancel your changes, click **Discard**.

Management Network Settings

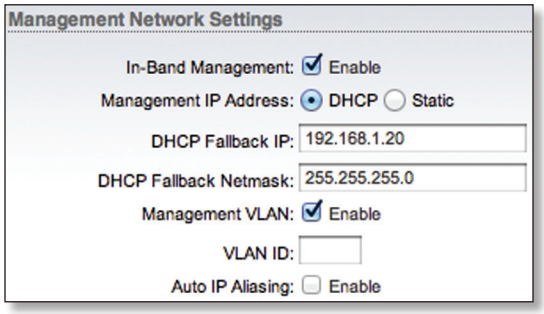
In-Band Management Enabled by default. In-band management is available through the local *Data* port or the *Data* port at the other end of the link.

Note: If *In-Band Management* is enabled, ensure that each airFiber radio of a link has a unique *IP Address*. If the airFiber radios use the same *IP Address*, then you may lose access via the *Data* ports.

Management IP Address The airFiber AF24 can use a static IP address or obtain an IP address from its DHCP server.

- **DHCP** Keep the default, *DHCP*, to use DHCP reservation on your router to assign a unique *IP Address*. The local DHCP server function of the router assigns a dynamic IP address, gateway IP address, and DNS address to the airFiber AF24.

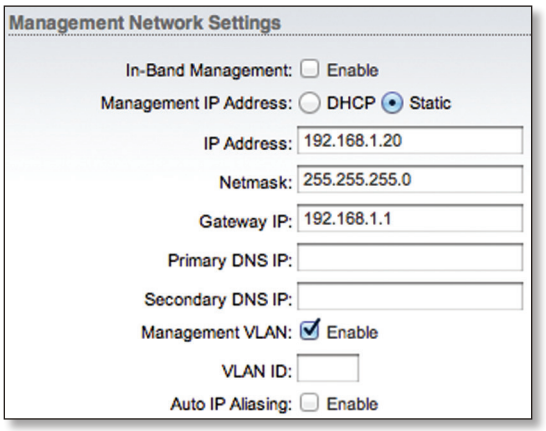
Note: If you do not know the IP address, then the only way to manage the airFiber AF24 is to reset the airFiber AF24 to its factory default settings. (Press and hold the **Reset** button for more than five seconds.) Its default *Management IP Address* is reset to *192.168.1.20*.



- **DHCP Fallback IP** Specify the IP address the airFiber AF24 should use if a DHCP server is not found.
- **DHCP Fallback Netmask** Specify the netmask the airFiber AF24 should use if a DHCP server is not found.

- **Static** Assign static IP settings to the airFiber AF24.

Note: IP settings should be consistent with the address space of the airFiber AF24's network segment.



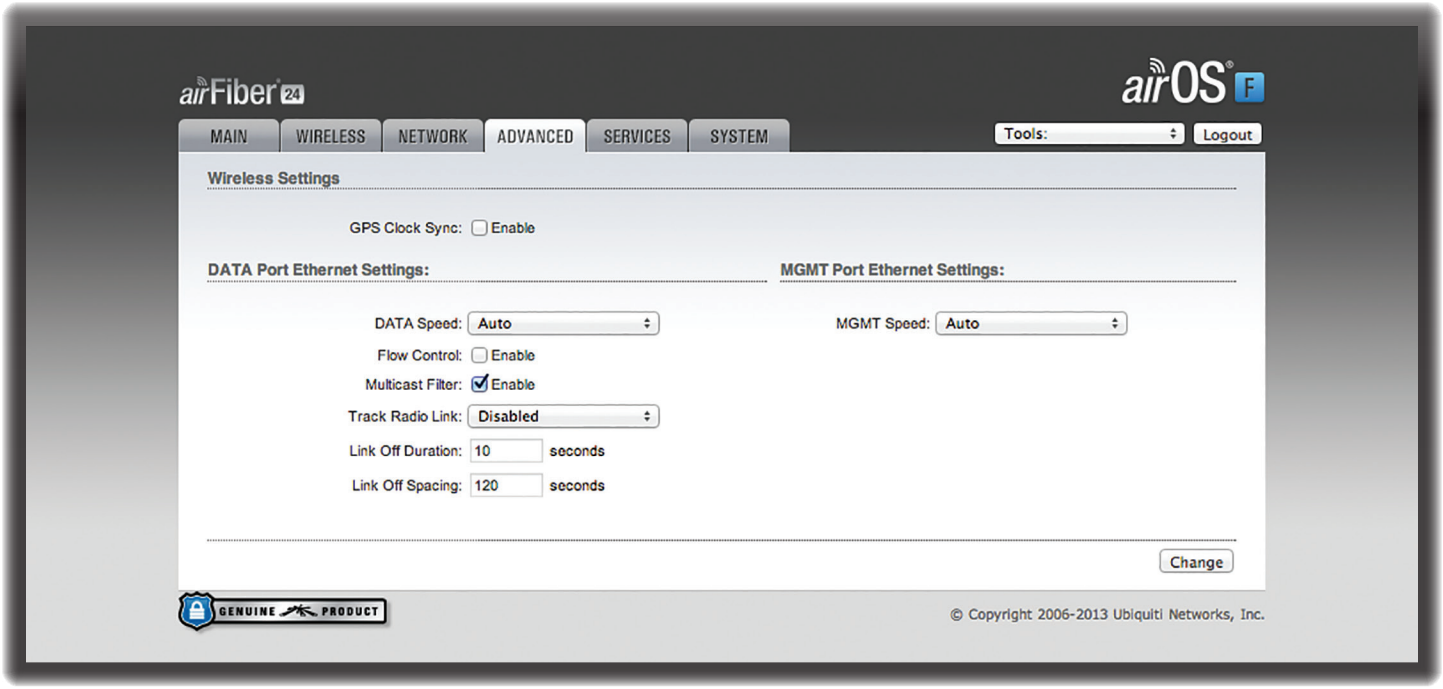
- **IP Address** Specify the IP address of the airFiber AF24. This IP will be used for device management purposes.
- **Netmask** When the netmask is expanded into its binary form, it provides a mapping to define which portions of the IP address range are used for the network devices and which portions are used for host devices. The netmask defines the address space of the airFiber AF24's network segment. The 255.255.255.0 (or "/24") netmask is commonly used on many Class C IP networks.
- **Gateway IP** Typically, this is the IP address of the host router, which provides the point of connection to the Internet. This can be a DSL modem, cable modem, or WISP gateway router. The airFiber AF24 directs data packets to the gateway if the destination host is not within the local network.
- **Primary DNS IP** Specify the IP address of the primary DNS (Domain Name System) server.
- **Secondary DNS IP** Specify the IP address of the secondary DNS server. This entry is optional and used only if the primary DNS server is not responding.

Management VLAN If enabled, automatically creates a management Virtual Local Area Network (VLAN).

- **VLAN ID** Enter a unique VLAN ID from 2 to 4094.

Auto IP Aliasing If enabled, automatically generates an IP address for the corresponding WLAN/LAN interface. The generated IP address is a unique Class B IP address from the 169.254.X.Y range (netmask 255.255.0.0), which is intended for use within the same network segment only. The Auto IP always starts with 169.254.X.Y, with X and Y as the last two octets from the MAC address of the airFiber AF24. For example, if the MAC address is 00:15:6D:A3:04:FB, then the generated unique Auto IP will be 169.254.4.251. (The hexadecimal value, *FB*, converts to the decimal value, *251*.)

The Auto IP Aliasing setting can be useful because you can still access and manage devices even if you lose, misconfigure, or forget their IP addresses. Because an Auto IP address is based on the last two octets of the MAC address, you can determine the IP address of a device if you know its MAC address.



Chapter 7: Advanced Tab

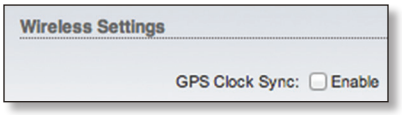
The *Advanced* tab handles advanced wireless and Ethernet settings. These settings should not be changed unless you know the effects the changes will have on the airFiber AF24.

Change To save or test your changes, click **Change**.

A new message appears. You have three options:

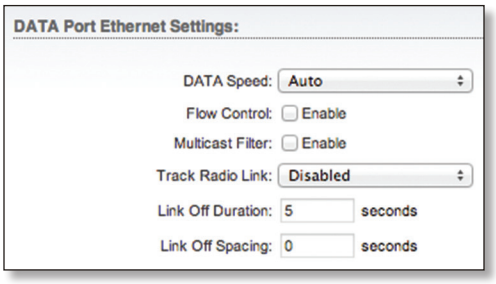
- **Apply** To immediately save your changes, click **Apply**.
- **Test** To try the changes without saving them, click **Test**. To keep the changes, click **Apply**. If you do not click *Apply* within 180 seconds (the countdown is displayed), the airFiber AF24 times out and resumes its earlier configuration.
- **Discard** To cancel your changes, click **Discard**.

Advanced Wireless Settings



GPS Clock Synchronization The airFiber uses GPS to synchronize the timing of its transmissions. By default, this option is disabled.

DATA Port Ethernet Settings



DATA Speed This is the speed of the *Data* port. By default, the option is **Auto.** The airFiber AF24 automatically negotiates transmission parameters, such as speed and duplex, with its counterpart. In this process, the networked devices first share their capabilities and then choose the fastest transmission mode they both support.

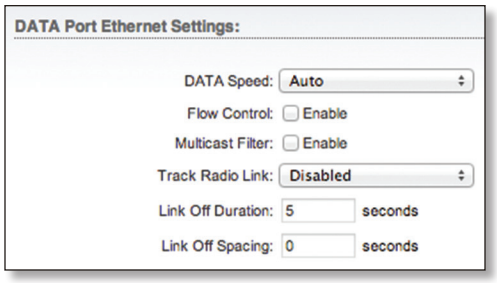
To manually specify the maximum transmission link speed and duplex mode, select one of the following options: **100 Mbps-Full**, **100 Mbps-Half**, **10 Mbps-Full**, or **10 Mbps-Half.** To achieve full performance with extra-long Ethernet cables, ensure that you use CAT6 qualified cables and interconnects.

Full-duplex mode allows communication in both directions simultaneously. Half-duplex mode allows communication in one direction at a time, alternating between transmission and reception.

Flow Control If enabled, the airFiber AF24 generates and responds to Ethernet layer PAUSE frames. The airFiber AF24 regulates inbound traffic from the customer's network to avoid buffer overflows within the airFiber AF24. Flow control has the effect of controlling the inter-packet spacing of packets headed into the airFiber Data interface.

Multicast Filter If enabled, the filter blocks multicast traffic from overloading the CPU when in-band management is enabled. This allows the airFiber AF24 to be managed in-band when the customer's network is carrying large volumes of multicast traffic, such as IPTV. The filter does not block multicast traffic going over the radio; it simply blocks it from reaching the airFiber's management interface CPU.

Track Radio Link If this option is enabled, the airFiber AF24 disconnects the Data port's Ethernet link when the RF link is lost (The Management port is never disabled by this option). The *Track Radio Link* option is useful because it quickly indicates a "link lost" condition to the customer's routing equipment (such as a direct connection to OSPF-enabled routers).



- **Disabled** The *Track Radio Link* option is disabled by default. The Data port's Ethernet link will always remain up regardless of the RF link state.
- **Use Timeout Duration** This option is designed for use by operators who are using in-band management. Two timers control the Data port's Ethernet link.

RF Link	Ethernet Link	Notes
Goes down for the first time	The Ethernet link goes down and remains down for the number of seconds specified by the *Link Off Duration* timer. The Ethernet link will then come back up so that the airFiber AF24 can be managed even when the RF link is down.	Even if the RF link goes back up before the *Link Off Duration* timer elapses, the Ethernet link remains down. The Ethernet link's downtime is long enough to signal to the customer's routing equipment that the path is lost.
Goes down for the second time	The Ethernet link remains up as long as time remains on the *Link Off Spacing* timer. When the *Link Off Spacing* timer elapses, then the Ethernet link goes down again for the number of seconds specified by the *Link Off Duration* timer. (This happens only if the RF link is still down.)	The Ethernet link's uptime is long enough so the operator has enough time to access the airFiber AF24, make configuration changes, and save those changes. Sufficient Ethernet link uptime is vital when a RF link is constantly up and down.

When the *Use Timeout Duration* option is enabled, then the *Track Radio Link* option and the following timers are enabled:

- **Link Off Duration** The *Link Off Duration* timer controls the length of time the Data port's Ethernet link will be down if the RF link goes down. Enter the number of seconds that the Ethernet link should be offline. For example, if this is set to 10 seconds, then when the RF link goes down, the Ethernet link will go down and remain down for 10 seconds (regardless of the RF link state), and then it will go back up.
- **Link Off Spacing** The *Link Off Spacing* timer controls the length of time the airFiber AF24 will wait before allowing the Data port's Ethernet link to go down for a second time if the RF link goes down again. Enter the minimum interval (in seconds) between offline events of the Ethernet link, regardless of the RF link status. The value for *Link Off Spacing* should be larger than the value for *Link Off Duration*, and it should be enough time for the operator to access the airFiber AF24, make any configuration changes, and apply those changes.

Note: If the *Link Off Spacing* timer is set to 0 seconds, then the Ethernet link will only use the *Link Off Duration* timer. If the *Link Off Duration* timer is set to 10 seconds and the RF link goes down, then the Ethernet link will go down for 10 seconds and then go back up regardless of the RF link state. If the RF link is still down, then the Ethernet link will not go down again until the RF link goes back up and then down again.

Here are two examples:

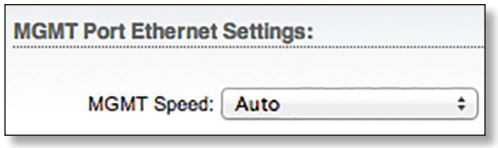
- Example #1
  - **Link Off Duration** *5* seconds
  - **Link Off Spacing** *60* seconds

  The Data port's Ethernet link will be initially disconnected when the RF link first goes down. That event will start a 60-second timer. The Ethernet link will remain offline for 5 seconds (regardless of the RF link status) and then come back online. The Ethernet link will remain online (regardless of the RF link state) until the 60-second timer expires.
- Example #2
  - **Link Off Duration** *20* seconds
  - **Link Off Spacing** *120* seconds

  The Data port's Ethernet link will be initially disconnected when the RF link first goes down. That event will start a 120-second timer. The RF link goes back up after 10 seconds; however, that does not affect the Ethernet link. The Ethernet link will remain offline for 20 seconds and then come back online. The RF link goes down again after 60 seconds; however, that does not affect the Ethernet link. The Ethernet link will then remain online until the 120-second timer expires.

- **Enabled** This option is designed for use by operators who are not using in-band management. The *Track Radio Link* option is enabled without timers, so the Data port's Ethernet link follows the RF link state exactly. If the RF link goes down, then the Ethernet link goes down and remains down until the RF link goes back up.

MGMT Port Ethernet Settings



MGMT Speed This is the speed of the *Config* port. By default, the option is **Auto.** The airFiber AF24 automatically negotiates transmission parameters, such as speed and duplex, with its counterpart. In this process, the networked devices first share their capabilities and then choose the fastest transmission mode they both support.

To manually specify the maximum transmission link speed and duplex mode, select one of the following options: **100 Mbps-Full**, **100 Mbps-Half**, **10 Mbps-Full**, or **10 Mbps-Half.** If you are running extra long Ethernet cables, a link speed of *10* Mbps could help to achieve better stability.

Full-duplex mode allows communication in both directions simultaneously. Half-duplex mode allows communication in one direction at a time, alternating between transmission and reception.

Chapter 8: Services Tab

The *Services* tab configures system management services: *Ping Watchdog*, *SNMP Agent*, *Web Server*, *SSH Server*, *Telnet Server*, *NTP Client*, *Dynamic DNS*, *System Log*, and *Device Discovery*.

Change To save or test your changes, click **Change**.

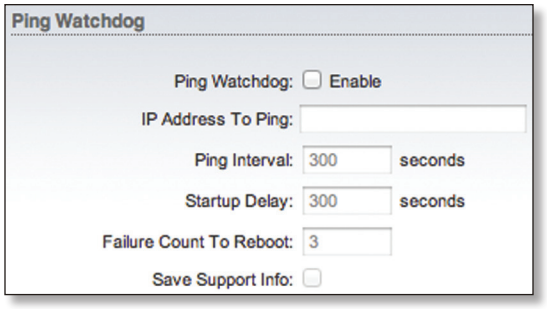
A new message appears. You have three options:

- **Apply** To immediately save your changes, click **Apply**.
- **Test** To try the changes without saving them, click **Test**. To keep the changes, click **Apply**. If you do not click *Apply* within 180 seconds (the countdown is displayed), the airFiber AF24 times out and resumes its earlier configuration.
- **Discard** To cancel your changes, click **Discard**.

Ping Watchdog

Ping Watchdog sets the airFiber AF24 to continuously ping a user-defined IP address (it can be the Internet gateway, for example). If it is unable to ping under the user-defined constraints, then the airFiber AF24 will automatically reboot. This option creates a kind of "fail-proof" mechanism.

Ping Watchdog is dedicated to continuous monitoring of the specific connection to the remote host using the *Ping* tool. The *Ping* tool works by sending ICMP echo request packets to the target host and listening for ICMP echo response replies. If the defined number of replies is not received, the tool reboots the airFiber AF24.



Ping Watchdog Enables use of *Ping Watchdog*.

- **IP Address To Ping** Specify the IP address of the target host to be monitored by *Ping Watchdog*.
- **Ping Interval** Specify the time interval (in seconds) between the ICMP echo requests that are sent by *Ping Watchdog*. The default value is *300* seconds.
- **Startup Delay** Specify the initial time delay (in seconds) until the first ICMP echo requests are sent by *Ping Watchdog*. The default value is *300* seconds.

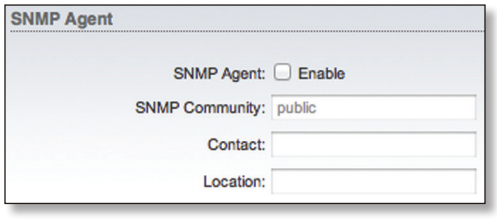
  The Startup Delay value should be at least 60 seconds as the network interface and wireless connection initialization takes a considerable amount of time if the airFiber AF24 is rebooted.
- **Failure Count to Reboot** Specify the number of ICMP echo response replies. If the specified number of ICMP echo response packets is not received continuously, *Ping Watchdog* will reboot the airFiber AF24. The default value is *3*.
- **Save Support Info** This generates a support information file.

SNMP Agent

Simple Network Monitor Protocol (SNMP) is an application layer protocol that facilitates the exchange of management information between network devices. Network administrators use SNMP to monitor network-attached devices for issues that warrant attention.

The airFiber AF24 contains an *SNMP Agent*, which does the following:

- Provides an interface for device monitoring using SNMP
- Communicates with SNMP management applications for network provisioning
- Allows network administrators to monitor network performance and troubleshoot network problems

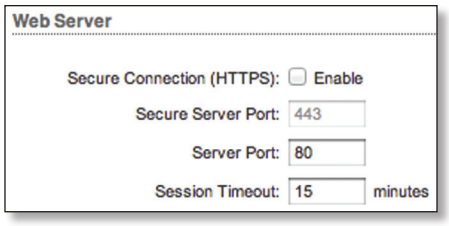


For the purpose of equipment identification, configure the *SNMP Agent* with contact and location information:

SNMP Agent Enables the *SNMP Agent*.

- **SNMP Community** Specify the SNMP community string. It is required to authenticate access to Management Information Base (MIB) objects and functions as an embedded password. The airFiber AF24 also supports a read-only community string; authorized management stations have read access to all the objects in the MIB except the community strings, but do not have write access. The airFiber AF24 supports SNMP v1. The default SNMP Community is *public*.
- **Contact** Specify the contact who should be notified in case of emergency.
- **Location** Specify the physical location of the airFiber AF24.

Web Server



The following *Web Server* parameters can be set:

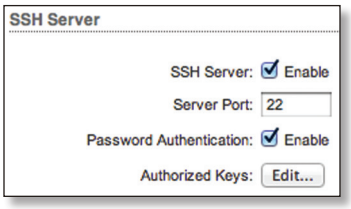
Secure Connection (HTTPS) If enabled, the *Web Server* uses secure HTTPS mode.

- **Secure Server Port** If secure HTTPS mode is used, specify the TCP/IP port of the *Web Server*.

Server Port If HTTP mode is used, specify the TCP/IP port of the *Web Server*.

Session Timeout Specifies the maximum timeout before the session expires. Once a session expires, you must log in again using the username and password.

SSH Server

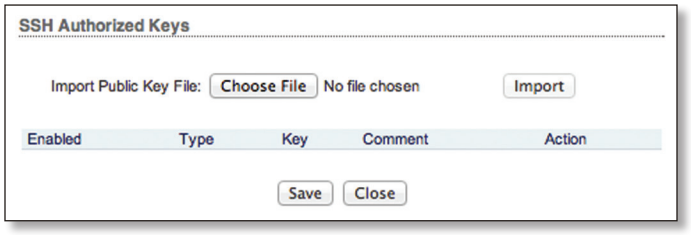


The following *SSH Server* parameters can be set:

SSH Server This option enables SSH access to the airFiber AF24.

- **Server Port** Specify the TCP/IP port of the *SSH Server*.
- **Password Authentication** If enabled, you must authenticate using administrator credentials to grant SSH access to the airFiber AF24; otherwise, an authorized key is required.

- **Authorized Keys** Click **Edit** to import a public key file for SSH access to the airFiber AF24 instead of using an admin password.



  - **Choose File** Click **Choose File** to locate the new key file. Select the file and click **Open**.
  - **Import** Imports the file for SSH access.
  - **Enabled** Enables the specific key. All the added keys are saved in the system configuration file; however, only the enabled keys are active on the airFiber AF24.
  - **Type** Displays the type of key.
  - **Key** Displays the key.
  - **Comment** You can enter a brief description of the key.
  - **Action** You have the following options:
    - **Add** Adds a public key file.
    - **Edit** Make changes to a public key file. Click **Save** to save your changes.
    - **Del** Deletes a public key file.
  - **Save** Saves your changes.
  - **Close** Discards your changes.

Telnet Server

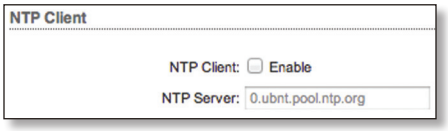
The following *Telnet Server* parameters can be set:

Telnet Server This option activates Telnet access to the airFiber AF24.

- **Server Port** Specify the TCP/IP port of the *Telnet Server*.

NTP Client

Network Time Protocol (NTP) is a protocol for synchronizing the clocks of computer systems over packet-switched, variable-latency data networks. You can use it to set the system time on the airFiber AF24. If the *Log* option is enabled, then the system time is reported next to every log entry that registers a system event.

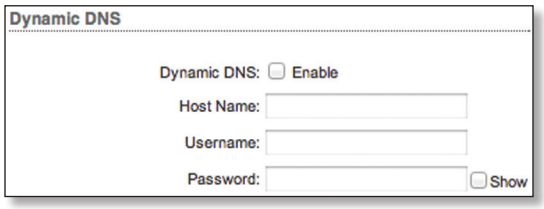


NTP Client Enables the airFiber AF24 to obtain the system time from a time server on the Internet.

- **NTP Server** Specify the IP address or domain name of the NTP server.

Dynamic DNS

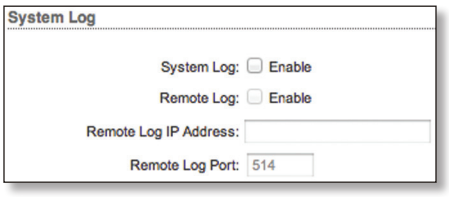
Domain Name System (DNS) translates domain names to IP addresses; Each DNS server on the Internet holds these mappings in its respective DNS database. Dynamic Domain Name System (DDNS) is a network service that notifies the DNS server in real time of any changes in the airFiber AF24's IP settings. Even if the airFiber AF24's IP address changes, you can still access the airFiber AF24 through its domain name.



Dynamic DNS If enabled, the airFiber AF24 allows communications with the DDNS server.

- **Host Name** Enter the host name of the DDNS server.
- **Username** Enter the user name of the DDNS account.
- **Password** Enter the password of the DDNS account.
- **Show** Check the box to display the password characters.

System Log

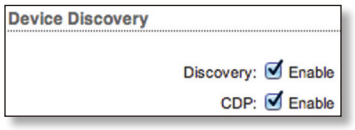


System Log This option enables the registration routine of system log (syslog) messages. By default it is disabled.

- **Remote Log** Enables the syslog remote sending function. System log messages are sent to a remote server, which is specified in the *Remote Log IP Address* and *Remote Log Port* fields.
  - **Remote Log IP Address** The host IP address that receives syslog messages. Properly configure the remote host to receive syslog protocol messages.
  - **Remote Log Port** The TCP/IP port that receives syslog messages. *514* is the default port for the commonly used system message logging utilities.

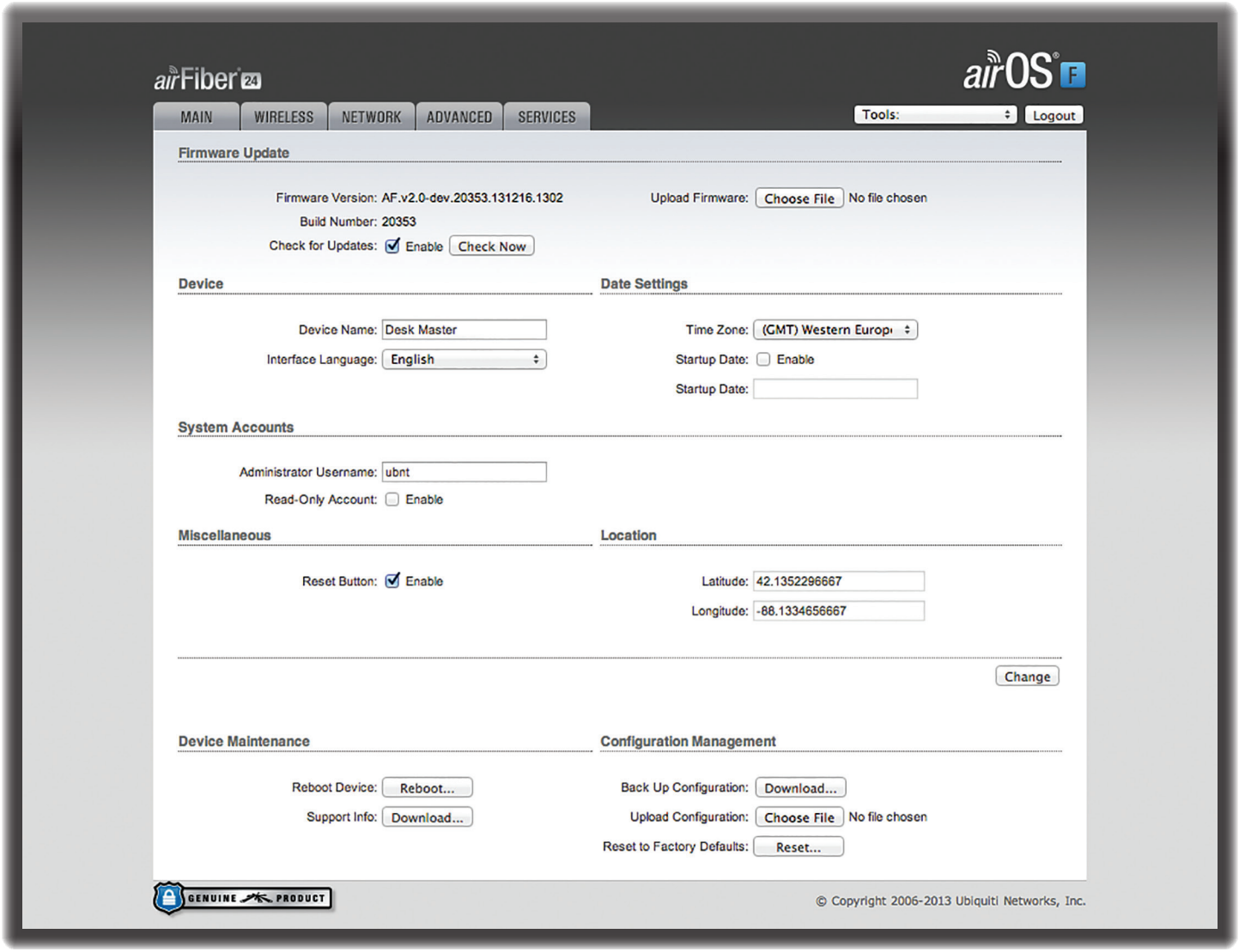
Every logged message contains at least a system time and host name. Usually a specific service name that generates the system event is also specified within the message. Messages from different services have different contexts and different levels of detail. Usually error, warning, or informational system service messages are reported; however, more detailed debug level messages can also be reported. The more detailed the system messages reported, the greater the volume of log messages generated.

Device Discovery



Discovery Enables device discovery, so the airFiber AF24 can be discovered by other Ubiquiti devices through the *Discovery* tool.

CDP Enables Cisco Discovery Protocol (CDP) communications, so the airFiber AF24 can send out CDP packets to share its information.



Chapter 9: System Tab

The *System* tab contains administrative options. This page enables the administrator to reboot the airFiber AF24, reset it to factory defaults, upload new firmware, back up or update the configuration, and configure the administrator account.

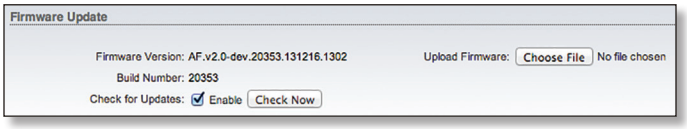
Change To save or test your changes, click **Change**.

A new message appears. You have three options:

- **Apply** To immediately save your changes, click **Apply**.
- **Test** To try the changes without saving them, click **Test**. To keep the changes, click **Apply**. If you do not click *Apply* within 180 seconds (the countdown is displayed), the airFiber AF24 times out and resumes its earlier configuration.
- **Discard** To cancel your changes, click **Discard**.

Firmware Update

The controls in this section manage firmware maintenance.



Firmware Version Displays the current firmware version.

Build Number Displays the build number of the firmware version.

Check for Updates By default, the firmware automatically checks for updates. To manually check for an update, click **Check Now**.

Upload Firmware Click this button to update the airFiber AF24 with new firmware.

The airFiber AF24 firmware update is compatible with all configuration settings. The system configuration is preserved while the airFiber AF24 is updated with a new firmware version. However, we recommend that you back up your current system configuration before updating the firmware.

This is a three-step procedure:

1. Click **Choose File** to locate the new firmware file. Select the file and click **Open**.
2. Click **Upload** to upload the new firmware to the airFiber AF24.
3. The Uploaded Firmware Version is displayed. Click **Update** to confirm.

If the firmware update is in process, you can close the firmware update window, but this does not cancel the firmware update. Please be patient, as the firmware update routine can take three to seven minutes. You cannot access the airFiber AF24 until the firmware update routine is completed.

WARNING: Do not power off, do not reboot, and do not disconnect the airFiber AF24 from the power supply during the firmware update process as these actions will damage the airFiber AF24!

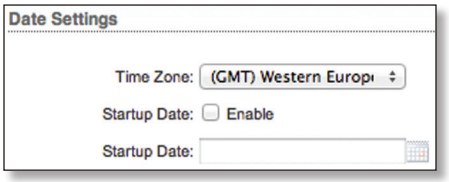
Device

The Device Name (host name) is the system-wide device identifier. The SNMP agent reports it to authorized management stations. The Device Name will be used in popular router operating systems, registration screens, and discovery tools.

Device Name Specifies the host name.

Interface Language Allows you to select the language displayed in the web management interface. *English* is the default language.

Date Settings



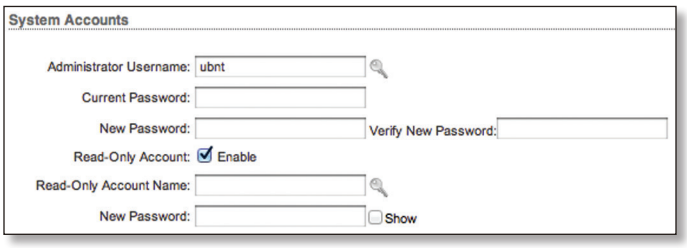
Time Zone Specifies the time zone in relation to Greenwich Mean Time (GMT).

Startup Date When enabled, you are able to change the airFiber AF24's startup date.

- **Startup Date** Specifies the airFiber AF24's startup date. Click the **Calendar** icon or manually enter the date in the following format: 2-digit month/2-digit day/4-digit year. For example, for April 5, 2012, enter **04/05/2012** in the field.

System Accounts

You can change the administrator password to protect your device from unauthorized changes. We recommend that you change the default administrator password when initially configuring the device.



Administrator Username Specifies the name of the administrator.

Key button Click this button to change the administrator password.

- **Current Password** Enter the current password for the administrator account. It is required to change the *Password* or *Administrator Username*.
- **New Password** Enter the new password for the administrator account.
- **Verify New Password** Re-enter the new password for the administrator account.

Note: The password length is 8 characters maximum; passwords exceeding 8 characters will be truncated.

Read-Only Account Check the box to enable the read-only account, which can only view the *Main* tab. Configure the username and password to protect your device from unauthorized changes.

- **Read-Only Account Name** Specifies the name of the system user.
- **Key button** Click this button to change the read-only password.
  - **New Password** Enter the new password for the read-only account.
  - **Show** Check the box to display the read-only password characters.

Miscellaneous

Reset Button To allow use of the airFiber AF24's physical reset button, check the box. To prevent an accidental reset to default settings, uncheck the box.

Note: You can reset the airFiber AF24 to default settings via the airFiber Configuration Interface. Go to the *System* tab > *Reset to Defaults*.

Location

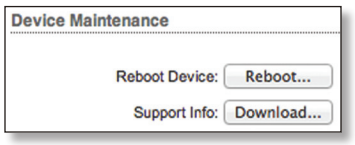
After the on-board GPS determines the location of the airFiber AF24, its latitude and longitude are displayed. If the GPS does not have a fix on its location, then "Searching for Satellites" will be displayed.

Latitude The latitude of the airFiber AF24's location is displayed.

Longitude The longitude of the airFiber AF24's location is displayed.

Device Maintenance

The controls in this section manage the airFiber AF24 maintenance routines: reboot and support information reports.



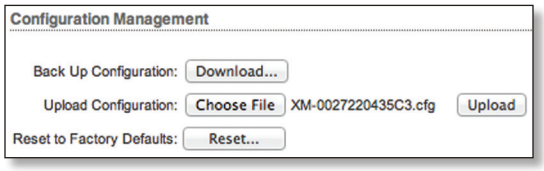
Reboot Device Initiates a full reboot cycle of the airFiber AF24. Reboot is the same as the hardware reboot, which is similar to the power-off and power-on cycle. The system configuration stays the same after the reboot cycle completes. Any changes that have not been applied are lost.

Support Info This generates a support information file that the Ubiquiti support engineers can use when providing customer support. This file only needs to be generated at their request.

Configuration Management

The controls in this section manage the airFiber AF24 configuration routines and the option to reset the airFiber AF24 to factory default settings.

The airFiber AF24 configuration is stored in a plain text file (.cfg file). You can back up, restore, or update the system configuration file:



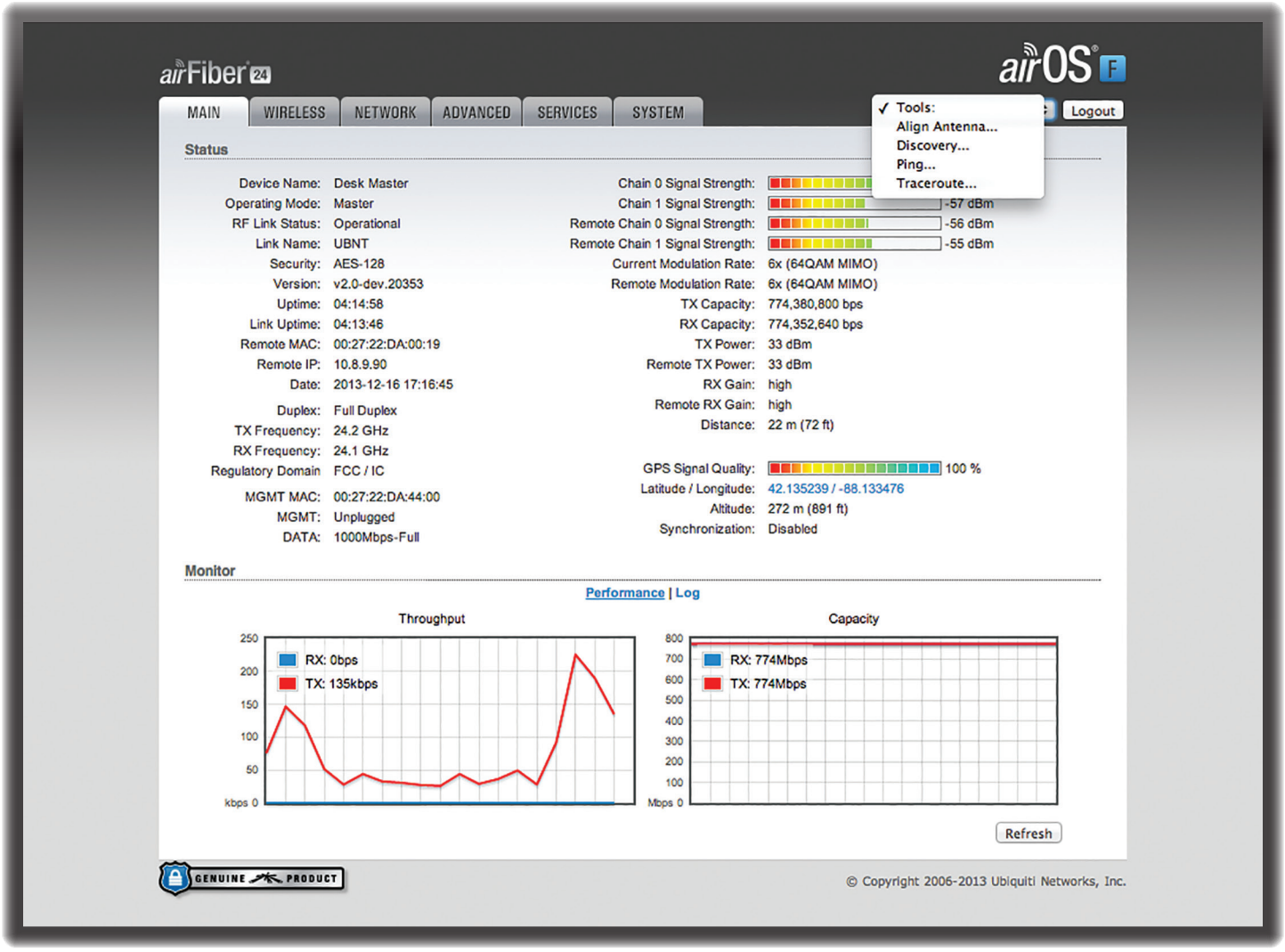
Back Up Configuration Click **Download** to download the current system configuration file.

Upload Configuration Click **Choose File** to locate the new configuration file. Select the file and click **Open**. We recommend that you back up your current system configuration before uploading the new configuration.

Upload Click this button to upload the new configuration file to the airFiber AF24. Click **Apply** to confirm.

After the airFiber AF24 reboots, the settings of the new configuration are displayed in the *Wireless*, *Network*, *Advanced*, *Services*, and *System* tabs of the airFiber Configuration Interface.

Reset to Factory Defaults Resets the airFiber AF24 to the factory default settings. This option will reboot the airFiber AF24, and all factory default settings will be restored. We recommend that you back up your current system configuration before resetting the airFiber AF24 to its defaults.

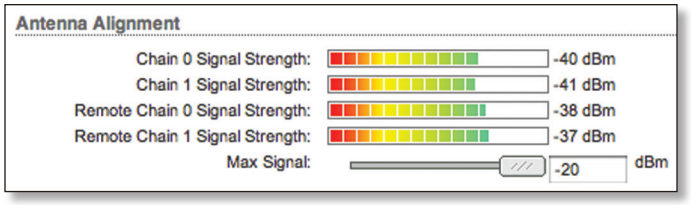


Chapter 10: Tools

Each tab of the airFiber Configuration Interface contains network administration and monitoring tools. Click the **Tools** drop-down list at the top right corner of the page.

Align Antenna

Use the *Align Antenna* tool to point and optimize the antenna in the direction of maximum link signal. (See **"Using the airFiber Configuration Interface" on page 12** for more details.) The *Antenna Alignment* window reloads every 250 milliseconds.



Chain 0/1 Signal Strength Displays the absolute power level (in dBm) of the received signal for each chain.

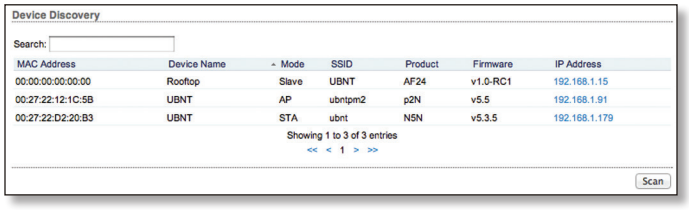
Changing the *RX Gain* on the *Wireless* tab does not affect the *Signal Strength* values displayed on the *Antenna Alignment* window. However, if "Overload" is displayed to indicate overload condition, decrease the *RX Gain*. See **"RX Gain" on page 24** for more details about *RX Gain* and overload condition.

Remote Chain 0/1 Signal Strength Displays the absolute power level (in dBm) of the received signal for each chain of the remote airFiber radio.

Max Signal Displays the maximum signal strength (in dBm). To adjust the range of the *Max Signal* meter, use the slider or manually enter the new value. If you reduce the range, the color change will be more sensitive to signal fluctuations, indicating the offset of the maximum indicator value and the scale itself.

Discovery

The *Device Discovery* tool searches for all Ubiquiti devices on your network. The *Search* field automatically filters devices containing specified names or numbers as you enter them.

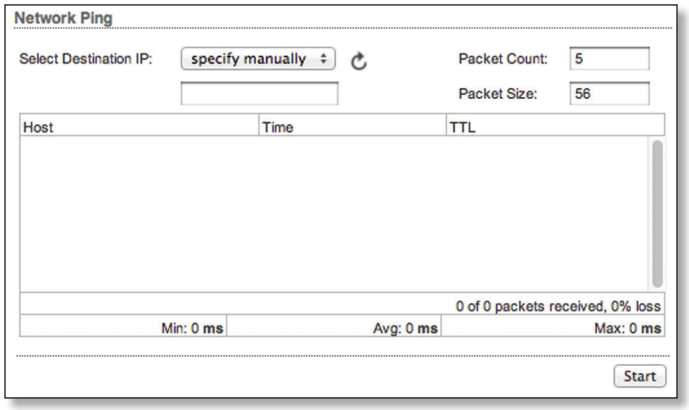


It reports the *MAC Address* (except for airFiber devices), *Device Name*, *Mode*, *SSID*, *Product* type, *Firmware* version, and *IP Address* for each Ubiquiti device. To access a device configuration through its web management interface, click the device's IP address.

To refresh the window, click **Scan**.

Ping

You can ping other devices on the network directly from the airFiber AF24. The *Ping* tool uses ICMP packets to check the preliminary link quality and packet latency estimation between two network devices.



Network Ping

Select Destination IP You have two options:

- Select a remote system IP from the drop-down list, which is generated automatically.
- Select **specify manually** and enter the IP address in the field displayed below.

Packet Count Enter the number of packets to send for the ping test.

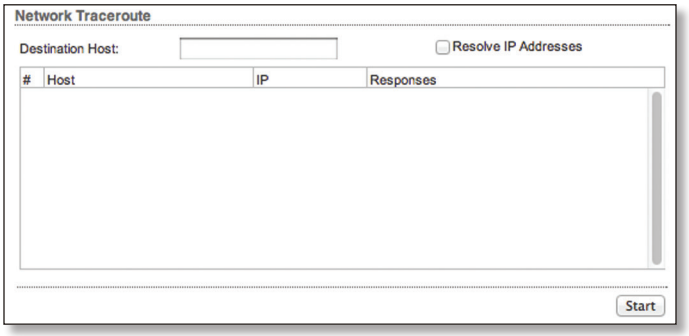
Packet Size Specify the size of the packet.

Start Click this button to start the test.

Packet loss statistics and latency time evaluation are displayed after the test is completed.

Traceroute

The *Traceroute* tool traces the hops from the airFiber AF24 to a specified outgoing IP address. Use this tool to find the route taken by ICMP packets across the network to the destination host.



Destination Host Enter the IP address of the destination host.

Resolve IP Addresses Select this option to resolve the IP addresses symbolically rather than numerically.

Start Click this button to start the test.

Responses are displayed after the test is completed.

Appendix A: Specifications

airFiber AF24	
Dimensions	649 x 426 x 303 mm (25.55 x 16.77 x 11.93 in)
Weight	10.5 kg (23.15 lb) (Mount Included)
Operating Frequency	24.05 – 24.25 GHz
Max. Power Consumption	< 50W
Power Supply	50V, 1.2A PoE GigE Adapter (Included)
Power Method	Passive Power over Ethernet (42-58VDC)
Certifications	CE, FCC, IC
Wind Loading	480 N @ 200 km/hr (108 lbf @ 125 mph)
Wind Survivability	200 km/hr (125 mph)
Mounting	Pole Mount Kit (Included)
Operating Temperature	-40 to 55°C (-40 to 131° F)
LEDs	(8) Status LEDs: Data Port Speed Data Port Link/Activity Configuration Port Speed Configuration Port Link/Activity GPS Synchronization Modulation Mode Master/Slave RF Status (1) Two-Digit LED Display Calibrated in dBm
Button	Reset
Interface	
Data Port	(1) 10/100/1000 Ethernet Port
Configuration Port	(1) 10/100 Ethernet Port
Auxiliary Port	(1) RJ-12, Alignment Tone Port
System	
Maximum Throughput	1.4+ Gbps
Maximum Range	13+ km (8+ mi)
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 Frequency	
GPS	GPS Clock Synchronization
Transceiver	
EIRP	~33 dBm (FCC/IC), ~20 dBm (CE)
Frequency Accuracy	±2.5 ppm without GPS Synchronization ± 0.2 ppm with GPS Synchronization
Channel Bandwidth	100 MHz
Operating Channels	24.1 GHz, 24.2 GHz
Modulation	64QAM MIMO 16QAM MIMO QPSK MIMO QPSK SISO ¼x QPSK SISO
Integrated Split Antenna	
TX Gain	33 dBi
RX Gain	38 dBi
Beamwidth	< 3.5°
Front-to-Back Ratio	70 dB
Polarity	Dual-Slant Polarization
Cross-Polarity Isolation	> 28 dB

Receive Sensitivity			
Modulation	Sensitivity	FDD Capacity*	TDD Capacity*
64QAM	-66 dBm	1500 Mbps	760 Mbps
16QAM	-72 dBm	1000 Mbps	507 Mbps
QPSK MIMO	-78 dBm	500 Mbps	253 Mbps
QPSK SISO	-80 dBm	250 Mbps	127 Mbps
¼x QPSK SISO	-87 dBm	62.5 Mbps	31.7 Mbps

* FDD = (2) 100 MHz channels and TDD = (1) 100 MHz channel

Appendix B: Safety Notices

1. Read, follow, and keep these instructions.
2. Heed all warnings.
3. Only use attachments/accessories specified by the manufacturer.

WARNING: Do not use this product in location that can be submerged by water.

WARNING: Avoid using this product during an electrical storm. There may be a remote risk of electric shock from lightning.

Electrical Safety Information

1. Compliance is required with respect to voltage, frequency, and current requirements indicated on the manufacturer's label. Connection to a different power source than those specified may result in improper operation, damage to the equipment or pose a fire hazard if the limitations are not followed.
2. There are no operator serviceable parts inside this equipment. Service should be provided only by a qualified service technician.
3. This equipment is provided with a detachable power cord which has an integral safety ground wire intended for connection to a grounded safety outlet.
   a. Do not substitute the power cord with one that is not the provided approved type. Never use an adapter plug to connect to a 2-wire outlet as this will defeat the continuity of the grounding wire.
   b. The equipment requires the use of the ground wire as a part of the safety certification, modification or misuse can provide a shock hazard that can result in serious injury or death.
   c. Contact a qualified electrician or the manufacturer if there are questions about the installation prior to connecting the equipment.
   d. Protective earthing is provided by Listed AC adapter. Building installation shall provide appropriate short-circuit backup protection.
   e. Protective bonding must be installed in accordance with local national wiring rules and regulations.

Appendix C: Warranty

Limited Warranty

UBIQUITI NETWORKS, Inc ("UBIQUITI NETWORKS") warrants that the product(s) furnished hereunder (the "Product(s)") shall be free from defects in material and workmanship for a period of one (1) year from the date of shipment by UBIQUITI NETWORKS under normal use and operation. UBIQUITI NETWORKS' sole and exclusive obligation and liability under the foregoing warranty shall be for UBIQUITI NETWORKS, at its discretion, to repair or replace any Product that fails to conform to the above warranty during the above warranty period. The expense of removal and reinstallation of any Product is not included in this warranty. The warranty period of any repaired or replaced Product shall not extend beyond its original term.

Warranty Conditions

The above warranty does not apply if the Product:

(I) has been modified and/or altered, or an addition made thereto, except by Ubiquiti Networks, or Ubiquiti Networks' authorized representatives, or as approved by Ubiquiti Networks in writing;

(II) has been painted, rebranded or physically modified in any way;

(III) has been damaged due to errors or defects in cabling;

(IV) has been subjected to misuse, abuse, negligence, abnormal physical, electromagnetic or electrical stress, including lightning strikes, or accident;

(V) has been damaged or impaired as a result of using third party firmware; or

(VI) has no original Ubiquiti MAC label, or is missing any other original Ubiquiti label(s).

(VII) has not been received by Ubiquiti within 30 days of issuance of the RMA.

In addition, the above warranty shall apply only if: the product has been properly installed and used at all times in accordance, and in all material respects, with the applicable Product documentation; all Ethernet cabling runs use CAT5 (or above), and for outdoor installations, shielded Ethernet cabling is used, and for indoor installations, indoor cabling requirements are followed.

Returns

No Products will be accepted for replacement or repair without obtaining a Return Materials Authorization (RMA) number from UBIQUITI NETWORKS during the warranty period, and the Products being received at UBIQUITI NETWORKS' facility freight prepaid in accordance with the RMA process of UBIQUITI NETWORKS. Products returned without an RMA number will not be processed and will be returned freight collect or subject to disposal. Information on the RMA process and obtaining an RMA number can be found at: **www.ubnt.com/support/warranty**.

Disclaimer

EXCEPT FOR ANY EXPRESS WARRANTIES PROVIDED HEREIN, UBIQUITI NETWORKS, ITS AFFILIATES, AND ITS AND THEIR THIRD PARTY DATA, SERVICE, SOFTWARE AND HARDWARE PROVIDERS HEREBY DISCLAIM AND MAKE NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, REPRESENTATIONS, GUARANTEES, OR WARRANTIES OF MERCHANTABILITY, ACCURACY, QUALITY OF SERVICE OR RESULTS, AVAILABILITY, SATISFACTORY QUALITY, LACK OF VIRUSES, QUIET ENJOYMENT, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT AND ANY WARRANTIES ARISING FROM ANY COURSE OF DEALING, USAGE OR TRADE PRACTICE IN CONNECTION WITH SUCH PRODUCTS AND SERVICES. BUYER ACKNOWLEDGES THAT NEITHER UBIQUITI NETWORKS NOR ITS THIRD PARTY PROVIDERS CONTROL BUYER'S EQUIPMENT OR THE TRANSFER OF DATA OVER COMMUNICATIONS FACILITIES, INCLUDING THE INTERNET, AND THAT THE PRODUCTS AND SERVICES MAY BE SUBJECT TO LIMITATIONS, INTERRUPTIONS, DELAYS, CANCELLATIONS AND OTHER PROBLEMS INHERENT IN THE USE OF COMMUNICATIONS FACILITIES. UBIQUITI NETWORKS, ITS AFFILIATES AND ITS AND THEIR THIRD PARTY PROVIDERS ARE NOT RESPONSIBLE FOR ANY INTERRUPTIONS, DELAYS, CANCELLATIONS, DELIVERY FAILURES, DATA LOSS, CONTENT CORRUPTION, PACKET LOSS, OR OTHER DAMAGE RESULTING FROM ANY OF THE FOREGOING. In addition, UBIQUITI NETWORKS does not warrant that the operation of the Products will be error-free or that operation will be uninterrupted. In no event shall UBIQUITI NETWORKS be responsible for damages or claims of any nature or description relating to system performance, including coverage, buyer's selection of products (including the Products) for buyer's application and/or failure of products (including the Products) to meet government or regulatory requirements.

WARNING: Failure to properly ground your airFiber units will void your warranty. (Please follow the instructions on **"Grounding" on page 8** for installation of the ground wires.)

Limitation of Liability

EXCEPT TO THE EXTENT PROHIBITED BY LOCAL LAW, IN NO EVENT WILL UBIQUITI OR ITS SUBSIDIARIES, AFFILIATES OR SUPPLIERS BE LIABLE FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES (INCLUDING LOST PROFIT, LOST DATA, OR DOWNTIME COSTS), ARISING OUT OF THE USE, INABILITY TO USE, OR THE RESULTS OF USE OF THE PRODUCT, WHETHER BASED IN WARRANTY, CONTRACT, TORT OR OTHER LEGAL THEORY, AND WHETHER OR NOT ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Note

Some countries, states and provinces do not allow exclusions of implied warranties or conditions, so the above exclusion may not apply to you. You may have other rights that vary from country to country, state to state, or province to province. Some countries, states and provinces do not allow the exclusion or limitation of liability for incidental or consequential damages, so the above limitation may not apply to you. EXCEPT TO THE EXTENT ALLOWED BY LOCAL LAW, THESE WARRANTY TERMS DO NOT EXCLUDE, RESTRICT OR MODIFY, AND ARE IN ADDITION TO, THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE LICENSE OF ANY SOFTWARE (EMBEDDED IN THE PRODUCT) TO YOU. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to any transactions regarding the sale of the Products.

Appendix D: Compliance Information

Installer Compliance Responsibility

Devices must be professionally installed and it is the professional installer's responsibility to make sure the device is operated within local country regulatory requirements.

FCC

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operations of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Industry Canada

This Class A digital apparatus complies with Canadian CAN ICES-3(B).

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil numérique de la classe A est conforme à la norme NMB-3(B) Canada.

Pour réduire le risque d'interférence aux autres utilisateurs, le type d'antenne et son gain doivent être choisies de façon que la puissance isotrope rayonnée équivalente (PIRE) ne dépasse pas ce qui est nécessaire pour une communication réussie.

Cet appareil est conforme à la norme RSS Industrie Canada exempts de licence norme(s). Son fonctionnement est soumis aux deux conditions suivantes:

1. Cet appareil ne peut pas provoquer d'interférences et
2. Cet appareil doit accepter toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement du dispositif.

RF Exposure Warning

The antennas used for this transmitter must be installed to provide a separation distance of at least 107 cm from all persons and must not be located or operating in conjunction with any other antenna or transmitter.

Les antennes utilisées pour ce transmetteur doivent être installé en considérant une distance de séparation de toute personnes d'au moins 107 cm et ne doivent pas être localisé ou utilisé en conflit avec tout autre antenne ou transmetteur.

CE Marking

CE marking on this product represents the product is in compliance with all directives that are applicable to it. This equipment is intended to be accessed only by service personnel and/or trained professionals.

Alert sign! follows CE marking

Alert sign must be indicated if a restriction on use applied to the product and it must follow the CE marking.

RoHS/WEEE Compliance Statement

English

European Directive 2002/96/EC requires that the equipment bearing this symbol on the product and/or its packaging must not be disposed of with unsorted municipal waste. The symbol indicates that this product should be disposed of separately from regular household waste streams. It is your responsibility to dispose of this and other electric and electronic equipment via designated collection facilities appointed by the government or local authorities. Correct disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about the disposal of your old equipment, please contact your local authorities, waste disposal service, or the shop where you purchased the product.

Deutsch

Die Europäische Richtlinie 2002/96/EC verlangt, dass technische Ausrüstung, die direkt am Gerät und/oder an der Verpackung mit diesem Symbol versehen ist , nicht zusammen mit unsortiertem Gemeindeabfall entsorgt werden darf. Das Symbol weist darauf hin, dass das Produkt von regulärem Haushaltmüll getrennt entsorgt werden sollte. Es liegt in Ihrer Verantwortung, dieses Gerät und andere elektrische und elektronische Geräte über die dafür zuständigen und von der Regierung oder örtlichen Behörden dazu bestimmten Sammelstellen zu entsorgen. Ordnungsgemäßes Entsorgen und Recyceln trägt dazu bei, potentielle negative Folgen für Umwelt und die menschliche Gesundheit zu vermeiden. Wenn Sie weitere Informationen zur Entsorgung Ihrer Altgeräte benötigen, wenden Sie sich bitte an die örtlichen Behörden oder städtischen Entsorgungsdienste oder an den Händler, bei dem Sie das Produkt erworben haben.

Español

La Directiva 2002/96/CE de la UE exige que los equipos que lleven este símbolo en el propio aparato y/o en su embalaje no deben eliminarse junto con otros residuos urbanos no seleccionados. El símbolo indica que el producto en cuestión debe separarse de los residuos domésticos convencionales con vistas a su eliminación. Es responsabilidad suya desechar este y cualesquiera otros aparatos eléctricos y electrónicos a través de los puntos de recogida que ponen a su disposición el gobierno y las autoridades locales. Al desechar y reciclar correctamente estos aparatos estará contribuyendo a evitar posibles consecuencias negativas para el medio ambiente y la salud de las personas. Si desea obtener información más detallada sobre la eliminación segura de su aparato usado, consulte a las autoridades locales, al servicio de recogida y eliminación de residuos de su zona o pregunte en la tienda donde adquirió el producto.

Français

La directive européenne 2002/96/CE exige que l'équipement sur lequel est apposé ce symbole sur le produit et/ou son emballage ne soit pas jeté avec les autres ordures ménagères. Ce symbole indique que le produit doit être éliminé dans un circuit distinct de celui pour les déchets des ménages. Il est de votre responsabilité de jeter ce matériel ainsi que tout autre matériel électrique ou électronique par les moyens de collecte indiqués par le gouvernement et les pouvoirs publics des collectivités territoriales. L'élimination et le recyclage en bonne et due forme ont pour but de lutter contre l'impact néfaste potentiel de ce type de produits sur l'environnement et la santé publique. Pour plus d'informations sur le mode d'élimination de votre ancien équipement, veuillez prendre contact avec les pouvoirs publics locaux, le service de traitement des déchets, ou l'endroit où vous avez acheté le produit.

Italiano

La direttiva europea 2002/96/EC richiede che le apparecchiature contrassegnate con questo simbolo sul prodotto e/o sull'imballaggio non siano smaltite insieme ai rifiuti urbani non differenziati. Il simbolo indica che questo prodotto non deve essere smaltito insieme ai normali rifiuti domestici. È responsabilità del proprietario smaltire sia questi prodotti sia le altre apparecchiature elettriche ed elettroniche mediante le specifiche strutture di raccolta indicate dal governo o dagli enti pubblici locali. Il corretto smaltimento ed il riciclaggio aiuteranno a prevenire conseguenze potenzialmente negative per l'ambiente e per la salute dell'essere umano. Per ricevere informazioni più dettagliate circa lo smaltimento delle vecchie apparecchiature in Vostro possesso, Vi invitiamo a contattare gli enti pubblici di competenza, il servizio di smaltimento rifiuti o il negozio nel quale avete acquistato il prodotto.

Appendix E: Declaration of Conformity

Česky [Czech]	UBIQUITI NETWORKS tímto prohla uje, e tento UBIQUITI NETWORKS device, je ve shod se základními po adavky a dal ími p íslu n mi ustanoveními sm rnice 1999/5/ES.
Dansk [Danish]	Undertegnede UBIQUITI NETWORKS erklærer herved, at følgende udstyr UBIQUITI NETWORKS device, overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Nederlands [Dutch]	Hierbij verklaart UBIQUITI NETWORKS dat het toestel UBIQUITI NETWORKS device, in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG. Bij deze verklaart UBIQUITI NETWORKS dat deze UBIQUITI NETWORKS device, voldoet aan de essentiële eisen en aan de overige relevante bepalingen van Richtlijn 1999/5/EC.
English	Hereby, UBIQUITI NETWORKS, declares that this UBIQUITI NETWORKS device, is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Eesti [Estonian]	Käesolevaga kinnitab UBIQUITI NETWORKS seadme UBIQUITI NETWORKS device, vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
Suomi [Finnish]	UBIQUITI NETWORKS vakuuttaa täten että UBIQUITI NETWORKS device, tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Français [French]	Par la présente UBIQUITI NETWORKS déclare que l'appareil UBIQUITI NETWORKS, device est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE. Par la présente, UBIQUITI NETWORKS déclare que ce UBIQUITI NETWORKS device, est conforme aux exigences essentielles et aux autres dispositions de la directive 1999/5/CE qui lui sont applicables.
Deutsch [German]	Hiermit erklärt UBIQUITI NETWORKS, dass sich diese UBIQUITI NETWORKS device, in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet". (BMWi) Hiermit erklärt UBIQUITI NETWORKS die Übereinstimmung des Gerätes UBIQUITI NETWORKS device, mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 1999/5/EG. (Wien)
Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ UBIQUITI NETWORKS ΔΗΛΩΝΕΙ ΟΤΙ UBIQUITI NETWORKS device, ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1995/5/ΕΚ.
Magyar [Hungarian]	Alulírott, UBIQUITI NETWORKS nyilatkozom, hogy a UBIQUITI NETWORKS device, megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
Íslenska [Icelandic]	Hér me l sir UBIQUITI NETWORKS yfir ví a UBIQUITI NETWORKS device, er í samræmi vi grunnkröfur og a rar kröfur, sem ger ar eru í tilskipun 1999/5/EC.
Italiano [Italian]	Con la presente UBIQUITI NETWORKS dichiara che questo UBIQUITI NETWORKS device, è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar o UBIQUITI NETWORKS deklar , ka UBIQUITI NETWORKS device, atbilst Direkt vas 1999/5/EK b tiskaj m pras b m un citiem ar to saist tajiem noteikumiem.
Lietuviškai [Lithuanian]	UBIQUITI NETWORKS deklaruoja, kad šis UBIQUITI NETWORKS įrenginys atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Malti [Maltese]	Hawnhekk, UBIQUITI NETWORKS, jiddikjara li dan UBIQUITI NETWORKS device, jikkonforma mal- ti ijiet essenzjali u ma provvedimenti o rajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
Norsk [Norwegian]	UBIQUITI NETWORKS erklærer herved at utstyret UBIQUITI NETWORKS device, er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.
Slovensky [Slovak]	UBIQUITI NETWORKS t mto vyhlasuje, e UBIQUITI NETWORKS device, sp a základné po iadavky a v etky príslu né ustanovenia Smernice 1999/5/ES.
Svenska [Swedish]	Härmed intygar UBIQUITI NETWORKS att denna UBIQUITI NETWORKS device, står l överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
Español [Spanish]	Por medio de la presente UBIQUITI NETWORKS declara que el UBIQUITI NETWORKS device, cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Polski [Polish]	Niniejszym, firma UBIQUITI NETWORKS o wiadcza, e produkt serii UBIQUITI NETWORKS device, spełnia zasadnicze wymagania i inne istotne postanowienia Dyrektywy 1999/5/EC.
Português [Portuguese]	UBIQUITI NETWORKS declara que este UBIQUITI NETWORKS device, está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Română [Romanian]	Prin prezenta, UBIQUITI NETWORKS declară că acest dispozitiv UBIQUITI NETWORKS este în conformitate cu cerinţele esenţiale şi alte prevederi relevante ale Directivei 1999/5/CE.

Appendix F: Contact Information

Ubiquiti Networks Support

Ubiquiti Support Engineers are located around the world and are dedicated to helping customers resolve software, hardware compatibility, or field issues as quickly as possible. We strive to respond to support inquiries within a 24-hour period.

Online Resources

Support: **support.ubnt.com**

Community: **community.ubnt.com**

Downloads: **downloads.ubnt.com**

2580 Orchard Parkway
San Jose, CA 95131
www.ubnt.com

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