





24 GHz Point to Point 1.4+ Gbps Radio

Model: AF24

QUICK START GUIDE

Introduction

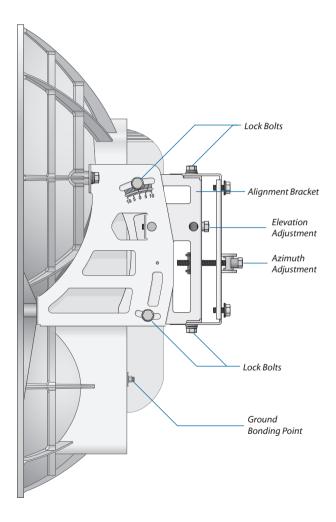
Thank you for purchasing the airFiber™ 24 GHz Point-to-Point Radio, model AF24. This Quick Start Guide is designed to guide you through the installation of the airFiber AF24 and show you how to access the airFiber Configuration Interface.

Package Contents

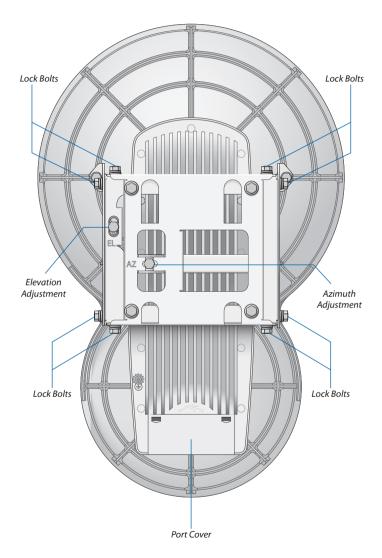


Hardware Overview

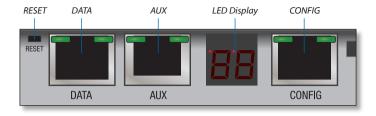
Side



Back

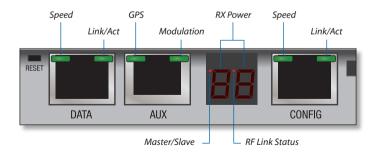


Interfaces



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.
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	
	Speed	On	1000 Mbps	
		Off	No Ethernet Link	
	Link/Act	On	Ethernet Link Established	
		Random Flashing	Ethernet Activity	
	GPS	Off	No GPS Synchronization	
		On	Operational (Strong Signal	
		Normal Flash*	Operational (Weak Signal)	
AUX		Off	1x (QPSK SISO)	
	Modulation	Short Flash*	2x (QPSK MIMO)	
		Normal Flash*	4x (16QAM MIMO)	
		Long Flash*	6x (64QAM MIMO)	
	RX Power (-dBm)	Number	Decodable RX Signal	
		Flashing Number	Undecodable RX Signal	
		oL	Overload Condition	
λe	Master/ Slave	Off	Slave Mode	
ispla		On	Master Mode	
LED Display	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)

Installation Requirements

- 17 mm wrench
- 13 mm 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 meter below the highest point on the structure
 - For tower installations, at least 3 meters below the top of the tower
- · Ground wire min. 8 AWG (10 mm²), max. length: 1 meter
- (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 should be used for all wired Ethernet connections. Category 6 is required for installations with long cable runs (up to 100 m).

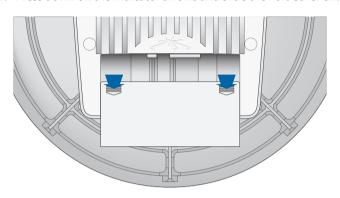
We recommend that you protect your networks from the most brutal environments and devastating ESD attacks with industrial-grade shielded Ethernet cable from Ubiquiti Networks. For more details, visit www.ubnt.com/toughcable

Installation Overview

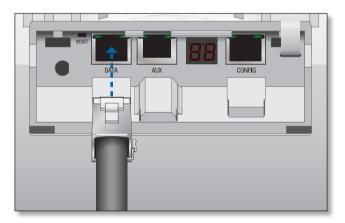
We recommend that you configure your paired airFiber radios before mounting. To configure device settings in the airFiber Configuration Interface, you will need to connect Power over Ethernet to the *DATA* port and connect an Ethernet cable between your computer and the *CONFIG* port. Once you have completed configuration, disconnect the cables to move the airFiber radios, and then reconnect at the site. After you have mounted the airFiber radios, then you can establish and optimize the RF link.

Connecting Power over Ethernet

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



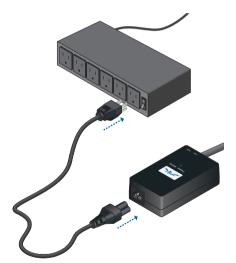
2. Connect an Ethernet cable to the DATA port.



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

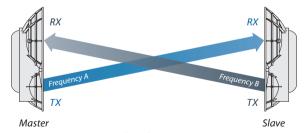
The instructions in this section explain how to access the airFiber Configuration Interface and configure the following settings:

- 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 are the same



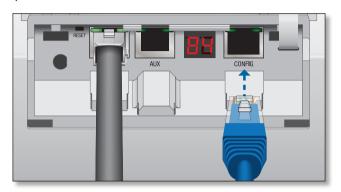
Half-Duplex Diagram

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. Connect an Ethernet cable from your computer to the CONFIG port on the airFiber AF24.



- 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).
- Launch your Web browser. Type http://192.168.1.20 in the address field and press enter (PC) or return (Mac).



 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:

- 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 are the same.
- 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.
- 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.
- By default, in-band management is disabled. To enable in-band management:
 - Click the **Network** tab.



- b. Check the box next to *In-Band Management*.
- c. Change the IP Address, Netmask, and other settings to make them compatible with your network.



Note: If *In-Band Management* is enabled, 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 CONFIG and DATA ports.

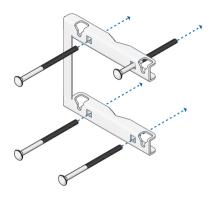
d. Click Change and then click Apply.

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.

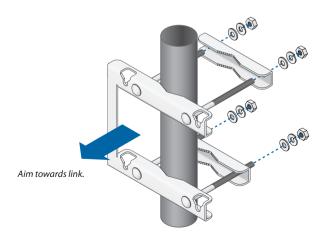
Hardware Installation

To install the airFiber AF24:

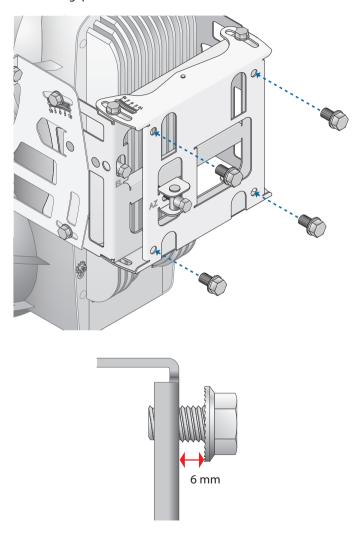
1. Insert the four M10x150 Carriage Bolts into the Pole Mount Bracket.



 Attach the Pole Mount Bracket to a pole. Orient the Pole Mount Bracket so it is aimed in the direction of the other airFiber AF24. Slip the Pole Clamps onto the M10x150 Carriage Bolts. Secure the clamps with the M10 Flat Washers, Split Lock Washers, and Hex Nuts.



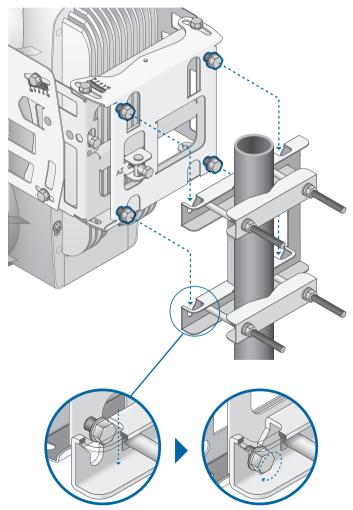
3. Secure the four M8x16 Serrated Flange Screws to the back of the Alignment Bracket. Do not completely tighten the screws; leave a 6 mm gap between the screw head and the bracket.



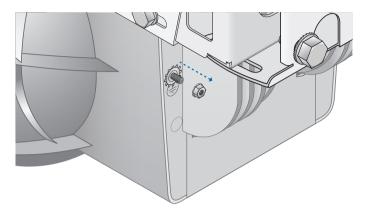
4. Lift the airFiber AF24 and align the four M8x16 Serrated Flange Screws with the slots on the Pole Mount Bracket. Seat the screws in the slots. Securely tighten the screws.



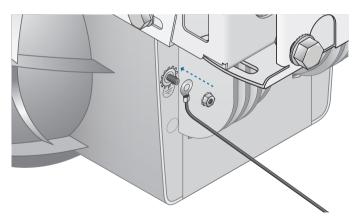
WARNING: To prevent injury, ensure that all four screws are seated and fully tightened.



- 5. Attach a ground wire by performing the following steps:
 - a. Remove the nut from the Ground Bonding Point.



b. Attach a ground wire (min. 8 AWG or 10 mm²) to the lug and replace the nut to secure the wire.



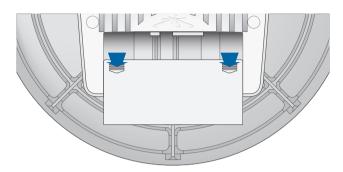
c. Secure the other end of the ground wire to the pole, tower, or grounding bar.



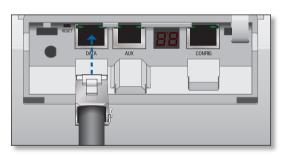
Note: The ground wire should be as short as possible and no longer than one meter in length.

Connecting Ethernet

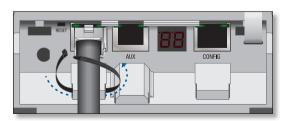
1. Press down on the indicator arrows and slide the Port Cover off.



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.



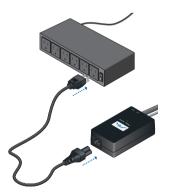
4. Connect the other end of the Ethernet cable from the *DATA* port to the Ethernet port labeled POE on the PoE Adapter.



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



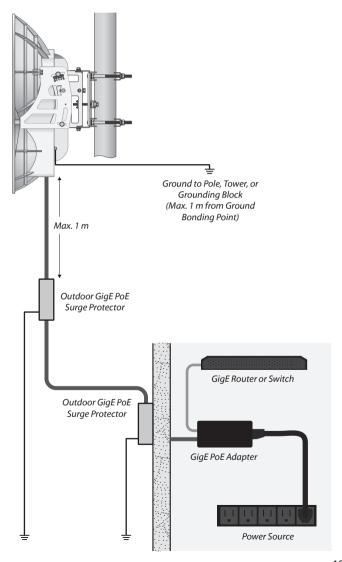
6. Connect the *Power Cord* to the power port on the *PoE Adapter*. Connect the other end of the *Power Cord* to a power source.





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.



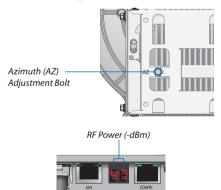
Alignment

To align the airFiber radios for best performance, you MUST align only one end of the link at a time. Begin the alignment process with the *Slave* first.

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



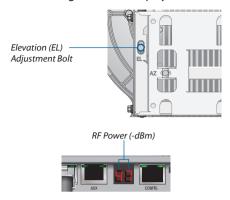
 While adjusting the azimuth, observe the numeric LED Display located next to the CONFIG port. The values are displayed in negative (-) dBm. Adjust the azimuth for the strongest received signal level. For example, a displayed value of 42 represents a received signal level of -42 dBm, which is a stronger received signal than 47, which represents -47 dBm.





Note: If the LED Displays indicates an overload condition , refer to the airFiber AF24 User Guide at: www.ubnt.com/documentation for more information.

Observe the LED display and adjust the elevation until the strongest received signal level is displayed.



- 4. Repeat steps 1-3 for the Master.
- 5. On the Slave, repeat steps 2-3 to finalize the alignment.
- 6. On the Master, repeat steps 2-3 to finalize the alignment.
- 7. 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*.



Note: There are three methods for fine-tuning the alignment:

- LED display (described above)
- · airFiber Configuration Interface
- audio tone (optional equipment required)

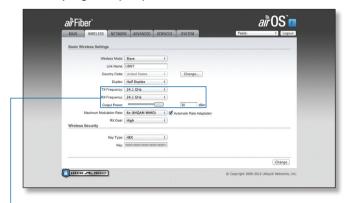
Refer to the airFiber AF24 User Guide for instructions on the airFiber Configuration Interface and audio tone methods. The User Guide is available at: www.ubnt.com/documentation

Specifications

airFiber AF24				
Operating Frequency	24.05 – 24.25 GHz			
Dimensions	649 x 426 x 303 mm			
Weight	10.5 kg (Mount Included)			
Max Power Consumption	< 50 Watts			
Power Supply	50V, 1.2A PoE GigE Adapter (Included)			
Power Method	Passive Power over Ethernet (42-58V)			
Certifications	CE, FCC, IC			
Mounting	Pole Mount Kit (Included)			
Operating Temperature	-40 to 55° C (-40 to 131° F)			
Networking Interface				
Data Port	(1) 10/100/1000 Ethernet Port			
Configuration Port	(1) 10/100 Ethernet Port			

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.



The Frequencies and Output Power fields are provided to the professional installer to assist in meeting regulatory requirements.

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

- 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.
- There are no operator serviceable parts inside this equipment. Service should be provided only by a qualified service technician.

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- 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.
 - 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.

General Warranty

UBIQUITI NETWORKS, Inc ("UBIQUITI NETWORKS") represents and warrants that the Products furnished hereunder 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 under the foregoing warranty shall be to repair or replace, at its option, any defective Product that fails during the warranty period. The expense of removal and reinstallation of any item is not included in this warranty.

The foregoing warranty is exclusive and in lieu of all other warranties, express or implied, including the implied warranties of merchantability and fitness for a particular purpose and any warranties arising from a course of dealing, usage or trade practice with respect to the products. Repair or replacement in the manner provided herein shall be the sole and exclusive remedy of Buyer for breach of warranty and shall constitute fulfillment of all liabilities of UBIQUITI NETWORKS with respect to the quality and performance of the Products. UBIQUITI NETWORKS reserves the right to inspect all defective Products (which must be returned by Buyer to UBIQUITI NETWORKS factory freight prepaid).

No Products will be accepted for replacement or repair without obtaining a Return Materials Authorization (RMA) number from UBIQUITI NETWORKS. Products returned without an RMA number will not be processed and will be returned to Buyer freight collect. UBIQUITI NETWORKS shall have no obligation to make repairs or replacement necessitated by catastrophe, fault, negligence, misuse, abuse, or accident by Buyer, Buyer's customers or any other parties. The warranty period of any repaired or replaced. Product shall not extend beyond its original term.

Warranty Conditions

The foregoing warranty shall apply only if:

- The Product has not been subjected to misuse, neglect or unusual (I) physical, electrical or electromagnetic stress, or some other type of accident
- (II) No modification, alteration or addition has been made to the Product by persons other than UBIOUITI NETWORKS or UBIOUITI NETWORK'S authorized representatives or otherwise approved by UBIOUITI NFTWORKS.
- (111) The Product has been properly installed and used at all times in accordance, and in all material respects, with the applicable Product documentation
- (IV) All Ethernet cabling runs use CAT5 (or above) shielded cabling.

Disclaimer: UBIQUITI NETWORKS does not warrant that the operation of the products is error-free or that operation will be uninterrupted. In no event shall UBIOUITI NETWORKS be responsible for damages or claims of any nature or description relating to system performance, including coverage, buyer's selection of products for buyer's application and/or failure of products to meet government or regulatory requirements.

Returns

In the unlikely event a defect occurs, please work through the dealer or distributor from which this product was purchased.

Compliance

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
- 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.

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For MPE and antenna usage details, please visit our website at www.ubnt.com/products

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

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 confrome à la norme NMB-003 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
- 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 110 cm from all persons and must not be located or operating in conjunction with any other antenna or transmitter, except as listed for this product's certification.

Les antennes utilisées pour ce transmetteur doivent être installé en considérant une distance de séparation de toute personnes d'au moins 110 cm et ne doivent pas être localisé ou utilisé en conflit avec tout autre antenne ou transmetteur, excluant la liste de certification de ce produit.

CE Marking

CE marking on this product represents the product is in compliance with all directives that are applicable to it.

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.



Declaration of Conformity

Česky UBIOUITI NETWORKS tímto probla uie, e tento UBIOUITI

NETWORKS device, je ve shod se základními po adavky a dal ími p [Czech]

íslu n mi ustanoveními sm rnice 1999/5/ES.

Dansk Undertegnede UBIQUITI NETWORKS erklærer herved, at følgende udstyr UBIOUITI NETWORKS device, overholder de væsentlige krav [Danish]

og øyrige relevante kray i direktiv 1999/5/EF.

Nederlands Hierbij verklaart UBIQUITI NETWORKS dat het toestel UBIQUITI

NETWORKS device, in overeenstemming is met de essentiële eisen [Dutch] en de andere relevante bepalingen van richtlijn 1999/5/EG.

> Bii deze verklaart UBIOUITI NETWORKS dat deze UBIOUITI NETWORKS device, voldoet aan de essentiële eisen en aan de overige relevante bepalingen van Richtliin 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.

Festi Käesolevaga kinnitab UBIQUITI NETWORKS seadme UBIQUITI

NETWORKS device, vastavust direktiivi 1999/5/EÜ põhinõuetele ja [Estonian] nimetatud direktiivist tulenevatele teistele asiakohastele sätetele.

Suomi UBIOUITI NETWORKS vakuuttaa täten että UBIOUITI NETWORKS

device, tyyppinen laite on direktiivin 1999/5/EY oleellisten. [Finnish]

vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

Français Par la présente UBIQUITI NETWORKS déclare que l'appareil UBIOUITI NETWORKS, device est conforme aux exigences [French]

essentielles et aux autres dispositions pertinentes de la directive

1999/5/CE.

Deutsch Hiermit erklärt UBIOUITI NETWORKS, dass sich diese UBIOUITI

NETWORKS device, in Übereinstimmung mit den grundlegenden [German] Anforderungen und den anderen relevanten Vorschriften der

Richtlinie 1999/5/EG befindet". (BMWi)

ΜΕΤΗΝ ΠΑΡΟΥΣΑ UBIOUITI NETWORKS ΔΗΛΟΝΕΙ ΟΤΙ UBIOUITI Ελληνική NETWORKS device, ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ [Greek]

ΑΠΑΙΤΉΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΈΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ

1995/5/EK.

Alulírott, UBIQUITI NETWORKS nyilatkozom, hogy a Magyar

UBIQUITI NETWORKS device, megfelel a vonatkozó alapvető [Hungarian]

követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.

Íslenska Hér me I sir UBIOUITI NETWORKS vfir ví a UBIOUITI NETWORKS device, er í samræmi vi grunnkröfur og a rar kröfur, sem ger ar eru í [Icelandic]

tilskipun 1999/5/EC.

Italiano Con la presente UBIOUITI NETWORKS dichiara che questo UBIOUITI NETWORKS device, è conforme ai requisiti essenziali ed alle altre [Italian]

disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.

Latviski Ar o UBIOUITI NETWORKS deklar, ka UBIOUITI NETWORKS device. atbilst Direkt vas 1999/5/EK b tiskaj m pras b m un citiem ar to saist [Latvian]

taiiem noteikumiem.

Lietuviškai [Lithuanian]

UBIOUITI NETWORKS deklaruoja, kad šis UBIOUITI NETWORKS jrenginys atitinka esminius reikalavimus ir kitas 1999/5/EB

Direktyvos nuostatas.

Malti Hawnhekk, UBIQUITI NETWORKS, jiddikjara li dan UBIQUITI NETWORKS device, jikkonforma mal- ti ijiet essenzjali u ma [Maltese] provvedimenti o rajn relevanti li hemm fid-Dirrettiva 1999/5/EC.

Norsk UBIQUITI NETWORKS erklærer herved at utstyret UBIQUITI NETWORKS device, er i samsvar med de grunnleggende krav og [Norwegian]

øvrige relevante krav i direktiv 1999/5/EF.

Slovensky UBIQUITI NETWORKS t mto vyhlasuje, e UBIQUITI NETWORKS device, sp a základné po jadavky a v etky príslu né ustanovenia [Slovak] Smernice 1999/5/FS

Svenska Härmed intygar UBIOUITI NETWORKS att denna UBIOUITI NETWORKS device, står I överensstämmelse med de väsentliga. [Swedish] egenskapskrav och övriga relevanta bestämmelser som framgår av

direktiv 1999/5/EG.

Español Por medio de la presente UBIQUITI NETWORKS declara que el UBIOUITI NETWORKS device, cumple con los requisitos esenciales [Spanish] y cualesquiera otras disposiciones aplicables o exigibles de la

Directiva 1999/5/CE.

Polski Ninieiszym, firma UBIOUITI NETWORKS o wiadcza, e produkt serii UBIQUITI NETWORKS device, spełnia zasadnicze wymagania i inne [Polish]

istotne postanowienia Dyrektywy 1999/5/EC.

Português UBIOUITI NETWORKS declara que este UBIOUITI NETWORKS device. está conforme com os requisitos essenciais e outras disposições da [Portuguese]

Directiva 1999/5/CE.

Română Prin prezenta, declarăm că acest produs este în conformitate cu cerintele esentiale și cu alte prevederi relevante din Directiva [Romanian] 1999/5/CE.

Ubiquiti Networks Support

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Online Resources

Wiki Page: wiki.ubnt.com

Support Forum: **forum.ubnt.com**Downloads: **downloads.ubnt.com**

