

Airmux-400

Broadband Wireless Multiplexer



Point-to-point and multi point-to-point broadband radio solution for Ethernet and TDM traffic over license-free frequencies

- Cost-effective multi point-to-point encrypted wireless broadband multiplexer
- Net throughput of up to 50 Mbps
- Transmission range of up to 75 miles (120 km)
- Operates in 2.4, 5.3, 5.4, 5.8 and 4.9 GHz transmission bands
- High reliability and availability based on robust air interface protocol

For the global markets of cellular backhaul, WiMAX and ISP backhaul, broadband access, large private and government networks, Airmux-400 offers high throughput, longer range and robustness at a competitive price.

Airmux-400 is a carrier-class, full duplex, 50-Mbps capacity, cost-effective multi point-to-point broadband wireless transmission device. It combines legacy TDM and Ethernet services for transmission over 2.4, 5.3, 5.4, 5.8 and 4.9 GHz bands, and is suitable for deployment in FCC and IC regulated countries.

RADCare Built-In!
12 months of
level 2 support

TALLEY

800.949.7079

order online today at www.talleycom.com

RAD

data communications

The Access Company

Airmux-400

Broadband Wireless Multiplexer

Airmux systems are deployed as single or multi point-to-point collocated links.

Transmission range of up to 75 miles (120 km) is attainable with an external antenna.

PHYSICAL CONFIGURATIONS

Airmux multiplexers consist of an outdoor unit (ODU), an optional external antenna and an indoor unit (IDU) with redundant DC power supplies. The outdoor unit is suitable for mast or wall installation.

SUPERIOR SPECTRAL EFFICIENCY

Built on advanced MIMO and OFDM technologies, Airmux-400 provides a high-capacity link at channel bandwidth of 20 MHz. This guarantees a robust air interface able to withstand strong RF interference and harsh ambient conditions.

SECURITY

Data transmitted over the air interface is encrypted using Advanced Encryption System (AES) with a 128-bit encryption key.

QUALITY OF SERVICE

When the link quality is low, Airmux-400 automatically searches for a clear channel within a pre-selected list of frequencies.

SHORT TIME-TO-SERVICE

Because Airmux-400 operates in license-exempt frequencies, it can be deployed in record time, eliminating the costs and delays involved in leasing lines or trenching fiber.

SFP PORT

The MSA-compatible port accepts SFP-based T3/E3 devices for transmitting 44.736-Mbps (T3) or 34.368-Mbps (E3) data streams over its wireless link.

HUB SITE SYNCHRONIZATION

Hub Site Synchronization (HSS) ensures simultaneous (multi point-to-point deployment) data transmission for all collocated radios by eliminating the interference that normally occurs when different ODUs transmit and receive from the same site (see *Figure 2*).

HSS, which supports up to 16 collocated units, enables a complex radio environment of mixed services (TDM or Ethernet) and channel bandwidth frequencies (20 MHz).

The collocation feature requires ordering the HSS unit as well as its synchronization cables.

1+1 LINK REDUNDANCY

The Monitored Hot Standby (MHS) 1+1 link redundancy protects the wireless transmission in case of equipment failure or air interface loss. Link switchover is performed in less than 50 msec.

DIVERSITY

With dual bipolar antennas Airmux-400 links can be configured to transmit the same data through both radios. This adds data transmission integrity under harsh conditions.

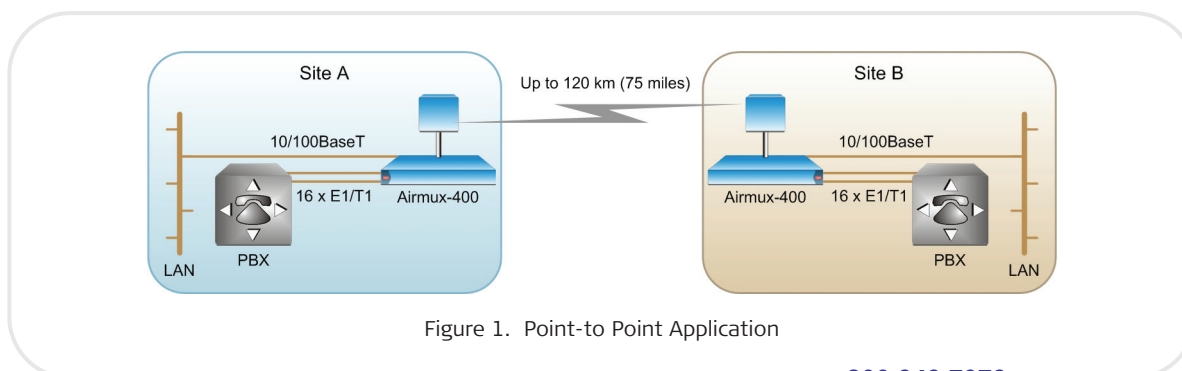


Figure 1. Point-to-Point Application

MANAGEMENT

A single SNMP-based network management application (Airmux Manager) is used to control multiple Airmux-400 and Airmux-200 links as a unified network.

VLAN management allows the separation of user traffic from NMS traffic. The user decides if such a separation is required. Both the headquarters and remote sites are configured with VLAN management.

Factory settings can be restored at any time for each ODU.

Information on links and management can be collected and analyzed via a single action.

The Airmux Manager Spectrum View utility is an RF survey tool designed to support the link installation prior to full link service activation. The tool provides comprehensive and clear spectral measurement information enabling easier, faster and better quality installations.

APPLICATIONS

Cellular Backhaul

Airmux-400 connects cellular base stations to controllers. This solution meets the requirements of cellular backhaul applications by providing Ethernet traffic for maintenance and control.

Broadband Access

Airmux-400 provides broadband Ethernet and leased line services, to Small and Medium Enterprises (SME).

Wireless ISP Backhaul

Wireless Internet Service Providers (WISP) backhaul their Point of Presence (POP) traffic to the network operations center. With Airmux-400, WISPs achieve higher capacity, and can offer bundled connectivity for up to 75 miles (120 km).

Remote Site Connectivity

Airmux-400 is also offered to enterprises with multiple sites that require a transparent connection of LANs across their various campuses.

Carrier class
performance for the
networks of today and
tomorrow



800.949.7079

order online today at www.talleycom.com

Airmux-400

Broadband Wireless Multiplexer

High-capacity,
cost-effective
backhaul solution

Specifications

RADIO

Frequency Bands (GHz)

5.8 (FCC/IC)

5.4 (FCC)

5.4 (IC)

5.3 (FCC/IC)

4.9 (FCC)

2.4 (FCC/IC)

Regulation

FCC/IC:

FCC 47CFR, Part 15, Subpart C,

FCC 47CFR, Part 15, Subpart E

FCC 47CFR, Part 90, Subpart Y

RSS-111

IC RSS-210

Data Rate

Up to 50 Mbps, full duplex,
user-configurable

Channel Bandwidth

20 MHz

Duplex Technique

TDD

Modulation

2×2 MIMO-OFDM (BPSK, QPSK, 16 QAM,
64 QAM), see *Table 1*

Transmit Power

See *Table 1*

Error Correction

FEC, k = 1/2, 2/3, 3/4, 5/6, see *Table 1*

Encryption

AES 128

Table 1. Radio Link Characteristics

Modulation	Rate		FEC	Max Tx Power
	Single Antenna [Mbps]	Dual Antenna [Mbps]		
BPSK	N/A	13	1/2	22
QPSK	13	26	1/2	22
	19.5	39	3/4	
16 QAM	26	52	1/2	22
	39	78	3/4	
64 QAM	52	104	2/3	20
	58.5	117	3/4	
	65	130	5/6	

TDM INTERFACE**Number of Ports**

4, 8 or 16

Type

T1/E1

Framing

Transparent to framing mode

Timing

Plesiochronous (independent
Tx and Rx timing)

Line Code

T1: B8ZS, AMI

E1: HDB3

Latency

8 msec

Line Impedance

T1: 100Ω, balanced

E1: 120Ω, balanced

Connector

RJ-45

Jitter and Wander

As per G.823, G.824

LAN INTERFACE**Number of Ports**

2

Type

10/100BaseT, autonegotiation (802.3u)

Framing/Coding

IEEE 802.3u

Bridging

Up to 2048 MAC addresses self-learning

Traffic Handling

MAC layer bridging, self-learning

Latency

3 msec (typical)

Line Impedance

100Ω

VLAN Support

Transparent

Connector

RJ-45 (10/100BaseT)

SFP PORT**Type**

Fast Ethernet

For full details, see the *SFP Transceivers data sheet* at www.rad.com

Note: It is strongly recommended to order this device with **original RAD SFPs installed**. This will ensure that prior to shipping, RAD has performed comprehensive functional quality tests on the entire assembled unit, including the SFP devices. RAD cannot guarantee full compliance to product specifications for units using non-RAD SFPs. For detailed specifications of the SFP transceivers, see the *SFP Transceivers data sheet*.

MANAGEMENT**Protocol**

SNMP, Telnet

Management Interface

10/100BaseT

Connector

RJ-45

Upgrade Capabilities

Local and over-the-air software download

Airmux-400

Broadband Wireless Multiplexer

Optimal performance
and unmatched
robustness in any
environment

ANTENNA

Characteristics

See Table 2

GENERAL

Diagnostics

Local and remote loopbacks

IDU-to-ODU Connection

Outdoor Cat.5e cable,
100m (328 ft) max. length

Grounding and Lightning Protection

Individual grounding for each IDU/ODU

Internal arrestors for lightning protection

Internal ESD protection circuits over
power/telecom lines

Power

DC: -20 to -60 VDC via AC/DC converter

Power Consumption

35W max (ODU with IDU)

Indicators

PWR (green) – Power status

IDU (green) – IDU status

ODU (green/red) – ODU-to-IDU link status

AIR I/F (green/red) – Air Interface status

SVC (green/red) – Service status

Environment

Outdoor unit and external antenna:

Enclosure: IP67 all-weather case

Temperature: -35° to 60°C
(-31° to 140°F)

Indoor units:

Temperature: 0° to 50°C
(32° to 122°F)

Humidity: Up to 90%, non-condensing

Physical

ODU (with integrated antenna):

Height: 371 mm (14.8 in)

Width: 371 mm (14.8 in)

Depth: 9 mm (3.6 in)

Weight 3.5 kg (7 lb)

IDU:

Height: 44 mm (1.7 in)

Width: 237 mm (9.3 in)

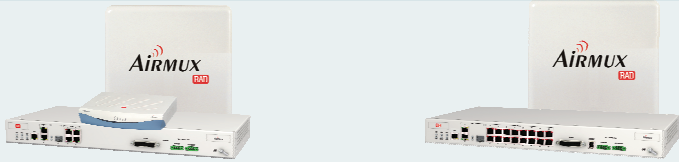
Depth: 165 mm (6.5 in)

Weight 0.5 kg (1.1 lb)

Table 2. Airmux-400 Antenna Options

Antenna Type	Frequency [GHz]	Gain [dBi]	Beam [degrees]	Dimensions [mm] [ft]		Weight [kg] [lb]		Connector
Integrated								
Flat panel	4.9x–5.875	19 (4.9x GHz) 23 (5.x GHz)	9	371×371×40	1.2×1.2×1.5	2.5	5.5	2 × N-type
Flat panel	2.400	16	16	371×371×40	1.2×1.2×1.5	2.5	5.5	2 × N-type
External								
Flat panel	2.400–2.700	19	5	371×371×40	1.2×1.2×1.5	2.5	5.5	2 × N-type
Flat panel	4.4x–5.4x	22	5.6	371×371×40	1.2×1.2×1.5	2.5	5.5	2 × N-type
Flat panel	4.940–5.800	23	5.6	371×371×40	1.2×1.2×1.5	2.5	5.5	2 × N-type
Flat panel	5.140–6.090	23	5.6	371×371×40	1.2×1.2×1.5	2.5	5.5	2 × N-type
Dish	5.250–6.000	28	5.6	Diam. 620	Diam. 2.0	20.4	45	2 × N-type
<i>Note: The range depends on the system configuration. For further information, contact the RAD partner nearest you or one of RAD's offices worldwide.</i>								

Table 3. Airmux Family Product Comparison

Features		
	Airmux-200 (Ver. 1.900)	Airmux-400 (Ver. 2.3)
Net throughput, full duplex	18 Mbps	50 Mbps
Ethernet ports	2 × Fast Ethernet	2 × Fast Ethernet
TDM ports	1, 2, 4	4, 8, 16
Security	AES 128	AES 128
Maximum range	50 miles (80 km)	75 miles (120 km)

Airmux-400

Broadband Wireless Multiplexer

Ordering

Airmux-400/IDUE/*

Indoor unit with redundant DC power supplies

Airmux-400/ODU/#

Outdoor unit with integrated antenna

Airmux-400/ODU/@/EXT

Outdoor unit for external antenna connection

Legend

* IDU-E interface:

4TDM	4 TDM ports, 2 Ethernet ports
8TDM	8 TDM ports, 2 Ethernet ports
16TDM	16 TDM ports, 2 Ethernet ports
ETH	2 Ethernet ports

Frequency band and regulation:

F24F	2.4 GHz, FCC/IC
F49F	4.9 GHz, 5.x GHz (default – 4.9 GHz), FCC/IC
F58F	5.x GHz (default – 5.8 GHz), FCC/IC

@ Frequency band and regulation:

F2449F	2.x GHz, 4.9 GHz, 5.x GHz (default – 4.9 GHz), FCC/IC
F2458F	2.x GHz, 5.x GHz (default – 5.8 GHz), FCC/IC

OPTIONAL ACCESSORIES

Airmux-400/ANT/\$

External antenna supplied with 1m (3.3 ft) cable

Legend

\$ External antenna:

19/2427/fp	19 dBi, 2.4–2.7 GHz, flat panel
22/4451/fp	22 dBi, 4.4–5.1 GHz, flat panel
23/4958/fp	23 dBi, 5.150–5.875 GHz, flat panel
23/5001/fp	23 dBi, 4.940–5.800 GHz, flat panel
28/5158/dish	28 dBi, 5.250–5.850 GHz, dish

CBL-Airmux-UTP/@

Assembled cable for permanent connection between IDU and ODU

Legend

@ Cable length:

25	25m (82 ft)
50	50m (164 ft)
75	75m (246 ft)
100	100m (328 ft)

Airmux-400/POE/a

Power-over-Ethernet (POE) device

Note: A POE device eliminates the need for ordering an IDU-E.

Airmux-400/PS-E-AC/a

Power adapter for IDU-E, 90–240 VAC to 48 VDC

Legend

a AC plug:

ACEU	European
ACUS	US
ACOC	Open-ended

Airmux-HSSU

Hub site sync unit to connect 8 collocated outdoor units and 2 additional HSSUs

CBL-HSS/@@

Assembled cable for permanent connection to HSS

Legend

@@ Cable length:

5	5m (16.4 ft) cable
15	15m (49.2 ft) cable
50	50m (164 ft) cable
100	100m (328 ft) cable

MHS-kit

Cable and patch panel assembly (8 × RJ-45 Y-connections) for Monitored Hot Standby configuration

TALLEY

800.949.7079

order online today at www.talleycom.com

RAD

data communications

The Access Company