

Airmux-200



Broadband Wireless Multiplexer



FEATURES

- Cost effective point-to-point broadband wireless multiplexer
- Operates at 5.x GHz, 4.9 GHz, and 2.4 GHz unlicensed and licensed bands
- Air data rate of up to 48 Mbps
- Transmission range of up to 80 km (50 miles)
- High reliability and availability based on robust air interface
- Air interface encryption
- Integrated solution for E1/T1 and Ethernet interfaces
- Redundant power supply and 4 E1/T1 interfaces available in extended IDU-E version
- Automatic channel selection
- Dry-contact alarm relay

DESCRIPTION

- Airmux-200 is a carrier-class, 48 Mbps capacity, cost effective point-to-point broadband wireless transmission system. It combines legacy TDM and Ethernet services for transmission over 5.x GHz, 4.9 GHz, and 2.4 GHz licensed and unlicensed bands, and is suitable for deployment in FCC regulated countries.
- Short time-to-service:
 - Wireless connectivity instead of private line leasing from service providers
 - License-exempt spectrum removes regulatory delays
 - Compact integrated system, easy to install and operate.
- Airmux-200 provides high performance and reliability. The interface ensures low BER, as well as low latency, and full compliance with E1/T1 interface jitter and wander requirements.
- Transmission range of up to 80 km (50 miles) is available with an external antenna.

- Air interface data is encrypted using Advanced Encryption System (AES) with a 128-bit encryption key.
- When the link quality is out of limits, Airmux-200 automatically searches for a clear channel within a pre-selected list of frequencies.
- External events trigger alarms via the dry-contact alarm inputs.
- Airmux multiplexers consist of an outdoor unit (ODU) and an indoor unit (IDU or IDU-E).
- The outdoor unit is suitable for mast or wall installation. Mounting brackets are supplied with the unit.

APPLICATIONS

- Cellular Backhauling
Airmux-200 connects between cellular base stations and controllers. This solution meets the requirements of cellular backhauling applications by providing four E1/T1 interfaces and Ethernet traffic for maintenance and control.

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- **Broadband Access**
Airmux-200 provides broadband Ethernet and leased line services, to Small and Medium Enterprises (SME).
- **Hot-Spot Backhauling**
Airmux-200 provides a robust alternative to the last mile connection between the WLAN access point and the data network, compared with the often used expensive E1/T1 leased lines.
- **Wireless ISP Backhaul**
Wireless Internet Service Providers (WISP) backhaul their Point of Presence (POP) traffic to the network operation center.
With Airmux-200, WISPs achieve higher capacity, and can offer bundled connectivity, with a range of up to 80 km (50 miles).
- **Remote Sites Connectivity**
Airmux-200 is offered to enterprises with multiple sites that require a transparent connection of LAN and PBX systems across their various campuses.

SPECIFICATIONS

RADIO

- **Frequency Bands**
5.8 GHz (5.725–5.850 GHz)
5.4 GHz (5.470–5.725 GHz)
5.3 GHz (5.250–5.350 GHz)
4.9 GHz (4.940–4.990 GHz)
2.4 GHz (2.400–2.4835 GHz)
2.3 GHz (2.300–2.400 GHz)
- **Data Rate**
Up to 48 Mbps, user-configurable
- **Channel Bandwidth**
20 MHz
- **Duplex Technique**
TDD
- **Modulation**
OFDM - BPSK, QPSK, 16 QAM, 64 QAM
- **Transmit Power**
See Table 1
- **RF Dynamic Range**
More than 50 dB

LAN INTERFACE

- **Number of Ports**
IDU: 1
IDU-E: 2
- **Type**
10/100BaseT, autonegotiation
- **Framing/Coding**
IEEE 802.3u
- **Bridging**
Self-learning, up to 2048 MAC addresses
- **Traffic Handling**
MAC layer bridging, self-learning
- **Latency**
3 msec (typical)
- **Line Impedance**
100Ω
- **VLAN Support**
Transparent
- **Connector**
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Table 1. Radio Regulatory Compliance and Maximum Transmit Power

Frequency [GHz]	USA and Canada		Europe (ETSI)	
	Regulation	Max. Tx Power [dBm]	Regulation	Max. Tx Power [dBm]
5.725 – 5.850	47CFR Part 15 Subpart C, RSS-210	17	N/A	N/A
5.470 – 5.725	N/A	N/A	EN 300 216 V1.2.1, EN 301 893 V1.2.2	8 EIRP ≤ 30
5.250 – 5.350	47CFR Part 15 Subpart E, RSS-210	8	N/A	N/A
4.940 – 4.990	47CFR Part 15 Subpart B	15	N/A	N/A
2.400 – 2.4835	47CFR Part 15 Subpart C, RSS-210	11	EN 300 328	-4 EIRP ≤ 20

APPLICATION

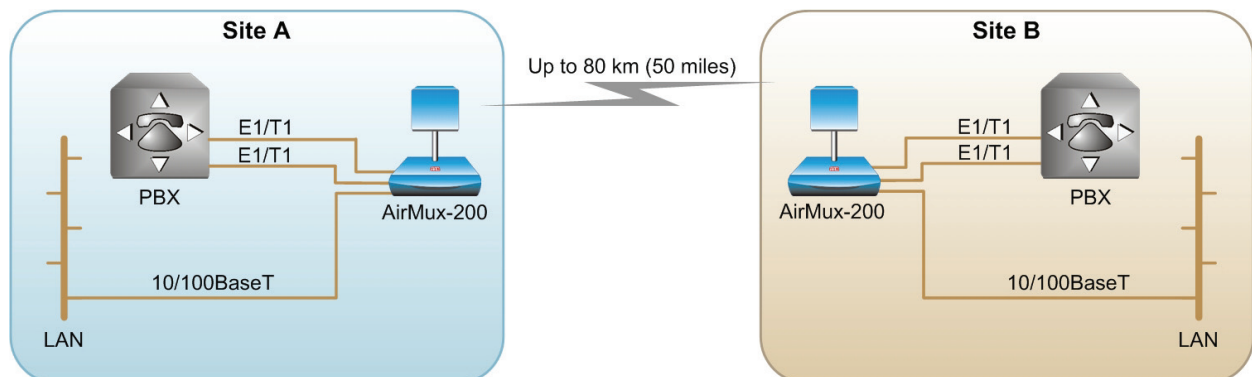


Figure 1. Airmux-200 in a Point-to Point Application

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E1/T1 INTERFACE

- **Number of Ports**
IDU: 1 or 2
IDU-E: 4
- **Framing**
Unframed
- **Timing**
Plesiochronous (independent Tx and Rx timing)
- **Line Code**
E1: HDB3
T1: B8ZS, AMI
- **Latency**
8 msec
- **Line Impedance**
E1: 120Ω, balanced
T1: 100Ω, balanced
- **Connector**
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- **Jitter and Wander Compliance**
As per G.823, G.824 requirements

MANAGEMENT

- **Protocol**
SNMP-based
- **Network Management**
SNMPc-based
- **Management Interface**
10/100BaseT

- **Connector**
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- **Upgrade Capabilities**
Local and over-the-air software download

GENERAL

- **Diagnostics**
Local and remote loopbacks
- **IDU-to-ODU Connection**
Outdoor Cat.5e cable,
100m (328 ft) maximum length
- **Power**
DC: -48, 24 VDC
AC: 100–240 VAC
Two AC power supply options are available for IDU-E:
 - Single fixed power supply
 - Two modular power supplies
- **Power Consumption**
ODU with IDU: 10W max
ODU with IDU-E: 14W max
- **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
SERVICE (green/red) – E1/T1 signal 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: 305 mm (12.0 in)
Width: 305 mm (12.0 in)
Depth: 58 mm (2.3 in)
Weight 1.5 kg (3.3 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)

IDU-E:

Height: 44 mm (1.7 in)
Width: 430 mm (17.0 in)
Depth: 290 mm (11.4 in)
Weight: 1.5 kg (3.3 lb)

ANTENNA

- **Characteristics**
See *Table 2*

Table 2. Airmux-200 Antenna Options

	Type	Gain [dBi]	Typical Range		Beam [degrees]	Dimensions		Weight		Connector	Lightning Protection
			[km]	[miles]		[mm]	[in]	[kg]	[lb]		
5.8, 5.4, 5.3 GHz											
Integrated	Flat panel	22	40	25	9.0	305×305×58	12×12×2.3	0.5	1.1	NR	Yes
External	Flat panel	28	80	50	4.5	600×600×51	23.6×23.6×2	5.0	11.0	N-type	No
5.8 GHz											
External	Dish	32.5	80	50	4.5	Dia 900	Dia 35.4	10	22	N-type	No
4.9 GHz											
External	Flat panel	21	24	15	9.0	305×305×58	12×12×2.3	0.5	1.1	N-type	Yes
External	Dish	27	80	50	5	Dia 600	Dia 23.6	5.0	11.0	N-type	Yes
2.3, 2.4 GHz											
Integrated	Flat panel	17	40	25	20	305×305×58	12×12×2.3	0.5	1.1	NR	Yes
External	Grid	24	80	50	7.5	600×997×380	23.5×39.2×15	2.0	4.6	N-type	No

Note: The range of the system depends on the system configuration, for further information, please contact the RAD distributor nearest you or one of RAD's offices worldwide.



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ORDERING

Airmux-200/IDU/~~/UTP/*

Indoor unit

Airmux-200/IDUE/~~/~2UTP/*

Extended indoor unit with optional redundant power supply

Airmux-200/ODU/#/~/^

Outdoor unit

Airmux-200/#/~/^/~~/UTP*/KIT

A system comprising two indoor units and two outdoor units

Airmux-200E/#/~/^/~~/~2UTP*/KIT

A system comprising two extended indoor units and two outdoor units

Note: Kits are supplied without the cable.

~ Specify power supply type:

115 for 115 VAC power supply

230 for 230 VAC power supply

IDU-E only:

48 for -48 VDC power supply

24 for 24 VDC power supply

Notes: The Airmux-200 IDU-E may be ordered with two AC modular removable power supplies.

The power supply of the single power supply option is not removable.

For IDU operation via -48 VDC, order either AC version.

Specify the frequency band and regulation:

F23 for 2.300–2.400 GHz

F24E for 2.400–2.4835 GHz, ETSI

F24E-LG for low-gain F24E

F24F for 2.400–2.4835 GHz, FCC

F49F for 4.940–4.990 GHz, FCC

F53E for 5.250–5.350 GHz, ETSI

F53F for 5.250–5.350 GHz, FCC

F53HP for high-power F53

F54E for 5.470–5.725 GHz, ETSI

F54E-HG for high-gain F54E

F54E-LG for low-gain F54E

F54HP for high-power F54

F58 for 5.725–5.850 GHz

Note: F24E, F24E-LG, F49F, F54E-LG, and F54E-HG are available with external antenna only.

* Specify interface type:

IDU:

E1 for E1 interface

T1 for T1 interface

2E1 for two E1 interfaces

2T1 for two T1 interfaces

ETH for Ethernet interface only

IDU-E:

4E1 for four E1 interfaces

4T1 for four T1 interfaces

ETH for Ethernet interface only

^ Specify **EXT** for outdoor unit with dedicated connector for external antenna connection

Note: If EXT is not specified, Airmux-200/ODU is supplied with an integrated antenna.

OPTIONAL ACCESSORIES

CBL-Airmux-UTP/@

Assembled cable for permanent connection between indoor and outdoor units

@ Specify cable length:

25 for 25m (82 ft) cable

50 for 50m (164 ft) cable

75 for 75m (246 ft) cable

100 for 100m (328 ft) cable

Airmux-ANT/\$

External antenna supplied with 1m (3.3 ft) cable

\$ Specify external antenna type, where **grid** is a grid antenna, **fp** is a flat panel antenna, and **dish** is a dish antenna:

21/4.9/db/fp for 21 dBi, 4.9 GHz

22/5.3/db/fp for 22 dBi, 5.3 GHz

22/5.4/db/fp for 22 dBi, 5.4 GHz

22/5.8/db/fp for 22 dBi, 5.8 GHz

24/2.4/db/grid for 24 dBi, 2.4 GHz

27/4.9/db/dish for 27 dBi, 4.9 GHz

27/4.9/db/fp for 27 dBi, 4.9 GHz

28/5.3/db/fp for 28 dBi, 5.3 GHz

28/5.4/db/fp for 28 dBi, 5.4 GHz

28/5.8/db/fp for 28 dBi, 5.8 GHz

32/5.3/db/dish for 32.5 dBi, 5.3 GHz

32/5.4/db/dish for 32.5 dBi, 5.4 GHz

32/5.8/db/dish for 32.5 dBi, 5.8 GHz

RM-33

Hardware kit for mounting one IDU in a 19-inch rack

data communications

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