



Point-to-Point Wireless TDM/LAN Multiplexers



**DESCRIPTION**

- The AirMux family is a group of multiplexers combining TDM and Ethernet traffic over wireless links.
- AirMux family's unique capabilities make them ideal for many applications:
  - Building-to-building PBX and LAN connectivity
  - Cellular BTS to BSC backhauling
  - Connection to temporary locations, such as, construction sites, mining sites, or military camps
  - Last mile services.
- The AirMux multiplexers consist of an outdoor unit (ODU) and an indoor unit (IDU).
- Units are available with an integrated antenna for ranges up to 16 km (10 miles) or with an external antenna for ranges up to 40 km (25 miles).

**AIRMUX-104 AND AIRMUX-106**

- AirMux-104 operates at FCC 5.725–5.850 GHz with 12 software-selectable channels. These frequencies are license-exempt in North America and many other countries.
- AirMux-106 operates at ETSI 5.500–5.700 GHz with 11 software-selectable channels. These frequencies are license-exempt in many European countries.
- 5.725–5.850 GHz and 5.500–5.700 GHz bands provide uninterrupted and more reliable transmission in comparison with the legacy 2.4 GHz unlicensed band, resulting in higher QoS. Operation over these bands is not affected by harsh weather conditions, such as fog or heavy rain.

**FEATURES**

- Wireless point-to-point multiplexers operating over FCC or ETSI bands
- Configurable combination of E1 or T1 and Ethernet traffic
- 2.3 Mbps full duplex wireless link
- Three product versions available:
  - AirMux-104: 5.725–5.850 GHz, FCC license-exempt band
  - AirMux-106 5.500–5.700 GHz, ETSI license-exempt band
  - AirMux-108: 3.400–3.600 GHz
- Time Division Duplex (TDD) technology used in AirMux-104 and AirMux-106 enables simple installation and free channel selection
- AirMux-108 utilizes Frequency Division Duplexing (FDD) with 100 MHz spacing
- Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC) supported by AirMux-106
- Up to 40 km (25 miles) operation range available with external antenna
- Manageable via built-in graphical terminal utility or SNMP-based RADview network management system

# AirMux-104, AirMux-106, AirMux-108

## Point-to-Point Wireless TDM/LAN Multiplexers

- Unlicensed bands allow faster and more affordable deployment without frequency coordination and license fees.
- TDD technology enables data to be transmitted and received over a single channel. This considerably simplifies installation and free channel selection procedures.
- Dynamic Frequency Selection (DFS) mechanism employed by AirMux-106 enables coexistence with any radar system active in the area. AirMux-106 performs channel monitoring and automatically selects the channel with the lowest interference.
- The Transmit Power Control (TPC) function, provides the capability of defining the transmit power in order to comply with the ETSI standard requirement of 30 dB.

### AIRMUX-108

- AirMux-108 operates over ETSI 3.400–3.600 GHz frequency range split into three bands. Each band is split into 14 software-selectable operation channels.
- Narrow channel bandwidth of 3.5 MHz enables quality of service in areas with high level of wireless traffic.

### DIAGNOSTICS

- A powerful Forward Error Correction (FEC) mechanism is used to ensure integrity of transmission, providing higher quality of service with BER as low as 1E-10 in optimal conditions.

- To minimize system downtime, AirMux provides comprehensive diagnostic capabilities that include:
  - Traffic monitoring
  - Real-time alarms generation that alert users on faulty conditions
  - Internal and external loopbacks on the local and remote units.

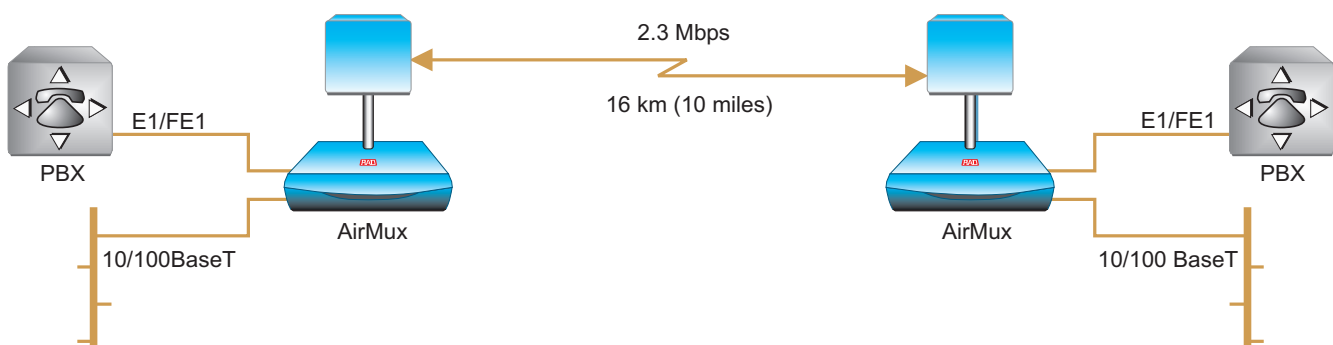
### MANAGEMENT

- AirMux Manager is a graphical terminal utility for single link management utilized for installing and configuring the link and aligning link antennas.
- SNMP based RADview fault management application is available for managing a network topology comprising of several links.

Table 1. AirMux Comparison Chart

	Multiplexor Technology	Frequency Range [GHz]	Transmitter Power [dBm]	No.of Channels	Special Features
<b>AirMux-104</b>	TDD	5.725–5.850	16.7	11	FCC license-exempt band
<b>AirMux-106</b>	TDD	5.500–5.700	+7 +2 –8	12	ETSI license-exempt band Radar monitoring and DFS Transmit power control
<b>AirMux-108</b>	FDD	3.400–3.600	16.7	14	3.5 MHz channels

## APPLICATION



# AirMux-104, AirMux-106, AirMux-108

## Point-to-Point Wireless TDM/LAN Multiplexers

### SPECIFICATIONS

#### WIRELESS LINK

- **Frequency Band**  
AirMux-104: 5.725–5.850 GHz  
AirMux-106: 5.500–5.700 GHz  
AirMux-108: 3.400–3.800 GHz
  - Band A: 3.400–3.450 GHz (low)  
3.500–3.550 GHz (high)
  - Band B: 3.425–3.475 GHz (low)  
3.525–3.575 GHz (high)
  - Band C: 3.450–3.500 GHz (low)  
3.550–3.600 GHz (high)
- **Regulatory Compliance**  
AirMux-104: FCC 47CFR Par15 Sub C and Sub B  
AirMux-106: ETSI EN 301 893  
AirMux-108: ETSI EN 301 216
- **Modem Data Rate**  
2.3 Mbps, full duplex
- **Duplexing Method**  
AirMux-104, AirMux-106: Time Division Duplex (TDD)  
AirMux-108: Frequency Division Duplex (FDD)
- **Channel Bandwidth**  
AirMux-104: 10 MHz (TDD)  
AirMux-106: 10 MHz (TDD)  
AirMux-108: 3.5 MHz (FDD)

- **Modulation**  
QPSK
- **Transmitter Power**  
AirMux-104: 16.7 dBm max  
AirMux-106: 10.0 dBm max  
AirMux-108: 16.7 dBm max
- **Receiver Sensitivity**  
-90 dBm at BER 1E-8
- **Antenna Specifications**  
See *Table 2*

#### LAN INTERFACE

- **Type**  
10/100BaseT, autonegotiation
- **Framing/Coding**  
IEEE 802.3/U
- **Bridging**  
Self-learning, up to 4000 MAC addresses
- **Traffic Handling**  
MAC layer bridging, self-learning
- **Line Impedance**  
100Ω
- **VLAN Support**  
Transparent
- **Data Rate**  
2.3 Mbps max, full duplex
- **Connector**  
RJ-45

#### E1 INTERFACE

- **Physical Interface**  
G.703
- **Framing**  
Unframed or G.704 (with or without CRC-4)
- **Data Rate**  
N × 64 kbps (N = 1, 2, ..., 32), user-selectable
- **Timing**  
Plesiochronous
- **Connector**  
RJ-45

#### T1 INTERFACE (AirMux-104 only)

- **Zero Suppression**  
AMI, B8ZS
- **Framing**  
SF, ESF
- **Data Rate**  
N × 64 kbps (N = 1, 2, ..., 24), user-selectable
- **Connector**  
RJ-45

Table 2. AirMux Antenna Options

	Type	Gain [dBi]	Range [km] [miles]	Beam [degrees]	Dimensions [mm]	Connector	Lightning Protection
<b>AirMux-104</b>							
Integrated	Flat panel	23	16 10	9	305×305×72	NR	Yes
External	Flat panel	28	40 25	4.5	600×600×51	N-type	Yes
<b>AirMux-106</b>							
Integrated	Flat panel	23	8 5	10.5	305×305×72	NR	Yes
External	Flat panel	28	16 10	4.5	600×600×51	N-type	Yes
<b>AirMux-108</b>							
Integrated	Flat panel	18	16 10	15 Azimuth 18 Elevation	305×305×72	NR	Yes
External	Dish	24.5	40 25	10	Diameter 600	N-type	Yes

# AirMux-104, AirMux-106, AirMux-108

## Point-to-Point Wireless TDM/LAN Multiplexers

### GENERAL

- **Indicators**  
SERVICE (green/red) – E1/T1 status  
AIR I/F (green/red) – Wireless link status  
IDU (green) – Indoor unit self-test  
ODU (green/red) – Indoor to outdoor unit link status  
PWR (green) – Power status
- **Upgrade Capabilities**  
Local and remote software download
- **Power**  
100–240 VAC using external AC/DC converter
- **Power Consumption**  
25W max (indoor and outdoor units)
- **Physical**  
Outdoor unit:  
Height: 305 mm / 12.0 in  
Width: 305 mm / 12.0 in  
Depth: 72 mm / 2.8 in  
Weight: 3.3 kg / 7.2 lb  
Indoor unit:  
Height: 44 mm / 1.7 in  
Width: 237 mm / 9.3 in  
Depth: 107 mm / 6.7 in  
Weight: 0.6 kg / 1.4 lb  
External antenna:  
Height: 600 mm / 23.6 in  
Width: 600 mm / 23.6 in  
Depth: 51 mm / 2.0 in  
Weight: 5 kg / 11.0 lb  
External dish antenna:  
Diameter: 600 mm / 23.6 in  
Weight: 5 kg / 11.0 lb
- **Environment**  
Outdoor unit and external antenna:  
Enclosure: all-weather case  
Temperature: -45–60°C/-49–140°F  
Indoor unit:  
Temperature: -5–45°C/23–113°F  
Humidity: Up to 90%, non-condensing

### ORDERING

- AirMux-104/ODU/\*/^**  
5.725–5.850 GHz point-to-point wireless TDM/LAN multiplexer, outdoor unit
- AirMux-106/ODU/E1/^**  
5.500–5.700 GHz point-to-point wireless TDM/LAN multiplexer, outdoor unit
- AirMux-108/ODU/E1/&**  
3.400–3.600 GHz point-to-point wireless TDM/IP multiplexer, outdoor unit
- AirMux/IDU/\***  
Point-to-point wireless TDM/LAN multiplexer, indoor unit
- \* Specify TDM interface:  
**E1** for E1 TDM interface  
**T1** for T1 TDM interface
- ^ Specify **EXT** for outdoor unit with a dedicated connector for external antenna connection
- & Specify AirMux-108 frequency band:
- Note: For a complete link two devices are required in the same specific band, e.g. for band A order Band A1 and Band A2.*
- Band A1:** Rx 3.400–3.450GHz, Tx 3.500–3.550 GHz
- Band A2:** Tx 3.400–3.450GHz, Rx 3.500–3.550 GHz
- Band B1:** Rx 3.425–3.475 GHz, Tx 3.525–3575 GHz
- Band B2:** Tx 3.425–3.475 GHz, Rx 3.525–3575 GHz
- Band C1:** Rx 3.450–3.500 GHz, Tx 3.550–3.600 GHz
- Band C2:** Tx 3.450–3.500 GHz, Rx 3.550–3.600 GHz

### CBL-AirMux/@

Cable for permanent connection between indoor and outdoor units

- @ Specify cable length:  
**25** for 25m (82 feet) cable  
**50** for 50m (164 feet) cable  
**75** for 75m (246 feet) cable  
**100** for 100m (328 feet) cable

### CBL-AirMux-Config

Cable for initial connection between indoor and outdoor units

*Note: The CBL-AirMux-Config cable is required only for initial indoor setup of the system. It is also recommended to include it into technician kits. The cable is 2m long.*

### Airmux-ANT/\$

External antenna

- \$ Specify external antenna type:  
**28DBI** for 28 dBi external flat panel antenna  
**24.5** for 24.5 dBi AirMux-108 external dish antenna

### Airmux-WM

Special hardware for mounting an outdoor unit on the wall

### RM-33

19" rack mounting hardware for mounting an indoor unit.



data communications

www.rad.com

- **International Headquarters**  
24 Raoul Wallenberg Street  
Tel Aviv 69719, Israel  
Tel: (972) 3-6458181  
Fax: (972) 3-6498250, 6474436  
Email: market@rad.com
- **U.S. Headquarters**  
900 Corporate Drive  
Mahwah, NJ 07430  
Tel: (201) 529-1100  
Toll free: 1-800-444-7234  
Fax: (201) 529-5777  
Email: market@radusa.com

193-101-10/04