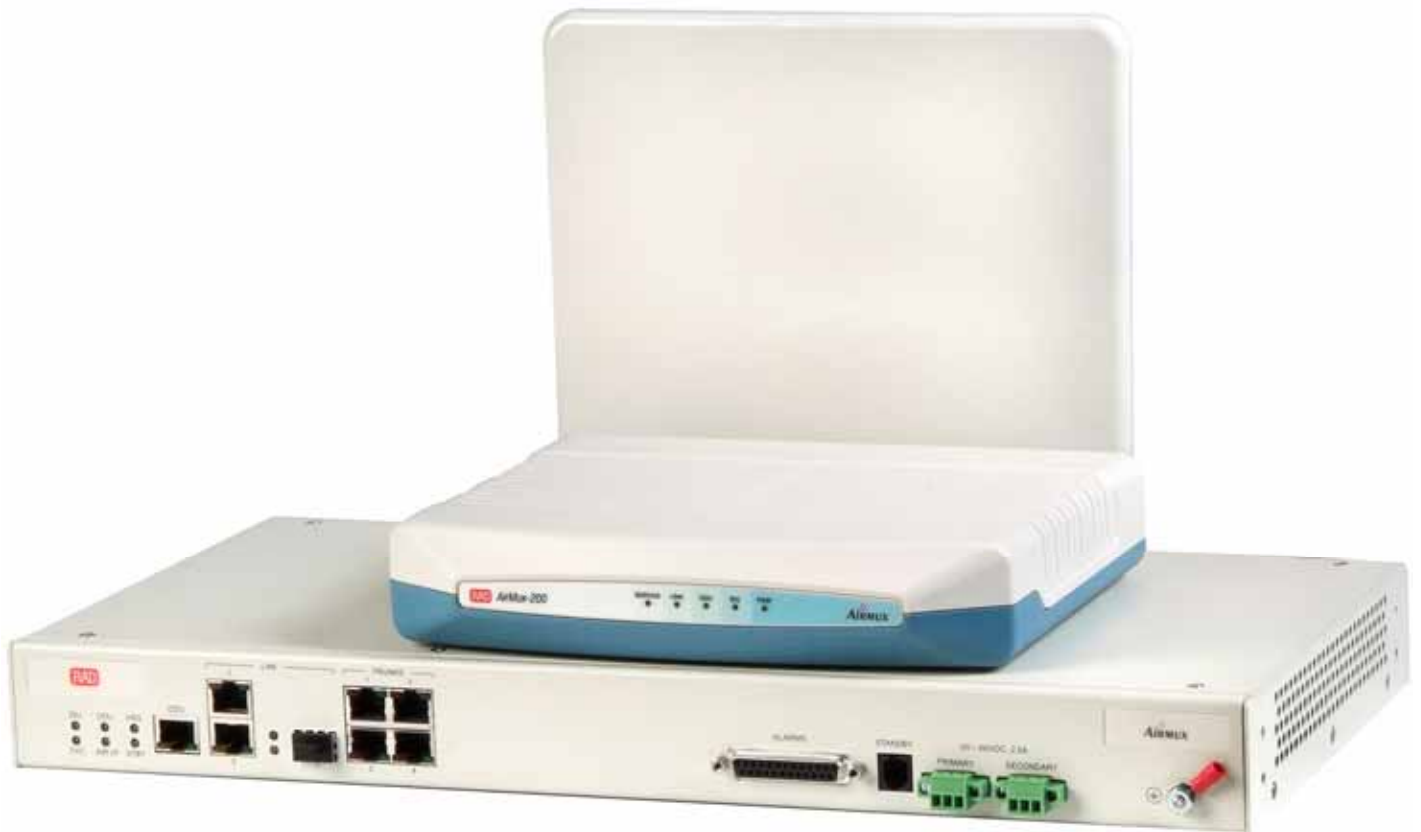


Airmux-200

Broadband Wireless Multiplexer



Carrier-class radio system for Ethernet and TDM traffic delivery over license-free frequencies

- Carrier-class cost-effective broadband wireless multiplexer with Layer-2 VLAN capabilities
- Net throughput of up to 18 Mbps full duplex
- Transmission range of up to 80 km (50 miles)
- 2.3 to 2.9 GHz and 4.9 to 6 GHz transmission bands
- High reliability and availability based on robust air interface protocol

Airmux-200 is a carrier-class, cost-effective multiple point-to-point broadband wireless transmission device. It combines legacy TDM and Ethernet services for transmission over 2.3 BRS to 2.9 GHz and 4.9 to 6.0 GHz bands, and is suitable for deployment in ETSI- and FCC-regulated countries.

For the global markets of cellular backhaul, WiMAX and ISP backhaul, broadband access, large private and government networks, Airmux-200 offers high throughput, longer range and robustness at a competitive price.



Airmux-200

Broadband Wireless Multiplexer

Fast and easy
deployments with
user-friendly
installation and
alignment tools

The Airmux product line is part of RAD's Access+ portfolio for Multiservice Access Platform and First Mile solutions. The portfolio combines extensive support for legacy services with future-proof Ethernet capabilities to address the challenges faced by utilities, transportation networks, carriers, and mobile operators in migrating to next-generation networks and services with flexibility, efficiency and carrier-class reliability.

MARKET SEGMENTS AND TYPICAL APPLICATIONS

Most common wireless applications are described below.

Service Providers and ISPs

Providing IP backhaul of 4G/broadband services in multiple point-to-point topologies, Airmux-200 offers broadband access for remote, rural and underserved communities:

nLOS (no line of sight) in urban environment

Long haul in rural setting (*Figure 2*).

Large corporate clients can build their networks to eliminate the recurring fee of incumbent leased line services while maintaining a secured dedicated capacity per site.

Private Networks

Airmux-200 can be used in high-capacity interbranch connectivity applications for university campuses, health care organizations, government institutions, large enterprises and public establishments with high traffic requirements.

Mobile Carriers

In rural-to-urban cellular backhaul applications, Airmux-200 extends mobile reach to rural locations with carrier-grade, long-haul point-to-point E1/T1 and Ethernet services. It also can be used for backhaul of 3G traffic in urban environment with easy migration path from converged TDM/IP networks to all-IP networks. Security and Surveillance

Aggregation and backhaul of traffic from multiple collocated megapixel video cameras, make Airmux-200 suitable for homeland security applications, municipal 'safe city' projects, border control installations.

AIRMUX-200 MODELS

In addition to Airmux-200, the following models are also available:

Airmux-200L – product kit consisting of an ODU with a PoE device. It supports Ethernet service only that enables improved position versus low-end competitors. Throughput is limited to 2 Mbps full-duplex with a maximum range of 20 km (12 miles).

While being intended for point-to-point applications, Airmux-200L can be used as a remote unit operating opposite collocated Airmux-200LC devices in multiple point-to-point installations.

Airmux-200LC – an Airmux-200L kit with hardware-ready collocation capabilities. It enables Airmux-200LC collocations at a central site using burst synchronization pulses to reduce mutual interference.

Airmux-200E, an outdoor unit for Ethernet traffic. It provides 6 Mbps full duplex and is upgradeable using a software license key to provide 18 Mbps. It supports 5, 10 and 20MHz channel bandwidth, including a PoE device.

Airmux-200VS –this version is suitable for video surveillance applications with asymmetric Ethernet throughput of 2/5 Mbps, at a distance of up to 20 km (12.4 miles).

ADDITIONAL AIRMUX PRODUCTS

IDU-R (Redundancy) – an IDU that provides E1/T1 backup for a leased line to maintain continuous operation of the link. Upon failure of the primary connection, IDU-R switches automatically to the backup link. The air interface can be defined as the primary or backup link. IDU-R operates with all ODUs.

ODU-HE (High End) – an enhanced ODU that features Hub Site Synchronization (HSS), transmits higher power for some frequencies and operates with IDU and PoE devices. ODU-HE can be ordered as a combo device, supporting multiple frequencies and regulations within a certain band range.

1+1 TDM LINK REDUNDANCY

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

POE-8 (Power over Ethernet) – an indoor unit that feeds up to eight ODUs from a single unit, instead of using eight separate POE devices. POE-8 uses AC as well as DC (-20 to -60 VDC) power.

OPoE (Outdoor Power over Ethernet) – a hardened product for outdoor installation.

PHYSICAL CONFIGURATIONS

Airmux multiplexers consist of a mast- or wall-mountable outdoor unit (ODU) and an indoor unit (IDU or IDU-E).

ODU-HE (high-end) operates with synchronized, collocated units and supplies a higher output power of up to 23 dBm.

Two AC power supply options are available for IDU-E: a single fixed power supply or two modular power supplies. All IDU products include wide-range DC (-20 to -60 VDC) and AC (by AC converter) power supplies.

SITE SYNCHRONIZATION

Hub Site Synchronization (HSS) assists in the collocation of multiple radios by reducing the interference that normally occurs when several radios transmit and receive in close proximity to one another. HSS enables a complex radio environment of mixed services (TDM and Ethernet) and channel bandwidth frequencies. The collocation feature requires ordering the HSS unit as well as its synchronization cables.

Note: Like any other RF deployment, the wireless operation is highly dependent on factors such as available frequencies, the physical space between radios, other interfering radios, and whether Airmux 200 or Airmux-400 units are used.

HSS does not eliminate the need for careful RF planning to ensure the design will work as planned.

For long distance coverage, the synchronization can be obtained, using a GPS Synchronization Unit (GSU). The GSU reduces the interference between the collocated radios by providing a GPS signal simultaneously to ODUs at all locations.

SECURITY

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

Guaranteed
bandwidth with
dedicated channels
and service level
agreement per
subscriber

Airmux-200

Broadband Wireless Multiplexer

RESILIENT ETHERNET RING

Ethernet rings are used to protect data against link and node failures.

ADAPTIVE MODULATION

Airmux-200 adaptively changes the modulation according to air conditions, targeting maximum rate while maintaining link stability. The rate drops temporarily after encountering interference, then automatically returns to the highest possible rate.

AIRLINK QUALITY OF SERVICE

When the link quality is out of limits, Airmux-200 automatically searches for a clear channel within a pre-selected list of frequencies.

5-, 10- AND 20-MHZ CHANNEL BANDWIDTH

Airmux-200 offers channel bandwidth at 5-, 10- and 20 MHz. The narrow channel bandwidth improves immunity to disturbances and enables deployment in high-interference environments, with enhanced channel allocation flexibility and improved sensitivity while the wide channel bandwidth allows transmission of high capacity services.

SHORT TIME-TO-SERVICE

Because Airmux-200 operates in license-exempt frequencies, it can be deployed in record time, eliminating the costs and delays involved in leasing lines or trenching fiber.

MANAGEMENT

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

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.

External events trigger alarms via the dry-contact alarm inputs.

New software releases can be downloaded simultaneously to several locations without affecting the service. The software can be activated later, when service disruption can be best tolerated.

Specifications

RADIO

Frequency Bands (GHz)

6.0 (5.805–6.020)
5.9 (5.740–5.940)
5.8 (5.740–5.835)
5.4 (5.500–5.700)
5.3 (5.260–5.330)
4.9 (4.950–4.980)
2.4 (2.412–2.462)
2.3 (2.312–2.387)
2.3 BRS (2.500–2.690 BRS)

Data Rate

Up to 18 Mbps, full duplex

Channel Bandwidth

5, 10, 20 MHz (depending on a model)

Duplex Technique

TDD

Modulation

OFDM - BPSK, QPSK, 16 QAM, 64 QAM

Transmit Power

See *Table 1*

RF Dynamic Range

More than 50 dB

Combo Model Frequencies

| Default Band [GHz] | Supported Bands [GHz] |
|--------------------|---|
| 5.4HP | 5.4 Universal, 5.8 FCC, 5.8 India WPC, 5.3 universal (HP), 5.9 universal (HP) |
| 5.4 FCC | 5.3 FCC, 5.3 universal HP, 5.4 FCC, 5.4 universal HP |
| 5.4 IC | 5.3 FCC, 5.4 IC, 5.3 universal HP, 5.4 universal HP |
| 5.8 IDA | 5.8 WPC |
| 5.8 FCC | 5.3 universal HP, 5.4 universal HP, 5.8 FCC, 5.8 WPC, 5.9 universal HP |

LAN INTERFACE

Number of Ports

IDU: 1, 2
IDU-E: 3 (2 copper, 1 SFP)

Type

10/100BaseT, autonegotiation

Framing/Coding

IEEE 802.3u

Bridging

Up to 2048 MAC addresses self-learning

Maximum Frame Size

2047 bytes

Traffic Handling

MAC layer bridging, self-learning

Latency

3 msec (typical)

Line Impedance

100Ω

VLAN Support

802.1p & Q

Connector

RJ-45

E1/T1 INTERFACE

Number of Ports

IDU: 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

Jitter and Wander

As per G.823, G.824

Connector

RJ-45

MANAGEMENT

Network Management Protocols

SNMP-based, Telnet

Management Interface

10/100BaseT

Connector

RJ-45

Upgrade Capabilities

Local and over-the-air software download

INTEGRATED 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: -48, 24 VDC

AC: 100–240 VAC

Power Consumption

ODU with IDU: 10W max

ODU with IDU-E: 14W max

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.

Indicators

IDU (green/orange/red): IDU status

ODU (green/red): ODU status

AIR I/F (green/orange/red): Air link status

SVC (green/orange/red): TDM service status

HSS (green/orange/red): HSS status

STBY (green/orange/red): MHS status

LINK (yellow): Ethernet link status

ACT (green): Ethernet activity 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)

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] |
| 5.740–5.940 | 47CFR Part 15 Subpart C, RSS-210 | 16/23 | N/A | N/A |
| 5.500–5.700 | N/A | N/A | EN 300 216 V1.2.1, EN 301 893 V1.4.1 | 8 EIRP ≤ 30 |
| 5.260–5.330 | 47CFR Part 15 Subpart E, RSS-210 | 8 | N/A | N/A |
| 4.950–4.980 | 47CFR Part 15 Subpart B | 25 (FCC) | N/A | N/A |
| 2.500–2.690 | 47CFR Part 15 Subpart B | 22 | EN 300 386 V1.3.2 EN 301 489-4 V1.3.1 EN 301 489-1 V1.4.1 | 23 |
| 2.412–2.462 | 47CFR Part 15 Subpart C, RSS-210 | 27 (for FCC) | N/A | N/A |
| 2.412–2.472 | N/A | N/A | EN 300 328 | -4 EIRP ≤ 20 |

Airmux-200

Broadband Wireless Multiplexer

Ordering

OUTDOOR UNIT

Airmux-200/ODU/#/!

Outdoor unit with integrated or external antenna. The unit can be ordered with IDU or IDU-E devices.

Legend

Frequency band and regulation:

- F23HP** 2.3 GHz, high power
- F24HP** 2.4 GHz, high power
- F24E-LG** 2.4 GHz, ETSI, low gain
- F24F** 2.4 GHz, FCC
- F53E** 5.3 GHz, ETSI
- F53HP** 5.3 GHz, high power
- F54E** 5.4 GHz, ETSI
- F54E-HG** 5.4 GHz, ETSI, high gain
- F54E-LG** 5.4 GHz, ETSI, low gain
- F54IC** 5.4 GHz, Canada
- F54HP** 5.4 GHz, high-power
- F58F** 5.8 GHz, FCC
- F58E** 5.8 GHz, ETSI

Note: F23HP, F24HP, F24E-LG, F53E, F54E-HG and F54E-LG are available with external antenna only.

Airmux-200/ODU-HE/\$/@/!

High-end outdoor unit with integrated or external antenna. The unit can be ordered with IDU, IDU-E or PoE devices.

Legend

Note: A multiple point-to-point application supports multiple collocated radio links at a central site. This site is based on high-end ODUs (ODU-HE) and on synchronization hub(s) (HSSU). When running a multiple point-to-point site, the customer must order the appropriate ODU-HEs, HSSUs, and cables.

\$ Frequency band and regulation:

- F24F** 2.4 GHz, FCC
- F24HP** 2.4 GHz, high power
- F25BRS** 2.5 GHz, FCC (BRS)
- F27HP** 2.7 GHz, high power
- F49F** 4.9 GHz, FCC
- F54E** 5.4 GHz, ETSI

- F54E-LG** 5.4 GHz, ETSI, low-gain
- F54F** 5.4 GHz, FCC
- F54HP** 5.4 GHz, high power
- F54IC** 5.4 GHz, Canada
- F58F** 5.8 GHz, FCC
- F58E** 5.8 GHz, ETSI
- F58IDA** 5.8 GHz, WPC India
- F58UK** 5.8GHz, UK
- F59HP** 5.9 GHz, high power
- F60HP** 5.805–6.020 GHz, high power

Notes:

F27HP, F54E-LG, F54IC, F58UK are available with external antenna only.

F54E and F54HP are available with integrated antenna only.

@ Special model with multiple frequency support (Default=regular high-end ODU):

CMB

Notes:

F54HP, F54IC, F58F, F58IDA are available with regular ODU-HE and combo tool.

F54F is available with combo tool only.

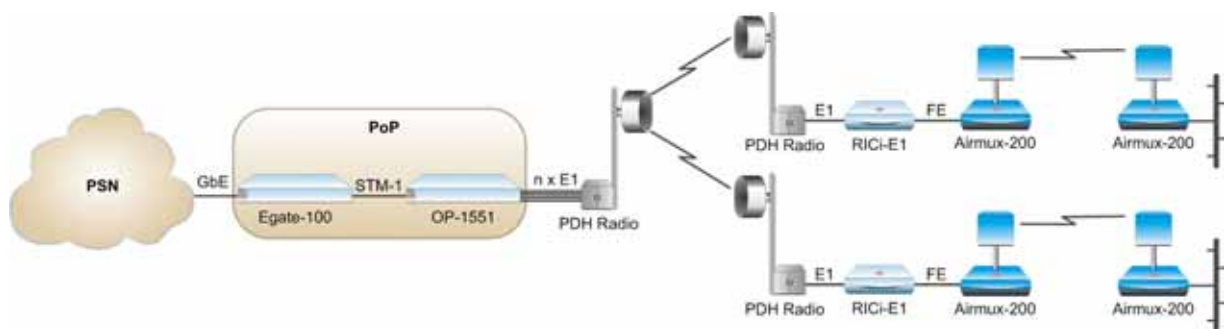


Figure 1. Extending the Reach of Ethernet-Based Services to Rural Locations over PDH Infrastructure

INDOOR UNIT FOR TDM AND ETHERNET SERVICES

Airmux-IDU/%

DC-powered indoor unit

Legend

- % IDU interface:
- 2TDM** 2 TDM (E1/T1) interfaces,
2 ETH interfaces, alarm port
 - 2ETH** 2 ETH interfaces

Notes:

VLANs and resilient ring topology are supported by both IDU/2TDM and IDU/2ETH models.

For AC power feeding, order external power adapter (Airmux-PS-E-AC/a). See *Optional Accessories* below.

Notes: The unit is supplied with AC-to-DC adapter.

Airmux-200/IDU-R/~/*

Indoor unit with TDM bypass

Legend

- ~ AC power adapter assembly with matching AC plug:

- ACEU** Europe
- ACUS** US
- ACUK** UK
- ACIDA** India
- ACAU** Australia
- ACOC** Open-ended connector
- ACAR** Argentina
- ACSA** South Africa

Note: Airmux-PS-AC adapter can be ordered separately. See *Optional Accessories*.

- * IDU interface:
- E1** E1 interface
 - T1** T1 interface
 - 2E1** 2 x E1 interfaces
 - 2T1** 2 x T1 interfaces
 - ETH** Ethernet interface only

Note: IDU-R model supports single E1 or T1 interface only.

Advanced
synchronization for
simultaneous
transmission from up
to 16 remote units

Airmux-200

Broadband Wireless Multiplexer

Table 2. Supported Channel Bandwidths

| Device | Frequency [GHz] | Antenna | Channel Bandwidth [MHz] |
|------------------------|----------------------|--|-------------------------|
| Airmux-200/ODU | 2.3, high power | External | 5, 10, 20 |
| | 2.4, high power | External | 5, 10, 20 |
| | 2.4, ETSI, low gain | External | 5, 10, 20 |
| | 2.4, FCC | External, integrated | 5, 10, 20 |
| | 5.3, ETSI | External | 5, 10, 20 |
| | 5.3, high power | External, integrated | 5, 10, 20 |
| | 5.4, ETSI | External, integrated | 20 |
| | 5.4, ETSI, high gain | External | 20 |
| | 5.4, ETSI, low gain | External | 20 |
| | 5.4, Canada | External, integrated | 20 |
| | 5.4, high power | External, integrated | 5, 10, 20 |
| | 5.8, FCC | External, integrated | 5, 10, 20 |
| | 5.8, ETSI | External, integrated | 20 |
| Airmux-200/ODU-HE | 2.4, FCC | External, integrated | 5, 10, 20 |
| | 2.4, high power | External, integrated | 5, 10, 20 |
| | 2.5, FCC (BRS) | External, integrated | 5, 10, 20 |
| | 2.7, high power | External | 5, 10, 20 |
| | 4.9, FCC | External, integrated | 10, 20 |
| | 5.4, ETSI | Integrated | 10, 20 |
| | 5.4, ETSI, low gain | External | 20 |
| | 5.4, FCC | External, integrated (with combo model only) | 5, 10, 20 |
| | 5.4, high power | External, integrated | 5, 10, 20 |
| | 5.4, Canada | External, integrated (with combo model) | 5, 10, 20 |
| | | External, integrated (without combo model) | 20 |
| | 5.8, FCC | External, integrated (with combo model) | 5, 10, 20 |
| | 5.8, ETSI | External, integrated | 20 |
| | 5.8, WPC India | External, integrated (with combo model) | 5, 10, 20 |
| | 5.9, high power | External, integrated | 5, 10, 20 |
| 6.0, high power | External, integrated | 20 | |
| Airmux-200VS | 2.4, FCC | External, integrated | 5, 10, 20 |
| | 5.4, ETSI | External, integrated | 5, 10, 20 |
| | 5.8, FCC | External, integrated | 5, 10, 20 |
| Airmux-200L/LC | 2.4, FCC | External, integrated | 5, 10, 20 |
| | 2.4, high power | External | 5, 10, 20 |
| | 5.8, FCC | External, integrated | 5, 10, 20 |
| Airmux-200/.../.../POE | 2.4, ETSI, low gain | External | 5, 10, 20 |
| | 2.4, FCC | External, integrated | 5, 10, 20 |
| | 2.4, high power | External, integrated | 5, 10, 20 |
| | 5.3, ETSI | External | 5, 10, 20 |
| | 5.3, high power | External, integrated | 5, 10, 20 |
| | 5.4, ETSI | Integrated | 20 |
| | 5.4, ETSI, high gain | External | 20 |
| | 5.4, ETSI, low gain | External | 20 |
| | 5.4, high power | External, integrated | 5, 10, 20 |
| 5.8, FCC | External, integrated | 5, 10, 20 | |

Airmux-400/IDUE/4TDM

Extended indoor unit with redundant wide range DC power supply (-20 to -60 VDC), 4 TDM ports, 2 FE ports, multiple clocks

Note: For AC power connection, order PS-E-AC adapter. See *Optional Accessories*.

PoE UNIT FOR ETHERNET SERVICES**Airmux-POE/a**

Power over Ethernet (PoE) device

Airmux-200/POE-DC/>

Power over Ethernet (PoE) device with DC plug

Airmux-200/POE-8/a

Indoor device with AC and DC power supply feeding 8 ODUs via PoE ports

Airmux-200/OPOE

Outdoor PoE device with AC power supply

Legend

a Power cable with matching plug:

| | |
|--------------|----------------------|
| ACEU | Europe |
| ACUS | US |
| ACUK | UK |
| ACIDA | India |
| ACAU | Australia/China |
| ACOC | Open-ended connector |
| ACAR | Argentina |
| ACSA | South Africa |
| DC | -20 to -60 VDC |

> Power supply:

| | |
|-----------|----------------------|
| 48 | -48 VDC power supply |
| 24 | 24 VDC power supply |

Airmux-OPOE/DC

Outdoor PoE device with wide-range DC power supply (-20 to -60 VDC)

PRODUCT BUNDLES

Product kits consisting of ODU and PoE devices

Airmux-200L/?/?/!/a

Outdoor unit with low-rate Ethernet traffic and PoE device

Table 3. Integrated Antenna Options

| Antenna Type | Frequency [GHz] | Gain [dBi] | Beam [degrees] | Dimensions | | Weight | | Connector |
|--------------|--------------------|---------------|-------------------|------------|-------------|--------|------|-----------|
| | | | | [mm] | [ft] | [kg] | [lb] | |
| Flat panel | 2.3–2.7 | 17.5 | 20 | 304×304×58 | 1.0×1.0×2.2 | 2.5 | 5.5 | N-type |
| Flat panel | 2.4–2.7 | 16 | 25 | 304×304×58 | 1.0×1.0×2.2 | 2.5 | 5.5 | N-type |
| Flat panel | 4.94–6.0 | 18.5, 22 | 10 | 304×304×58 | 1.0×1.0×2.2 | 2.5 | 5.5 | N-type |

Airmux-200

Broadband Wireless Multiplexer

Airmux-200LC/?/%/!/a

Collocated outdoor unit with low-rate Ethernet traffic and PoE device

Legend

? Net Ethernet throughput:
2 2 Mbps

% Frequency band and regulation:
F24F 2.4 GHz, FCC
F24HP 2.4 GHz, high power
F58F 5.8 GHz FCC

! Antenna:
INT Integrated
EXT External

a AC cable with matching plug:

ACEU Europe
ACUS US
ACUK UK
ACIDA India
ACAU Australia/China
ACOC Open-ended connector
ACAR Argentina
ACSA South Africa
DC -20 to -60 VDC

Note: 2.4 GHz HP frequency is supported by units with external antenna only.

Airmux-200E/6M/*/\$

Outdoor unit for Ethernet traffic that provides 6 Mbps full duplex with PoE device

Legend

* Frequency band and regulation:
F24F 2.4 GHz, FCC
F54E 5.4 GHz, ETSI
F54HP 5.4 GHz, high power
F58F 5.8 GHz, FCC

\$ External antenna (optional)

Airmux-200E-LIC-ETH/#

Software license key

Legend

License key:
6M22M 6Mbps to 22Mbps
6M18M 6Mbps to 18Mbps

Airmux-200"/a!/POE

Outdoor unit with PoE device

Legend

" Frequency band and regulation:
F24E-LG 2.4 GHz, ETSI, low-gain
F24F 2.4 GHz, FCC
F24HP 2.4 GHz, high power
F53E 5.3 GHz, ETSI
F53HP 5.3 GHz, high power
F54E 5.4 GHz, ETSI
F54E-HG 5.4 GHz, high gain
F54E-LG 5.9 GHz, low gain
F54HP 5.4 GHz, high power
F58F 5.8 GHz, FCC

Notes:

F24E-LG, F53E, F54E-LG and F54E-HG are available with external antenna only.

F54E is available with integrated antenna only.

a Power cable with matching plug:

ACEU Europe
ACUS US
ACUK UK
ACIDA India
ACAU Australia/China
ACOC Open-ended connector
ACAR Argentina
ACSA South Africa
DC -20 to -60 VDC

! Antenna:
INT Integrated
EXT External

OPTIONAL ACCESSORIES

Airmux-ANT/\$

External antenna supplied with 1m (3.3 ft) cable

Legend

\$ External antenna, where **grid** is a grid antenna, **fp** is a flat panel antenna, and **dish** is a dish antenna:

- F27-17/fp** 17dBi, 2.7-2.9 GHz, 2.7 GHz band
- F2X-24/grid** 24 dBi, 2.3–2.9 GHz, 2.3, 2.4, 2.5, 2.7 GHz bands
- F5X-18/fp** 18 dBi, 5.15–5.875 GHz, 5.3, 5.4, 5.8 GHz bands
- F4.9-21/fp** 21 dBi, 4.90–5.35GHz, 4.9 GHz band
- F5.X-22/fp** 22 dBi, 5.15–6.02GHz, 5.3, 5.4, 5.8, 5.9, 6.0 GHz bands
- F2.4-24/grid** 24 dBi, 2.3–2.5 GHz, 2.3, 2.4 GHz bands

F2.5-24/grid 24 dBi, 2.5–2.7 GHz, 2.5 GHz band

F4.9-27/dish 27 dBi, 4.9–5.1 GHz, 4.9 GHz band

F5.X-28/fp 28 dBi, 5.15–6.02 GHz, 5.3, 5.4, 5.8, 5.9, 6.0 GHz bands

F5.8-29/dish 29 dBi, 5.72–5.85 GHz, 5.8 GHz band

F5.3-32/dish 32 dBi, 5.25–5.35 GHz, 5.3 GHz band

F5.4-32/dish 32dBi, 5.470–5.725 GHz, 5.4 GHz band

F5.8-32/dish 32.5 dBi, 5.725–5.850 GHz, 5.8 GHz band

Note: For detailed description of external antennas, see *Airmux-200 External Antennas data sheet* at www.rad.com.

Airmux-HSSU

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

Airmux-GSU/a

Outdoor GPS-based synchronization kit (GSU, GPS antenna, 1.5m (4.9 ft) RF cable, CBL-Airmux-HSS/5 cable, PoE unit, and mounting kits for GSU and GPS antenna)

Legend

- a** Power cable with matching plug:
 - ACEU** Europe
 - ACUS** US
 - ACUK** UK
 - ACIDA** India
 - ACAU** Australia/China
 - ACOC** Open-ended connector
 - AR** Argentina
 - DC** -20 to -60 VDC

CBL-Airmux-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

Table 2. ODU/IDU Interoperability

| | | Airmux-200/ODU | Airmux-200/ODU-HE | Airmux-200/.../.../POE | Airmux-200L/LC | Airmux-200VS |
|-------|----------|----------------|-------------------|------------------------|----------------|--------------|
| IDU | IDU/2TDM | ✓ | ✓ | ✓ | x | x |
| | IDU/2ETH | ✓ | ✓ | ✓ | x | ✓ |
| IDU-E | | ✓ | ✓ | ✓ | x | x |
| PoE | | x | ✓ | ✓ | ✓ | ✓ |

Airmux-200

Broadband Wireless Multiplexer

CBL-Airmux-UTP/@

Assembled cable for permanent connection between indoor and outdoor units

Legend

- @ Cable length:
- 25** 25m (82 ft) cable
 - 50** 50m (164 ft) cable
 - 75** 75m (246 ft) cable
 - 100** 100m (328 ft) cable

Airmux-PS-AC/a

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

Airmux-PS-E-AC/a

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

Legend

- a AC plug:
- ACEU** Europe
 - ACUS** US
 - ACUK** UK
 - ACIDA** India
 - ACAU** Australia/China
 - ACOC** Open-ended connector
 - AR** Argentina

MHS-kit

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




Airmux-Lighting-Protection

External lightning and surge protection kit, including outdoor lighting protection unit and 2m (6.5 ft) IDU-ODU cable

RM-33

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

Table 2. Airmux Family Comparison Table

| | |  Airmux-200 (Ver. 1.9.5) |  Airmux-400 (Ver. 2.6) |  Airmux-5000 (Ver. 3.2) |
|----------------------------|--|--|---|---|
| Topology | Point-to-point + multiple point-to-point | Airmux-200 Airmux-200L/LC Airmux-200E | Airmux-400L Airmux-400 | - |
| | Point-to-multipoint | - | - | ✓ |
| Bandwidth [Mbps] | Airmux-200: 18 | Airmux-200L/LC: 2 Airmux-200E: 6 (can be upgraded to 18/22Mbps by using a license key) | Airmux-400L/50 (Ethernet + TDM) | 200 |
| | Airmux-200E: 6 | | Airmux-400/200 (Ethernet + TDM) | |
| Services | Airmux-200: 2 Ethernet + 1, 2, 4 E1/T1 | Airmux-200L/LC: 1 Ethernet | Airmux-400: Up to 3 Ethernet + up to 16 E1/T1 | 1 Ethernet port via PoE |
| | Airmux-200E: 6 | | Airmux-400L: Up to 3 Ethernet + up to 8 E1/T1 | |
| HSS | | ✓ | ✓ | ✓ |

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Order this publication by Catalog No. 803516



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