

RAD Airmux-5000 Solution Guide



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Product Overview:

Airmux-5000

Point-to-Multipoint Ethernet Radio

RAD's Airmux-5000 carrier-class point-to-multipoint Ethernet radio system is the ideal wireless solution for business access users demanding high-capacity throughput with guaranteed bandwidth and Service level Agreement (SLA) per subscriber. Featuring up to 100 Mbps (symmetrical) full duplex sector capacity and shared base station architecture, a single Airmux-5000 base station supports up to 16 remote Subscriber Units (SUs) with multiband operation over 4.9 to 5.8 GHz frequencies.

The Airmux-5000 delivers optimal radio performance with advanced OFDM and MIMO, enhanced interference mitigation, inter- and intra-site synchronization, dedicated traffic bandwidth allocation, and low latency, making it ideal for:

Service providers and ISPs, offering IP backhaul and 4G/broadband access for remote, rural and underserved communities

Private networks, requiring high-capacity inter-branch connectivity for university campuses, health care organizations, government institutions, large enterprises and public establishments

Security and surveillance applications, requiring aggregation and backhaul of traffic from multiple co-located HD cameras

Utilities – Scada backhaul, auto meter reading, smart grid.

Public Safety – 2-Way backhaul, Traffic Control

Federal – Airport Sensors, Forestry and border surveillance.

- Sell Points -

- Lowest cost Mbps / Highest Price-Performance
- Fast and easy deployments with user-friendly installation and alignment tools
- Guaranteed bandwidth with dedicated channels and Service level Agreement per subscriber
- OFDM/MIMO ensure high spectral efficiency and robust performance, even in nLOS/NLOS (no line of sight/near line of sight) installations, strong RF interference, or harsh ambient conditions
- Advanced synchronization features support simultaneous transmission from up to 16 remote units
- Supports 128-Bit AES Encryption
- Shared Base Station architecture delivers low-cost per subscriber
- Point-to-Point performance in a Point-to-Multipoint Ethernet radio
- Includes RADcare Level 2 Maintenance Services featuring 24/7 phone support.

Airmux-5000 – Product Features

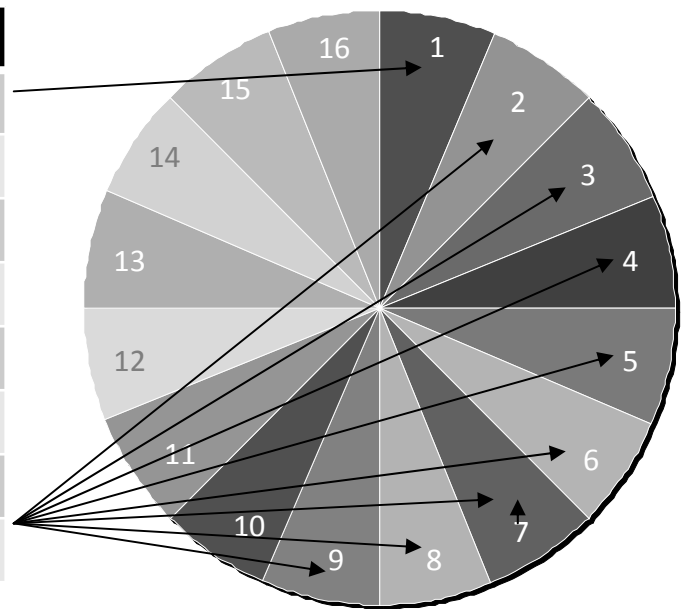
<p>Service</p>	<ul style="list-style-type: none"> • Configurable Maximum Information Rate (MIR) per SU • Enhanced QoS – 4 level queue per SU • Networking features – VLAN, QinQ per SU • Long Range – 25 miles / 40km @ 20 Mbps
<p>Radio Performance</p>	<ul style="list-style-type: none"> • Advanced OFDM & MIMO 2x2 / Diversity for nLOS performance • Time Division Dulexing Radio (TDD) • Enhanced interference mitigation capability • Inter & intra site sync. to reduce self interference • Dedicated traffic bandwidth allocation ensuring SLA & latency • Low latency, typical 4 to 10 msec • Channel BW – 10, 20, 40 MHz • Includes False Radar Monitoring Systems for 5.4GHz DFS Challenges.
<p>Operational</p>	<ul style="list-style-type: none"> • Multi-band Base Stations and Subscriber Units • Simple to deploy • Includes integrated spectrum analyzer feature. • Fully integrated with Airmux – Legacy solutions: <ul style="list-style-type: none"> • Coexists with Airmux-200 / Airmux-400 • Single NMS - RADview platform

Airmux-5000 Time Slots

Time Slots (TS)

- HBS (Base Station) Aggregated capacity is 100Mbps @ 20MHz Channel Bandwidth or 200Mbps @ 40MHz Channel Bandwidth
- At 20MHz Channel Bandwidth:
 - ✓ Every TS provides up to **6.4Mbps** BW (aggregate)
 - ✓ 8 TS will provide **51.2Mbps** (Aggregate)

Number of TS per HSU	Aggregate Capacity
1	6.4Mbps
2	12.8Mbps
3	19.2Mbps
4	25.6Mbps
5	32Mbps
6	38.4Mbps
7	44.8Mbps
8	51.2Mbps



Airmux-5000 - Base Station

- Multi-band 4.9, 5.3, 5.4, 5.8GHz
- 200Mbps Aggregate Throughput
 - 100Mbps (20MHz)
 - 200Mbps (40MHz)
- Supports up to 16 SU's Per Sector
- Guaranteed SLA & Capacity per Sector
- Small form factor ODU
- Low Power consumption
- High TX power for long range (25dBm)

Single sector base station

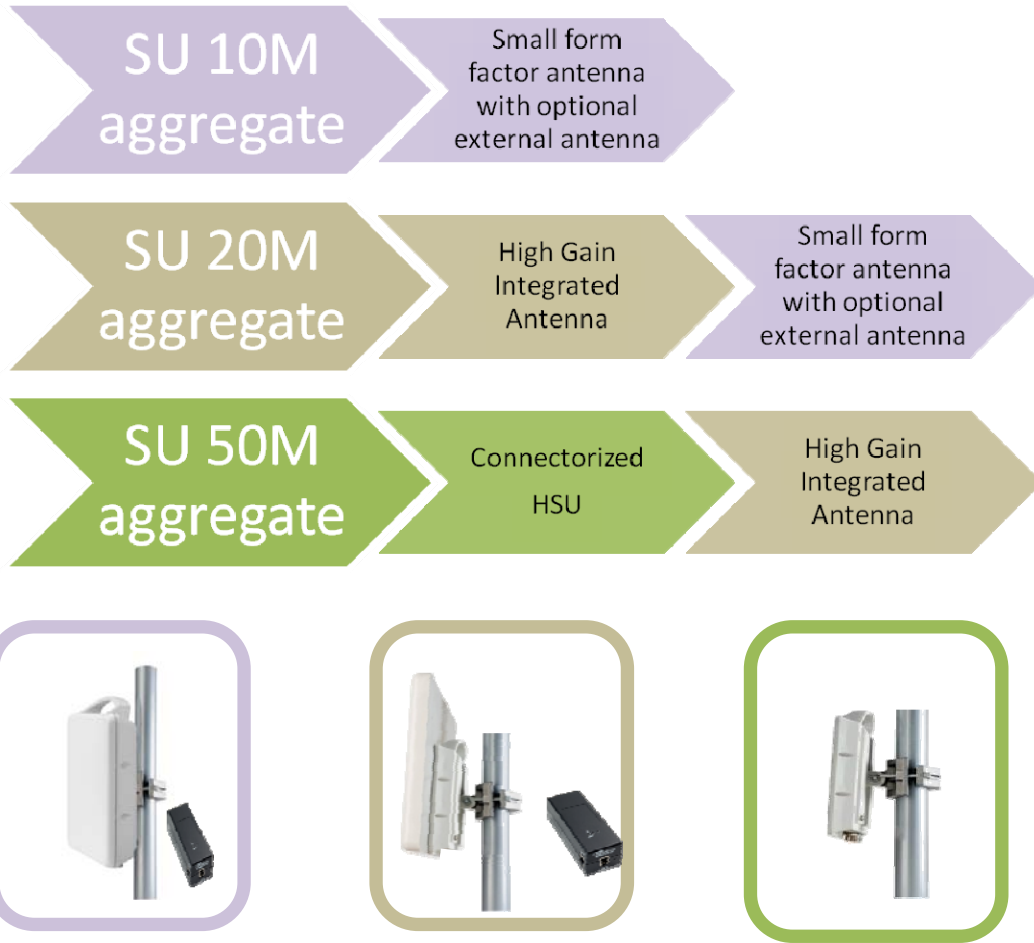


**Base Station Radio Connected for external antenna (2x N-type).
Supports MIMO / Diversity.**

Manufacture Part Number: Airmux-5000/BS/F58F/200M/EXT

TESSCO SKU: 378003

Airmux-5000 – Subscriber Units



TESSCO Part Number	Manufacture Part Number	Description
338577	AIRMUX-5000/SU/F58F/10M/EMB	10Mbps Subscriber Unit (Embedded + Connector)
318231	AIRMUX-5000/SU/F58F/20M/INT	20Mbps Subscriber Unit (Integrated)
378398	AIRMUX-5000/SU/F58F/20M/EMB	20Mbps Subscriber Unit (Embedded + Connector)
328485	AIRMUX-5000/SU/F58F/50/EXT	50Mbps Subscriber Unit (Connectorized)
378948	AIRMUX-5000/SU/F58F/50/INT	50Mbps Subscriber Unit (Integrated)

Airmux-5000 HPMP – 2011 Roadmap

Airmux-5000: Release 3.2 is now GA

Release 3.1 GA - May

- Sector Capacity: 100Mbps aggregated, symmetric
- SUs: 50Mbps, 20Mbps, 10Mbps
- MiMO
- Frequency: 4.9 to 6 GHz (FCC/ETSI)
- Up to 16 users per sector
- Channel BW: 20MHz
- Adaptive Modulation
- Intra/Inter site TDD Sync (HSS & GPS)
- DFS for FCC & ETSI
- RNMS & Airmux- Manager
- LBC

Release 3.15 LA - June

- VLAN – layer 2 VPN
- Spectrum viewer
- Diversity
- Radio Planner

Release 3.2 GA – September

Software

- Sector capacity: 200Mbps aggregate
- Channel BW: 10/20/40 MHz
- GbE interface
- Asymmetric
- QoS (4 Q)

New Hardware

- New frequency – 3.3 – 3.8 Ghz



Indoor Power Over Ethernet Injector - Supports both Base Station and Subscriber Units.

Power Over Ethernet Injectors (PoE)		
TESSCO Link SKU	Model Number	Description
353767	AIRMUX-400/POE/ACUS	Power Over Ethernet (PoE) Injector with AC Plug.

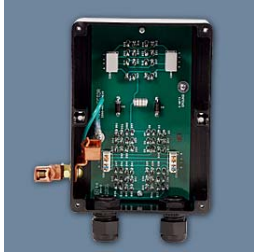


Ethernet Interface (HBS): 10/100/1000BaseT

Ethernet Interface (HSU): 10/100BaseT

CAT5E Bundled Cable Kits		
TESSCO Link SKU	Model Number	Description
361296	AIRMUX-CBL-UTP/25	25 Meter CAT5E Cable
361616	AIRMUX-CBL-UTP/50	50 Meter CAT5E Cable
361593	AIRMUX-CBL-UTP/75	75 Meter CAT5E Cable

331350	AIRMUX-CBL-UTP/100	100 Meter CAT5E Cable
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SKU: 312396



SKU: 338540



SKU: 351887

Lightning Arrestor (Base Station): 10/100/1000BaseT

Lightning Arrestor (Subscriber Unit): 10/100BaseT

Lightning Arrestors		
TESSCO Link SKU	Model Number	Description
312396	ALPU-1000BTR	Base Station Modular Lightning Arrestor.
338540	1101-1030	Base Station Inline Lightning Arrestor
326641	1000-1164	Base Station Lightning Arrestor Tower Mounting Bracket
351887	ALPU-POE-60	Subscriber Unit Lightning Arrestor

External Base Station Antennas		
TESSCO Link SKU	Model Number	Description
348202	Airmux-5000/BS-ANT/14/4959/FP	90 Degree, 14dBi Gain, Dual Polarized, 4.90 – 5.950GHz Panel Antenna.

308936	Airmux-5000/BS-ANT/15/4959/FP	60 Degree, 15dBi Gain, Dual Polarized, 4.90 – 5.950GHz Panel Antenna.
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SKU: 435547



SKU: 313009



SKU: 441048

External Subscriber Unit Antennas		
TESSCO Link SKU	Model Number	Description
435547	FPD.5-5-18	5.15GHz – 5.85GHz .5' Dual Polarized Flat Panel Antenna. 18dBi Gain. Type-N Termination.
313009	MA-WA56-DP25NB	4.9GHz – 5.875GHz 1' Dual Polarized Flat Panel Antenna. 23.5dBi Gain. Type-N Termination.
441048	SPD2-5.2NS	5.25GHz – 5.85GHz, 2' Dual Polarized Parabolic Dish. 28.1dBi Gain. Type-N Termination.
310268	SPD2-4.7NS	4.4GHz – 5.00GHz, 2' Dual Polarized Parabolic Dish. 26.6dBi Gain. Type-N Termination.
66068	RD2	2' Molded Radome.
457391	SPD3-5.2NS	5.25GHz – 5.85GHz, 3' Dual Polarized Parabolic Dish. 31.1dBi Gain. Type-N Termination.
371489	SPD3-4.7NS	4.4GHz – 5.00GHz, 2' Dual Polarized Parabolic Dish. 28.1dBi Gain. Type-N Termination.
83497	RD3	3' Molded Radome.



SKU: 331623



SKU: 462301



SKU: 360590

RF Ancillary Items		
TESSCO Link SKU	Model Number	Description
331623	600-07-07-P6'	6' Jumper with Dual N-Male Connectors. Includes Heat Shrink
462601	AL-LSXM-MA	2.0GHz – 6.0GHz RF Surge Arrester. Type N-Male / N-Female Connectors
360590	916860-001	Silicone Weatherproofing Tape



SKU: 365570



SKU: 357484

Managed Ethernet Switches (Base Station)		
TESSCO Link SKU	Model Number	Description
365570	1700595G1	24-Port Layer 2 Switch

357484	SLX-8MG-1	Industrial Ethernet Managed Gigabit Switch
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SKU: 326505



SKU: 354368

Consumer Routers (Subscriber Units)		
TESSCO Link SKU	Model Number	Description
326505	ESR-9855G	300Mbps Wireless N Gaming Router & 4 Port Switch
354368	ESR-1221 EXT	150Mbps Wireless N Economy Router

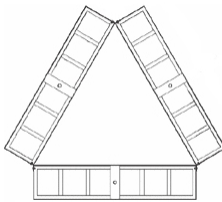


Hub Site Synchronization Equipment		
TESSCO Link SKU	Model Number	Description
321546	AIRMUX-HSSU	Hub Site Synchronization Unit. Connects up to 8 Collocated Base Stations
337717	AIRMUX-GSU/ACUS	GPS Unit for multi-site synchronization
386064	CBL-HSS/5	5 Meter Hub Site Synchronization Cable Kit

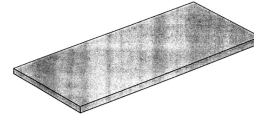
385247	CBL-HSS/15	15 Meter Hub Site Synchronization Cable Kit
356397	CBL-HSS/50	50 Meter Hub Site Synchronization Cable Kit
383275	CBL-HSS/100	100 Meter Hub Site Synchronization Cable Kit



SKU: 320212



SKU: 416937



SKU: 453497

Roof Top Mounting Equipment		
TESSCO Link SKU	Model Number	Description
320212	TP-G412-96	8' Universal Tripod Mount
416937	MT-416	Non-Penetrating Roof Tripod Sled
453497	WSRM/18-48	Rubber Matt