

All-Outdoor 24 GHz



Fast Ethernet/TDM Microwave Systems for Business Critical All-Outdoor Applications

All-outdoor 24 GHz systems are the shorter-range, higher capacity alternative to ExtendAir 5 GHz systems and the flexible, license-free alternative to ExtendAir Licensed 23 GHz systems. Delivering guaranteed Ethernet throughput and toll-quality voice in urban and suburban environments, these TDD-based systems support 200 Mbps aggregate Ethernet throughput and optional native 4xT1/E1. ExtendAir is designed to meet the business critical performance, capital and operating requirements of enterprises, government organizations and service providers.

Best of both worlds. 24 GHz radio systems offer the flexible, license-free operation associated with the 2.4 and 5 GHz bands while leveraging virtually interference-free spectrum coupled with ultra-narrow beamwidth and smaller antennas to deliver the peace of mind associated with licensed band systems.

Multi-port flexibility. In another industry first for entry-level all-outdoor systems, ExtendAir includes a 3x10/100BaseT version that provides users the flexibility to deploy repeater sites or accept direct input from multiple IP devices such as surveillance cameras without the use of an external switch.

Pay as you grow.

All capacity enhancements and optional features are remotely upgradeable using a software license key.

The native difference. deliver true carrier-class capability, made possible by running Ethernet and optional TDM natively. That means rock-solid TDM performance regardless of IP traffic behavior. It also means that when T1/E1 ports are added, TDM throughput is traded bit-for-bit for Ethernet throughput and vice versa, so there's never a question about available user throughput for either transport. As a result, ExtendAir allows risk-free network migration for both private and operator networks, including 3G to LTE evolution at the network edge.

Best-in-class data networking. designed to support complex IT environments, with support for Ethernet rate limiting, VLAN tagging (802.1Q) and QoS (802.1p) with four traffic classes and multiple filters.

Throughput symmetry control. Network managers know from experience that not all IP traffic is symmetric. ExtendAir can allocate Ethernet throughput evenly or asymmetrically up to 80:20 between the two link directions, maximizing channel utilization for applications such as video surveillance, data backup and Internet services.

High security. allow network managers to support the most stringent security requirements with optional FIPS 197-compliant AES 128-bit and 256-bit encryption for data traffic protection and support for both encrypted SNMP v3 and SSL/SSH to ensure management security.

Primary Specifications		ExtendAir rc24000 / rc24005	ExtendAir rc24010
Maximum Capacity	Ethernet (Aggregate)	200 Mbps	
	TDM	-	4xT1/E1
Frequency (GHz)		24.05–24.25 GHz	

System		
Outdoor Unit (ODU) Models	rc24000: 1x10/100BaseT PoE rc24005: 1x10/100BaseT PoE + 2x10/100BaseT rc24010: 1x10/100BaseT PoE + 4xT1/E1	
Frequency Bands	24.05–24.25 GHz FCC Part 15.249	
Channel Bandwidth (MHz)	16, 32, 64	
Antenna Interface	WR-42/UBR220	
Max output Power	QPSK - 64 QAM	-1.5 dBm
Receiver Threshold (BER=10 ⁻⁶) over temperature (dBm) ¹		
QPSK	16 MHz	-83
	32 MHz	-79.5
	64 MHz	-76.5
16 QAM	16 MHz	-75.5
	32 MHz	-72
	64 MHz	-69
64 QAM	16 MHz	-68.5
	32 MHz	-65
	64 MHz	-62
Aggregate Throughput (Mbps) (Max system Layer 1/Max Ethernet Layer 2) ²		
QPSK	16 MHz	31 / 27
	32 MHz	64 / 55
	64 MHz	129 / 110
16 QAM	16 MHz	64 / 55
	32 MHz	129 / 110
	64 MHz	200 / 197
64 QAM	16 MHz	96 / 81
	32 MHz	187 / 163
	64 MHz	200 / 197
Output Power (min power)	-5 dBm	
Maximum RSL	0 dBm no damage	
QPSK	-25 dBm error-free	
16-64QAM	-30 dBm error-free	
Power Control Step Size	0.5 dB	
Throughput Symmetry Control	5 modes: 20 / 80, 80 / 20, 35 / 65, 65 / 35, 50 / 50	
Error Floor	10 ⁻¹²	
FEC	Reed Solomon T=8	
Latency (T1/E1)	1 ms, typical	
Data Security	NIST FIPS 197-compliant 128-bit AES and 256-bit AES ³	
Link Security	96-bit security key	
Spectrum Analyzer	Embedded	
Management	In-band management Out-of-band management (24005 models only)	
Security	SSL/SSH and secure, encrypted SNMPv3	
Web GUI	HTTP, HTTPS (Internet Explorer, Firefox, Safari, Chrome)	
CLI	Telnet, SSH via Ethernet	
SNMP	v1, v2c, and secure v3	
MIB	MIB I, MIB II	
Collocation	Sync Internal and GPS (1pps)	
Installation and Management Manual	Embedded in radio, accessible via HTTP GUI	
Compliance	SNMP v1, v2c, v3 FCC 15.249 IC RSS-210	

Physical

Dimensions (H x W x D)	23.9 cm x 23.9 cm x 13.3 cm 9.4" x 9.4" x 5.25"
Operating Temperature	-40 to +65 °C; -40 to +149 °F
Full Spec Temperature	-40 to +60 °C; -40 to +140 °F
Weight	3.6 kg / 8.2 lbs.
Environmental	NEMA 4 / IP66
Altitude	4600 m / 15,000 ft.
Humidity	100% condensing

Interfaces

Ethernet	RJ48C/RJ45 Female (1 or 3) ⁴	
Interface Speed	10/100BaseT (PoE or PoE + ETH2 + ETH3)	
Duplex	Half, Full, Auto	
Compliance	802.3 with MDIX	
VLAN	802.1q, transparent, trunk and management only	
QoS ⁵	4 QoS traffic classes; filters on: port, IEEE802.1p, IPv4 TOS or DiffServ, IPv6 traffic class, 802.1Q VLAN ID, SA/DA MAC	
Ethernet Rate Limiting	Configurable per port via software	
Maximum Packet Size	2048 bytes	
T1/E1 (xx010 models only)	T1 (x4)	E1 (x4)
Impedance	RJ48C / RJ45 Female (x2)	120 ohms, balanced
Line Code	100 ohms, balanced	AMI, B8ZS, selectable per channel
Data Rate	1.544 Mbps	HDB3
Compliance	ANSI T1.102-1987; ITU-T; G.823; GR-499-CORE	2.048 Mbps
Loopback Modes	ANSI T1.102-1987; ITU-T; G.823; GR-499-CORE	
Loopback Modes	Remote Internal; Remote External; Local Line	
Sync	RJ45 Female (x1)	
Input/Output	Internal sync or 1pps (GPS)/SyncOut	
DC Power	<40 W, 48 VDC 0.8 A	
AC/PoE Power Adapter		
Input	100–240 VAC, 0.5 A	
Output	72 W, 48 VDC	
Warranty	Two years ⁶	

¹ ± 1 dB over temperature.

² Maximum Layer 1 throughput as measured with 64-byte packets and maximum Layer 2 Ethernet + TDM throughput as measured with 1536-byte packets. In both cases throughput includes source address, destination address and CRC overhead. Base configurations start at 27 Mbps aggregate with 55, 110 and 200 Mbps upgrades available.

³ Software license key option.

⁴ 24000 & 24010 models include a single PoE 10/100BaseT port. 24005 model includes one PoE 10/100BaseT port and two additional 10/100BaseT ports.

⁵ Software upgrade required.