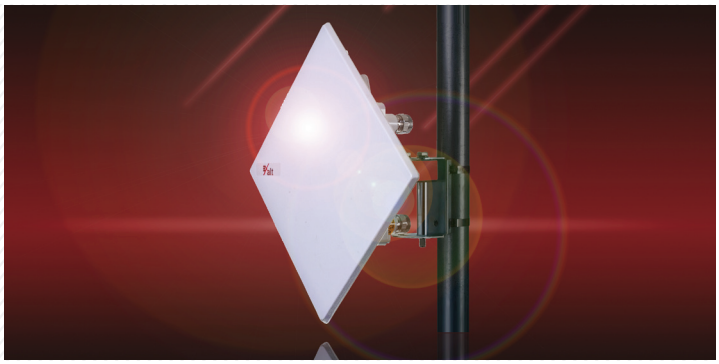
ExtendAir r5000 Series



High Performance Microwave Systems for Business Critical All-Outdoor Applications

ExtendAir is a first-of-its-kind line of entry-level high performance radio systems designed to deliver guaranteed Ethernet throughput and toll-quality voice over long ranges. The ExtendAir r5000 series radios are rugged, all-outdoor, tri-band systems operating in the 5.3, 5.4, and 5.8 GHz license-exempt bands delivering a best-in-class 162 Mbps of aggregate throughput and optional native 4xT1/E1. The ExtendAir r5000 series is designed to meet the business-critical performance and flexibility requirements of enterprises, government organizations and service providers.

Uncompromised performance. Exalt's unique high performance point-to-point technology allows the ExtendAir r5000 series to offer licensed-like performance, with the ability to deliver sustained throughput over long distances in high interference environments. As compared to competing systems that reduce throughput in the presence of interference just to maintain a connection, with ExtendAir, you always know what capacity you're going to get.

Lowest cost per Mbps-mile. ExtendAir delivers the highest throughput in the category for any given range and the longest range for any given throughput. That means ExtendAir offers the best value and the lowest cost per Mbps-mile in the industry.

Toll-quality voice. ExtendAir r5000 series radios support native Ethernet and, optionally, native TDM traffic, with 1 ms typical latency for both. So whether it's TDM voice or VoIP, ExtendAir won't get in the way of a good user experience.

Pay as you grow. The future is hard to predict. With ExtendAir systems, you don't have to. All capacity enhancements and optional features are remotely upgradeable using a software license key.

Best-in-class data networking. ExtendAir was 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. And ExtendAir offers the ultimate security with optional FIPS 197-compliant 128-bit and 256-bit AES.

Spectral flexibility. The tri-band ExtendAir offers a full 505 MHz of 5 GHz spectrum in which to find the best channel, providing selectable channel bandwidth and the ability to tune channels with 1 MHz resolution. ExtendAir puts the power to optimally manage spectrum utilization in the hands of the user.

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.

Primary Specifications		ExtendAir r5000 / r5005 rc5000 / rc5005	ExtendAir r5010 / r5015 rc5010 / rc5015
Maximum Capacity	Ethernet (Aggregate)	162 Mbps	
	TDM	–	4xT1/E1
Frequency (GHz)		Tri-band 5 GHz: 5.250–5.350, 5.470–5.725, 5.725–5.875 GHz	

Specifications — ExtendAir r5000 Series

System			
Outdoor Unit (ODU) Models	1x10/100BaseT PoE		
	1x10/100BaseT PoE + 2x 10/100BaseT		
	1x10/100BaseT PoE + 4x T1/E1		
Frequency Bands[1](GHz)	5.250–5.350, 5.470–5.725, 5.725–5.875		
Tuning Resolution	1 MHz		
Output Power (full power)[2]	5.725–5.875 GHz	5.250–5.350 GHz[3]	5.470–5.725 GHz[3]
QPSK	+22 dBm	+20 dBm	+20 dBm
16QAM	+18 dBm	+18 dBm	+18 dBm
64QAM	+16 dBm	+16 dBm	+16 dBm
Output Power (min. power)	0 dBm		
Power Control Step Size	0.5 dB		
Aggregate User Throughput (Ethernet Mbps) [4]			
Channel Bandwidth[5]	8/10 MHz Channel	16/20 MHz Channel	32/40 MHz Channel
QPSK	13	27	55
16QAM	26	55	109
64QAM	38	81	162
Receiver Threshold (BER=10^{-6}) over temperature (dBm)			
QPSK	-86	-83	-80
16QAM	-79	-76	-73
64QAM	-73	-70	-67
System Gain (dB)			
QPSK	108	105	102
16QAM	97	94	91
64QAM	89	86	83
Non-overlapping Channels			
5.250–5.350 GHz	10	5	2
5.470–5.725 GHz	29	14	7
5.725–5.875 GHz	18	9	4
Range[6] (99.99% availability)	Up to 15 miles / 24 km at 162 Mbps sustained user throughput		
Maximum RSL	0 dBm no damage		
QPSK	-25 dBm error-free		
64QAM	-30 dBm error-free		
Throughput Symmetry Control	5 modes: 20/80, 80/20, 35/65, 65/35, 50/50		
Error Floor	10^{-12}		
FEC	T=8		
Latency (T1/E1)	1ms, typical		
Data Security	NIST FIPS 197-compliant 128-bit AES and 256-bit AES[7] or 96-bit proprietary encryption		
Spectrum Analyzer	Embedded		
Management	In-band and out-of-band management (5005 models only)		
Security	SSL/SSH and secure, encrypted SNMPv3		
HTTP	Embedded web server GUI (Internet Explorer, Firefox)		
CLI/Telnet	via 10/100BaseT		
SNMP	v1, v2c, and secure v3		
MIB support	MIB I, MIB II, Exalt MIB		
Installation and Management Manual	Embedded in radio, accessible via HTTP GUI		
Compliance	SNMP v1, 2c, v3		
	FCC 15.247, FCC 15.407		
	EN 301-893, EN 302-502		
	EN 60-950, EN 301-489		
	IC RSS-210		

[1] Not all frequency bands are authorized or available for use in all countries. Consult Exalt for UNII band availability in the US.

[2] Output power is specified per modulation to accurately show the corresponding system gain and throughput, and not just the maximum power the radio can achieve.

[3] Output power is limited to +13 dBm per US and International EIRP regulations for UNII bands. Consult your Exalt representative for full output power terms and availability.

[4] Total aggregate user throughput, not over-the-air modulated data rate. Systems are 27 Mbps with upgrade options of 55 and 120 Mbps. r5015 and rc5015 models are 5 Mbps +2xT1/E1 upgradeable to 120 Mbps+4xT1/E1.

[5] FCC: 8, 16, 32 MHz; ETSI: 10, 20, 40 MHz

[6] FCC rules, 5.8 GHz ISM band, average climate & terrain, connectorized rc version with 6' dish antennas, 3 dB transmission losses and 99.99% availability. Longer or shorter distances can be achieved for alternate antennas, country regulations, transmission system losses path topologies, availability requirements and radio configurations. Refer to Exalt Link Budget Calculator and Path Profiler tools.

[7] Software license key option.

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Specifications (Cont.)

ExtendAir r5000 Series

System Components		
Complete Link	Two terminals, each mounting kit, & accessory kit	
Single Terminal	One terminal with mounting kit, & accessory kit	
Accessory Kit	Grounding hardware, water-proofing tape	
Power Supply Kits	AC Power Kit or DC Power Kit (ordered separately)	
Mounting Kits	Available for r and r-c models (spare)	
ExaltSync GPS Sync Kit	GPS receiver and mounting bracket (optional)	
Physical	Integrated antenna	Connectorized
Physical Configuration	Outdoor Unit (ODU)	
Dimensions (H x W x D)	13.3" x 13.3" x 4.5"	9.4" x 9.4" x 5.25"
	33.8 cm x 33.8 cm x 11.4 cm	23.9 cm x 23.9 cm x 13.3 cm
Antenna	Integrated	Type N Connector
Integrated Antenna		
Gain/3 dB Beamwidth	23 dBi / 10 degrees	
Operating Temperature	-40 to +65°C; -40 to +149°F	
Full Spec Temperature	-40 to +60°C; -40 to +140°F	
Weight	Connectorized rc: 2.72 kg / 6 lbs.	
	Integrated antenna r: 3.18 kg / 7 lbs.	
Environmental	NEMA 4 / IP66	
Altitude	4600 m / 15,000 ft.	
Humidity	100% condensing	
Interfaces		
RF	Connectorized r: N-type Female	
Ethernet	RJ48C/RJ45 Female (x1 or x3)[8]	
Interface Speed	10/100BaseT (PoE or PoE +ETH1 +ETH2)	
Duplex	Half, Full, Auto-MDIX	
Compliance	802.3	
VLAN	802.1q, transparent, trunk, and management only; over 4,000 VLAN IDs	
QoS	4 QoS traffic classes; filters on: port, IEE802.1p, IPv4 TOS or DiffServ, IPv6 traffic class, 802.1Q VLAN ID, SA/DA MAC	
Ethernet Rate Limiting	Configurable per port via software, 1 Kbps resolution	
Maximum Packet Size	2048 bytes	
T1/E1[8]	T1 (x4)	E1 (x4)
	RJ48C/RJ45 Female (x2)	
Impedance	100 ohms, balanced	120 ohms, balanced
Line Code	AMI, B8ZS, selectable per channel	HDB3
Data Rate	1.544 Mbps	2.048 Mbps
Compliance	ANSI T1.102-1987; ITU-T; G.823; GR-499-CORE	CEPT-1; G.703; ITU-T-G.703
Loopback Modes	Remote Internal; Remote External; Local Line	
ExaltSync Synchronization	RJ45 Female (x1)	
Input	1pps (GPS)	
Output	Sync out	
DC Power	<25W	
AC/PoE Power Adapter		
Input	100-240VAC, 0.5A	
Output	40W, 56VDC	

Warranty	Two years[9]

[8] TDM models include a single PoE 10/100BaseT port. IP/Ethernet only models include one PoE 10/100BaseT port and two additional 10/100BaseT ports.

[9] Terms and conditions apply. Consult your Exalt sales representative for details.

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