Exalt™

ExploreAir™ All-Outdoor Bands 11, 18, 23 GHz

Gigabit Ethernet Microwave Systems for High Capacity Backhaul

ExploreAir All-Outdoor is a first-of-its-kind line of high performance, point-to-point Gigabit Ethernet radio systems covering all bands from 2 to 40 GHz. Designed to deliver guaranteed full-duplex Ethernet throughput up to 500 Mbps for long-haul applications over distances exceeding 24 miles, ExploreAir All-Outdoor radios are rugged, zero footprint systems requiring no cabinet space. ExploreAir features and benefits include:

Ultra-high per carrier capacity. ExploreAir is the industry's first system to make full use of the 80 MHz channel in the 18 GHz band, delivering 500 Mbps full-duplex Ethernet throughput per carrier and making ExploreAir the highest capacity single-carrier, single-channel system available in sub-60 GHz bands.

Single-unit sparing. A single ExploreAir radio can be used to spare an entire band, thanks to the industry's first field-replaceable diplexer in an all-outdoor radio. Compared to traditional approaches, the use of ExploreAir drops the cost of spares by 50% to 90%.

On-tower hub aggregation. With up to three Gigabit Ethernet ports, ExploreAir can aggregate traffic from two lower capacity ExploreAir or ExtendAir® links without the need for an external switch or extra cable runs. All aggregated traffic can be delivered to the site router over a single CAT5 cable.

The Native TDM Difference. ExploreAir features optional native 4xT1/E1, providing a means to easily and reliably carry legacy TDM, regardless of IP traffic behavior, making ExploreAir the ideal solution for low-latency backhaul of co-located 2G, 3G and 4G/LTE sites.

Errorless and Jitterless Adaptive Modulation. With a rate adaptation range of 256QAM to QPSK, ExploreAir can be used to deliver even higher ranges and data rates at high availability levels, then temporarily reduce throughput in the event of a fade while still ensuring the delivery of high priority traffic.

Data networking. ExploreAir systems incorporate full layer 2 switching along with optional 3xGbE in combination with critical features such as 802.1Q (VLAN tagging), 802.1p (QoS) and Ethernet rate limiting.

Remote management. ExploreAir systems include a full set of remote management tools such as Telnet/Command Line Interface (CLI), RS232, HTTP, HTTPS and SNMPv1, v2c and v3. In addition, the three Ethernet port xx105 models provide unique out-of-band management functionality allowing both endpoints of a link to be managed independently.

Primary Specifications		ExploreAir rc11100 / rc11105 rc18100 / rc18105 rc23100 / rc23105	ExploreAir rc11110 rc18110 rc23110
Maximum Capacity	Ethernet (Full-Duplex)	500 Mbps	
	TDM	–	4xT1/E1
Frequency (GHz)		11 GHz (10.7–11.7 GHz), 18 GHz (17.7–19.7 GHz) , 23 GHz (21.2–23.61 GHz)	

Specifications — ExploreAir All-Outdoor—Bands 11, 18, 23 GHz Series

System

Models	
	rc11100, rc18100, rc23100: 1x10/100/1000BaseT PoE
	rc11105, rc18105, rc23105: 1x10/100/1000BaseT PoE + 2x10/100/1000BaseT
	rc11110, rc18110, rc23110: 1x10/100/1000BaseT PoE + 4xT1/E1

		10.70–11.70 GHz	17.70–19.70 GHz	21.2–23.61 GHz
Frequency Bands		10.70–11.70 GHz	17.70–19.70 GHz	21.2–23.61 GHz
TR Spacing (MHz)		490 / 500	1560	1200
Channel Bandwidth (MHz)		10, 30, 40, 80[1]	30, 40, 50, 80	30, 40, 50
Antenna Interface		WR-75	WR-42	WR-42
Output Power (dBm)				
	QPSK	-	23	21
	16QAM	23	21	19
	32QAM	22	20	18
	64QAM	21	20	17
	128QAM	20	18	16
	256QAM	19	17	15
Receiver Threshold (BER=10^{-6} typical (dBm))				
QPSK	10 MHz	-	-	-
	30 MHz	-	-82	-82
	40 MHz	-	-81	-80
	50 MHz	-	-80	-79
	80 MHz	-	-78	-
16QAM	10 MHz	-	-	-
	30 MHz	-79	-76	-76
	40 MHz	-	-75	-74
	50 MHz	-	-74	-73
	80 MHz	-	-72	-
32QAM	10 MHz	-	-	-
	30 MHz	-74	-73	-73
	40 MHz	-72	-72	-71
	50 MHz	-	-71	-70
	80 Mhz	-70	-69	-
64QAM	10 MHz	-76	-	-
	30 MHz	-71	-70	-70
	40 MHz	-70	-69	-68
	50 MHz	-	-68	-67
	80 MHz	-67	-66	-
128QAM	10 MHz	-73	-	-
	30 MHz	-68	-67	-67
	40 MHz	-67	-66	-65
	50 MHz	-	-65	-64
	80 MHz	-64	-63	-
256QAM	10 MHz	-70	-	-
	30 MHz	-65	-64	-64
	40 MHz	-64	-63	-62
	50 MHz	-63	-62	-61
	80 MHz	-61	-60	-

ExploreAir All-Outdoor—Bands 11, 18, 23 GHz Series

Frequency Bands		10.70–11.70 GHz	17.70–19.70 GHz	21.2–23.61 GHz
Throughput (Mbps full-duplex) (Max system layer 1 / Max Ethernet layer 2)[3]				
QPSK	10 MHz	-	-	-
	30 MHz	-	58 / 47	58 / 47
	40 MHz	-	77 / 62	77 / 62
	50 MHz	-	96 / 78	96 / 78
	80 MHz	-	154 / 124	-
16QAM	10 MHz	-	-	-
	30 MHz	115 / 93	115 / 93	115 / 93
	40 MHz		154 / 124	154 / 124
	50 MHz		192 / 155	192 / 155
	80 MHz	-	308 / 249	-
32QAM	10 MHz	-	-	
	30 MHz	144 / 117	144 / 117	144 / 117
	40 MHz	192 / 155	192 / 155	192 / 155
	50 MHz	-	241 / 194	241 / 194
	80 MHz	385 / 311	385 / 311	-
64QAM	10 MHz	58 / 47	-	-
	30 MHz	173 / 140	173 / 140	173 / 140
	40 MHz	231 / 186	231 / 186	231 / 186
	50 MHz	-	289 / 233	289 / 233
	80 MHz	462 / 373	462 / 373	-
128QAM	10 MHz	-	-	-
	30 MHz	202 / 163	202 / 163	202 / 163
	40 MHz	269 / 218	269 / 218	269 / 218
	50 MHz	-	337 / 272	337 / 272
	80 MHz	539 / 435	539 / 435	-
256QAM	10 MHz	77 / 62	-	-
	30 MHz	231 / 186	231 / 186	231 / 186
	40 MHz	308 / 249	308 / 249	308 / 249
	50 MHz	-	385 / 311	385 / 311
	80 MHz	616 / 500	616 / 500	-
Emissions Designators	5 MHz	-	-	-
	10 MHz	10M0W7D	-	-
	30 MHz	30M0W7D	30M0W7D	30M0W7D
	40 MHz	40M0W7D	40M0W7D	40M0W7D
	50 MHz	-	50M0W7D	50M0W7D
	80 MHz	80M0W7D	80M0W7D	-

Maximum RSL	0 dBm no damage
QPSK	-25 dBm error-free
64QAM	-30 dBm error-free
Range @ 500 Mbps (99.9%, 99.99% availability)[4]	24 mi / 38 km, 12 mi / 19 km
Output Power (min power)	0 dBm
Power Control Step Size	0.5 dB
Error Floor	10^{-12}
FEC	Reed Solomon T=8
TDM latency	<1ms typical
Ethernet latency	<100µs at full throughput GbE
Data Security	NIST FIPS 197-compliant 128-bit AES and 256-bit AES[5] or 96-bit proprietary encryption
Spectrum Analyzer[6]	Embedded
Adaptive Modulation[6]	QPSK – 256QAM fully configurable; errorless and jitterless

[3] Maximum layer 1 throughput as measured with 64-byte packets and maximum layer 2 Ethernet with 1536-byte packets. In both cases throughput includes source address, destination address and CRC overhead. Base configurations start at 100 Mbps full-duplex with 100, 200, 300, 400 and 500 Mbps upgrades available depending on the band of operation.

[4] 18 GHz, 6 ft / 1.8 m dish, dry climate, 3dB transmission losses. Adaptive modulation provides rate-adaptation down to 124 Mbps full duplex with 99.999% availability at 24 miles.

[5] Software license key option.

[6] Software upgrade required.

Specifications (Cont.) — ExploreAir All-Outdoor—Bands 11, 18, 23 GHz Series

Management	In-band management
	Out-of-band management (xx105 models only)
Security	SSL / SSH and secure, encrypted SNMPv3
HTTP	Embedded web server GUI (Internet Explorer, Firefox, Safari, Chrome)
CLI/Telnet	via 10/100/1000BaseT
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, v2c, v3
	Part 101
	IC RSS-210; SRSP-305.9

Physical

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

Interfaces

RF Diplexers[7]	11 GHz TR 490 / 500 MHz; Hi / Lo	18 GHz TR 1560 MHz; Hi / Lo	23 GHz TR 1200 MHz; Hi / Lo
	Band 1: 10.70–10.90 GHz / 11.20–11.40 GHz	Band 1: 17.70–18.14 GHz / 19.26–19.70 GHz	Band 1: 21.20–21.62 GHz / 22.40–22.82 GHz
	Band 2: 10.85–11.05 GHz / 11.35–11.55 GHz	-	Band 2: 21.59–22.01 GHz / 22.79–23.21 GHz
	Band 3: 11.00–1.20 GHz / 11.50–11.70 GHz	-	Band 3: 21.98–22.40 GHz / 23.18–23.60 GHz

Ethernet	RJ48C/RJ45 Female (x1 or x3)[8]	
Interface Speed	10/100/1000BaseT (PoE or PoE + ETH2 + ETH3)	
Duplex	Half, Full, Auto	
Compliance	802.3 with MDIX	
VLAN	802.1q, transparent, trunk, and management only	
QoS[6]	8 priority levels, 8 queues; 802.1p, 802.1q(VLAN ID), source MAC address, destination MAC address	
Ethernet Rate Limiting	Configurable per port via software	
Maximum Packet Size	9728 bytes	

T1/E1 (xx010 models only)	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	

DC Power	<40 W, 48 VDC, 0.8 A
AC Power Adapter	
Input	100–240 VAC, 2.3 A
Output	72 W, 48 VDC
Warranty	Two years[9]

[6] Software upgrade required.

[7] Field replaceable. Refer to warranty terms and conditions.

[8] xx010 TDM models include a single PoE 10/100BaseT port. xx005 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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