



# ExploreAir™ All-Outdoor FCC 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—FCC 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
--------	--

Frequency Bands		10.70–11.70 GHz	17.70–19.70 GHz	21.2–23.61 GHz
FCC Part 101				
TR Spacing (MHz)		490 / 500	1560	1200
Channel Bandwidth (MHz)		10, 30, 40, 80 <sup>1</sup>	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 <sup>-6</sup> typical (dBm)) <sup>2</sup>				
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	-

<sup>1</sup> 80 MHz channel operation is subject to FCC approval of proposed rulemaking allowing contiguous 2 x 40 MHz channels in the 11 GHz Part 101 FCC band for broadband applications. Software upgrade is required.

<sup>2</sup> ± 1dB over temperature.

**Specifications (Cont.)**

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

Frequency Bands FCC Part 101		10.70–11.70 GHz	17.70–19.70 GHz	21.2–23.61 GHz
<b>Throughput (Mbps full-duplex) (Max system layer 1 / Max Ethernet layer 2)<sup>3</sup></b>				
<b>QPSK</b>	10 MHz	-	-	-
	30 MHz	-	58 / 47	58 / 47
	40 MHz	-	77 / 62	77 / 62
	50 MHz	-	96 / 78	96 / 78
	80 MHz	-	154 / 124	-
<b>16QAM</b>	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	-
<b>32QAM</b>	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	-
<b>64QAM</b>	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	-
<b>128QAM</b>	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	-
<b>256QAM</b>	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	-
<b>Emissions Designators</b>	5 MHz	-	-	-
	10 MHz	10M0W7D	-	-
	30 MHz	30M0W7D	30M0W7D	30M0W7D
	40 MHz	40M0W7D	40M0W7D	40M0W7D
	50 MHz	-	50M0W7D	50M0W7D
	80 MHz	80M0W7D	80M0W7D	-
<b>Maximum RSL</b>		0 dBm no damage		
<b>QPSK</b>		-25 dBm error-free		
<b>64QAM</b>		-30 dBm error-free		
<b>Range @ 500 Mbps (99.9%, 99.99% availability)<sup>4</sup></b>		24 mi / 38 km, 12 mi / 19 km		
<b>Output Power (min power)</b>		0 dBm		
<b>Power Control Step Size</b>		0.5 dB		
<b>Error Floor</b>		10 <sup>-12</sup>		
<b>FEC</b>		Reed Solomon T=8		
<b>TDM latency</b>		<1ms typical		
<b>Ethernet latency</b>		<100µs at full throughput GbE		
<b>Data Security</b>		NIST FIPS 197-compliant 128-bit AES and 256-bit AES <sup>5</sup> or 96-bit proprietary encryption		
<b>Spectrum Analyzer<sup>6</sup></b>		Embedded		
<b>Adaptive Modulation<sup>6</sup></b>		QPSK – 256QAM fully configurable; errorless and jitterless		

<sup>3</sup> 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.

<sup>4</sup> 18 GHz FCC, 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.

<sup>5</sup> Software license key option.

<sup>6</sup> Software upgrade required.



## Specifications (Cont.)

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

<b>Management</b>	In-band management Out-of-band management (xx105 models only)		
<b>Security</b>	SSL / SSH and secure, encrypted SNMPv3		
<b>HTTP</b>	Embedded web server GUI (Internet Explorer, Firefox, Safari, Chrome)		
<b>CLI/Telnet</b>	via 10/100/1000BaseT		
<b>SNMP</b>	v1, v2c, and secure v3		
<b>MIB support</b>	MIB I, MIB II, Exalt MIB		
<b>Installation and Management Manual</b>	Embedded in radio, accessible via HTTP GUI		
<b>Compliance</b>	SNMP v1, v2c, v3 FCC Part 101 IC RSS-210; SRSP-305.9		
<b>Physical</b>			
<b>Dimensions (H x W x D)</b>	9.4" x 9.4" x 5.25" 23.9 cm x 23.9 cm x 13.3 cm		
<b>Operating Temperature</b>	-40 to +60 °C; -40 to +140 °F		
<b>Full Spec Temperature</b>	-40 to +65 °C; -40 to +149 °F		
<b>Weight</b>	3.6 kg / 8.2 lbs.		
<b>Environmental</b>	NEMA 4 / IP66		
<b>Altitude</b>	4600 m / 15,000 ft.		
<b>Humidity</b>	100% condensing		
<b>Interfaces</b>			
<b>RF Diplexers<sup>7</sup></b>	<b>11 GHz TR 490 / 500 MHz; Hi / Lo</b> Band 1: 10.70–10.90 GHz / 11.20–11.40 GHz Band 2: 10.85–11.05 GHz / 11.35–11.55 GHz Band 3: 11.00–1.20 GHz / 11.50–11.70 GHz	<b>18 GHz TR 1560 MHz; Hi / Lo</b> Band 1: 17.70–18.14 GHz / 19.26–19.70 GHz - -	<b>23 GHz TR 1200 MHz; Hi / Lo</b> Band 1: 21.20–21.62 GHz / 22.40–22.82 GHz Band 2: 21.59–22.01 GHz / 22.79–23.21 GHz Band 3: 21.98–22.40 GHz / 23.18–23.60 GHz
<b>Ethernet</b>	RJ48C/RJ45 Female (x1 or x3) <sup>8</sup> 10/100/1000BaseT (PoE or PoE + ETH2 + ETH3)		
<b>Interface Speed</b>	10/100/1000BaseT (PoE or PoE + ETH2 + ETH3)		
<b>Duplex</b>	Half, Full, Auto		
<b>Compliance</b>	802.3 with MDIX		
<b>VLAN</b>	802.1q, transparent, trunk, and management only		
<b>QoS<sup>6</sup></b>	8 priority levels, 8 queues; 802.1p, 802.1q(VLAN ID), source MAC address, destination MAC address		
<b>Ethernet Rate Limiting</b>	Configurable per port via software		
<b>Maximum Packet Size</b>	9728 bytes		
<b>T1/E1 (xx010 models only)</b>	<b>T1 (x4)</b> RJ48C / RJ45 Female (x2)	<b>E1 (x4)</b> 120 ohms, balanced	
<b>Impedance</b>	100 ohms, balanced	120 ohms, balanced	
<b>Line Code</b>	AMI, B8ZS, selectable per channel	HDB3	
<b>Data Rate</b>	1.544 Mbps	2.048 Mbps	
<b>Compliance</b>	ANSI T1.102-1987; ITU-T; G.823; GR-499-CORE	CEPT-1; G.703; ITU-T-G.703	
<b>Loopback Modes</b>	Remote Internal; Remote External; Local Line		
<b>DC Power</b>	<40 W, 48 VDC, 0.8 A		
<b>AC Power Adapter</b>			
<b>Input</b>	100–240 VAC, 2.3 A		
<b>Output</b>	72 W, 48 VDC		
<b>Warranty</b>	Two years <sup>9</sup>		

<sup>6</sup> Software upgrade required.

<sup>7</sup> Field replaceable. Refer to warranty terms and conditions.

<sup>8</sup> xx010 TDM models include a single PoE 10/100BaseT port. xx005 models include one PoE 10/100BaseT port and two additional 10/100BaseT ports.

<sup>9</sup> Terms and conditions apply. Consult your Exalt sales representative for details.

