

## Expandable 4-16xT1/E1 + 10/100BaseT Wireless Backhaul Microwave Radio

New breed of all-indoor  
2.4GHz radio

Spectrum efficient

Software expandable  
from 4 to 16 T1/E1

Highest IP and TDM  
capacity

Carrier class

Resilient transmission

Lowest cost per  
megabit-mile

- 2400 to 2483.5MHz ISM
- 4 to 16 x T1/E1 + 10/100BaseT Ethernet
- Over 200Mbps user capacity
- 8 non-overlapping channels (4xT1/E1)
- 1MHz tuning resolution
- 1.5 RU rack-mount
- 20-60 VDC power supply
- >30 miles @ 99.999%\*
- 2-year standard warranty\*\*

\*Distance based on FCC regulations, average climate & terrain, 6' dish antennas, 3dB transmission system losses at each end with ~100Mbps throughput. Longer or shorter distances will apply for alternative antennas, country regulations, transmission system losses, path topologies and radio configurations.

\*\*Terms and conditions apply. See your Exalt Communications representative for details.

- ✓ **Eliminate** leased line expenses
- ✓ **Connect** locations in days, not weeks
- ✓ **Upgrade** capacity of existing systems
- ✓ **Carry** voice and Ethernet simultaneously
- ✓ **Avoid** interference
- ✓ **Improve** manageability
- ✓ **Reduce** installation and maintenance
- ✓ **Secure** wireless backhaul links
- ✓ **Future-proof** connections
- ✓ **Expand** capacity of existing systems

### Telecommunications Carriers

- Extend networks
- Expand TDM capacity from 4xT1/E1 to 8, 12, or 16xT1/E1 via software
- Add Ethernet connectivity
- Provide management capability
- Improve interference avoidance flexibility

### Education, Medical & Business Users

- Connect campus locations securely
- Eliminate leased line costs
- Install connections instantly
- Interconnect PBX trunk lines
- Carry voice and data connections seamlessly
- Provide high IP traffic bandwidth

### Government Agencies

- Create secure inter-building networks, rapidly
- Backhaul video monitoring systems
- Implement backbones for private/public access networks
- Interconnect PBX trunk lines

### Industrial

- Create high-speed inter-facility connections
- Backhaul high-capacity video monitoring systems along with telemetry data
- Connect oil drilling platforms, power stations and utility centers



As the only 2.4GHz system with software expandability from 4 to 16 T1/E1 plus 100BaseT, the EX-2.4i-16 wireless backhaul microwave radio extends the advantages of the license-exempt 2.4GHz band to provide maximum TDM capacity, IP functionality, and minimal latency for the most demanding carrier-class backhaul applications.

Using very efficient proprietary modulation techniques, resulting in a very narrow occupied RF bandwidth, the EX-2.4i-16 uniquely provides up to **8 non-overlapping frequency channels**. It also provides **fine-tuning capability across the entire frequency band**, with up to **62 center frequencies of operation** and no hardware changes required for retuning. This results in unprecedented system densities and interference avoidance capability compared to other carrier-class systems in this band.

Developed specifically to meet the demanding and changing requirements of the carrier-class user, the EX-2.4i-16 provides **software expandability from 4 to 16 T1/E1 and a smooth upgrade path to higher capacity Ethernet services**. TDM capacity may be conveniently expanded in groups of four ports via firmware option. In addition, the EX-2.4i-16 offers excellent radio system performance and the **lowest cost per megabit-mile in its class**.

## System

Frequency Band	2400 to 2483.5MHz	
Tuning Resolution	1MHz	
Output Power (at full power)	+27dBm, Mode 1 +24dBm, Mode 2	
Output Power (at min power)	+ 7dBm	
Power Control Step Size	0.5dB	
Receiver Threshold (guaranteed over temperature @BER=10 <sup>-6</sup> )	<b>Mode 1</b>	<b>Mode 2</b>
8MHz channel	-88dBm	-80dBm
16MHz channel	-85dBm	-77dBm
32MHz channel	-82dBm	-74dBm
64MHz channel <sup>1</sup>	-79dBm	-71dBm
Receiver Threshold (typical)	2db better	
Maximum RSL (Mode 1)	-25dBm error-free 0dBm no damage	
Non-overlapping channels		
8MHz channel	8	
16MHz channel	4	
32MHz channel	2	
64MHz channel <sup>1</sup>	1	
Aggregate User Capacity <sup>2</sup>	<b>Mode 1</b>	<b>Mode 2</b>
8MHz channel	13Mbps	27Mbps
16MHz channel	27Mbps	55Mbps
32MHz channel	55Mbps	110Mbps
64MHz channel <sup>1</sup>	110Mbps	216Mbps
Max. Supported T1/E1 ports	<b>Mode 1</b>	<b>Mode 2</b>
8MHz channel	4/3	8/6
16MHz channel	8/6	16/12
32MHz channel	16/12	16/16
64MHz channel <sup>1</sup>	16/16	16/16
Error Floor	10 <sup>-12</sup>	
Maximum packet size	1916 bytes	
Latency (T1/E1)	1ms typical	
Link Security	96-bit proprietary AES encryption <sup>1</sup>	
Management	HTTP GUI Telnet/CLI SNMPv3 <sup>3</sup> 802.1Q <sup>3</sup> FCC 15.247 IC RSS-210	
VLAN		
Regulatory Compliance		

## Physical

Physical Configuration	Single-piece Indoor Unit (IDU)
Dimensions (H x W x D)	1.5 RU 2.63 x 17 x 14 inches 6.7 x 43.2 x 35.6 cm
Operating Temperature	-40 to +65 degrees C -40 to +149 degrees F
Full Spec Temperature	-25 to +60 degrees C -13 to +140 degrees F
Weight	12 pounds; 5.5 kg

<sup>1</sup> Firmware option required

<sup>2</sup> The figure listed is the actual aggregate user throughput, maximum, as measured at layer 2. T1 or E1 circuits may be enabled one at a time, as needed, and subtract 3.1Mbps (1.544Mbps full-duplex) or 4.1Mbps (2.048Mbps full-duplex), respectively, from the aggregate user throughput. Some combinations of frame size, link distance, T1/E1 enabling, bandwidth, mode and desired latency will result in reduced maximum aggregate throughput. See your Exalt Communications representative for details.

<sup>3</sup> Firmware upgrade required

## Physical (continued)

Environmental	GR-1089-CORE intra-building
Altitude	15,000 feet; 4.6 km
Humidity	95% non-condensing

## Interfaces

RF	N-type (F) 50 ohms RJ48C/RJ45 (F) 100 ohms, balanced AMI, B8ZS, selectable per channel 1.544Mbps ANSI T1.102-1987 GR-499-CORE 120 ohms, balanced HDB3 2.048Mbps CEPT-1; G.823 ITU-T-G703 Remote Internal Remote External Local Line RJ45 (F), auto-MDIX 10/100BaseT Half, Full, Auto 802.3 9-pin Sub-D (F) 9600 bps EIA-574 (RS-232) 9-pin Sub-D (F) (2) TTL/Closure (2) Relay (Form C) RJ45 (F) Internal Sync 1pps (GPS) <sup>3</sup> 6-pin barrier strip ±20-60VDC <40W (48V : <0.8A, 24V: <1.6A)
T1/E1 (x16) <sup>4</sup>	
T1 Impedance	
T1 Line Codes	
T1 Clocking Speed	
T1 Compliance	
E1 Impedance	
E1 Line Codes	
E1 Clocking Speed	
E1 Compliance	
Loopback Modes	
Ethernet (x2)	
Interface Speed	
Duplex	
Compliance	
Console (Serial)	
Interface Speed	
Compliance	
Alarm	
Inputs	
Outputs	
Sync (In and Out)	
Signaling	
DC Power	
Input Voltage	
Consumption	
AC Power Adapter	
Input	
Output	

## System Components

Complete link	Two terminals, each with AC adapter & accessory kit <sup>5</sup>
Single terminal	One terminal with AC adapter & accessory kit
Accessory kit	DC power connector, rack and grounding hardware (spare)
AC adapter	AC adapter (spare)
GPS sync kit <sup>3</sup>	GPS antenna and mounting bracket (option)

<sup>4</sup> Capacity may be increased in groups of 4T1/E1 from 4 to 16 via separately purchased software option.

<sup>5</sup> For hot-standby protection, two complete links (4 terminals) are required along with protection kit and firmware option.