



EX-4.9r/EX-4.9r-c

## Expandable 2-4xT1/E1 + 10/100BaseT Licensed Multi-Service Wireless Ethernet Bridge

All-outdoor 4.9GHz  
Ethernet bridges

Licensed band operation

Market leading capacity  
and range

Environmentally  
hardened

T1/E1 and Ethernet  
support

Spectrum efficient

Carrier-class

Resilient transmission

Selectable polarization  
switching for integrated  
and external antenna

Lowest cost per megabit-  
mile

- 4940 to 4990 MHz
- 10/100BaseT Ethernet + 4xT1/E1
- Up to 55Mbps user capacity with up to 4xT1/E1
- 10 and 20MHz channel support
- Up to 5 non-overlapping channels
- > 10 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 55Mbps 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.

- ✓ **Deploy** carrier-class wireless backhaul on 4.9GHz
- ✓ **Carry** voice and Ethernet simultaneously
- ✓ **Eliminate** leased line expenses
- ✓ **Avoid** infrastructure bottlenecks
- ✓ **Reduce** installation and maintenance costs
- ✓ **Connect** locations in days, not weeks
- ✓ **Maximize** system collocation and minimize costs
- ✓ **Avoid** interference
- ✓ **Secure** public safety wireless backhaul connections
- ✓ **Facilitate** frequency coordination
- ✓ **Collocate** systems and re-use spectrum

### Municipalities

- Create secure inter-building networks rapidly
- Interconnect PBXs and IP backbones over the same high capacity wireless backhaul link
- Connect campus locations securely with AES encryption
- Eliminate leased line costs
- Facilitate 4.9GHz channel coordination

### Public Safety Agencies and Emergency Response Centers

- Interconnect emergency response centers securely and reliably
- Backhaul IP and T1/E1 voice traffic simultaneously
- Avoid interference
- Eliminate leased line costs
- Install connections instantly
- Carry voice and data connections seamlessly
- Backhaul security and surveillance video
- Outfit mobile command centers with high capacity licensed backhaul
- Provide management capability
- Maximize system collocation and reduce installation expenses



The EX-4.9r and EX-4.9r-c from Exalt Communications are carrier-class, all outdoor, multi-service Ethernet bridges for the licensed 4.9GHz public safety band.

Using state-of-the-art proprietary modulation techniques, the EX-4.9r and EX-4.9r-c deliver the highest combined Ethernet and TDM capacity for point-to-point 4.9GHz applications. Starting at 27Mbps and 2xT1/E1, the system can be upgraded to 55Mbps and 4xT1/E1 connectivity with an optional software key, providing simultaneous data and voice interconnection with a choice of proprietary or AES encryption for highly secure emergency response and public safety applications.

The EX-4.9r and EX-4.9r-c provide **affordable** multi-service performance and maximum reliability in a system designed to meet the stringent requirements of telecommunications carriers. In comparison, most 4.9GHz solutions are based on Wi-Fi OFDM, which is best-effort technology designed for consumer applications with unpredictable throughput, reliability, and latency. Exalt delivers reliable, sustained Ethernet and T1/E1 capacity over longer distances in the most adverse environmental and path conditions and at the **lowest cost per megabit-mile available today!**

The system is available with integrated antenna (EX-4.9r) or type-N female connectors (EX-4.9r-c) for external antenna mounting.



# EX-4.9r/EX-4.9r-c Specifications

## System

Frequency Band <sup>1</sup>	4940-4990MHz
Output Power (at full power)	<b>Mode 1</b> <b>Mode 2</b>
10 MHz channel	+22dBm +21dBm
20MHz channel	+24dBm +21dBm <sup>2</sup>
Output Power (at min power)	+4dBm
Power Control Step Size	0.5dB
Receiver Threshold (guaranteed over temperature @BER=10 <sup>-6</sup> )	<b>Mode1</b> <b>Mode2</b>
10MHz channel	-86dBm -78dBm
20MHz channel	-83dBm -75dBm <sup>2</sup>
Receiver Threshold (typical)	2dB better than above
Maximum RSL (Mode 1)	-25dBm error-free 0dBm no damage
Integrated Antenna <sup>3</sup> (EX-4.9r only)	
Gain	20dBi
3dB Beamwidth	15 degrees
Non-overlapping channels	
10MHz channel	5
20MHz channel	2
Aggregate User Capacity <sup>4</sup>	<b>Mode1</b> <b>Mode2</b>
10MHz channel	13Mbps 27Mbps
20MHz channel	27Mbps 55Mbps <sup>2</sup>
Supported T1/E1 ports	<b>Mode1</b> <b>Mode2</b>
10MHz channel	2/2 2/2
20MHz channel	2/2 4/4 <sup>2</sup>
Error Floor	10 <sup>-12</sup>
Latency (T1)	1ms, typical
Maximum packet size	1916 bytes
Link Security	96-bit Security Key AES encryption <sup>2</sup>
Management	HTTP GUI CLI/Telnet SNMPv3 <sup>5</sup>
Regulatory Compliance	FCC Part 90 IC RSS-111

## Physical

Physical Configuration	Outdoor unit (ODU)
Dimensions (H x W x D)	
EX-4.9r (integrated antenna)	14.6 x 14.6 x 2.3 inches 37 x 37 x 5.7 cm
EX-4.9r-c (2x Type-N connectorized)	13 x 13 x 3.5 inches 33 x 33 x 9 cm
Operating Temperature	-40 to +65 degrees C -40 to +149 degrees F
Full Spec Temperature	-40 to +60 degrees C -40 to +140 degrees F

<sup>1</sup> 4.9GHz may or may not be available in all countries. Consult your Exalt Communications representative for details.

<sup>2</sup> Firmware option required

<sup>3</sup> Integrated antenna (EX-4.9r) and external antenna versions (EX-4.9r-c) both have user-selectable polarization switching.

<sup>4</sup> The figure listed is the actual aggregate user throughput, maximum, as measured at layer 2. T1 circuits may be enabled one at a time, as needed, and subtract 3.1Mbps (1.544Mbps full-duplex) from the aggregate user throughput. Some combinations of frame size, link distance, T1 enabling, bandwidth, mode and desired latency will result in reduced maximum aggregate throughput. See your Exalt Communications representative for details.

## Physical (Continued)

Weight	(EX-4.9r-c) 14 pounds; 6.4 kg (EX-4.9r) 12 pounds; 5.5kg
Environmental	NEMA 4/IP56
Altitude	15,000 feet; 4.6 km
Humidity	100% condensing

## Interfaces

RF (x2)	N-type Female, 50 ohm (EX-4.9r-c only)
T1/E1 (x4)	RJ48C/RJ45 (F)
T1 Impedance	100 ohms, balanced
T1 Line Codes	AMI, B8ZS, selectable per channel
T1 Clocking Speed	1.544Mbps
T1 Compliance	ANSI T1.102-1987 ITU-T; G.823; GR-49T-CORE
E1 Impedance	120 ohms, balanced
E1 Line Codes	HDB3
E1 Clocking Speed	2.048Mbps
E1 Compliance	CEPT-1; G.703; ITU-T-G703
Loopback Modes	Remote Internal Remote External Local Line
Ethernet	RJ45 (F), auto-MDIX
Interface Speed	10/100BaseT
Duplex	Half, Full, Auto
Compliance	802.3
Sync (In)	RJ45 (F)
Signaling	1pps (GPS) <sup>5</sup>
AC Power Adapter	
Input	100-240VAC, 1.5A
Output	48VDC, 1.5A, 72W via Power injector

## System Components

Complete link	Two terminals, each with AC adapter, accessory kit, and mounting kit,
Single terminal	One terminal with AC adapter, accessory kit, and mounting kit
Accessory kit	Power injector, weatherproof connector, PoE cable, RSL antenna alignment cable, weatherproofing tape, and grounding hardware (spare)
AC adapter	AC adapter (spare)
Mounting kits	EX-4.9r mounting hardware (spare) EX-4.9r-c mounting hardware (spare)
GPS sync kit <sup>5</sup>	GPS antenna and mounting bracket (optional)

<sup>5</sup> Firmware upgrade required