

New breed of all-outdoor
5 GHz Ethernet bridges

Environmentally
hardened

Highest capacity

Spectrum efficient

Carrier class

Resilient transmission

Dual-polarized integrated
or external antenna

Lowest cost per megabit-
mile

- **Tri-band 5GHz:**
 - 5250 to 5350 MHz
 - 5470 to 5725 MHz
 - 5725 to 5850 MHz
- **10/100BaseT Ethernet + 4xT1/E1**
- **Over 200Mbps user capacity**
- **54 non-overlapping channels (4xT1/E1)**
- **1MHz tuning resolution**
- **>30 miles @ 99.999%***
- **2-year standard warranty****

- ✓ **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
- ✓ **Extend** fiber networks
- ✓ **Future-proof** connections
- ✓ **Expand** capacity of existing systems
- ✓ **Collocate** systems and re-use spectrum

Enterprise, Education & Medical

- Connect campus locations securely
- Eliminate leased line costs
- Install connections instantly
- Carry voice and data connections seamlessly
- Provide high IP traffic bandwidth
- Migrate TDM connections to IP

Government Agencies

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

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
- Add Ethernet capacity to your existing licensed microwave systems
- Avoid interference

Telecommunications Carriers

- Extend networks
- Expand capacity
- Add Ethernet connectivity
- Provide management capability
 - Improve interference avoidance flexibility



The EX-5r and EX-5r-c are the only carrier-class, tri-band, wireless Ethernet bridges that extend and combine the advantages of all available license-exempt 5GHz bands to provide maximum functionality for demanding outdoor wireless connectivity and backhaul applications.

Using very efficient proprietary modulation techniques, resulting in a very narrow occupied RF bandwidth, and utilizing all three license-exempt bands from 5250 to 5850 MHz, the EX-5r uniquely provides up to **54 non-overlapping frequency channels**. It also provides **fine-tuning capability across all of the frequency bands**, with up to **415 center frequencies of operation** and no hardware changes required for retuning. Combined with unique synchronization capabilities, these features result in unprecedented system densities, spectrum re-use, and interference avoidance capabilities compared to other carrier-class systems in these bands.

The EX-5r and EX-5r-c provide excellent system performance and several unique features, such as its simple, hop-in-a-box installation, that result in the **lowest cost per megabit-mile in its class**. The system is available with internally switched, dual polarized integrated antenna (EX-5r) or type-N female connectors (EX-5r-c) for external antenna mounting.

*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.

System

Frequency Bands ¹	5250-5350MHz 5470-5725MHz 5725-5850MHz
Tuning Resolution	1MHz
Output Power (at full power)	
5725-5850MHz band	+24dBm, Mode 1 +21dBm, Mode 2
5470-5725MHz band	+13dBm
5250-5350MHz band	+13dBm
Output Power (at min power)	Full power minus 20dB
Power Control Step Size	0.5dB
Receiver Threshold (guaranteed over temperature @BER=10 ⁻⁶)	
8MHz channel	Mode 1 -86dBm Mode 2 -78dBm
16MHz channel	-83dBm -75dBm
32MHz channel	-80dBm -72dBm
64MHz channel ²	-77dBm -69dBm
Receiver Threshold (typical)	2dB better
Maximum RSL (Mode 1)	-25dBm error-free 0 dBm no damage
Integrated Antenna ³ (EX-5r only)	
Gain	20dBi
3dB Beamwidth	15 degrees
Non-overlapping channels	5.3GHz 5.4GHz 5.8GHz
8MHz channel	10 29 15
16MHz channel	5 14 7
32MHz channel	2 7 3
64MHz channel ²	1 3 1
Aggregate User Capacity ⁴	Mode 1 Mode 2
8MHz channel	13Mbps 27Mbps
16MHz channel	27Mbps 55Mbps
32MHz channel	55Mbps 110Mbps
64MHz channel ²	110Mbps 216Mbps
Error Floor	10 ⁻¹²
Latency (T1/E1)	1ms, typical
Maximum packet size	1916 bytes
Link Security	96-bit proprietary AES encryption ²
Management	HTTP GUI CLI/Telnet SNMPv3
VLAN	802.1Q
Regulatory Compliance	FCC 15.247 FCC 15.407 IC RSS-210

¹ Not all frequency bands are authorized or available for use in all countries. Consult your Exalt Communications representative for details.

² Firmware option required.

³ Integrated antenna (EX-5r) and external antenna version (EX-5r-c) both have user-selectable polarization switching.

⁴ 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.

Physical

Physical Configuration	Outdoor unit (ODU)
Dimensions (H x W x D)	
EX-5r (integrated antenna)	13 x 13 x 4.25 inches 33x 33 x 10.8 cm
EX-5r-c (2x Type-N F 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
Weight	14 pounds; 6.4 kg
Environmental	NEMA 4/IP56
Altitude	15,000 feet; 4.6 km
Humidity	100% condensing
Interfaces	
RF(x2)	N-type Female, 50 ohm (EX-5r-c only)
T1/E1 (x4)	2x 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 GR-499-CORE
E1 Impedance	120 ohms, balanced
E1 Line Codes	HDB3
E1 Clocking Speed	2.048Mbps
E1 Compliance	CEPT-1; G.823; ITU-T-G.703
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)
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-5r mounting kit (spare) EX-5r-c mounting kit (spare)
GPS sync kit	GPS antenna and mounting bracket (optional).