

Spectrum efficient

Software expandable capacity to 200Mbps

Environmentally hardened

Strong link security

Spectrum Analyzer

Single spare serves both ends

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
  - 55 Mbps upgradeable to 100Mbps or 200Mbps
  - AES encryption (option)
  - 54 non-overlapping channels
  - 1MHz tuning resolution
  - >30 miles @ 99.999%\*
  - 2-year standard warranty\*\*

- ✓ **Connect** locations in days, not weeks
- ✓ **Upgrade** capacity of existing systems
- ✓ **Reduce** installation and maintenance costs
- ✓ **Collocate** systems and re-use spectrum
- ✓ **Improve** manageability with SNMPv3
- ✓ **Extend** fiber networks
- ✓ **Avoid** interference
- ✓ **Eliminate** leased line expenses
- ✓ **Secure** wireless backhaul links
- ✓ **Future-proof** connections

#### Enterprise, Education & Medical

- Connect campus locations securely
- Eliminate leased line costs
- Install connections instantly
- Provide high IP traffic bandwidth
- Migrate TDM connections to IP
- Provide management capability and security with SNMPv3 and AES encryption

#### Government Agencies

- Create secure inter-building networks
- Backhaul video monitoring systems with asymmetric transmission
- Implement backbones for private/public access networks

#### Internet Service Providers

- Deploy carrier-class IP backhaul
- Upgrade capacity as needed
- Select 5.3, 5.4 or 5.8GHz bands for greatest installation flexibility.

#### Industrial

- Create high-speed inter-facility IP backbones
- Connect oil drilling platforms, power stations and utility centers
- Avoid interference

#### Telecommunications Carriers

- Extend networks
- Expand capacity
- Add Ethernet connectivity
- Provide management capability
- Improve interference avoidance
- Migrate TDM connections to IP



The EX-5r IP and EX-5r-c IP 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 IP 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 systems uniquely provide up to **54 non-overlapping frequency channels**. They also provide **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, low latency, spectrum re-use, interference avoidance, and carrier-class reliability compared to other Ethernet bridging solutions in these bands.

The EX-5r IP and EX-5r-c IP provide excellent system performance and several unique features resulting in the **lowest cost per megabit-mile in its class**. The system is available with internally switched, dual polarized integrated antenna (EX-5r IP) or type-N female connectors (EX-5r-c IP) 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.



# EX-5r IP/EX-5r-c IP Specifications

## System

Frequency Bands <sup>1</sup>	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 <sup>-6</sup> )	
8MHz channel	<b>Mode 1</b> -86dBm <b>Mode 2</b> -78dBm
16MHz channel	-83dBm   -75dBm
32MHz channel	-80dBm   -72dBm <sup>2</sup>
64MHz channel <sup>2</sup>	-77dBm   -69dBm
Receiver Threshold (typical)	2dB better
Maximum RSL (Mode 1)	-25dBm error-free 0 dBm no damage
Integral Antenna <sup>3</sup> (EX-5r IP only)	
Gain	20dBi
3dB Beamwidth	15 degrees
Non-overlapping channels	<b>5.3GHz</b> <b>5.4GHz</b> <b>5.8GHz</b>
8MHz channel	10    29    15
16MHz channel	5    14    7
32MHz channel <sup>2</sup>	2    7    3
64MHz channel <sup>2</sup>	1    3    1
Aggregate User Capacity <sup>4</sup>	
8MHz channel	<b>Mode 1</b> 13Mbps <b>Mode 2</b> 27Mbps
16MHz channel	27Mbps   55Mbps
32MHz channel	55Mbps   110Mbps <sup>2</sup>
64MHz channel <sup>2</sup>	110Mbps   200Mbps
Throughput Symmetry	5 Modes 20/80; 80/20 35/65; 65/35 50/50
Error Floor	10 <sup>-12</sup>
Latency	1ms, typical
Maximum packet size	1916 bytes
Link Security	96-bit proprietary AES 128/256 encryption
Spectrum Analyzer	Embedded
Management	HTTP GUI CLI/Telnet SNMPv3
VLAN	802.1Q
Regulatory Compliance	FCC 15.247 FCC 15.407 IC RSS-210

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

<sup>2</sup> Firmware option required.

<sup>3</sup> Integral antenna (EX-5r IP) and external antenna version (EX-5r-c IP) both have user-selectable polarization switching.

<sup>4</sup> The figure listed is the actual aggregate user throughput, maximum, as measured at layer 2.

## Physical

Physical Configuration	Outdoor unit (ODU)
Dimensions (H x W x D)	
EX-5r IP (integral antenna)	13 x 13 x 4.25 inches 33x 33 x 10.8 cm
EX-5r-c IP (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
<b>Interfaces</b>	
RF(x2)	N-type Female, 50 ohm (EX-5r-c IP only)
Ethernet (PoE)	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 IP mounting kit (spare) EX-5r-c IP mounting kit (spare)
ExaltSync™ GPS sync kit	GPS antenna and mounting bracket (optional).