

BreadCrumb® LX5

Portable Wireless Mesh Network Node

APPLICATIONS

► MINING

For open pit and underground mines, BreadCrumb devices form a resilient network for mine monitoring and control. Typical applications include emergency rescue, fleet management systems, machine health monitoring, high precision drilling/loading, collision avoidance, voice communications (VoIP) and video.

► MILITARY

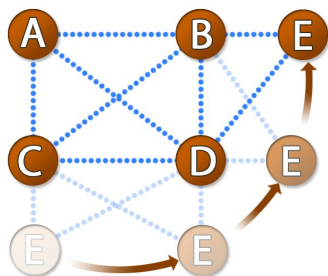
With battery power, rugged enclosures, single-switch operation and robust security, BreadCrumb devices are perfect for military applications such as perimeter security, sensor data collection, video surveillance, convoy security, RFID tracking and more. Depending on BreadCrumb model, security options range from WEP, WPA2, FIPS 140-2 to Suite B.

► FIRST RESPONDERS

BreadCrumb devices form an instant secure network for emergency response, disaster relief, RFID tagging, voice communications (VoIP), laptops, tablets, smartphones, video and sensor applications. The included Ethernet port can provide Internet access through satellite or microwave links.

INSTAMESH®

InstaMesh is an advanced, patented* protocol developed by Rajant that allows for continuous and instantaneous routing of wireless and wired connections. It enables complete network mobility, robust fault tolerance, high throughput and low latency, with very low maintenance and administration requirements. The BreadCrumb devices combine InstaMesh with support for standards in wireless access, security, network monitoring, QoS and much more...



In this diagram, the Rajant mesh network adapts to the changes caused by the movement of Node E. New links are established in real-time keeping the network available, intact and secure.

Because Rajant uses primarily Layer-2 and does not use a root node or LAN Controller, mobility and bandwidth are maximized.

* U.S. Patent 8,341,289 B2

Rajant BreadCrumb® LX5

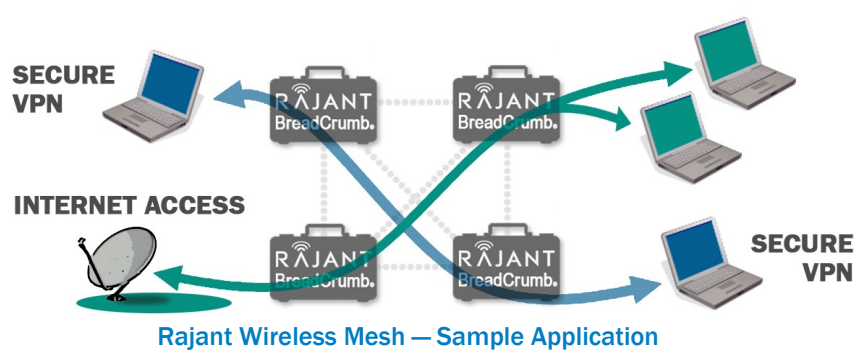
The Rajant BreadCrumb LX5 is a rugged, wireless device that forms a mesh network when used in conjunction with other BreadCrumb devices. The BreadCrumb LX5 contains up to four transceivers, six external antenna ports, and supports IEEE 802.11a/b/g/n protocols to enable data, voice, and video applications. This device can operate in extreme conditions and has several mounting options.



BreadCrumb® LX5 Benefits

- Multiple transceiver configurations support comprehensive applications and deployment environments—900 MHz, 2.4 GHz, 4.9 GHz, 5 GHz as well as military, licensed, public service and other proprietary frequencies.
- Six external antenna ports allow for multiple-input and multiple-output (MIMO) transceivers.
- Supports NSA Suite B cryptography algorithms for data and MAC address encryption and per-hop, per-packet authentication
- Rugged and environmentally sealed.
- Offers high-bandwidth for data, voice, and video applications.
- Ability to scale to hundreds of mobile, high-bandwidth nodes.
- Runs Rajant's patented InstaMesh® routing protocol, so the network quickly adapts to moving network elements.
- Employs IEEE 802.11a/b/g/n standards for compatibility with millions of commercial off-the-shelf (COTS) client devices such as laptops, tablets, smartphones, IP cameras, sensors, and other wired and wireless networking equipment.
- Self-configuring operation for fast and easy deployments.
- Offers multiple simultaneous bridge-mode links to the same Ethernet network through the Automatic Protocol Tunneling (APT) feature.

Rajant BreadCrumb® LX5



BreadCrumb LX5

MODEL	900 MHz (802.11g)		2.4 GHz (802.11n)		5 GHz (802.11n)	
	Transceivers	Antenna Ports per Transceiver	Transceivers	Antenna Ports per Transceiver	Transceivers	Antenna Ports per Transceiver
LX5-2295A	1	1	2	2	1	1
LX5-2295C	1	1	1	2	1	2
LX5-2255A	-	-	2	2	2	1
LX5-2255B	-	-	2	1	2	2
LX5-2255C	-	-	1	2	1	2
			1	1	1	1
LX5-2955B	1	1	1	1	2	2
LX5-2955C	1	1	1	2	1	2
					1	1
LX5-2455	-	-	1	2	2	2

- Custom transceiver configurations are available upon request. May include a mix of licensed, military or unlicensed frequencies.
- 802.11g and 802.11a transceivers utilize one antenna port. 802.11n transceivers may utilize one or two antenna ports depending on LX5 model.
- 802.11n transceivers need two antenna ports to utilize multiple-input and multiple-output (MIMO) capability.
- For 802.11n transceivers, the Max. RF Transmit Power specification is for the combined power output of the two antenna ports.

TRANSCIVER	900 MHz (802.11g)	2.4 GHz (802.11n)	4.9 GHz (802.11a)	5 GHz (802.11n)
Antenna Connector	(1) Type N Female	(Up to 2) Type N Female	(1) Type N Female	(Up to 2) Type N Female
Frequency	902 — 928 MHz	2.402 — 2.472 GHz	4.942 — 4.987GHz	5.735 — 5.835 GHz
Modulation	DSSS, CCK, OFDM	DSSS, CCK, OFDM	OFDM	OFDM
Max. RF Transmit Power*	30 dBm ± 1 dB	29 dBm ± 2 dB	28 dBm ± 1.5 dB	28 dBm ± 2 dB
* RF transmit power is governed by local regulations and varies by frequency.				
Receive Sensitivity	1 Mbps: -97 dBm ± 1 dB 2 Mbps: -95 dBm ± 1 dB 5.5 Mbps: -92 dBm ± 1 dB 11 Mbps: -90 dBm ± 1 dB 6 Mbps: -93 dBm ± 1 dB 9 Mbps: -93 dBm ± 1 dB 12 Mbps: -91 dBm ± 1 dB 18 Mbps: -89 dBm ± 1 dB 24 Mbps: -86 dBm ± 1 dB 36 Mbps: -82 dBm ± 1 dB 48 Mbps: -77 dBm ± 1 dB 54 Mbps: -74 dBm ± 1 dB	1 Mbps: -97 dBm ± 2 dB 11 Mbps: -92 dBm ± 2 dB 6 Mbps: -95 dBm ± 2 dB 54 Mbps: -80 dBm ± 2 dB MCS0/8: -94 dBm ± 2 dB MCS1/9: -93 dBm ± 2 dB MCS2/10: -91 dBm ± 2 dB MCS3/11: -90 dBm ± 2 dB MCS4/12: -86 dBm ± 2 dB MCS5/13: -83 dBm ± 2 dB MCS6/14: -77 dBm ± 2 dB MCS7/15: -74 dBm ± 2 dB	6 Mbps: -91 dBm ± 1.5 dB 9 Mbps: -89 dBm ± 1.5 dB 12 Mbps: -87 dBm ± 1.5 dB 18 Mbps: -84 dBm ± 1.5 dB 24 Mbps: -81 dBm ± 1.5 dB 36 Mbps: -78 dBm ± 1.5 dB 48 Mbps: -75 dBm ± 1.5 dB 54 Mbps: -71 dBm ± 1.5 dB	6 Mbps: -96 dBm ± 2 dB 54 Mbps: -79 dBm ± 2 dB MCS0/8: -94 dBm ± 2 dB MCS1/9: -93 dBm ± 2 dB MCS2/10: -91 dBm ± 2 dB MCS3/11: -90 dBm ± 2 dB MCS4/12: -86 dBm ± 2 dB MCS5/13: -83 dBm ± 2 dB MCS6/14: -77 dBm ± 2 dB MCS7/15: -74 dBm ± 2 dB

Rajant BreadCrumb® LX5

NETWORK & SECURITY

Network	VLAN and QoS support; Access Point; Bridge; Gateway; DHCP; NAT and Port Forwarding; Automatic Protocol Tunneling (APT).
Security	- Multiple cryptographic options including NSA Suite B algorithms. - Separately configurable data and MAC address <i>encryption</i> via AES256-GCM, AES192-GCM, AES128-GCM, AES256-CTR, AES192-CTR, and AES128-CTR. - Configurable per-hop, per-packet <i>authentication</i> between BreadCrumbs via AES256-GMAC, AES192-GMAC, AES128-GMAC, HMAC-SHA512, HMAC-SHA384, HMAC-SHA256, HMAC-SHA224, and HMAC-SHA1. - Supports IEEE 802.11i: AES-CCMP and TKIP encryption, WPA-Personal/Enterprise, WPA2-Personal/Enterprise, 802.1x; 64/128-bit WEP; Access Control Lists; Compatible with Layer-2 and Layer-3 client/server and peer-to-peer security solutions; Compatible with Harris SecNet 54® encryption.

POWER

Input Voltage	24 – 48 VDC
Power Consumption*	3 transceivers: 7 W (average, idle); 26 W (maximum, peak) @ 24 V 4 transceivers: 8 W (average, idle); 33 W (maximum, peak) @ 24 V

* Power consumption depends on transceiver configuration.

INPUT / OUTPUT

Ethernet	(Up to 2) 10/100/1000 Mbps, IEEE 802.3, RJ-45, auto MDI/MDIX
USB	(Up to 2) USB host ports for firmware upgrade, and for GPS device add-on
LED	Status LED
Switch 1	LED Configuration / Zeroize Keys and Restore Factory Defaults Switch
Switch 2	Power On/Off

PHYSICAL

Dimensions	197 mm x 220 mm x 29 mm (7.750" x 8.665" x 1.125")
Weight	1850 g ± 150 g (4 lbs 1.3 oz ± 5.3 oz) (weight depends on transceiver configuration)
Temperature	Storage: -40 °C to 80 °C (-40 °F to 176 °F) Operating: -40 °C to 80 °C (-40 °F to 176 °F)
Humidity	95% (non-condensing)
Enclosure	Designed for IP67 (6: Dust-tight, 7: Waterproof)
Certification	Pending FCC Part 15 (USA), ICES-003 and RSS-210 (Canada)
Warranty	1 Year



► www.rajant.com

Rajant Data Sheets
WEB QUICK LINK

Rajant Corporation • 400 East King Street • Malvern, PA • 19355 • tel 484.595.0233 • fax 484.595.0244

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