

# BreadCrumb® LX

## 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 Miner Tracking, Emergency Rescue, Voice communications (VoIP), Dispatch, Routing, Health Monitoring and Video.

#### ► MILITARY

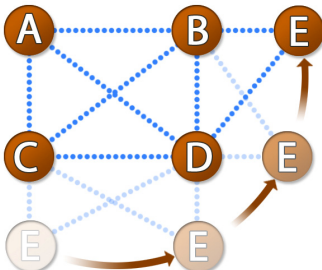
With battery power, rugged enclosures, single-switch operation and robust security, BreadCrumb devices are perfect for military applications such as Perimeter Security, Sensor Data Collection, Video Surveillance, Convoy Security, RFID Tracking and more. Depending on BreadCrumb model, security options range from WEP, WPA2, SecNet 54® to FIPS 140-2.

#### ► FIRST RESPONDERS

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

### InstaMesh®

InstaMesh® is an advanced 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 zero maintenance and administration. The BreadCrumbs 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. Multiple gateways and secure mesh-to-mesh authentication are also supported.

### Rajant BreadCrumb® LX

The Rajant BreadCrumb LX is a rugged, multi-radio, wireless transceiver that forms a mesh network (using InstaMesh®) when used in conjunction with other BreadCrumb devices. This portable, wireless mesh network node contains three radios and supports open-standard IEEE 802.11a/b/g protocols to enable data, voice, and video applications. The available radio configurations are 2.4GHz/900MHz, 2.4GHz/2.4GHz, 2.4GHz/4.9GHz and 2.4GHz/5.8GHz. This full featured device can operate in extreme conditions and has several mounting options.



### BreadCrumb® LX Benefits

- Multiple radio configurations support comprehensive applications and deployment environments—900 MHz, 2.4 GHz, 4.9 GHz and 5 GHz (LoS and NLoS).
- Ability to scale to hundreds of mobile, high-bandwidth nodes.
- Rugged and portable for applications in extreme situations .
- Open-system IEEE 802.11a/b/g standards for compatibility with millions of commercial off-the-shelf (COTS) client devices such as laptops, PDAs, IP cameras, sensors, VoIP phones and other IP devices.
- Runs InstaMesh®, so the network quickly adapts to moving network elements.
- Offers high-bandwidth for data, voice, and video applications.
- Self-configuring operation for fast and easy deployments.
- Data encryption to ensure privacy.
- Supports multiple gateway connections through Automatic Protocol Tunneling (APT), eliminating loops and packet storms.
- Mesh-to-mesh authentication provides secure networking.

### BC|Commander® Management Tool

BC|Commander and BC|Commander Enterprise software tools are used to configure, manage, and monitor your Rajant network.

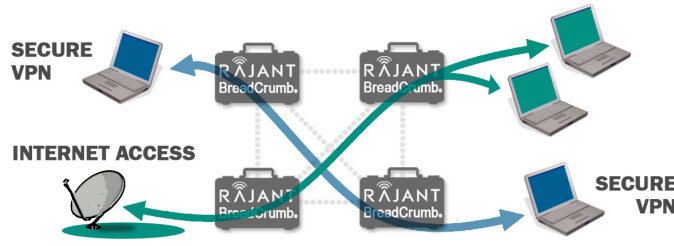
- Topology maps show BreadCrumb and client device connections and parameters.
- BreadCrumb/client device channel, frequency, MAC address, IP address, nickname assignment, signal and noise levels and time-since-last-update.
- Channel and link speed of connections.
- Manual radio, SSID, DHCP, gateway and port forwarding, access control, security, and encryption settings.



Rajant BreadCrumb® LX

MODELS

- LX-2409**  
2.4 GHz/900 MHz
- LX-2424**  
2.4 GHz/2.4 GHz
- LX-2449**  
2.4 GHz/4.9 GHz
- LX-2450**  
2.4 GHz/5 GHz



Rajant Wireless Mesh—Sample Application

**BreadCrumb LX**  
Includes omnidirectional antennas, pole mounting bracket and power supply.

WIRELESS	900 MHz	2.4 GHz	4.9 GHz	5 GHz
Antenna Connector	(1) Type N (f)	(1) Type N (f)	(1) Type N (f)	(1) Type N (f)
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	28 dBm ± 1 dB	26 dBm ± 1.5 dB	28 dBm ± 1.5 dB

\* RF transmit power is governed by local regulations and varies by frequency.

Receive Sensitivity	1 Mbps: -97 dBm ± 1dB	1 Mbps: -97 dBm ± 1dB		
	2 Mbps: -95 dBm ± 1dB	2 Mbps: -96 dBm ± 1dB		
	5.5 Mbps: -92 dBm ± 1dB	5.5 Mbps: -95 dBm ± 1dB		
	11 Mbps: -90 dBm ± 1dB	11 Mbps: -92 dBm ± 1dB		
	6 Mbps: -93 dBm ± 1dB	6 Mbps: -94 dBm ± 1dB	6 Mbps: -94 dBm ± 1.5dB	6 Mbps: -94 dBm ± 1.5dB
	9 Mbps: -93 dBm ± 1dB	9 Mbps: -93 dBm ± 1dB	9 Mbps: -93 dBm ± 1.5dB	9 Mbps: -93 dBm ± 1.5dB
	12 Mbps: -91 dBm ± 1dB	12 Mbps: -91 dBm ± 1dB	12 Mbps: -91 dBm ± 1.5dB	12 Mbps: -91 dBm ± 1.5dB
	18 Mbps: -89 dBm ± 1dB	18 Mbps: -90 dBm ± 1dB	18 Mbps: -90 dBm ± 1.5dB	18 Mbps: -90 dBm ± 1.5dB
	24 Mbps: -86 dBm ± 1dB	24 Mbps: -86 dBm ± 1dB	24 Mbps: -86 dBm ± 1.5dB	24 Mbps: -86 dBm ± 1.5dB
	36 Mbps: -82 dBm ± 1dB	36 Mbps: -83 dBm ± 1dB	36 Mbps: -83 dBm ± 1.5dB	36 Mbps: -83 dBm ± 1.5dB
	48 Mbps: -77 dBm ± 1dB	48 Mbps: -77 dBm ± 1dB	48 Mbps: -77 dBm ± 1.5dB	48 Mbps: -77 dBm ± 1.5dB
	54 Mbps: -74 dBm ± 1dB	54 Mbps: -74 dBm ± 1dB	54 Mbps: -74 dBm ± 1.5dB	54 Mbps: -74 dBm ± 1.5dB

**NETWORK & SECURITY**

Network	VLAN and QoS Support; Access Point; Bridge; Gateway; DHCP; NAT and Port Forwarding; Automatic Protocol Tunneling (APT) feature, which enables multiple simultaneous bridge-mode links to the same Ethernet network.
Security	Supports IEEE 802.11i: AES-CCMP and TKIP encryption, WPA-Personal/Enterprise, WPA2-Personal/Enterprise, 802.1x; 64/128-bit WEP; AES-256 encryption and HMAC-SHA1 authentication between BreadCrumbs; 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 (passive power over Ethernet)
Power	17 W @ 24 V (peak)

**INPUT / OUTPUT**

Ethernet	(2) IEEE 802.3, RJ-45 10/100 Mbps, auto MDI/MDIX
USB	Built-in USB port for firmware upgrades, and for GPS device add-on
LED	Status LED
Switch	Zeroize Keys / Restore Factory Defaults Switch

**PHYSICAL**

Dimensions	21.3 cm x 18.2 cm x 5.7 cm (8.4" x 7.2" x 2.2")
Weight	1.4 kg (3.1 lb)
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	IP67 (6: Dust-Tight, 7: Waterproof)
Certification	FCC Class A (US), IC RS210 (Canada)
Warranty	1 Year



▶ [www.rajant.com](http://www.rajant.com)



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