BreadCrumb® ES1-ATEX1 and ES1-C1D1

HazLoc Wireless Mesh Network Node

Electrical equipment operating in an explosive gas atmosphere must be designed to ensure that the equipment does not produce a spark or reach a temperature that ignites flammable gases or vapors. The Rajant BreadCrumb ES1-ATEX1 and ES1-C1D1 models are IP67 Kinetic Mesh network devices intended for use in Hazardous Locations (HazLoc) with the following regional classifications in zones or divisions which are areas where a mixture is likely to occur in normal operation: ES1-ATEX1 - European & IECEX classification: ATEX Zone 1 (gases); and ES1-C1D1 - North American classification: Class 1 Division 1 (gases).

BreadCrumb ES1-ATEX1 and ES1-C1D1 Features

- Combines Kinetic Mesh backhaul, Wi-Fi access and layer2 switching across interfaces in a single device
- Outdoor rated: -40°C to 60°C temperature range; IP66 and IP68; Stainless steel pole mounting kit and wall mounting kit available
- Rajant's InstaMesh® networking software enables the network to quickly adapt to rapidly-deployed and constantly moving network elements
- 2.4 GHz and 5 GHz radio frequencies support wide variety of applications
- Lightweight, portable, and low power consumption
- Support for several strong cryptographic options used for data and MAC-address encryption and per-hop, per-packet authentication
- High bandwidth for data, voice, and video applications
- Scalability to hundreds of mobile, high-bandwidth nodes
- Integrated Wi-Fi Access Point service for compatibility with millions of commercial off-the-shelf (COTS) client devices

BreadCrumb® ES1-ATEX1 and ES1-C1D1 HazLoc Wireless Mesh Network Node

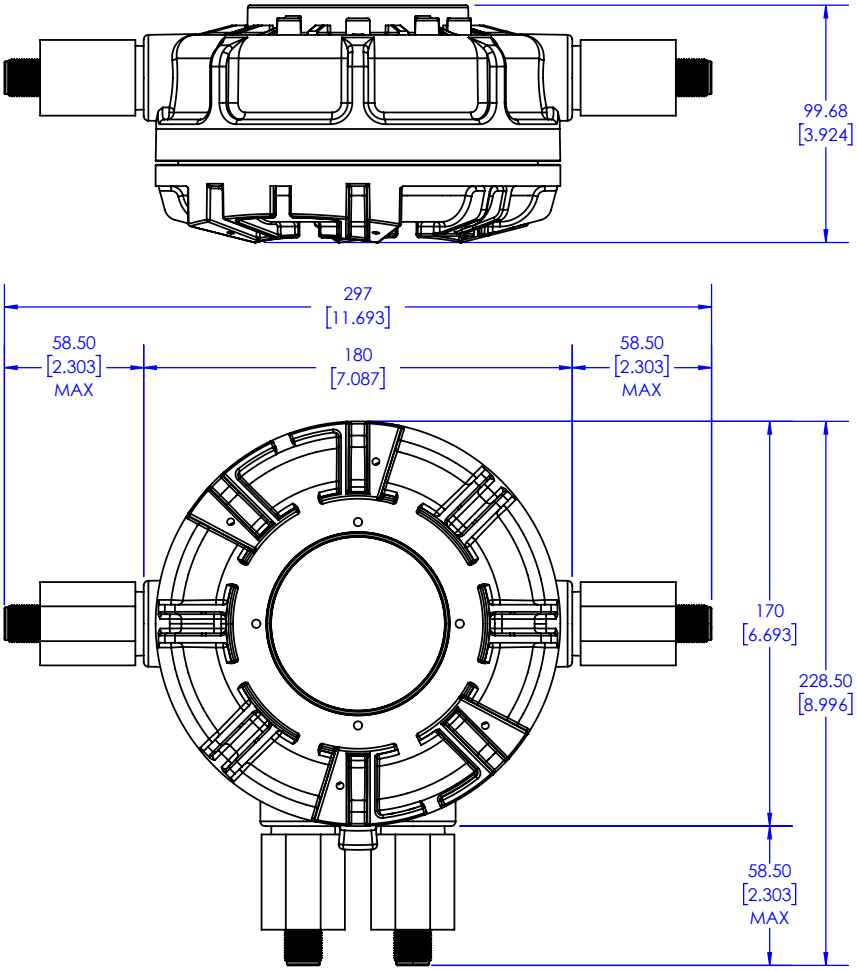
Model	Description
ES1-ATEX1 and ES1-C1D1	ES1 with (1) 2.4 GHz, 1x1 SISO, 150 Mbps and (1) 5 GHz, 2x2 MIMO, 300 Mbps transceivers.

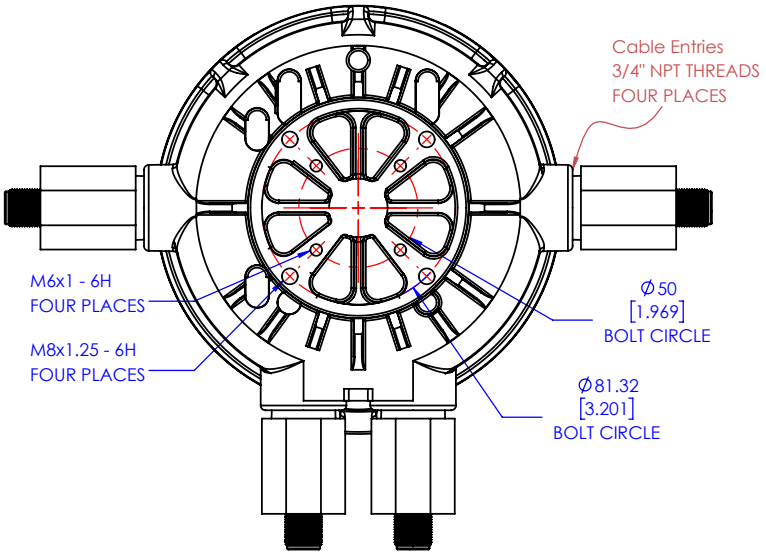
Wireless	2.4 GHz	4.9/5 GHz
Antenna Connector	(1) Type N (female)	(2) Type N (female)
Frequency[2]	2402 – 2482 MHz	U-NII-1: 5150 – 5250 MHz U-NII-2A: 5250 – 5350 MHz U-NII-2C: 5470 – 5725 MHz U-NII-3: 5725 – 5850 MHz
Modulation	DSSS, CCK, OFDM	OFDM
Max. Physical Layer Data Rate	150 Mbps (throughput varies)	300 Mbps (throughput varies)
Max. RF Transmit Power[3]	13 dBm ± 2 dB	13 dBm ± 2 dB
Receive Sensitivity	Varying between -93 dBm ± 2 dB and -72 dBm ± 2 dB	

Network & Security	
Network Functionality	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 (implementation not certified). • Separately configurable data and MAC address encryption via AES256-GCM, AES192-GCM, AES128-GCM, AES256-CTR, AES192-CTR, AES128-CTR, XSalsa20, XSalsa20/12, and XSalsa20/8. • Configurable per-hop, per-packet authentication between BreadCrumbs via AES256-GMAC, AES192-GMAC, AES128-GMAC, HMAC-SHA512, HMAC-SHA384, HMAC-SHA256, HMAC-SHA224, HMAC-SHA1, and Poly-1305-AES. • 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	9-30 VDC, dedicated terminals or Passive PoE
Power Consumption	2.8 W (average, idle); 5 W (maximum, peak) @ 24 V
Input/Output	
Ethernet	Power and Ethernet through same port.
Physical	
Dimensions	See diagram on page 3
Weight	3.54kg (7.8lbs)
Temperature	Ambient (operating): -40°C to 60°C (-40°F to 140°F)
Storage	-40°C to 70°C (-40°F to 158°F)
Enclosure[4]	IP66 and IP68
Certification	• FCC (US): ES1–2450R • IC (Canada): ES1–2450R • ICASA (South Africa): ES1–2450R • MIC (Japan): ES1–2450R • CE mark (European Economic Area, Switzerland and Turkey): ES1–2450R • AS/NZS 4268 (Australia and New Zealand): ES1–2450R • IFT/NOM (Mexico): ES1–2450R • CRC (Colombia): ES1–2450R • Indonesia: ES1–2450R • TRA (United Arab Emirates): ES1–2450R • Kenya: ES1–2450R • India: ES1–2450R • Malaysia: ES1–2450R • ANATEL (Brazil): ES1–2450R • Philippines: ES1-2450R • Guinea: ES1-2450R
Compliance	• Electrostatic discharge (ESD) immunity testing compliant to EN 61000-4-2 • Electrical fast transient (EFT) / burst immunity testing compliant to EN 61000-4-4 • Surge immunity testing compliant to EN 61000-4-5
Warrranty	1 Year
Construction	SWA Aluminum; SWS Stainless Steel

[1] U.S. Patent 8341289B2
[2] Channel, frequency and bandwidth options vary based upon regional and local regulations and certifications.
[3] RF transmit power is governed by local regulations and varies by frequency.
[4] Must be installed with the approved mating connectors. Excessive shock and vibration, temperature extremes or fluctuations may void the manufacturer's warranty.

Product Diagram





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*Industrial Wireless Networks **Unleashed.***