Rajant CU1

Portable Wireless Mesh Network Node

The Rajant CU1 is an IP67 Kinetic Mesh® network device intended for use in harsh environments on everything from heavy-duty machinery to light-duty vehicle applications. The CU1 is ideal for non-autonomous tele-remote construction and mining applications. This portable mesh network node contains two transceivers with up to four external antenna ports and provides Ethernet and Wi-Fi access point interfaces to enable data, voice, and low-bandwidth video applications. Housed in an environmentally robust metal case, the CU1 provides operational ruggedness, outstanding shock and vibration characteristics, and a wide-range temperature rating.

Rajant CU1 Key Features

- Combines Kinetic Mesh backhaul, Wi-Fi access and layer 2 switching across interfaces in a single device

- Outdoor-rated:
    - TBD temperature range
    - IP67 rating for protection against dust and water ingress

- Rajant's InstaMesh® networking software, enables the network to quickly adapt to rapidly-deployed and quickly or constantly moving network elements

- 2.4 GHz, 4.9 GHz and 5 GHz radio frequencies supporting a wide variety of applications and environments

- Embedded ultra-robust, meter-level GNSS receiver with concurrent reception of up to four L1 GNSS (GPS, GLONASS, BeiDou, Galileo) constellation signals. Requires an external GNSS antenna.

- 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 802.11ax Wi-Fi Access Point service for compatibility with millions of commercial off-the-shelf (COTS) client devices such as laptops, tablets, smart phones, IP cameras, sensors, and other IP devices

- Self-configuring operation for fast and easy deployments

- Reliable and fast off-loading to Ethernet via multiple, simultaneous bridge-mode links through Automatic Protocol Tunneling (APT) feature

- Mesh Clustering allows per-BreadCrumb sub-meshes that will only mesh with user-defined nodes

[1] U.S. Patent 9,001,645

Rajant CU1 Advantages

At Rajant, we solve your Wi-Fi and LTE problems by extending the range of standard Wi-Fi and LTE, enabling machine-to-machine communications to see around obstructions, and providing sitewide ubiquitous Wi-Fi coverage to connect to Wi-Fi IoT devices including VoIP handsets.

The CU1 is intended for industrial IoT markets, including mining, construction, airports, oil & gas, utilities, solar, wind, smart cities, and public safety.

This is a robust product that can add connectivity to an existing network. The CU1 can be deployed as a mobile or infrastructure wireless node.

This industrial network node not only offers reliability, performance, and scalability but also security to support virtually any application operating in outdoor environments.

These BreadCrumbs adapt quickly to changing environments to eliminate communication gaps and provide higher reliability than any other wireless network available.

InstaMesh®

InstaMesh is the advanced, patented[1] protocol developed by Rajant that directs the continuous and instantaneous forwarding of packets from wireless and wired connections. It enables complete network mobility, high throughput, and low latency with very low maintenance and administrative requirements. Operating at Layer 2 and not requiring a root node or LAN Controller, InstaMesh provides robust fault tolerance even if there is a connection or node outage. No matter how you configure your network, InstaMesh networking software always determines the most efficient pathway between any two points, even when those points are in motion.

Model	Description
CU1-5250	CU1 with (1) dual-band 2.4/4.94-5.85 GHz, 2x2 MIMO, 573.5/2402 Mbps and (1) 4.94-5.85 GHz, 2x2 MIMO, 2402 Mbps transceivers.

Wireless	Dual-Band 2.4 GHz	Dual-Band 4.94-5.85 GHz	4.94-5.85 GHz
Antenna Connector	(2) Type N (female)	(2) Type N (female)	(2) Type N (female)
Frequency[2]	2402 – 2482 MHz	4940 – 4990 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	4940 – 4990 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 with up to 1024-QAM	OFDM with up to 1024-QAM	OFDM with up to 1024-QAM
Max. Physical Layer Data Rate	573.5 Mbps (throughput varies)	2402 Mbps (throughput varies)	2402 Mbps (throughput varies)
Max. RF Transmit Power[3]	30 dBm ± 2 dB	30 dBm ± 2 dB	30 dBm ± 2 dB
Receive Sensitivity	TBD	TBD	TBD

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). For information on models with full Suite B certification, contact Rajant or your authorized Rajant partner. • 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 encryption, WPA-Personal/Enterprise, WPA2-Personal/Enterprise, iPSK, 802.1x; Access Control Lists; Compatible with Layer-2 and Layer-3 client/server and peer-to-peer security solutions.

Power
PoE
IEEE 802.3bt Type 3 / PoE++ or 41.1 — 57.0 VDC Passive PoE
Power Consumption[4]
TBD

[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] Power consumption depends on transceiver configuration.

Input/Output	
Ethernet	(1) M12 X-Code female connector, 10/100/1000/2500 Mbps, IEEE 802.3, auto MDI/MDIX
USB	USB port for firmware upgrades, and for GPS device add-on (through adapter cable)
LED	Status LED
Switch	LED Configuration / Zeroize Keys and Restore Factory Defaults (through optional adapter cable)

GNSS Receiver					
Supported GNSS systems		GPS/QZSS	GLONASS	Galileo	BeiDou
Signal		L1C/A (1575.42 MHz)	L1OF (1602 MHz + k*562.5 kHz, k = -7,...,5,6)	E1-B/C (1575.42 MHz)	B1I (1561.098 MHz)
Acquisition	**Cold Start**	29 s	27 s	32 s	42 s
	Hot Start	2 s	2 s	2 s	2 s
	Aided Start	2 s	2 s	2 s	5 s
Max Navigation Update Rate	**PVT**	25 Hz	25 Hz	25 Hz	25 Hz
Sensitivity	**Tracking and navigation**	-166 dBm	-166 dBm	-160 dBm	-159 dBm
	Reacquisition	-160 dBm	-156 dBm	-158 dBm	-154 dBm
	Cold Start	-148 dBm	-145 dBm	-145 dBm	-140 dBm
	Hot Start	-159 dBm	-156 dBm	-159 dBm	-154 dBm
Position Accuracy	**PVT**	2.0 m CEP	4.0 m CEP	3.0 m CEP	3.0 m CEP
Antenna	Requires an external GNSS antenna				
Antenna Connector	TNC female				
Power Output for Active Antenna	3.2 V, max 50 mA				

Physical	
Dimensions	180 mm x 158 mm x 51 mm (7.09" x 6.22" x 2.01")
Weight	1080 g (2 lb 6.1 oz)
Temperature	TBD
Enclosure	IP67
Certification	TBD

Updated 09/11/2025

20+ Years OF GAME-CHANGING **WIRELESS**

RAJANT
INTELLIGENT EDGE
Enabling Industrial AI