

Peregrine for Government

Mobile Wireless Mesh Network Node

The Rajant Peregrine for Government BreadCrumb® is Rajant's new quad transceiver industrial-grade, high-performance BreadCrumb platform. The Peregrine for Government supports a maximum combined data rate of 4.3 Gbps and up to 6X enhanced throughput performance over existing BreadCrumbs. It offers multiple MIMO radio interfaces, high throughput, and enhanced security performance with up to 256-QAM and 80 MHz channels.



Peregrine for Government Platform Key Features

- Rajant's patented InstaMesh® networking software enables the network to quickly adapt to rapidly-deployed and quickly (or constantly) moving network elements
- Multiple concurrent transceivers for high levels of network reliability, redundancy and diversity, and fewer problems due to interference, congestion, and equipment outages
- Up to 4.3 Gbps of physical layer data rate combined over four transceivers
- Multiple radio frequencies – 2.4 GHz, 5 GHz, 605 — 1400 MHz, 700 MHz, 1.4 GHz, 3.6 GHz, 4.8 GHz as well as military, licensed, public service, and other proprietary radio frequencies
- Multiple antenna-port configurations with 2x2 MIMO (multiple-input, multiple-output), substantially increasing the capacity of transceivers
- Support for several strong cryptographic options used for data and MAC-address encryption and per-hop, per-packet authentication
- Rugged and environmentally sealed enclosures
- High bandwidth for data, voice, and video applications
- Scalability to hundreds of mobile, high-bandwidth nodes
- Integrated 802.11ac Wi-Fi Access Point and client mode service for compatibility with millions of commercial off-the-shelf Wi-Fi client and access point devices such as laptops, tablets, smartphones, IP cameras, sensors, and other IP devices
- Self-forming and self-healing operation for fast and easy deployments
- Reliable and fast off-loading to Ethernet via multiple, simultaneous bridge-mode links through the Automatic Protocol Tunneling (APT) feature

Utilizing the Peregrine for Government Platform to Your Advantage

The Peregrine for Government is our high-performance BreadCrumb platform. Combined with Rajant's patented InstaMesh protocol, the Peregrine for Government can integrate Kinetic Mesh wireless networks with other networks such as LTE/5G. The Peregrine for Government is part of Rajant's initiative to develop deeply integrated solutions that securely combine data from connected people, vehicles, machines, and sensors, with machine learning. This data combination unlocks the benefits of process optimization, digital twins, predictive analytics, condition-based maintenance, augmented reality, and virtual reality while improving worker safety. The Peregrine for Government is interoperable with all of our BreadCrumb models to expand market capabilities for industries like rail, shipping ports, military, mining, and heavy construction.

InstaMesh®

InstaMesh is the advanced, patented¹ 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
FE1—4431	Peregrine for Government with two 4.8 GHz, 3x3 MIMO, 1300 Mbps, one 3.6 GHz, 2x2 MIMO, 866.7 Mbps and one 1.4 GHz 2x2 MIMO, 866.7 Mbps transceivers. Up to 4.3 Gbps of data rate combined over four transceivers.

Power	
DC Power	20 — 60 VDC
PoE	IEEE 802.3bt Type 3 / PoE++ or 38 — 60 VDC Passive PoE
Power Consumption⁷	4 transceivers: 10 W (average, idle); 34 W (maximum, peak) @ 48 V

Wireless	2.4 GHz	5 GHz	605 – 1400 MHz	700 MHz
Antenna Connector	(2) Type N (female)	(2) Type N (female)	(2) Type N (female)	(2) Type N (female)
Frequency²	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	605 – 1400 MHz	785 – 805 MHz
Modulation	DSSS, CCK, OFDM with up to 64-QAM	OFDM with up to 256-QAM	OFDM with up to 256-QAM	OFDM with up to 256-QAM
Max. Physical Layer Data Rate	300 Mbps (throughput varies)	866.7 Mbps (throughput varies)	866.7 Mbps (throughput varies)	144 Mbps (throughput varies)
Max. RF Transmit Power^{3, 4}	30 dBm	30 dBm	31 dBm (tentative)	31 dBm (tentative)
Receive Sensitivity^{5, 6}	-100 dBm (@ 1 Mbps, 20 MHz channel bandwidth) to -76 dBm (@ 300 Mbps, 40 MHz channel bandwidth)	-94 dBm (@ 6 Mbps, 20 MHz channel bandwidth) to -68 dBm (@ 866.7 Mbps, 80 MHz channel bandwidth)	TBD	-100 dBm (@ 6.5 Mbps, 20 MHz channel bandwidth) to -76 dBm (@ 144 Mbps, 20 MHz channel bandwidth) (tentative)

⁷ Power consumption depends on transceiver configuration

⁸ Weight depends on transceiver configuration

Wireless Cont.	1.4 GHz	2.2 GHz	3.6 GHz	4.8 GHz
Antenna Connector	(2) Type N (female)	(2) Type N (female)	(2) Type N (female)	(3) Type N (female)
Frequency²	1425 – 1525 MHz	2200 – 2300 MHz	3600 – 3700 MHz	4800 – 4940 MHz
Modulation	OFDM with up to 256-QAM	OFDM with up to 256-QAM	OFDM with up to 256-QAM	OFDM with up to 256-QAM
Max. Physical Layer Data Rate	866.7 Mbps (throughput varies)	866.7 Mbps (throughput varies)	866.7 Mbps (throughput varies)	1300 Mbps (throughput varies)
Max. RF Transmit Power^{3, 4}	30 dBm	31 dBm (tentative)	28 dBm	32 dBm
Receive Sensitivity^{5, 6}	-100 dBm (@ 6.5 Mbps, 20 MHz channel bandwidth) to -76 dBm (@ 144 Mbps, 20 MHz channel bandwidth)	-100 dBm (@ 6.5 Mbps, 20 MHz channel bandwidth) to -76 dBm (@ 144 Mbps, 20 MHz channel bandwidth) (tentative)	-99 dBm (@ 6.5 Mbps, 20 MHz channel bandwidth) to -75 dBm (@ 144 Mbps, 20 MHz channel bandwidth)	-96 dBm (@ 6.5 Mbps, 20 MHz channel bandwidth) to -74 dBm (@ 144 Mbps, 20 MHz channel bandwidth)

Network & Security

Network Functionality	VLAN and QoS support; Access Point; Bridge; Gateway; DHCP; NAT and Port Forwarding; Automatic Protocol Tunneling (APT).
Security	<ul style="list-style-type: none"> 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 and TKIP encryption, WPA-Personal/Enterprise, WPA2-Personal/Enterprise, iPSK, 802.1x; 64/128-bit WEP; Access Control Lists; Compatible with Layer-2 and Layer-3 client/server and peer-to-peer security solutions.

¹ U.S. Patent 9,001,645

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 Transmit power tolerance is ± 2 dB

⁵ Receive sensitivity tolerance is ± 2 dB

⁶ Receive sensitivity criteria is less than 10% packet error rate (PER)

Input/Output

Ethernet	(2) M12 X-Code female connector, 10/100/1000 Mbps, IEEE 802.3, auto MDI/MDIX
USB	USB 2.0 Type A female host port for firmware upgrade, USB-based zeroize and GPS device add-on
LED	(2) Status LED
Switch	LED configuration / zeroize keys and restore factory defaults (reset) switch
PWR	M12 L-Code male connector for DC power

Physical

Dimensions	264.9 mm x 253.7 mm x 46.2 mm (10.43 in x 9.99 in x 1.82 in)
Weight⁸	2946 g (6 lbs 7.9 oz)
Temperature	Startup: -40 °C to +70 °C (-40 °F to 158 °F) Ambient (operating): -40 °C to +70 °C (-40 °F to 158 °F) Storage: -40 °C to +80 °C (-40 °F to 176 °F)
Enclosure	Designed for IP67 (6: Dust-tight, 7: Waterproof)
Certification	
Warranty	1 year