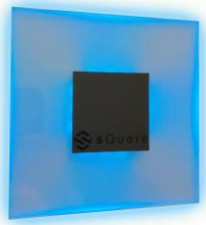
IoT Infrastructure



sQuare Cardinal

Wi-Fi/BLE Gateway and Wi-Fi Mesh Node

The combination of the Cardinal Module with the sQuare Emotional IoT Assistant offers a sophisticated, integrated solution that leverages the strengths of both technologies. This innovative combination yields several benefits to customers across various industries such as warehousing, underground/tunnel operations, museums, and cinemas.

The sQuare Cardinal is a wall mounted device that is an elegant 18cm square. It is equipped with RGB led for notification and interaction with the people around it. The light creates a halo around the device to illuminate the surrounding wall.

It is designed as visual user interface, an IoT Hub, and a Wi-Fi connectivity platform. Together it can provide environmental information to nearby users and to a central monitoring system (such as a BMS).

The sQuare Cardinal operates as Wi-Fi/BLE gateway and IoT hub, receiving BLE information from the sensors and publishing MQTT messages. It is a powerful infrastructure wireless network node bringing the benefits of Rajant Kinetic Mesh Networking and Instamesh.

The sQuare Cardinal extends the range of traditional Wi-Fi past the limitations of fixed infrastructure with no line-of-sight requirements using two transceivers having a combined data rate of 1.73 Gbps. The device offers also edge computing for processing sensor messages and creating sensor fusion with synthetic data streams.

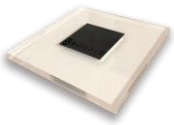
Key Features

- A wireless IoT hub to receive sensor data over BLE and process into MQTT messages
- Sends messages to actuators placed in the area to perform actions
- Show through the lighting status: alerts, notices, environmental parameters
- Works as an edge computing gateway for processing sensor messages and creating sensor fusion with synthetic data streams
- Sends MQTT data to server or BMS for use in applications
- Ability to connect WiFi client devices to the network
- Extended range for Wi-Fi connectivity to clients and wireless backhaul to the LAN without wires
- Ability to connect natively to Cowbell and any edge processor
- Low-cost installation (no external antennas, ethernet wires, etc just electricity)
- Show Cardinal's status with LED (helps deployment and troubleshooting)

Benefits and Value

At Rajant, we solve your Wi-Fi problems by extending the range of standard Wi-Fi, enabling machine-to machine communications to see around obstructions, and providing sitewide ubiquitous Wi-Fi coverage. Rajant Kinetic Mesh® enables operations to become smarter, more autonomous, and more mobile. The sQuare Cardinal is intelligent, self-optimizing, and uniquely able to support M2M connectivity between equipment and people with full operational mobility.

Kinetic Mesh coverage solves potential IoT device connectivity issues and eliminates communication gaps in difficult environments.



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Benefits and Value

1. **Seamless Integration and Scalability**: With the capability to connect natively to a Cowbell edge processor, and support for WiFi client devices, the product offers a flexible and scalable solution. It serves as an efficient IoT hub that can integrate with a variety of devices and systems, allowing businesses to scale up their IoT infrastructure as needed without significant additional investment.
2. **Simplified Installation and Maintenance**: The low-cost installation, which requires no external antennas, long Ethernet wires, or complex infrastructure, just electricity, significantly reduces initial process and complexity. The direct ingress to LAN or wireless backhaul also eliminates the need for traditional wired network infrastructure, further reducing costs and complexity. Its design for easy provisioning and the ability to show Cardinal's status for deployment and troubleshooting streamlines maintenance efforts and reduces the need for specialized technical support.
3. **Operational Efficiency and Cost Savings**: This device is a combination of an IoT hub, lighting, user interface, WiFi connectivity and wireless backhaul; all of which a typically purchased as independent systems. By offering a single integrated system, users have a significantly lower cost of ownership than they could get from doing their own integration of each technology.
4. **Edge Performance Savings:** By serving as an edge computing gateway, the product allows for the processing of sensor messages and sensor fusion with synthetic data streams on-site. This reduces the need for data to be sent to a server or BMS for processing, lowering bandwidth costs and decreasing response times for automated systems.
5. **Enhanced Environmental Monitoring and Automation**: By integrating sensor data processing with smart lighting, this solution offers real-time environmental monitoring, such as tracking temperature, humidity, and occupancy levels. It can automatically adjust lighting and climate control systems in response to environmental changes or occupancy, improving comfort and safety while reducing energy consumption.
6. **Aesthetic value**: The value of having a device that can be shown proudly in view of their customers. A design made of shapes and colors which they can leverage to promote the product and capabilities .

InstaMesh®

InstaMesh is the advanced, patented protocol developed by Rajant that directs the continuous and instantaneous forwarding of packets from wireless and wired connections.

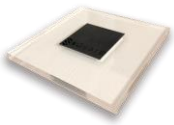
It enables complete network mobility, high throughput, and low latency with very low maintenance and administrative requirements.

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.

RAJANT

SPEC SHEET



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Product Features	
Product Code	50.100004.027
User interface	12 dots Led strip WS2812B for Wi-Fi and IoT status PMMA transparent laser dotting panel
Tag detection	Detection up to 60 meters (BLE and WiFi 2,4GHz)
Power Supply	POE by AG1 RJ45 connector 24-53V DC 10-53 VDC (12/24/48) 3pin connector
Receiver Sensitivity	Noise Suppression Receiver (NSR)
Connector interface	AG1 - RJ45, USB A, 3pin DC power | IoT – USB micro B
Ethernet	10/100/1000, auto MDI/MDIX, RJ45, VDC passive PoE
Wireless Connectivity	WiFi dual-band 2.4/5 GHz
Internal memory (gateway)	4MB
Max Data Rate	300 Mbps | 866.7 Mbps | 866.7 Mbps
Wi-Fi AP Frequency	2402 – 2482 MHz | 5150 – 5850 MHz |
Wi-Fi AP TX power	25 dBm
Wi-Fi AP antenna gain	5 dBi
Wi-Fi IoT Frequency	2402 – 2482 MHz
Wi-Fi IoT TX power	14 dBm
Wi-Fi IoT antenna gain	2 dBi
IoT BLE	Bluetooth v4.2 and Bluetooth LE specific
IoT BLE TX power	14 dBm
IoT BLE antenna gain	2 dBi
Wi-Fi Security	Open, WEP, WPA, WPA2
Supported Protocols	IP, TCP, UDP, ARP, ICMP, HTTP, DHCP
Operating Temperature	-10°C / +50°C
Protection	IP20
Size and weight	180x180x40 mm - 450 gr
Warranty	1 year
Certifications	CE, FCC, IC * all *pending**