Ridgetop Group Inc
Engineering Innovation

Sentinel Gateway™

Features

- Edge computing with cloud compatibility and embedded data analytics for near real-time diagnostics
- Secure wireless access point and dual band connectivity
- Advanced smart router functionality with a secure network drive and 1 TB SSD storage
- Dead reckoning GPS receiver

Applications

- Coordinates the IoT RotoSense network of intelligent sensors for advanced rotational and vibration analysis by routing, processing, and storing the wireless accelerometer and temperature data.
- Host and deploys customized software programs for data acquisition, analysis, and alerting methods such as email, text, or SMS.
- Flexible communication protocol is robust and scalable for warehouses, shipping ports, constructions sites, and other industrial/commercial applications

Description

The **Sentinel Gateway** is an industrial IoT data acquisition server that is complete with edge analytics and customized software programs for unique applications. The Sentinel Gateway was originally designed to coordinate a low power 2.4 GHz IEE 802.15.4 network for the RotoSense family of smart sensors. The gateway was later enhanced with a Linux based single board computer (SBC) that provides other connectivity options such as Ethernet, Cellular, and dual-band Wi-Fi. This innovative toolbox and multiple Ridgetop Group sensor designs have been evaluated in the aerospace industry and the railroad industry.

Aerospace applications include monitoring helicopter gearbox systems with a wireless accelerometer or the flexing of the rotary blades with a Wi-Fi based Fiber Bragg Grating sensor. Railroad applications include correlating track features with a built-in GPS module, monitoring the ride quality of a train's bogie or frame system, and diagnosing anomalous events on the rotating components such as the wheels hubs or bearings. All such practices are scalable to wide variety of additional applications.

Sentinel Gateway

When used with RotoSense, the Sentinel Gateway hosts the Sentinel MotionView software application on a secure network drive. The intuitive software platform allows users to interact with the RotoSense network by acquiring wireless accelerometer data, processing that data, and making it available via the network drive where it can be exported to the cloud or processed with advanced data analytics tools such as MATLAB, Microsoft Excel, and more.
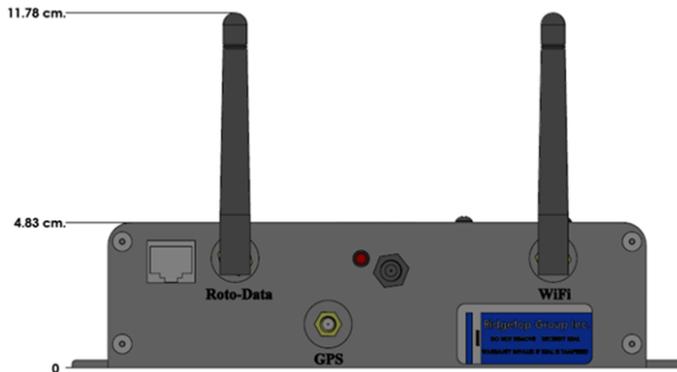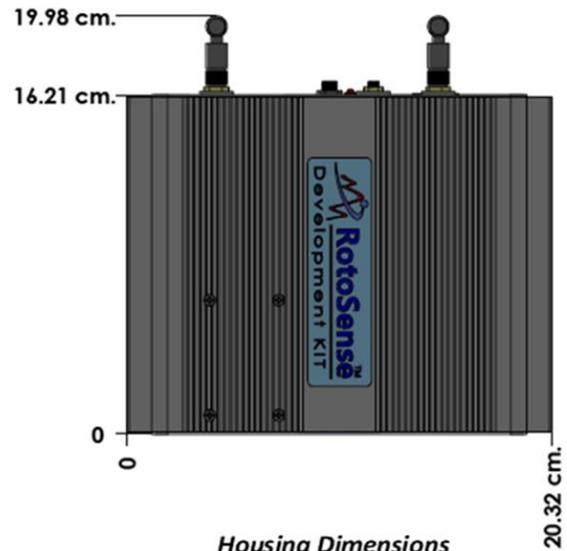
Sentinel Gateway Application Diagram
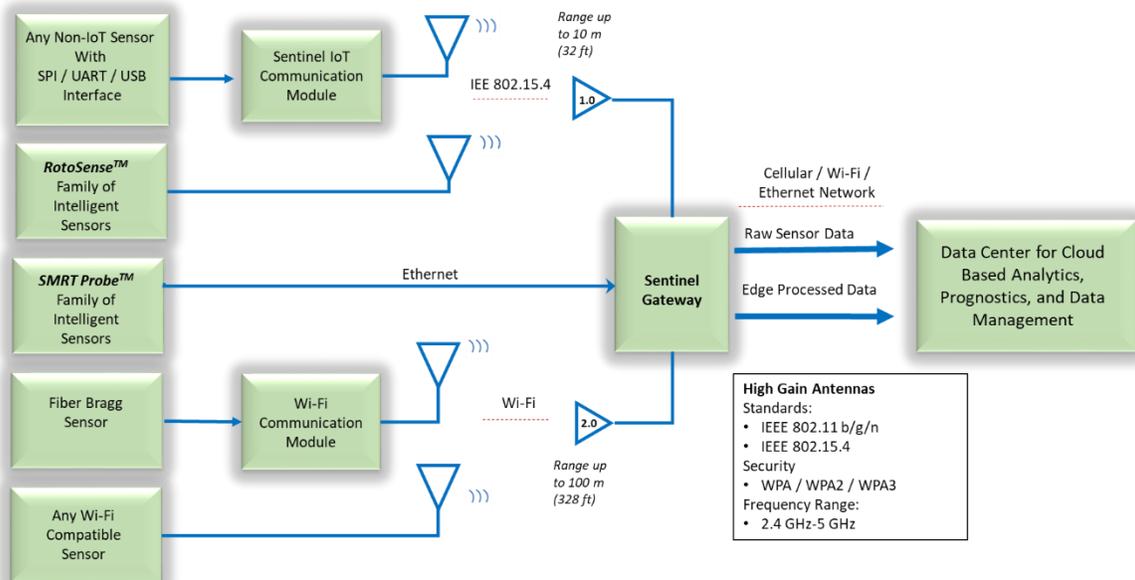
Sentinel Gateway Construction

Interface Panel

Housing Dimensions

Electrical and Mechanical Specifications

SENSOR PARAMETERS	Specifications
Protocol / Standard	Sentinel IoT: IEEE 802.15.4 Wi-Fi: IEE 802.11 b/g/n
Frequency Range	Sentinel IoT: 2.4GHz Wi-Fi: 2.4 GHz – 5 GHz
Transmission Rate	Sentinel IoT: 22 Kb/s Wi-Fi: 250-500 Kb/s
Security	Sentinel IoT: Binary Wi-Fi: WPA/WPA2/WPA3
Range	Sentinel IoT: 10 m (32 ft) Wi-Fi: 100 m (328 ft)
IP Addressing	Dynamic and Static IP support
Storage	1 TB SSD
SBC Processor	Intel Celeron N3160
SBC Operating System	Linux Ubuntu
SBC Memory	4 GB DDR3L Dual Channel RAM
GPS	Dead reckoning GPS receiver (NMEA-0183 standard output)
RotoSense Data Downloading	1 -2 minute download time for full memory buffer mode/streaming mode
Networking	Private network or join existing network
Connectivity Interfaces	Wi-Fi Access Point or Wired Ethernet Port
Power Input	12 [V] 3 [A] locking barrel power supply
*Operating temperature	0°C to 70 °C
ASSEMBLY PARAMETERS	Specifications
*Dimensions	20.3 cm x 16.2 cm x 4.8 cm (Length x Width x Height)
*Weight	1.071 kg (2.362 lbs.)
*Enclosure material	Aluminum alloy

*Specifications are application specific and subject to change.