OmniSense G-900-E Wireless Gateway Product Brief

Overview

The OmniSense FMS G-900-E Gateway connects the OmniSense FMS family of Sensors to a 10/100 Ethernet LAN. It combines an x86 based embedded Linux web server and a 900MHz wireless transceiver into a compact enclosure. A Gateway constantly monitors for any Sensors attempting a connection. When a connection with a Sensor is established the Gateway will typically read out the Sensor's log file containing the measurements the Sensor has taken, and then relay that data over an internet connection to the OmniSense FMS Database Server. The Gateway can also, on command from the FMS Web Server, update the Sensor's time of day, read out the Sensor's stored GPS position[1], and even perform an in-service firmware upgrade of the Sensor's operating firmware. The software in the Gateway can also be upgraded while the Gateway is in service. One Gateway can cover an area of roughly 100 meters in diameter and support more than 1000 sensors[2]. Multiple Gateways can be used together to provide full coverage of larger areas.

Embedded Web Server

The G-900-E Gateway uses an Intel x86-compatible processor running an embedded Linux operating system to run the processes which enable connectivity to a LAN and or the internet. The Gateway runs all the common protocols necessary for true plug and play operation with most common LAN and WAN environments. In most applications the Gateway can be plugged in and with no user configuration it will relay Sensor data to the OmniSense FMS web site.

Wireless Link

The G-900-E Gateway uses the 915 MHz frequency band which the FCC permits unlicensed use for Industrial, Scientific and Medical (ISM) purposes under FCC Part 15.247. Within that band the G-900-E uses a technique known as Frequency Hopping Spread Spectrum (FHSS) to minimize the chance of interference with other devices sharing the same frequency band. The use of 127 different hopping channels virtually guarantees an error free link can be established between a Gateway and Sensors even in the presence of other devices, including other Gateways, sharing the same frequency band. The system uses both a Network Address (like your zip code) which is

[1] Permanently stored by the OmniSense Installer at time of installation
[2] Assuming the Sensors report in once per hour

common to all Gateways and Sensors at a site and a Device Address (like your street address) which is unique to every Gateway and Sensor. The combination of addresses ensures a reliable, secure, error free link between Gateways and Sensors.

Network Security

The G-900-E is totally secure and hacker-proof by design. Hackers can not gain access to your network through a G-900-E. This is accomplished not through clever encryption or passwords but through a simple fact of the system's architecture. A gateway only does one thing; it reads data from the sensor and relays that data to a pre-programmed IP address. A gateway accepts no commands from a sensor and it can not be configured or controlled from the wireless interface. Simply stated, accessing other devices on your LAN through a G-900-E is not possible.

Ethernet Interface

The LAN interface technical specifications are as follows:

- Ethernet Version 2.0/IEEE 802.3
- RJ45 Ethernet 10Base-T or 100Base-TX auto sensing
- ARP, UDP/IP, TCP/IP, Telnet, ICMP, SNMP, DHCP, BOOTP, TFTP, Auto IP, SMTP and HTTP
- Management – Internal Web Server, SNMP, Telnet Login
- 10/100 Activity LED

Power Requirements

The gateway should be powered using the supplied AC to DC power adapter.

- Supply connector dimensions - 2.1 mm ID x 5.5 mm OD x 12 mm L
- Supply voltage - 3.3 VDC
- Maximum supply current - 250 mA

Specifications

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Specifications

Parameter	Min	Typ	Max	Units
Operating Temperature	-40	25	85	°C
Storage Temperature	-40		85	°C
Operating Humidity	0		95	%RH[3]
Operating Voltage		3.3		Vdc
Operating Current Active		200		mA
Gateway Length		4.25		Inches
Gateway Width		2.625		Inches
Gateway Height		1.25[4]		Inches
Gateway Weight		3		Ounces
Wireless Frequency Band	902		928	MHz
Wireless Transmit Power		10		dBm
Wireless Range		100[5]		m
Wireless Channels		127		Channels
Wireless Channel Separation		200		KHz

[3] Non-condensing
[4] Excludes antenna
[5] Varies based on many factors including the presence of obstacles such as concrete walls and interference from other electronic equipment

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