

GCN-533 Geolocation Cluster Node

Product Data Sheet

Description

The GCN-533 Cluster Node is part of Omnisense's Series 500 geolocation system. It is a robust IP67 rated industrial grade battery powered wireless sensor device which provides positioning and sensory information describing its motion and behaviour.

The Series 500 Geolocation system comprises a number of nodes which form a mesh network in which the devices measure the precise time-of-arrival of radio signals transmitted by neighbours. The sophisticated Omnisense Joint Time and Location Engine uses the measurements to compute the positions of the nodes relative to others in the network to high precision (1 m under good condition), both indoors and outdoors.

In addition to the 2.4 GHz IEEE 802.15.4a radio transceiver usable up to 400 m range in good conditions. Each GCN-533 device also contains three-axis accelerometers, magnetometers, rate gyroscope (P version) and an altimeter, which are used to measure movement of the node. The high performance version supports strap-down inertial navigation for demanding real-time applications.

It has one or two two connectors fitted (depending on version). It can be operated from a DC power source in the range 4.5 to 30 V DC such as a vehicle battery or solar panel. Its internal battery provides for weeks of backup operation. It also supports several optional auxiliary interfaces including digital I/O and serial ports allowing easy connection to external equipment.

Ordering

The GCN-533 Cluster Node is normally supplied as part of a Series 500 Geolocation System. Three versions of the node are offered:

- GCN-533, standard node with single 6-pin connector for power or re-charging;
- GCN-533P, higher performance version used for hard real-time applications and those requiring external interfaces (second connector);
- GCN-533C, used as a WSN gateway with the Omnisense CLS503 Collector.



Example Applications

The GCN-533 is primarily designed for outdoor and vehicular applications:

- Site level logistics
- Warehouse and yard management
- Construction sites for larger assets
- Mining: underground and open cast
- Defence, including GPS-denied situations
- General purpose rugged outdoor use

The GCN-533 nodes can be freely mixed with GCN-523 nodes in a Series 500 Geolocation Cluster System; they offer similar functionality, but different form factor and environmental specifications.

Contact Information

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Specifications

Accuracy	± 2 m 95%, ± 1 m CEP under good propagation conditions: line-of-sight or near-line-of-sight in a relatively uncluttered environment. Accuracy is independent of distance between nodes. Full 3D positioning.
Range	Up to 400 m under ideal radio path conditions, less in obstructed conditions. A typical outdoor working range is 200 m.
Antenna	Dual internal chip antennas, omnidirectional with polarisation diversity.
Frequency of operation	2.4 GHz ISM band using IEEE 802.15.4a
Radio	50 mW (+17 dBm)
Network Protocol	Proprietary - tree and mesh architecture, supporting mobility
Measurement	2 ms duration, repetition rate dependent on network, typical intervals between 0.5 s and 60 s.
Battery	NiMH internal rechargeable - 2xAA cells, in separate battery compartment
Battery life	Typically 7 days, actual battery life depends on usage. Battery voltage reporting and low battery warning
Recharging time	Approximately 8 hours
External Power	4.5-30 V DC, maximum 100 mA Suitable for direct connection to vehicle battery or solar panel.
Sensors	3 axis accelerometer, 3 axis magnetometer, Temperature 3 axis rate gyroscope and Altimeter (optional: P version)
Motion detection	Mean and peak activity levels in each measurement cycle. Full attitude: heading, pitch and roll
Display and User controls	None
External Interface (optional)	2 x open collector outputs (1A) 2 x inputs, normally open, for dry contact or open collector inputs 2 x RS232 serial ports, 1 x USB 2.0 port
Size	120 mm x 60 mm x 60 mm
Weight	Approximately 200 g
Environmental	-25°C to +65°C, non-condensing, IP67 rated
Approvals	CE, ETSI and FCC compliant (pending).

