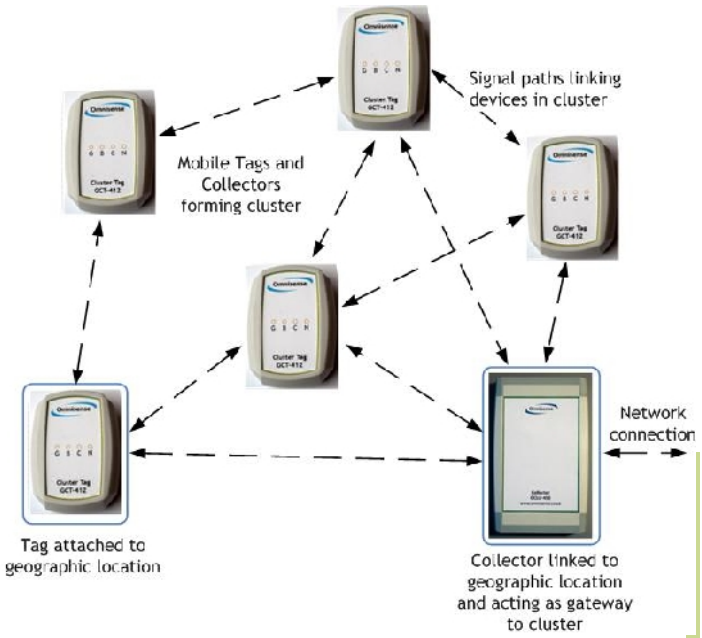
Cluster Geolocation: Series 400

The Omnisense Series 400 Geolocation system provides a unique fusion of technologies including relative positioning of neighbouring devices which enables the system to be deployed without the need to install any infrastructure. Devices within a neighbourhood form an adhoc mesh network which is used for both communications and relative positioning. Assets to be monitored (people or things) are provided with Cluster **Tags** and one or more **Collector** devices is used to feed position, velocity and orientation data for the tags via a network connection to the application software.

Series 400 devices are optionally equipped (refer to Table 1 below) with GPS and Inertial sensors which are used in conjunction with the radio cluster communications to provide seamless geolocation capability across mixed environments including indoors and outdoors.

The Series 400 Cluster Geolocation system is unique in its ability to provide high accuracy continuous location data about assets across **indoor-outdoor** environments in a flexible instantaneously deployable architecture without the need for any permanent infrastructure.



Tag	Inertial	High-performance GPS	Low-power GPS	Advanced Location Engine	Ethernet	Wi-Fi	GPRS	Display	RFID Reader	Rechargeable Battery	Primary Battery	When	Suitable for
GCT 411	✓									✓		Now	Personnel tag; e.g. mines
GCT 412	✓	✓								✓		Now	Personnel: indoor/outdoor, 1st responder, industrial
GCT 413	✓	✓					✓			✓		Q2	Wide area; e.g. healthcare, transport
GCT 421	✓										✓	Q2	Asset tag (indoor): e.g. Livestock
GCT 422	✓		✓								✓	Q2	Asset tag (indoor/outdoor): e.g. Livestock
GCT 423	✓		✓				✓				✓	Q2	Wide area assets; e.g. horses, equipment
GCT 424											✓	Q1	Very low cost “beacon”; e.g. healthcare, mining
GCT 431	✓	✓								✓		Now	Long range: e.g. defence, mining, first responder
GCT 432	✓	✓					✓			✓		Q2	Long range wide area tracker: e.g. transport
Collector													
GCLU 451	✓	✓		✓	✓			✓		✓		Q1	Standard Collector with Graphical Display
GCLU 452	✓	✓		✓	✓					✓		Now	Standard Collector with Ethernet (IP) connectivity
GCLU 453	✓	✓		✓	✓	✓				✓		Q2	Wi-Fi connected GCLU
GCLU 454	✓	✓		✓	✓		✓			✓		Q2	Wide area GPRS/3.5G connectivity
GCLU 471	✓	✓		✓	✓			✓	✓	✓		Q2	Portable RFID reader: e.g. theme parks, construction

Table 1: Series 400 Product Family Feature Chart

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System	
Technology	802.15.4 (ZigBee) - ranging GPS Inertial: accelerometer & gyroscope
Accuracy	±2 m dependent on configuration
Start-up	< 1 minute typically
Output	Position, speed and orientation
Update rate	1 second to 1 hour configurable
Frequency	2.4 GHz band (selectable channel)
Range	50m to 1km
Tags	Up to 200+ depending on update rate
Battery Life	Hours to Years depending on options Rechargeable or Primary battery
Collector	At least 1 to provide connectivity
Interconnect	Ethernet 10/100 Base-T (IP)
Resilience	Devices fully independent

Application Data Feed	
Interface	Ethernet Wi-Fi optional GPRS/3.5G optional
Protocol	TCP/IP
Data Stream	XML formatted data feed NMEA option available
Content	Position, Speed, Orientation, Context
Position	Cartesian X, Y, Z (metres) Optional WGS84
Update Rate	Configurable: 1 second to 1 hour

Cluster Tag	
Size	70 x 50 x 20 mm standard 120 x 75 x 20 mm long range
Weight	~40 g, ~80g long range
Battery life	8 to 168 hours rechargeable up to 5 years primary Dependent on configuration
Battery	Rechargeable Lithium Ion Primary alkaline (replaceable)
Antenna	Internal for standard Tags External whip for long range Tags
Radio approval	EN 300 440, European SRD
RF Power	10 mW peak (2.4 GHz band)
User Interface	LED indicators No user controls

Collector	
Size	120 x 75 x 20 mm plus antenna
Processor	Embedded for advanced location
OS	Embedded Linux
Location	Omnisense Joint Timing & Location Engine (JTLE) providing advanced hybrid speed and location calculations
Mounting	Completely mobile (integrated Tag) Can be fixed if required
Interface	Ethernet, optional Wi-Fi, 3.5G
UI	Local push buttons and LEDs Remote via Ethernet Optional graphics display
Throughput	Up to 10 tag positions per second
Data Logging	Flash storage for local recording
Diagnostics	Extensive system health monitoring

Description

A typical application will comprise one or more Collectors and a number of Tags associated with the person or asset being monitored. Any combination of devices within the Series 400 range can be used in a system.

At least one Collector is used to provide a data connection to the application. Multiple collectors can be used to provide redundancy and increased data throughput if required.

For longer range applications the GCT-431/2 Tags provide extended coverage up to 1km range. It is not necessary for all Tags to be within range of one another provided that interconnectivity across the group can be established via multiple radio hops.

For applications in which Tags (or Cluster units) move completely out-of-range the GPS can provide wide area coverage and the optional GPRS/3.5G connectivity real time data monitoring capability.

In addition to standard products, Omnisense is willing to undertake customisation to the specific needs of an application.

Prices and availability of equipment supplied on request, info@omnisense.co.uk.

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