



ESSENSIUM

# LOST<sup>®</sup> Sensor Tracking

## Location System for Sensor Tracking Real Time Location System in Logistics

- ❑ LOST is a unique **real time positioning** solution for **indoor and outdoor** applications. It combines **sub-meter accuracy** with **low infrastructure cost**.
- ❑ LOST enables **reliable supply chain management** and **efficient asset and goods tracking**.

### Overview

The LOST system is the solution for most Real-Time-Location problems in indoor and outdoor environments. It provides solutions for applications in logistics, people and asset tracking. It performs indoor and outdoor vehicle tracking in warehouses and docking areas, preventing any missing link and assuring a fully controlled and reliable supply chain management. With its high accuracy and long range, combined with low infrastructure requirements, LOST brings RTLS technology to the maturity point where it can enable significant efficiencies in the logistics industry, providing competitive advantage and quick ROI for its adopters.

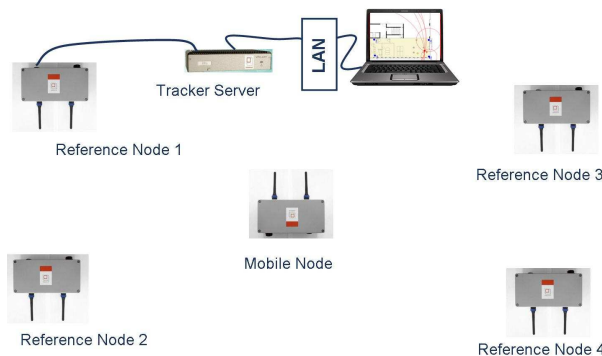


Figure 1: Minimum LOST setup

### Typical System Configuration

Essensium's LOST RTLS system requires at least four Reference Nodes (RN) with known positions, located around the perimeter of the tracking zone, and one or more Mobile Nodes (MN) whose location is sought. This minimum configuration is shown in Figure 1. By measuring the time-of-flight of a dedicated LOST radio signal between each of the reference nodes and the mobile nodes, their distances can be derived. This distance information is communicated wirelessly (via an 802.15.4 interface) to a gateway Reference Node which is connected via Ethernet to a tracker-server. The tracker-server runs the LOST software, translating distances into positions of the mobile

nodes. The tracker server also manages the RTLS network. With this set-up, indoor and outdoor areas of 200mx200m can be monitored.

### Logistics Applications

The LOST system is very well suited for tracking vehicles indoors or outdoors covering wide areas. As is shown in Figure 2, the reach of LOST is easily extended by adding Reference Nodes on carefully chosen locations, to easily cover several square kilometers.

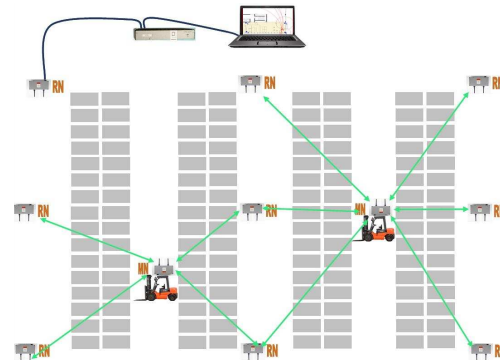


Figure 2: LOST setup for Logistics Applications

Tracking is done in real-time over the complete area and without having to construct access restrictions such as pass gates, as is the case with RFID solutions. Mobile Nodes can be mounted on transport equipment such as trucks, forklifts, trailers and straddle carriers. Also crates, pallets and containers containing valuable goods can be tracked and traced while they are moved or stored.

### Logistics Pick & Place

The high accuracy and long range of Essensium's LOST RTLS system make it particularly attractive for the implementation of 'virtual tagging' through the Pick & Place mode of operation.

Pick & Place functionality allows the logistics application to track the position of all transported goods in a facility (indoors or outdoors) without the need for a high volume of tags to be installed on each crate/pallet/container/etc.

The high accuracy position measurements from LOST allow an installation where the tags on the goods are replaced by Mobile Nodes being placed only on the transport equipment, allowing an unlimited number of goods to be tracked using a limited number of Mobile Nodes.





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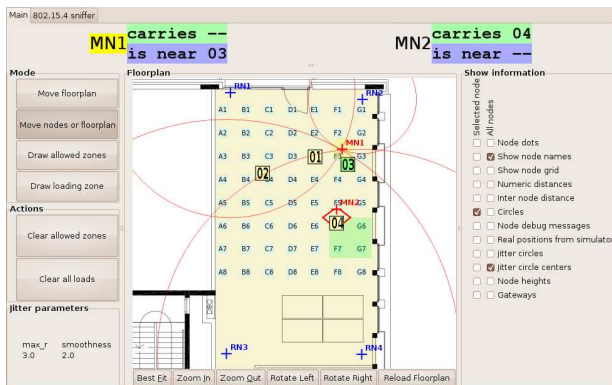
**Fig 3: Tag the Carrier = Track the Goods**

Goods only need to be identified at the point of entry to the premises, at which point they are assigned a 'virtual tag' associated with their location. Accurate tracking of the positions and movement of the transport machines allows the transport of goods around the premises to be tracked with high precision, and the 'virtual tags' to be moved along with the goods. This information enables the provision of a WMS database with absolute knowledge of the identity and location of all the stored goods as well as real-time tracking and control of transport operations. This enables numerous benefits, including

- Automatic verification that correct goods are being picked by operators.
- Removal of manual intervention to verify and record position of goods when placed in storage.
- Fully dynamic adjustability of storage floorplan.
- Calculations of optimum routes for pick and place operations.
- In-cab display of identification of goods located in vicinity of vehicle.

## User Friendly Interface

The calculated positions are stored in the LOST SQL database on the Tracker Server Appliance. A user can log in to retrieve the actual and past positions of all the nodes using a Client Database Application for querying the data of interest. In addition to GIS extensions, which are provided to support easy integration capabilities in GIS based applications and user interfaces, the LOST Tracker Server Appliance also has an elaborate trigger framework allowing automatic server-side functions.



**Fig 4: Graphical User Interface**

The Graphical User Interface as shown in Figure 4 provides an interface between the user application and the LOST database. It is used to enter the floor plan, to visually position the Reference Nodes and to monitor and manage the Mobile Nodes. It contains a number of wizards that will help the customer go through the set-up of a LOST positioning network.

Some additional functions are made available in the GUI for the purpose of demonstrating the capabilities of the LOST System solution, such as "Pick & Place" simulation, inter-node distances, etc.

## Technical Specifications

### Summary Technical Specifications

- Accuracy: better than 50cm for ranges up to 500m
- Update rate : Configurable from 1msec per node
- Number of nodes: 1000 nodes per zone.
- Radio Frequencies
  - Ranging channel: 2.4GHz ISM band 200MHz bandwidth coexistent with 802.11.xx.
  - Data communication channel: 2.4GHz 802.15.4 compliant with proprietary software stack.
- Certifications EU / CE: CE class A compliance
- Power Supply
  - Reference Node: 100-240AC 6.5W

Document : 01FS0924.007  
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