

# *nanoLES 3 Live* – Real Time Location Engine

## Professional Location and Monitoring Solutions

### Introduction

*nanoLES* (Location Engine Server) *3 Live* is nanotron's location engine for Real Time Location System (RTLS) solutions. As the core of nanotron's Location Awareness ecosystem *nanoLES* runs as a standalone application or as a background service. *nanoLES* is now available for Windows and various Linux Distributions, please contact us for more details via [info@nanotron.com](mailto:info@nanotron.com).

### Location Technology

**TDOA Positions:** *nanoLES* calculates native TDOA based positions for unlimited tags using precise time of arrival stamps (TOA) from the anchor infrastructure.

**Location Blinks:** *nanoLES* supports applications with highest throughput by relying on high precision and efficient location blinks.

**Anchor Synchronization:** Anchors are synchronized wirelessly with sub-nanosecond precision to provide high location accuracy for real-time TDOA.

**Multi-Radio Support:** *nanoLES* seamlessly supports nanotron's Chirp and Ultra-wideband (UWB) anchor based solutions for wide applications demands. Customers benefit from the long range, low energy and radio robust Chirp technology as well as the UWB technology for high location accuracy.

**Automatic Anchor Authentication** provides a very convenient licensing mechanism.

**TOA Data Queue:** The integrated TOA Data Queue compensates network delays.

### *nanoLES 3* Highlights

- Native TDOA location with precise TOA
- Location Meta Data
- World-wide access to location data
- Windows and Linux

### Radio Technology

- Technology-independent Wireless Anchor Synchronisation
- Identical system integration cycle for Chirp and UWB radio technology

### Scalability

- Scales to several thousand tags
- Flat sea of anchor infrastructure

### Geometries Simplified

**Multi-Sections:** *nanoLES* supports breaking down complex area geometries into sections to enable various location awareness applications. Users can mix and match 0D (presence), 1D (tunnel), 2D (area) and 3D (space) sections. *nanoLES* provides parallel processing of tag blinks in multiple sections.

**Section Ambiguity Resolution:** Section transitions are supported with RSSI based ambiguity scores. Section-specific location data are available to adapt the ambiguity resolution to applications.

## Bidirectional Communication

**Concurrent Data Transmission:** A location blink may contain user payload allowing user data exchange while collecting location data.

**Direct Backchannel Access:** The backchannel interface enables sending application and configuration messages to tags, actuators or sensors.

## Key Features

**Network Scalability:** The flat Sea of Anchor infrastructure enables spatial system scalability through an unlimited number of anchors. Typical scalability challenges caused by master/slave networks are avoided.

**Common API:** The common technology-independent API ensures one identical system integration cycle for Chirp and UWB.

**World-wide Location Access:** Remote access supports convenient management access to *nanoLES* from all over the world. Multi-client read access supports location and status reports.

## Extended Feature Set

### Management Interface

**Full Accessibility:** *nanoLES* has a management interface to bring up the RTLS easily and to configure and control the location server. In addition, the accessibility to optimize the system performance and to visualize the location results is provided.

**Enhanced Logging:** Location data record and replay supports backup, analysis and demonstrations. The complete Location Engine is fully controllable with scripts to automate and customize applications.

### Location Meta Data

**Ease of Use:** *nanoLES* provides simple and straightforward location data accessibility for highest flexibility during positioning, post-processing and system integration, see Figure 1.

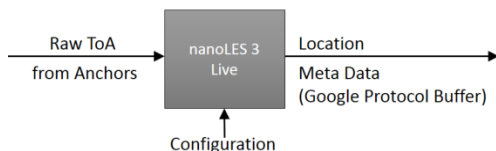


Figure 1: *nanoLES* easy accessibility

**API Support:** Developers get API and Parser support for the easy location meta data access to post-process easily via C++, Java, C#, Ruby and more.

**Google Protocol Buffer:** *nanoLES* implements the Google Protocol Buffer Data Structure. This

compact and efficient binary data format extends the location data directly available while having smallest communication efforts.

## Location Data Processing

**Boundary:** The location boundary supports automated outlier elimination comprising polygon and box boundaries, contours and borders as well as obstacle definitions.

**Filter:** *nanoLES* position adaption filters provide a Kalman filter including a motion model. The max TDOA distance filter provides plausibility checks.

**Location Accuracy Indicators:** With GDOP and MSE, *nanoLES* enables handling the location data according to the indicated accuracy.

## Productivity Toolset - Toolbox 3

**Seamless Tool Integration:** Toolbox 3 is a productivity toolset around *nanoLES* 3 to enable rapid get-to-market by reducing the software effort required for system integration.

Toolbox 3 provides tools to configure, control and analyze the RTLS as well as to visualize locations, see Figure 2.

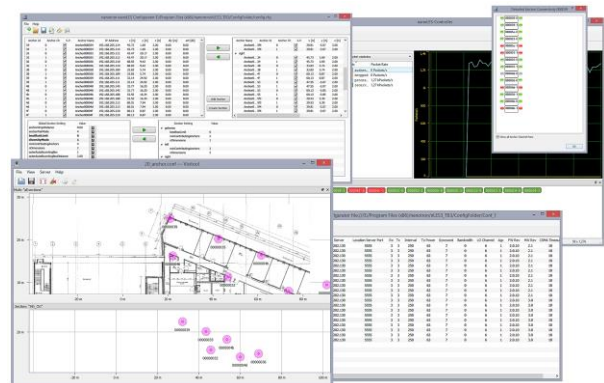


Figure 2: *Toolbox 3* for Enhanced Productivity

## Ordering Information

Order No.	Description
SNLES03	nanoLES 3 Live
KN01TB3	nanotron Toolbox 3
KNRINT02EA	RTLS Integration Kit
BNUT01STP5	Tag Pack
KN03SATLE	Ranger II

## Further Reading

- [1] nanoLES 3 User Guide V1.5
- [2] Toolbox 3 User Guide V1.0

Today nanotron's *embedded location platform* delivers location-awareness for safety and productivity solutions across industrial and consumer markets. The platform consists of chips, modules and software that enable precise real-time positioning and concurrent wireless communication. The ubiquitous proliferation of interoperable location platforms is creating the location-aware Internet of Things.

Visit [www.nanotron.com](http://www.nanotron.com) for more information on nanotron's complete line of products and tools or write to us at nanotron Technologies GmbH, Alt-Moabit 60, 10555 Berlin, Germany.