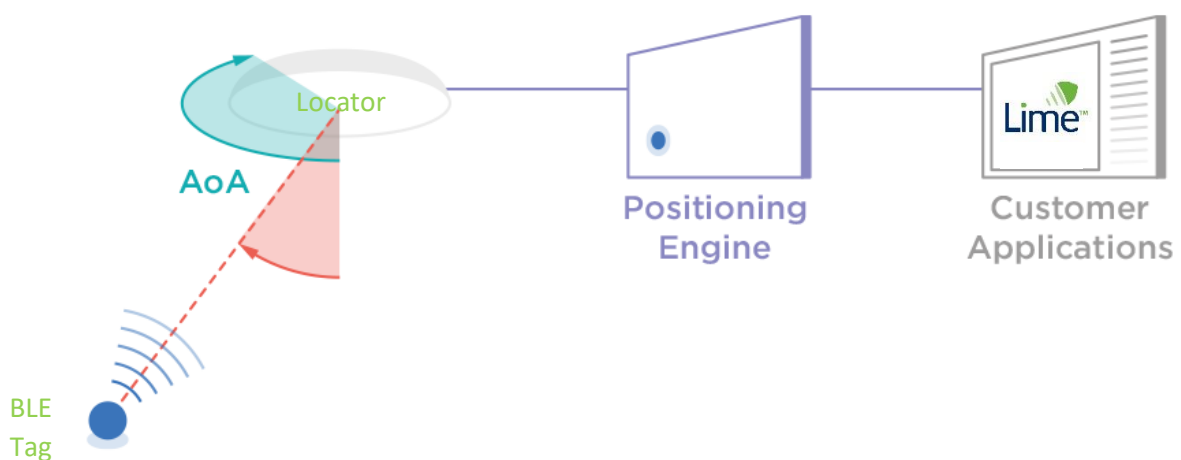# Quuppa

Intelligent Real Time Location System

The Quuppa Intelligent Locating System™ is a powerful system for various location-based services and applications. It provides accurate real-time positioning data using Bluetooth® Low Energy (Bluetooth LE) technology, unique Direction-Finding signal processing methods and advanced proprietary algorithms.

Advanced antennas, the Locators, measure the direction of a radio signal transmitted by a Tag. The Quuppa Positioning Engine (QPE) then computes the Tag's position.

The Quuppa system is based on Bluetooth Low Energy technology, which provides several advantages – including long tag battery lifetime, compatibility with mobile devices and the ability to carry sensor data alongside positioning data.

The unique insight behind the Quuppa system is combining Bluetooth wireless technology with Direction Finding signal processing methodology, enabling the superior positioning accuracy compared to solutions that are based on Received Signal Strength Indication (RSSI). Since the introduction of Bluetooth 4.0 (Bluetooth Low Energy), which includes location-oriented specific profiles, Bluetooth technologies have become very valuable for location-based applications. The technology is well suited to Angular-based measurement methods for Real Time Locating Systems (RTLS).

The Bluetooth technology and Direction-Finding methodology are freely available for anyone. However, turning these building blocks into a reliable and scalable solution is not a trivial task. What makes Quuppa truly unique are the advanced positioning algorithms developed by technology pioneers for more than 15 years.

Confidex Viking BLE tag applied to outdoor asset

Quuppa System Components

In order to run a Quuppa system, the minimum required components are Quuppa Locators, Quuppa Tags (or custom tags built on the Tag Module, Firmware or emulation specification), QPE Software license and Quuppa Site Planner software.

Hardware: Locators

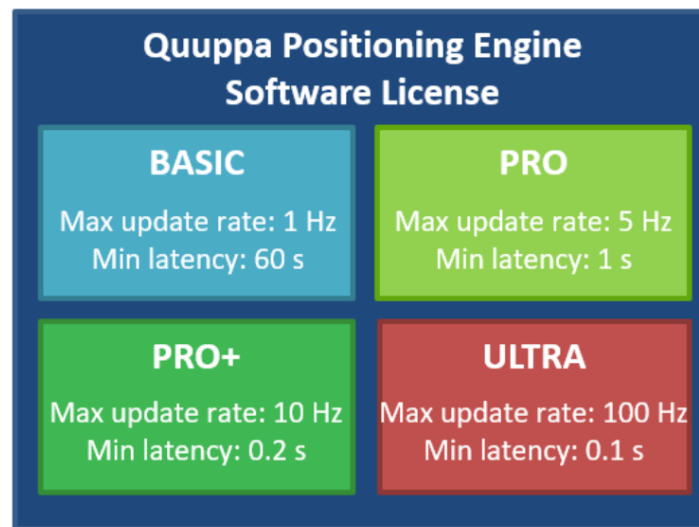| Quuppa Locators		
Item	Description	Picture
Quuppa LD-6L	**Quuppa Locator** - A radio transceiver used for monitoring the location of Quuppa Tags and other BLE-enabled devices emitting a Quuppa-compatible BLE packet.	
Quuppa LD-7L	**Quuppa Long-Range Locator** - A radio transceiver used for monitoring the location of Quuppa Tags and other BLE-enabled devices emitting a Quuppa-compatible BLE packet.	

Hardware: Tags

Quuppa Tags and Tag Modules		
Item	Description	Picture
Quuppa QT1	**Quuppa Tag Module** - Quuppa PCB Module to be integrated into custom mechanics with battery and possible carrier board. Native and full support for Quuppa Proprietary channels and Back-channel. QT1 is not shipped with a battery.	
Quuppa QT1-1	**Quuppa Tag** - A small radio transceiver to attach to an object for tracking. Native and full support for Quuppa Proprietary channels and Back-channel. Button and LED functions.	
Quuppa LD-6T	**Quuppa Tag** - A small radio transceiver to attach to an object for tracking. Native and full support for Quuppa Proprietary channels and Back-channel. Includes button. LD-6T supports location update rate up to 50Hz.	

Note – software is available to convert Android smartphones into Quuppa compatible tags.

Software: Quuppa Positioning Engine

There are four different levels of QPE software available, depending upon the level of update speed and latency required.

Quuppa Positioning Engine				
Item	Description	Max position update rate	Min position latency	Purpose and typical use
Quuppa PE-LIC-BASIC	License for Quuppa Positioning Engine with BASIC performance.	1 Hz	60 seconds	Suitable for use cases not requiring real time data, where data can be analyzed afterwards. Example: Analyzing of shopper behavior in a retail store.
Quuppa PE-LIC-PRO	License for Quuppa Positioning Engine with PRO performance.	5 Hz	1 second	Suitable for use cases requiring real-time tracking of objects moving at walking-pace. Examples: real-time tracking of goods in warehouse, patients in hospitals, navigation in a museum, finding products and getting coupons in a retail store
Quuppa PE-LIC-PROPLUS	License for Quuppa Positioning Engine with PRO+ performance.	10 Hz	0.2 second	Suitable for use cases requiring real-time tracking of high-speed objects. Examples: Safety applications such as collision avoidance of forklifts in a warehouse environment.
Quuppa PE-LIC-ULTRA	License for Quuppa Positioning Engine with ULTRA performance.	100 Hz	0.1 second	Suitable for use cases requiring real-time tracking of high-speed objects. Examples: Team sports and individual sports. Safety applications such as collision avoidance of forklifts in a warehouse environment.

Additional supporting software is available as follows:

QPE Application Software

This is used to assist with the installation and configuration of a Quuppa RTLS system. It is included in the cost of a valid QPE software license.

Quuppa Application Software		
Item	Description	Purpose and typical use
Quuppa Site Planner	SW license for Quuppa Site Planner (QSP), works with Quuppa Focusing Locator for system configuration.	The QSP is used for planning and configuring new Quuppa projects, as well as for modifying existing ones. It is also used for configuring Quuppa Tags.
Quuppa Data Player	Quuppa Data Player (QDP) enables Real-time Viewing, Recording, Replaying, and Analyzing data generated with the Quuppa system.	The QDP is used for evaluating the performance and data quality of Quuppa system in an actual environment. When used together with the Quuppa Push & Log Module the sorted data can be logged again in CSV. Example: Analyzing performance of Quuppa system in real time or offline.
Quuppa System Simulator	Quuppa System Simulator (QSS) runs a virtual Quuppa System for testing and development purposes.	The QSS is used for developing and testing applications, testing system components interfacing with the Quuppa system, dimensioning hardware capacity, verifying deployment plan before physical implementation, and learning and training about Quuppa system.

Additional Optional Software Modules for QPE

Optional SW modules are available to all of the Quuppa Positioning Engine BASIC/PRO/PRO+/ULTRA license types:

Item	Description	Purpose and typical use
Quuppa BackChannel Module Quuppa PE-MOD-QBC	The QBC enables Client Applications to write data to Tags using Quuppa Web API, as well as the location based commands that can be defined with QSP.	Reconfiguring or commanding Quuppa Tags through QPE APIs when Tags are already on the site. Sending any data to custom made Tags through QPE API. Examples: Blinking LEDs of a custom Tag based on behavior or position. Player tag entering or leaving playing field is activated or deactivated automatically. Note: Configuring Tags with QSP and Focusing Locator does not require this module.
Quuppa Push & Log Module Quuppa PE-MOD-QPL	The QPL enables Pushing data via UDP stream, or Logging data directly to a local file.	The data format can be either CSV or JSON. The content of the data can be defined with the Quuppa Site Planner. Examples: Overlaying Quuppa position on top of a live video broadcast. Logging the position of retail baskets and trollies for offline post-processing of shopper behavior.
Quuppa Offline Module Quuppa PE-MOD-QOM	The QOM enables QPE to run without an internet connection. However, in order to edit the project, the project has to be submitted to QCP.	This module is used in cases where Internet connectivity to the QCP cannot be maintained. Examples: High security facilities. Note: This module is only available to perpetual base licenses. The Locator IDs in use are permanently locked to the license. If the module is activated for a license sliced from a pool, the license can no longer be returned back to the pool.

Quuppa Generation Q: Subscription based RTLS service

This is the latest addition to the Quuppa family and offers an alternative simplified subscription model for providing location services.

Generation Q Quuppa Locators		
Item	Description	Picture
Quuppa Q17	**Generation Q Quuppa Locator Q17** - A radio transceiver used for monitoring the location of Quuppa Tags and other Bluetooth Low Energy (BLE)-enabled devices emitting a Quuppa-compatible BLE packet.	

Quuppa Locator Subscription includes the right to use the Quuppa Positioning Engine (QPE) software that covers the corresponding amount of Quuppa Q17 Locators. Quuppa Locator Subscriptions also include software functionalities as described in the table below:

Software functionalities for Generation Q Locator Subscriptions			
Functionality name	BASIC	PRO (MSRP, 1year/3 years)	PROPLUS (MSRP, 1 year/3 years)
Quuppa Positioning Engine (QPE) Software with QPE features	Included	Included	Included
Quuppa Site Planner (QSP)	Included	Included	Included
Quuppa Data Player (QDP)	Included	Included	Included
Quuppa System Simulator (QSS)	Included	Included	Included
Quuppa Push & Log Module (QPL)	n/a	Included	Included
Quuppa BackChannel Module (QBC)	n/a	Included	Included

Quuppa Integration with Lime

Lime can be used as middleware to integrate Quuppa with downstream enterprise systems. This is the best option where a blend of tracking technologies are being used to track the assets of a business. Alternatively, Codegate can provide integration services directly with the Quuppa system.

For more information go to www.codegate.co.uk/BLE
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