sewio

locate and track indoor

RTLS TECHNOLOGY OVERVIEW

☐
☐ Real time location system features wireless UWB technology enabling superior precise object tracking for months of battery lifetime.

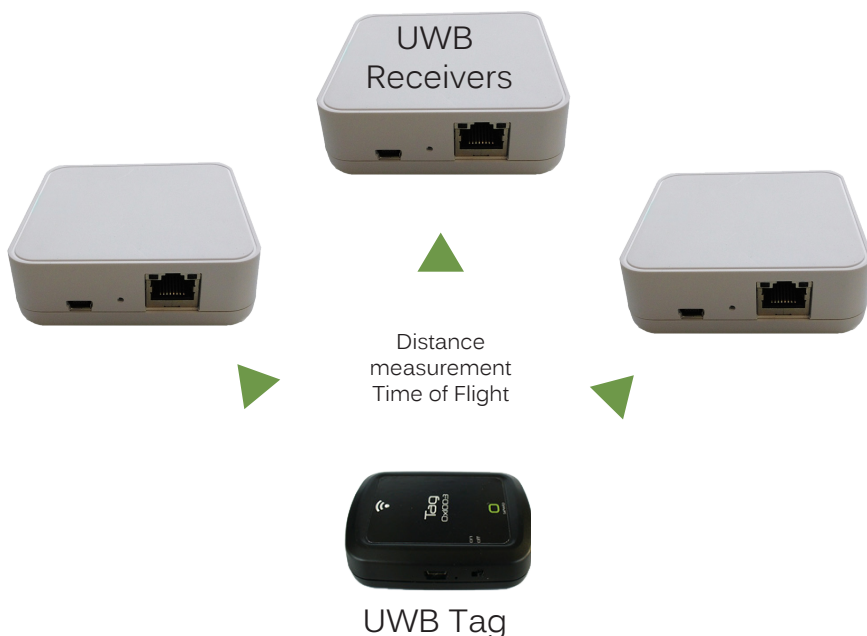## UWB IEEE 802.15.4 a
Ultra Wide Band wireless technology

3-7 GHz
500 MHz channels
30 cm precision
reading 50 meters
low energy

UWB Receivers

Distance measurement Time of Flight

UWB Tag

EASY DEPLOYMENT

- Commission process done within 60 minutes
- Minimum cable infrastructure
- Battery operated Anchors

FULLY SCALABLE

- Easy scalability by adding more components into the network
- No reconfiguration required
- Scale 1000+ Tags

SUB-METER ACCURACY

- Accuracy within 30 cm
- UWB technology allows to neglect the reflected signals
- Enhanced filtering methods

WEB VISUALIZATION

- Real-time and history monitoring and visualization of tracks
- Management of buildings, plans and zones
- Motion statistic information

OPEN-API

- Real-time location data access
- REST or Websocket interface
- Extensive API documentation

FULL CUSTOMIZATION

- HW and SW customization reflecting the specific needs of projects
- R&D and development services
- Online technical support

RTLS COMPONENTS
SYSTEM ARCHITECTURE

UWB ANCHORS

UWB ANCHORS

UWB ANCHORS

UWB TAG

UWB ANCHORS

Ethernet

RTLS LOCATION
GATEWAY

local LAN

SensMap - web visualization

UWB Anchor

- Driven by MCU ARM Cortex M4
- Configurable via USB terminal
- Reading distance of 20-50 meters
- Power Over Ethernet (Optional)
- Ethernet output
- Firmware for RTLS Master Anchor or Slave Anchor
- For Indoor use
- Dimensions 76x76x25mm

UWB Li-Ion Tags

- MCU Ultra Low Power EFM32G M3
- Li-ion 600mA (USB charge)
- Configurable via USB / Serial Terminal
- MMA8453 – acceleration sensor
- Optional components: MPL3115A2 – altitude/pressure sensor, MAG3110 – orientation/magnetic field sensor
- User LED, User Button, JTAG header available

RTLS Location Gateway

- Raspberry Pi v2.0
- WiFi adapter Ralink RT 5370 802.11n
- Location engine with MySQL database
- HTTP API - Websocket or REST interface
- SensMap - web visualization SW

AUTOMOTIVE

Every production hall represents various challenges. Sewio responds to such challenges with Industry Positioning RFID system.

Industry Positioning enables several number of solutions bringing high added value for automotive market. Precise position of product, vehicle, tool or pedestrian is transfered into the powerful information enabling to speed up the production process, to reduce the number of injuries, to control unauthorized entrance or even to switch off the tool, when operated inappropriately. All such innovative processes bring one most significant advantage of saving money.

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SEVEN
SEWIO
SOLUTIONS

PEDESTRIAN SAFETY
AGV NAVIGATION
FORKLIFTS MONITORING
PRODUCT POSITIONING
TOOL CONTROL
ZONE ENTRANCE
FLYING DRONES

NAVIGATION AND LOCALIZATION

NAVIGATION OF GUIDED VEHICLES

Using Industry Positioning allows to navigate guided vehicles by easily chaning the virtual waypoints in user application. It allows to avoid installation of magnetics strip into the hall floor, which are generally used for vehicles navigation.

PRODUCT LOCALIZATION

Tags mounted on the cars periodically reports the position of the car and its production state. Operator is offered with real time information about the actual state of the car and remaining time to finish of each operation. The Tag design is compliant with the requirement of frugality to car capote and water resistance.

DRONES NAVIGATION

The distribution of spare parts within the production hall can be realized using autonomously navigated drones delivering components to required assembling spots. Sewio offers light-weight Tags for such special applications.

> "Drone age is coming. It has been estimated that annual spending on them around the world will almost double to $11.4 billion by 2022."
> source www.wikistrat.com
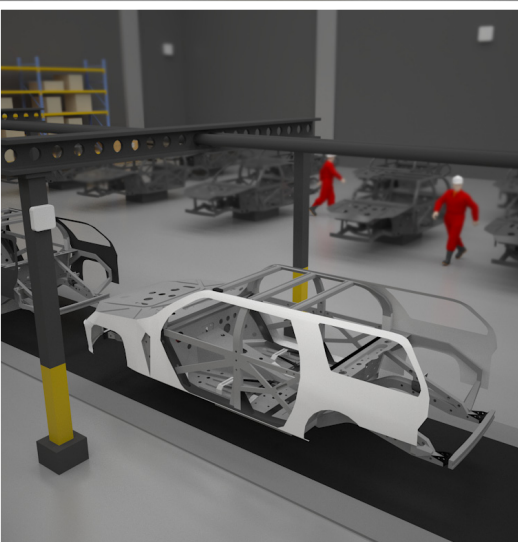
MONITORING AND CONTROL

ZONE ENTRANCE

Creating the virtual zones in visualization software allows to be alerted about the entrance to the monitored zones. SensMap software features enhances management of zones, floor plans and even the building that can be managed from the Google Maps.

ZERO FAULT TOOLS

Error proofed assembling is achieved by controlling the proximity of operated tool upon the correct product. In case of violation the electric power of assembly tool is autonomously switched off.

PEDESTRIAN SAFETY

Leveraging the ranging feature of the sensor devices enables to reliably measure distance between the pedestrian and forklifts. Such information reveals action causing immediate stop of the machine or to notify driver about the upcoming clash.

RTLS/RFID TECHNOLOGY OVERVIEW

Smart combination of Sewio RTLS and RFID technology leverages new application of real time asset tracking. The track of package is launched immediately after package reading by vehicle mount RFID reader. The asset tracking is transformed into enhanced forklift tracking.
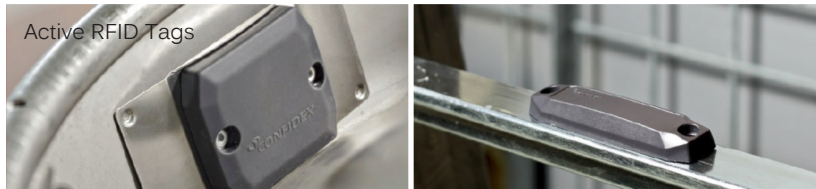
Tracked forklift equipped with vehicle mount RFID reader

Passive RFID Sticker

Vehicle Mount RFID Antenna

Vehicle Mount IV7 RFID Reader

Passive RFID Tags

Active RFID Tags

IV7 RFID Reader

- Designed for mobile-mount appplications
- Rugged cast aluminium alloy housing, sealed to IP67
- ETSI (865-868 MHz) & FCC (902-928 MHz) compliant
- DC power supply, 12-60 V, 4,5 A max.

PROCESS OF ASSET TRACKING
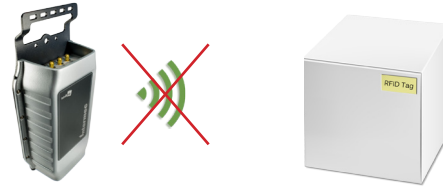
Package identified by RFID Reader

Start of forklift tracking

Package out of RFID Reader zone = Stop tracking

[x,y] information of pickup spot

[x,y] of track

[x,y] of delivered location

LOGISTIC AND WAREHOUSES

Not only navigation of forklift over the hall, but also the showing of exact positioning of product spot in shelf speed up the entire logistics process.

SEWIO RTLS & RFID

By smart integration of Sewio RTLS and RFID technology we enable tracking of product within the logistics and warehouse facility in massive scale. Passive Tags and RFID readers identify products while Sewio RTLS track the vehicle or person moving with such products. In this way, the operation cost for product tracking is significantly reduced.

DRONE COORDINATION

Term drone is nowadays term for innovation and we are part of it, since using real-time location data leverages possibility of drone navigation and coordination in overcrowded warehouse facilities. Milimeter based precision is reached by laser radar integration.

AUTOMATED DRONE INVENTORY

Highly automated inventory leverages autonomously operated drones enhanced by the laser based product identification system. Inventory data are visualized in real-time and also stored in local memory of drone. Drone features self charging capabilities.
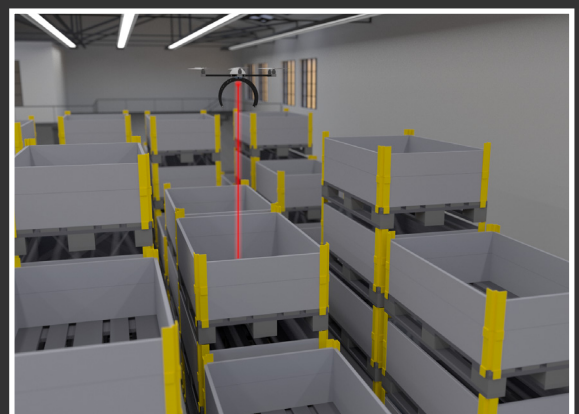
PROXIMITY DETECTION SYSTEM

Proximity Detection System (PDS) provides comprehensive solution for personal safety by applying the outstanding wireless ranging operations. It increases the safety by notyfing the operators about the entrance to the defined zone or it enables to autonomously turning off the controlled machine.

PDS enables continuous distance measurement among set of Slave Anchors and Tag carried by person. Master anchor relays all the measurements to Controller - SW app running on embedded device.

DANGER ZONE
WARNING ZONE
NOTIFICATION ZONE
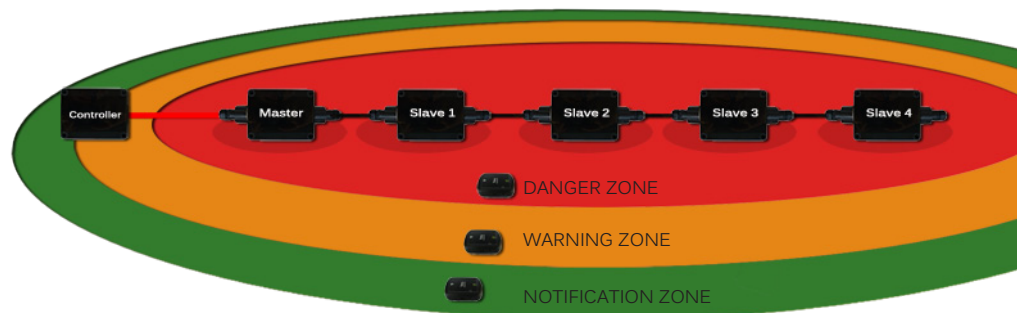
PDS Anchors IP67

- Industrial enclosure with IP67 protection
- Reading distance 20-50 meters
- Entrance detection in 30 cm of precision
- Zones and event management, HTTP Interface
- RF channels and ID configurable
- **Connected in line by galvanic isolated pairs**
- **Slaves connected with RJ45 with bayonet locking**
- **RS422 protocol between Slaves PoE integrated (24-72V)**

PDS Tags

- Ready for mounting on helmet or vest
- 70x50x21mm (25 g)
- Li-Ion 600 mAh battery integrated (USB charging)
- Sensors on board:
  MMMA8453 (accelerometer)
  PL3115A2 (altitude/pressure)
 MAG3110 (compass/magnetic field)

MINING AND CONSTRUCTION

The Anchors mounted on the particular parts of the drilling machines allow to monitor distance of the worker operating around the machine. Due to integration of http interface at each anchors, customer is offered with user friendly interface for monitoring and configuration of any Anchor on machine.

Configurable parameters:

- Definition of zones, default Warning, Notification, Dangerous zone
- Event management for arbitrary zone, switching relay, turning on the light beacon or horn, notification via sms or email
- Refresh rate of monitoring
- Frequency, channel
- ID of Anchors

Proximity Detection system comply with the EU legislation on drilling and funding machines EN 16228.
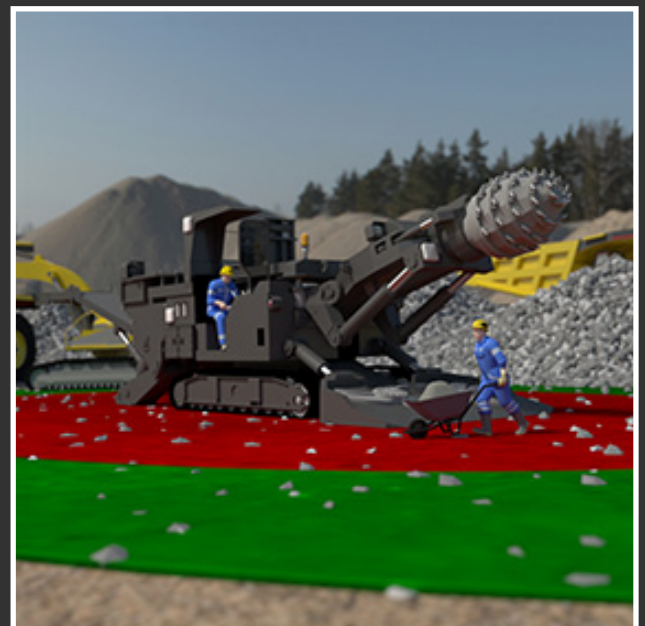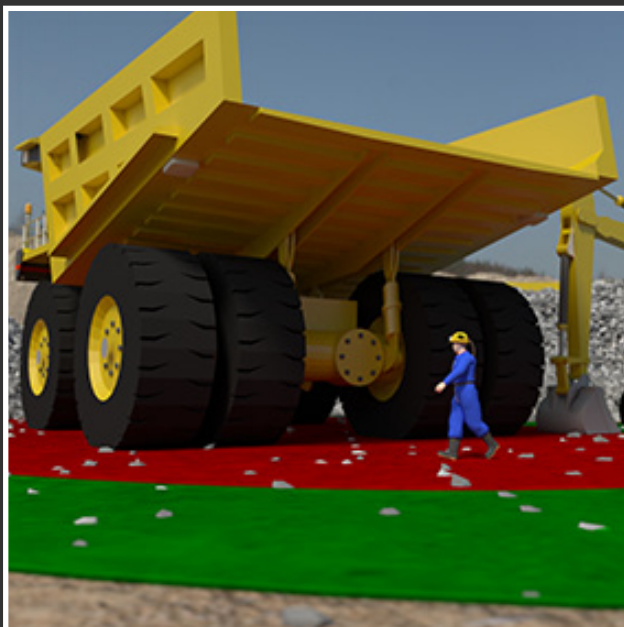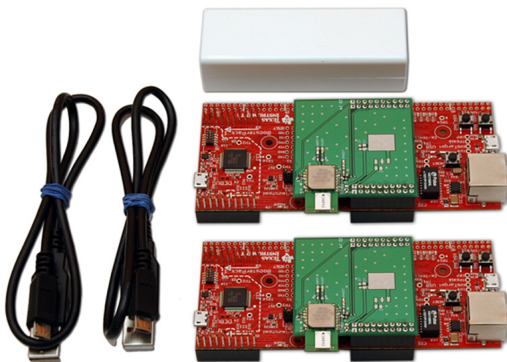
PRODUCTS
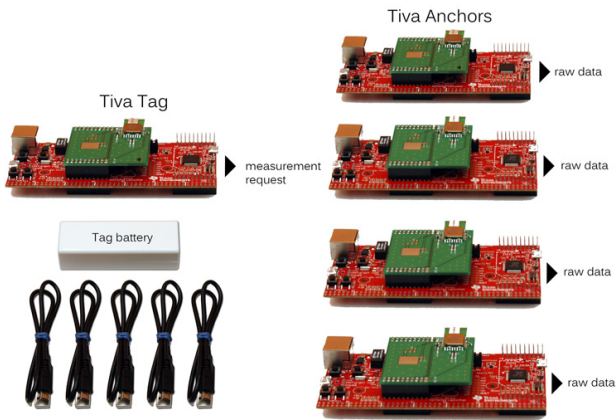
RTLS Kit Dev
Set of RTLS products for development

RTLS Kit Lite
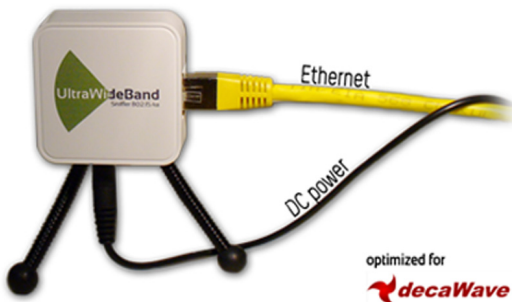RTLS Kit up to 2000 m^2

UWB Ranging Kit
Precise distance measurement

PDS Set
Proximity Detection System

UWB Sniffer
Packet analyser of UWB devices

Open Sniffer v2.0
Zigbee, 6lowPAN, IEEE 802.15.4

RTLS Kit Pro

Full set of RTLS devices and deployment tools
SensMap Visualization software

Batteries for Anchors

Laser Range Measurer

Rapsberry Pi2
(RTLS Server + SensMap)

Tripods for easy installation

NOTES

- www.sewio.net