



**Scalable Real time Location System for Automotive Manufacturing
powered by**



Milan Simek / CEO

TECHNOLOGY



Ultra Wide Band Radio IEEE 802.15.4a



- Reading distance: 50 meters
- Web management
- Power Over Ethernet (Optional)
- Ethernet/WiFi backhaul
- Indoor/Outdoor application
- Optionally battery powered
- Dimension: 76x76x25 mm



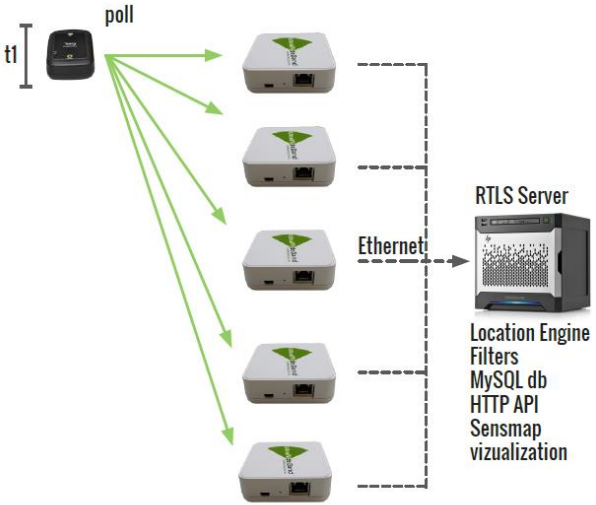
- Li-Ion 600 mAh (USB charge)
- Configurable via USB
- Acceleration, Altitude, Orientation
- Magnetic field sensors
- User LED, Power Button
- Dimension: 70x50x21 mm
- Weight: 25g



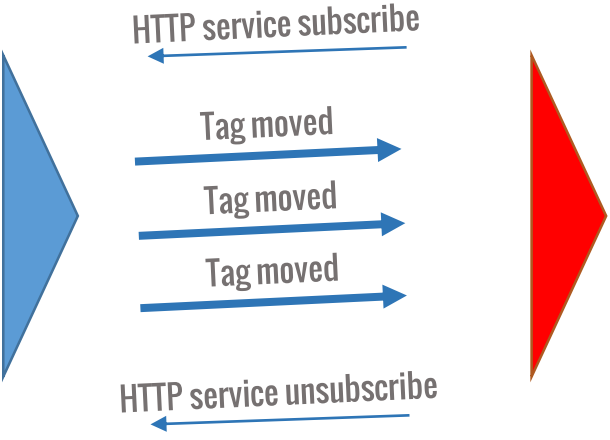
- RTLS SW - All in one
- Location/filter engine
- API HTTP server
- Websocket/REST
- Sensmap SW
- Realtime monitoring in web
- Building and zone management

EASY INTEGRATION WITH HTTP API

Sewio RTLS Platform



Sewio integration API



Customer Software Solution



```

2.12 Get Tags

Description: Get Tags feeds for particular user
Required Header Parameters: X-ApiKey
Required URL Parameters: username
Optional Filter URL Parameters: None
Request Example: http://192.168.225.134/sensmapserver/api/tags/rtlsuser
Response Example (in CSV format FEED_ID;TAG_ADDR;X;Y;Z):
12534;0x1001;0.6;3.2;0
12535;0x1002;-1.4;-0.4;0
12536;0x1003;-1.5;0.3;0
12538;0x1004;-0.7;0.4;0
12539;0x1005;-2.3;-0.1;0
    
```

REAL TIME LOCATION SYSTEM

Anchors

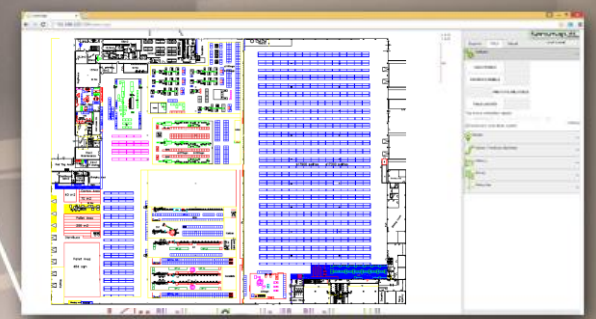
RTLS Server

Tag

Sensmap
Web client

Visualization,
control

Local
network






THURSDAY, 10.03.2016

14:00 -
15:30

INDOOR NAVIGATION: A KEY TECHNOLOGY FOR INDUSTRY 4.0
 Precise localisation, effective route-planning – here's how to do it

 Deutsch
 Forum B | Hall 3



Chaired by: **Prof. Dr. Michael Hauth**, *Chairman, Intralogistik-Netzwerk in Baden-Württemberg e.V.; Professor of Logistics and Purchasing and Head of MSc. Industrial Engineering, University of Mannheim*

Whether it involves the use and control of new-generation ground conveyors, the recording of inventory levels in real time or tracking & tracing – the exact localisation of items is always required. There are different technologies on the market designed to accomplish this. What do they offer in comparison with each other? How can the most efficient possible material flow within the company be arranged with their help?

Research findings and day-to-day practice show you what is already working now and where the challenges of the future lie.



3 BUSINESS VERTICALS

LOGISTICS



SMART SOLUTION FOR INTRALOGISTICS

sewio
locate and track indoor

Location intelligence for your intralogistics flow

Optimize your logistics flow and reduce number of injuries with wireless tracking system.

TIME SPENT IN ZONE 43 MIN



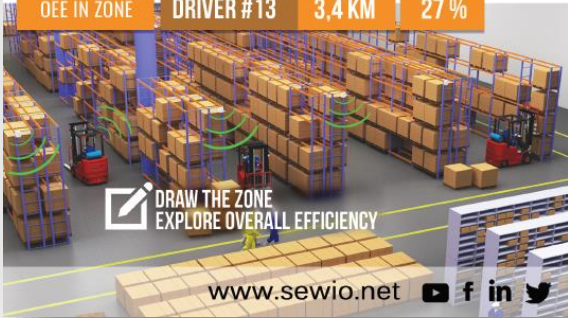
NUMBER OF ACCIDENTS 2

69 %
OEE IN ZONE

DRIVER #7	9,2 KM	73 %
DRIVER #13	3,4 KM	27 %

DRAW THE ZONE
EXPLORE OVERALL EFFICIENCY

www.sewio.net



RETAIL



IMPROVE CUSTOMER EXPERIENCE

sewio
locate and track indoor

Reflect customer needs by understanding their behaviour

Increase your profitability with location intelligence - start to understand customer behaviour and improve shopping experience.



↑ ENTER DIRECTION

EXIT DIRECTION →

4 MIN SPENT IN ZONE

CUSTOMERS IN ZONE 28



www.sewio.net



SPORT



READ PLAYER MOTION

sewio
locate and track indoor

New concept of performance analysis

Read motion of players to boost team performance and control players overload.



DISTANCE 4,4 KM

MAX SPEED 10,4 KM/H



MAX DISTANCE	JOHN	7,2 KM
MIN DISTANCE	PAUL	2,2 KM

21,7 MIN

18,3 MIN

OFFENSIVE ZONE

DEFENSIVE ZONE



www.sewio.net

PICK BY VISION PROCESS IN SKODA

ŠKODA



LUCA.....
Logistic Solutions

sewio
locate and track indoor



**SUPPORT IN PICKING OF MATERIAL
NAVIGATION AND TRANSMISSION OF INFORMATION
FOR EMPLOYEE**

RFID VERSUS UWB

13MHz/860 MHz

RFID



Identify



Tags

3,5 GHz/6,5 GHz

UWB



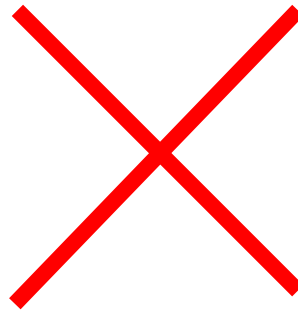
Identify



Measure
time of flight



active Tags



ULTRA WIDE BAND

Standard IEEE 802.15.4a - 2011
 Frequency band: 3 - 7 GHz,
 Channel bandwidth: 500 MHz,
 Recommended channels: No.1, No.5

Channel	Center Frequency (MHz)	Band (MHz)	Bandwidth (MHz)
1	3494.4	3244.8 – 3744	499.2
2	3993.6	3774 – 4243.2	499.2
3	4492.8	4243.2 – 4742.4	499.2
4	3993.6	3328 – 4659.2	1331.2 (real approx. 900)
5	6489.6	6240 – 6739.2	499.2
7	6489.6	5980.3 – 6998.9	1081.6 (real approx. 900)

WiFi 5GHz

-40dBm

UWB
channel 1

-90dBm

UWB
channel 5

-90dBm

[GHz]

3,2

3,5

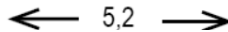
3,7

5,2

6,2

6,5

6,7



<http://newton.ee.auth.gr/pavlidou/papers/J075.pdf>



<http://www.decawave.com/>

RTLS NETWORK

Active Tags

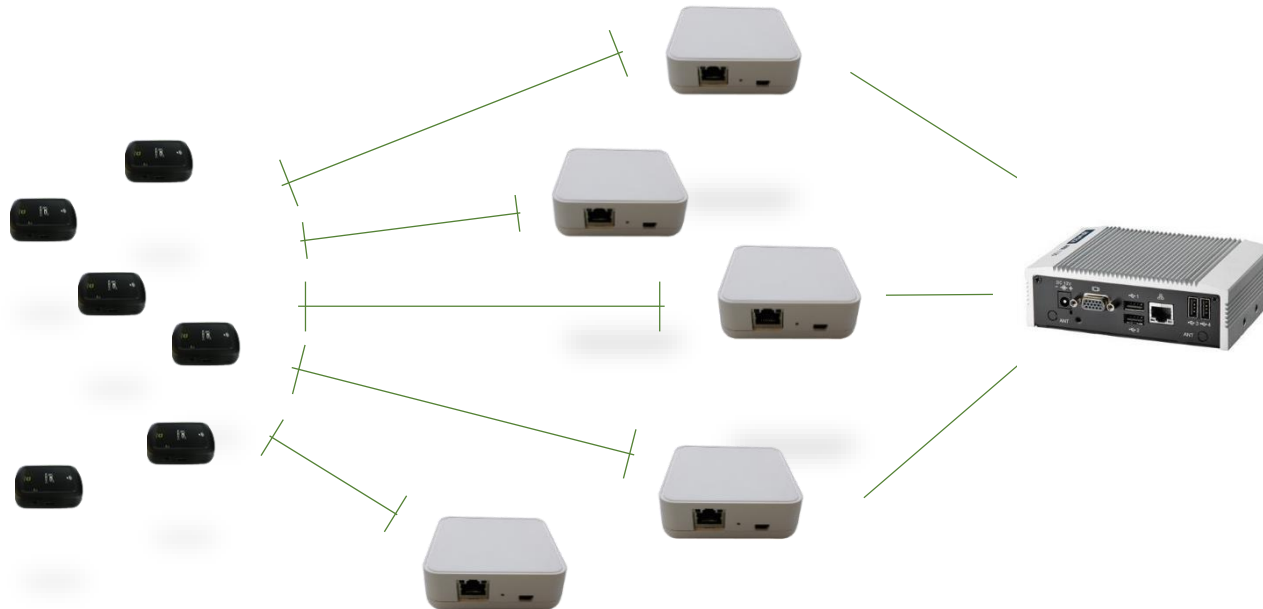
(powered from battery or vehicle accumulator)

Readers at fixed positions

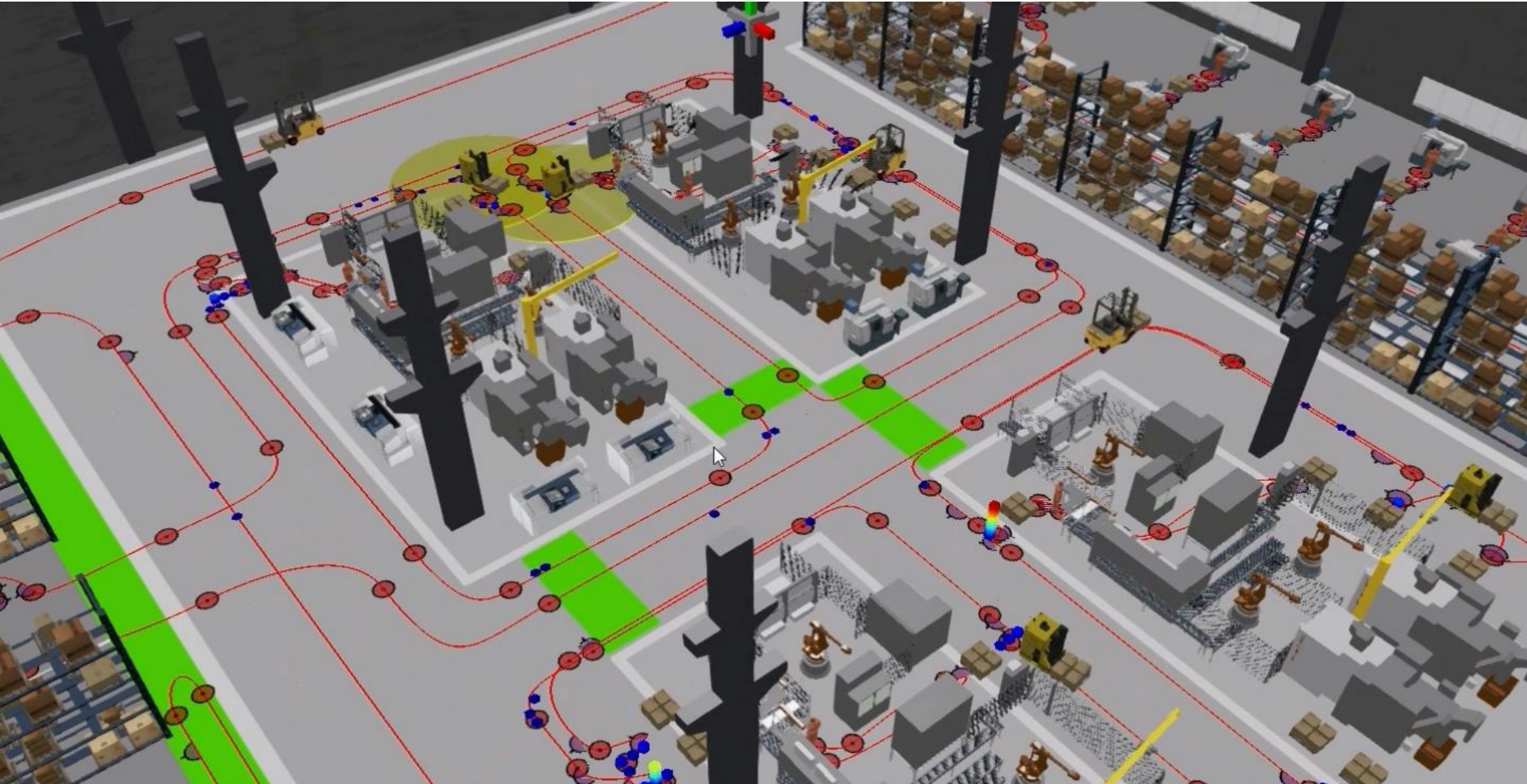
(5V/ PoE)

RTLS Server

(Location Engine, MySQL, HTTP API)

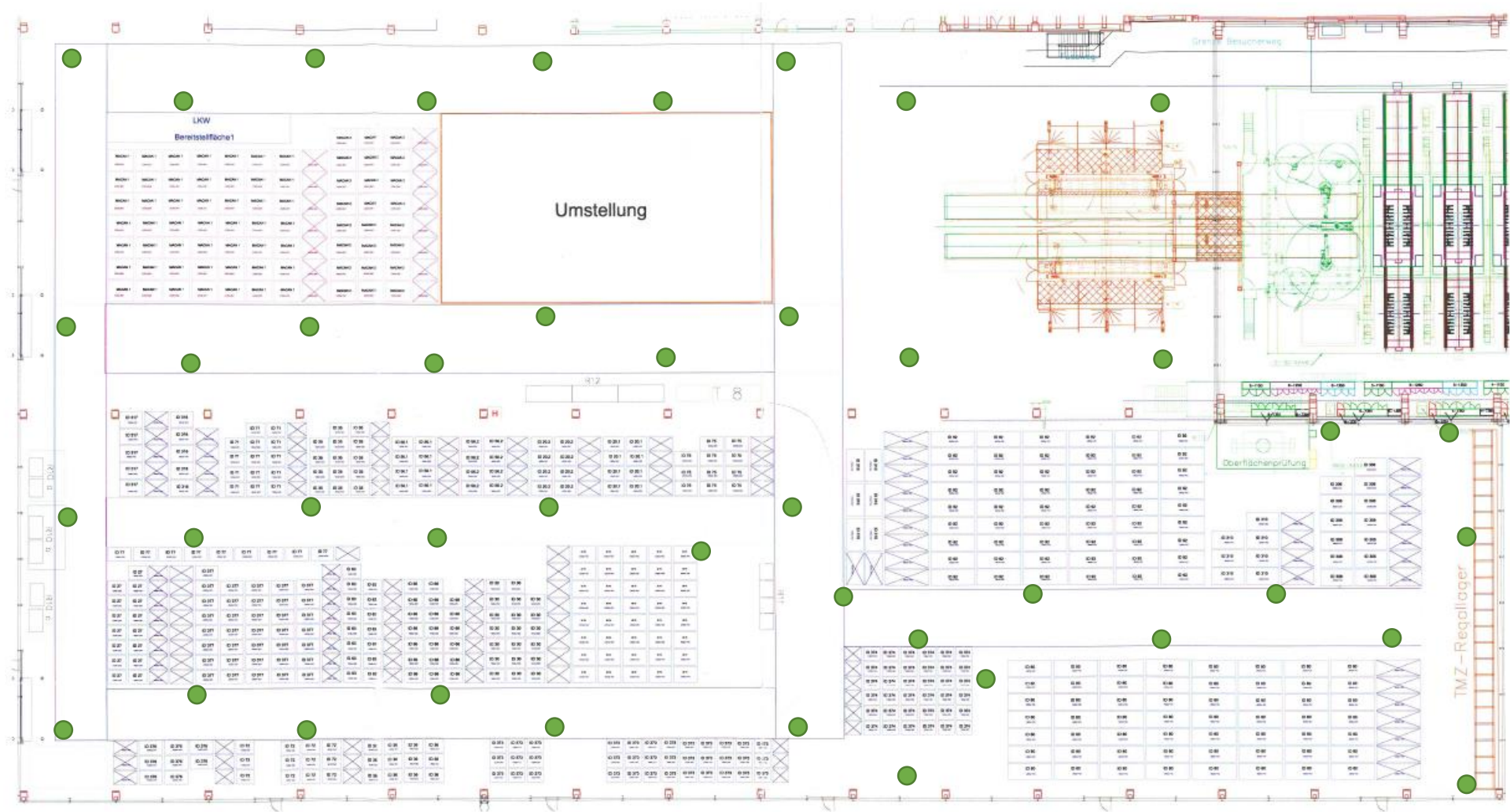


PROJECT: COMPLEX SYSTEM OF INTRALOGISTICS FLOW MONITORING IN AUTOMOTIVE



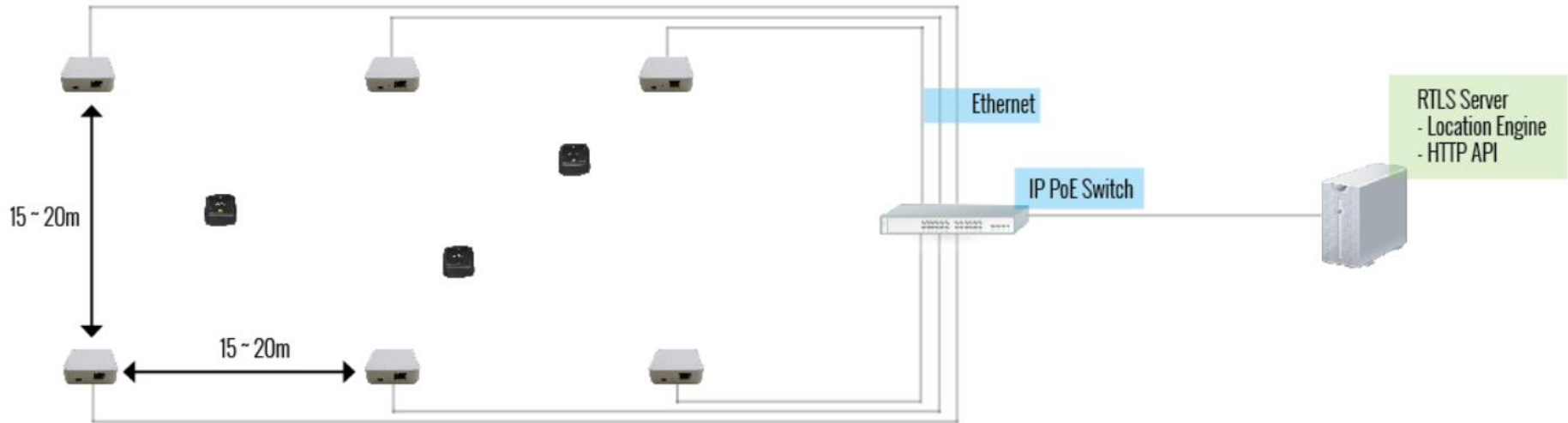
LAYOUT – MILL FACILITY

50 UWB Readers



DEVICE NETWORKING

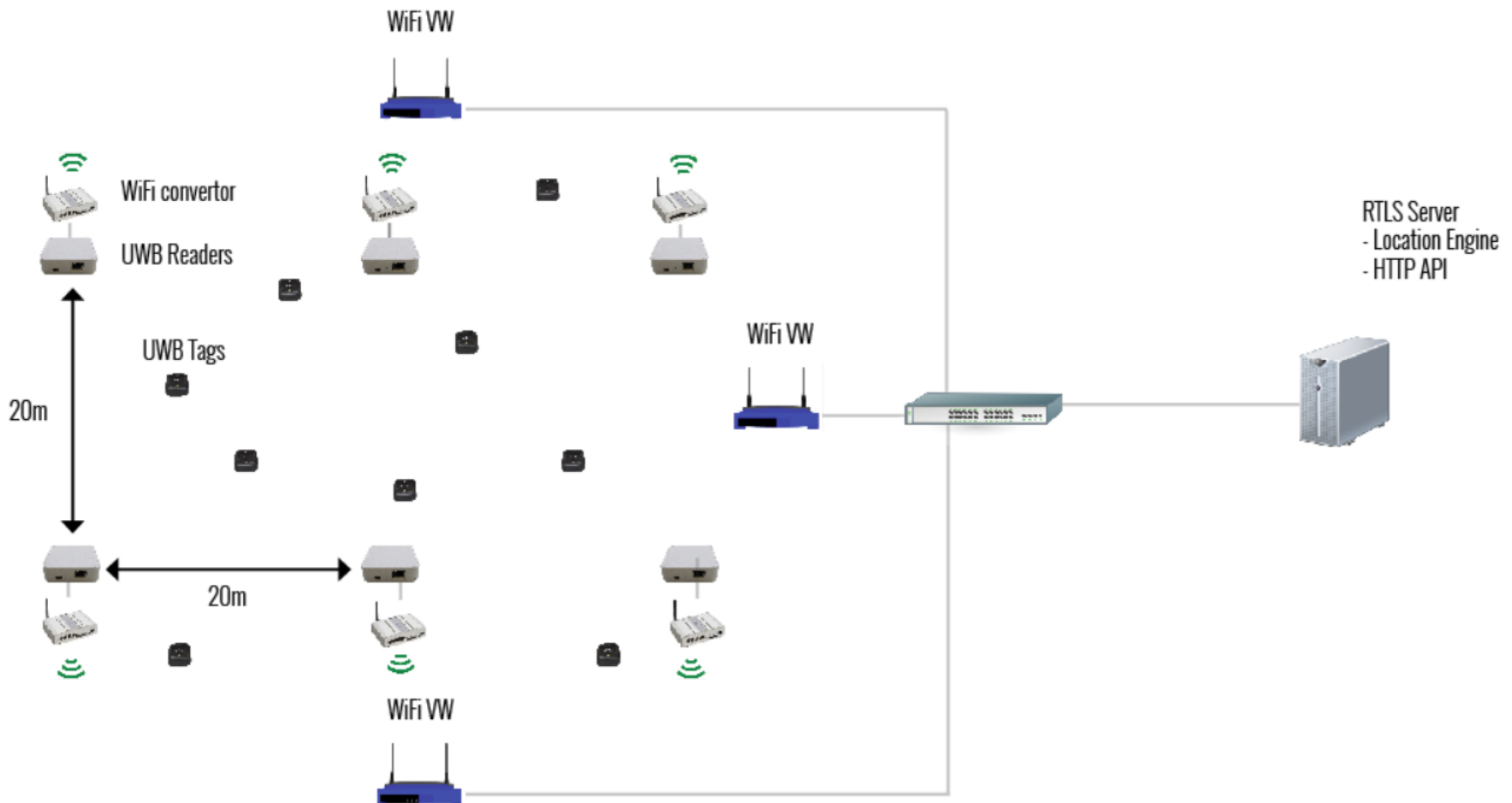
1) Ethernet Expensive infrastructure



DEVICE NETWORKING

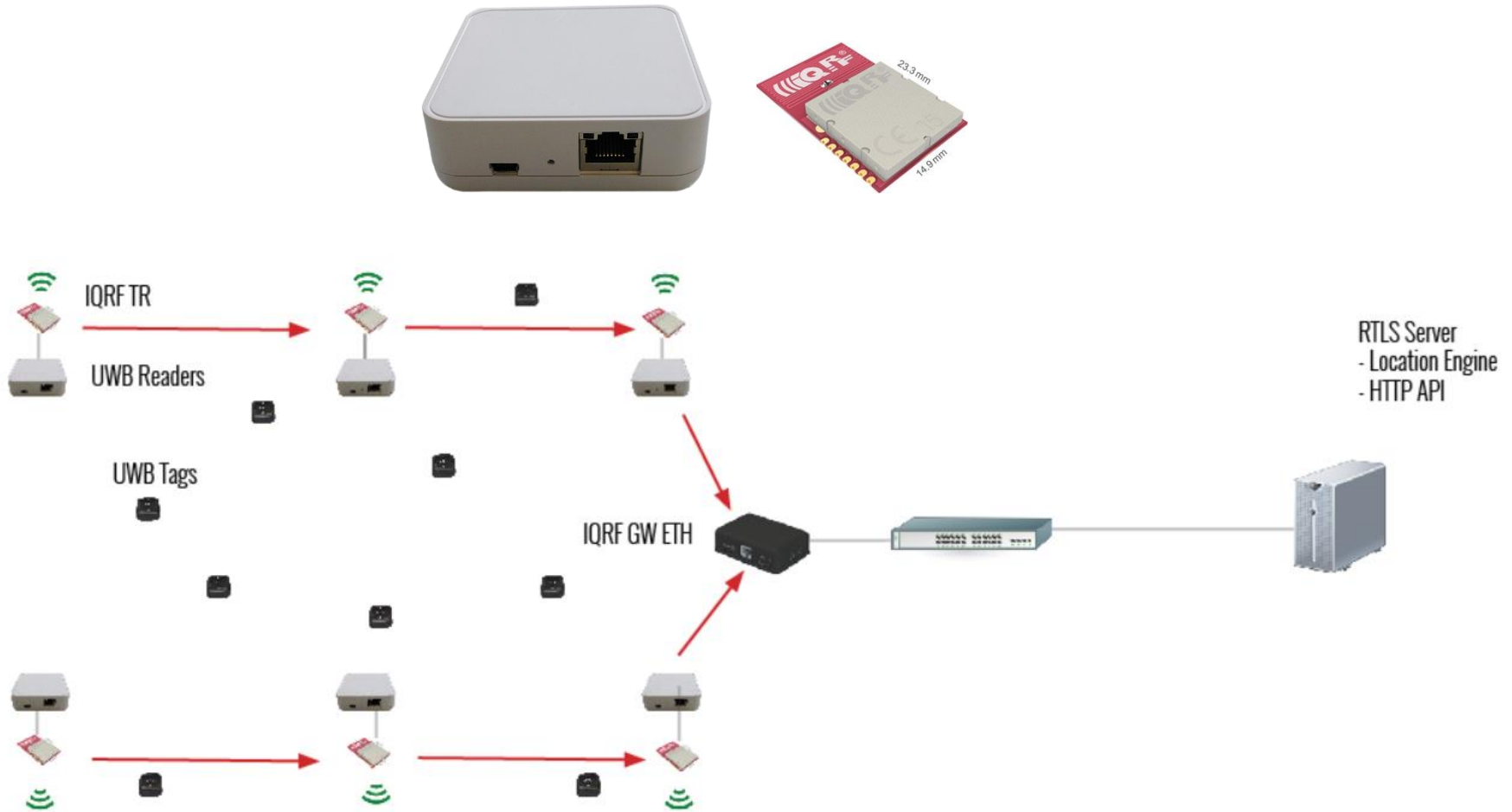
2) WiFi 5 GHz

WiFi shared with another services



DEVICE NETWORKING

3) IQRF



IQRF CHALLENGES



Project requirements:

- 60 vehicles (pilot)
- 500 ms refresh
- 50 cm precision
- + people in future
- + more vehicles

IQRF Challenge:

- Data rate: kbps
 - 60 vehicles generate 81 kbps in total - every 500 ms
- Latency
- Interferences

NEXT STEP

BUILD TEST NETWORK OF 50 TR MODULES

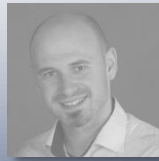
**EVALUATE LATENCY AND JITTER
TEST THROUGHPUT**

HIGH FOCUS ON RELIABILITY



iqrf.org

2011



Milan



Lubos



2014



Top 10

2015



1st



2016



Customers in 33 countries



Launched assembly line



sewio

locate and track indoor

www.sewio.net
simek@sewio.net

