IIoT Manufacturer

How does Active RFID Technology combines the long range detection and the detection's accuracy for industrial security and tracking applications?

Willy Le Mercier, BDM – ELA Innovation

Auto ID event – 2017, March 07th

ELA Innovation
The IIoT offer

Identify

Locate

Measure

ELA Innovation
At a glance

- **17**-year **experience in Active RFID technology**
- **19** team members
- **300.000** industrial connected objects deployed over the world
- Global revenue **tripled** in **3** years
- **200%** **growth** for Export sales in 2016
- Distribution network over **13** countries
- **2M€** funds raising planned for 2017H1

ELA Innovation
The key points

- **A wide range** of active tags, readers, softwares and antennas
- **In-House Design** of tag's Radio Transmission core
- Long lifecycle : **up to 20 years!**
- **Long RF range : >** 100m
- **"Green" Focus**: Very Low Electromagnetic Emissions, eco-design, …
- Integrated **Environmental Sensors** (temperature, RH, motion, magnetic, …)

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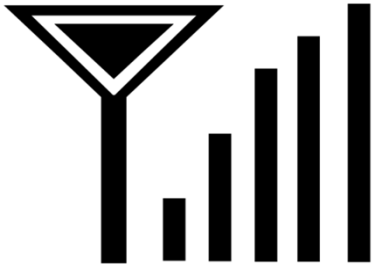
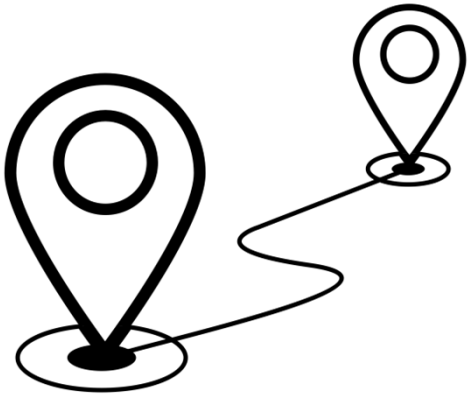
Technical context



- **Main benefit of Active RFID : long range identification**
- **433MHz or 868MHz or 2.4GHz frequencies : uncontrolled RSSI (radio power) fluctuations**
- **Practical consequences : inaccurate distance of detection**



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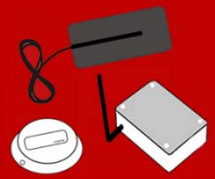
Technical solution

- **Solution : new *DOT* active tag based upon :**
  - **433MHz transmitting part**
  - **Low Frequency Field receiving part**

- **Principle : the new DOT active tag measures a very stable value of LF field and integrates this value into its 433MHz frame**
- **Advantages : to offer accurate distance of detection (+/- 50cm) over 7m as well as providing this information over long range (around 100m)**

ACTIVE TAG



TAG DOT

- Pedestrian detection around forklifts
- 1 year, Range indoor/outdoor: up to 7m
- EC mark

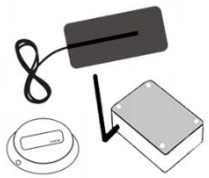
PUCK DOT

- Asset tracking with high accuracy of detection
- 10 years, Range indoor/outdoor: up to 7m
- EC mark

TAG ACTIVATOR

- Badges activator
- High accuracy detection: 3 to 7m
- EC mark

APPLICATION CASES



ACCESS CONTROL

ANTI-THEFT SOLUTION

2 - RTLS & ASSET TRACKING

TELEMATICS

1 - WORKER SAFETY

SPORT TIMING SOLUTION

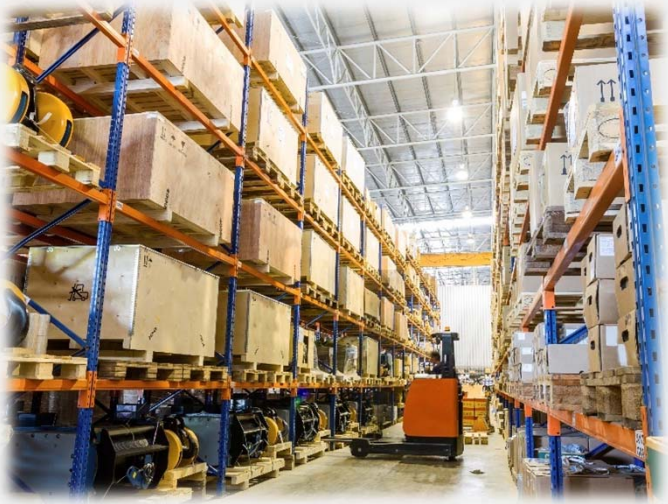
SMART BUILDINGS/CITIES

MANUFACTURING MGT

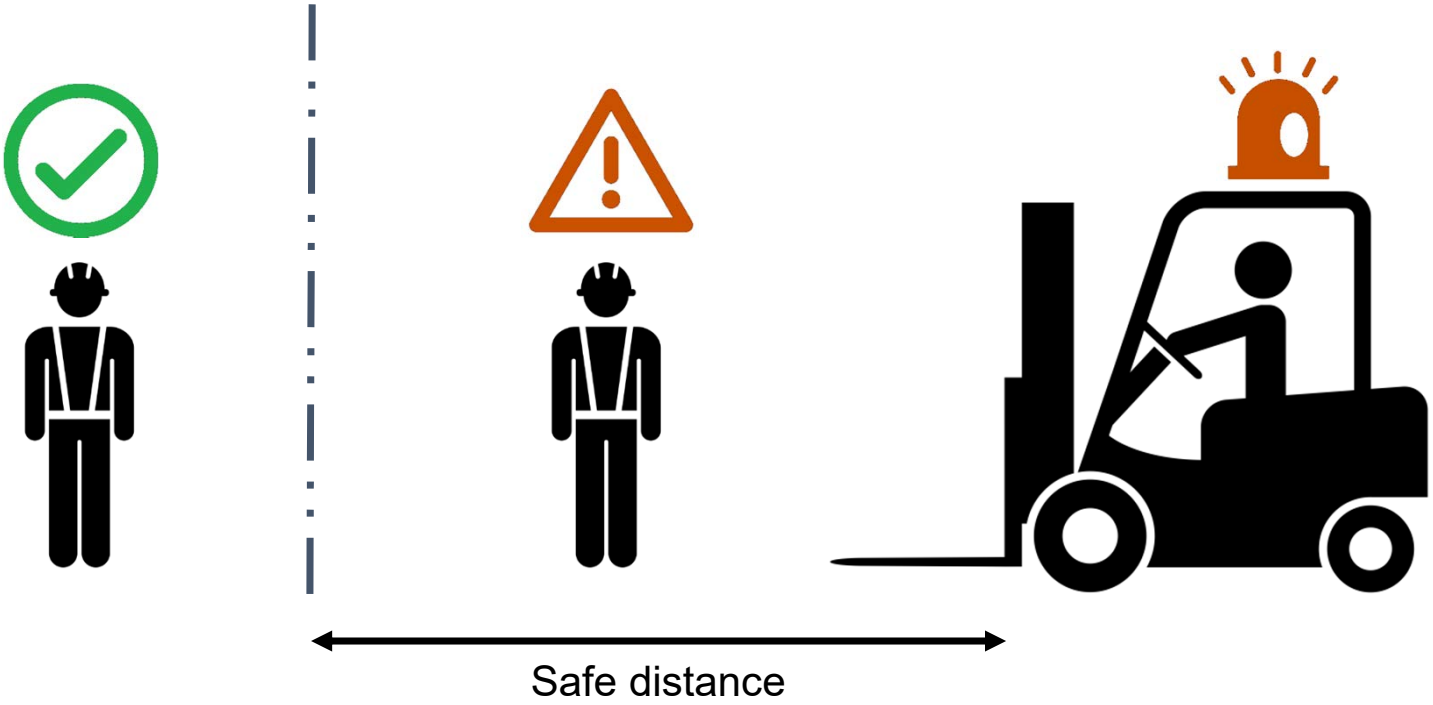
WORKER SAFETY

Pedestrian detection around forklifts

- The forklift driver is alerted in real time of the pedestrians' presence around machinary
- Pedestrian detection accurary over short distances (1 to 7m) and up to 80m

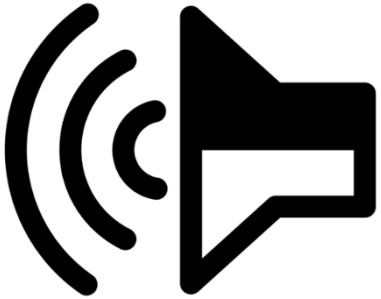


WORKER SAFETY

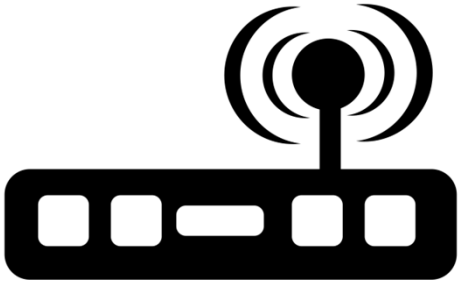


WORKER SAFETY

Portable



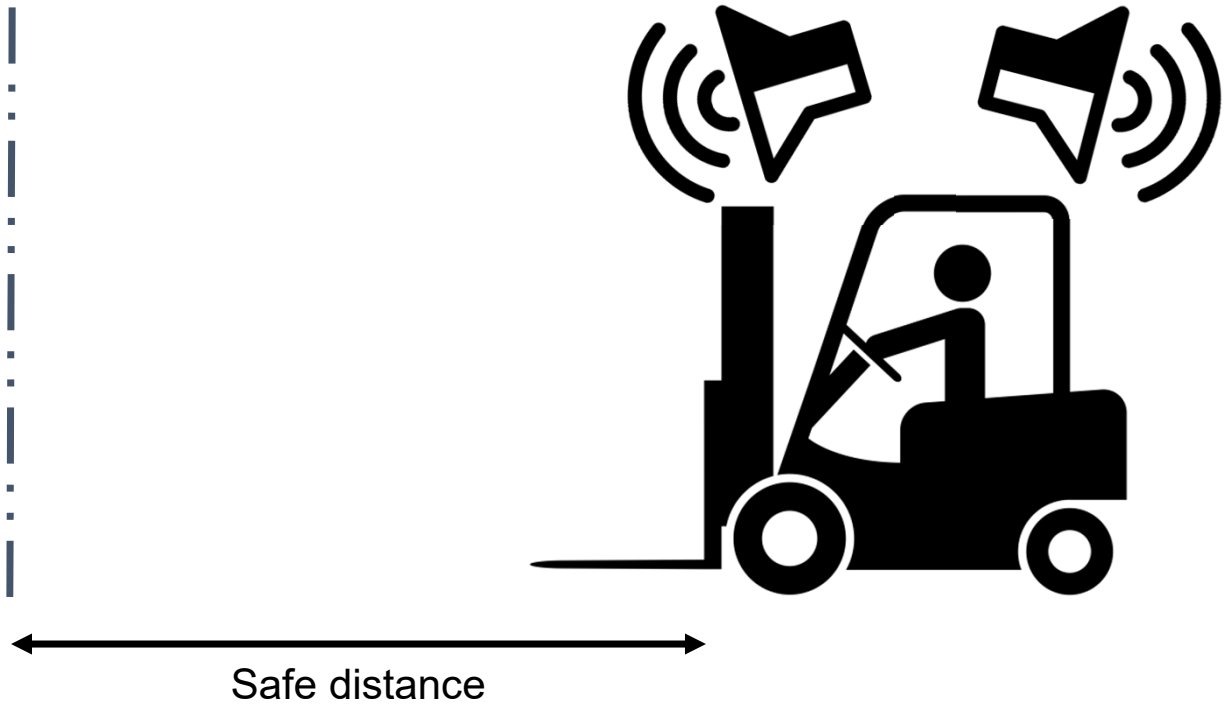
Magnetic transmitter



Active RFID reader

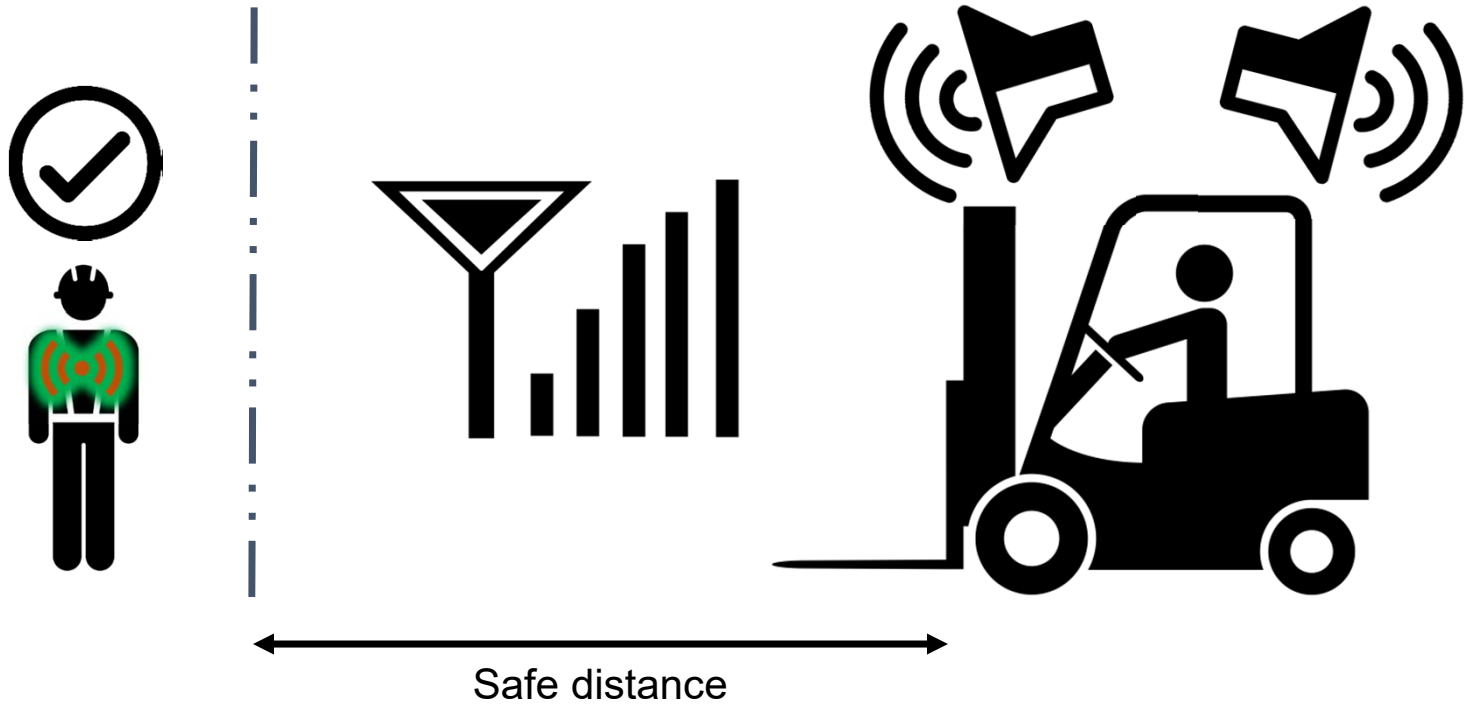
WORKER SAFETY

Step 1 : the forklift truck transmits a magnetic field (low frequency).



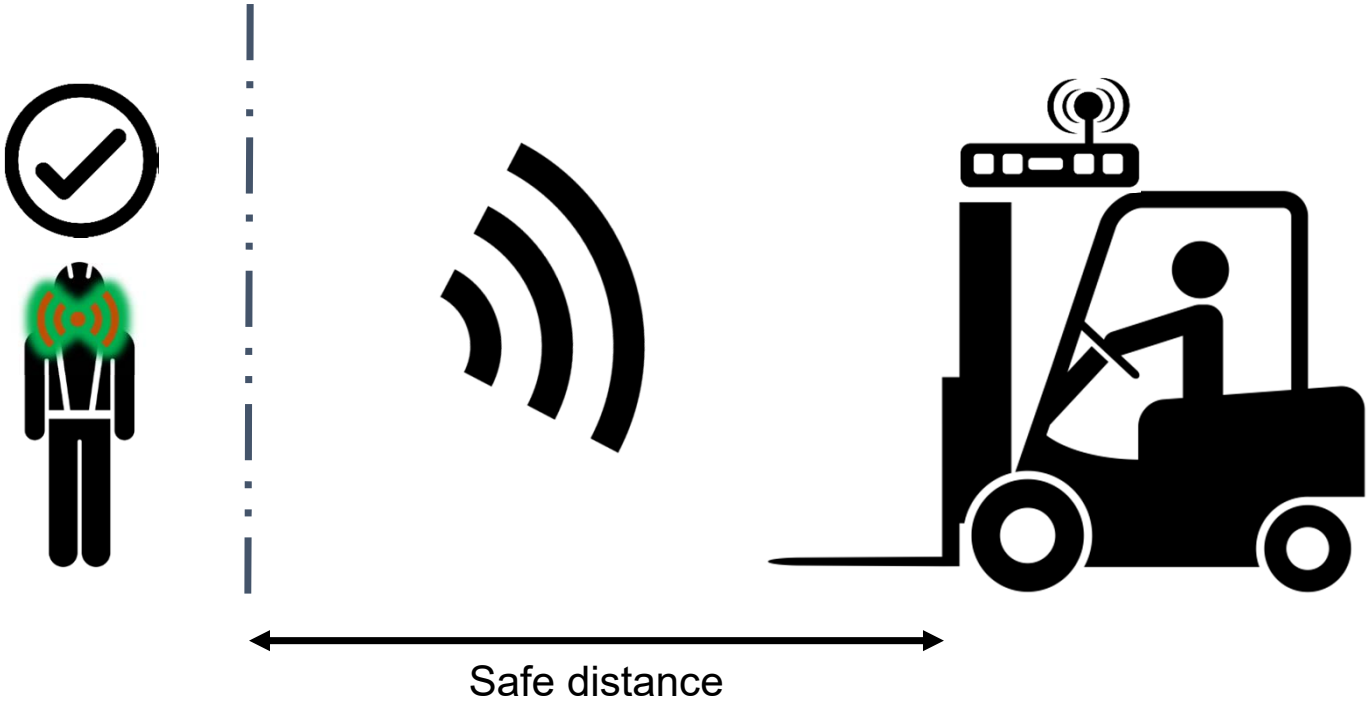
WORKER SAFETY

Step 2 : the TAG measures the magnetic field.



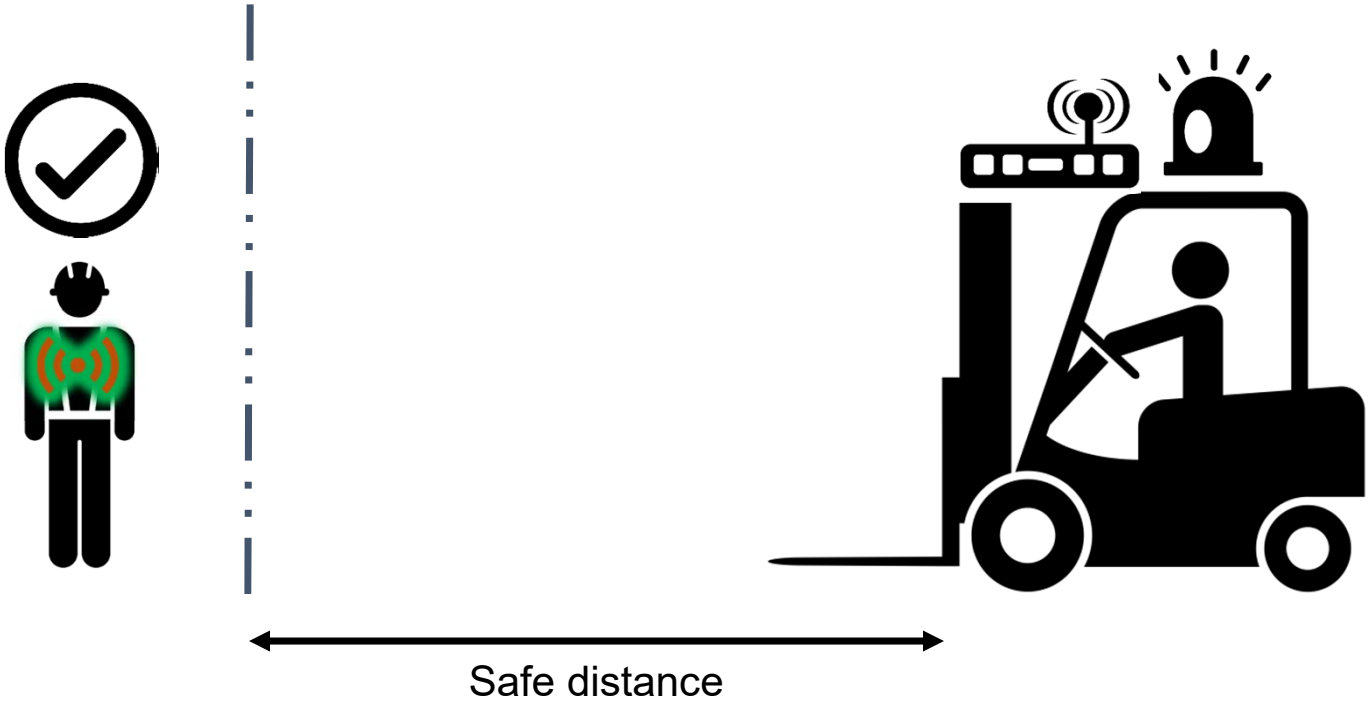
WORKER SAFETY

Step 3 : the measured value is broadcasted by UHF transmission to the forklift truck (standard Active RFID reader).



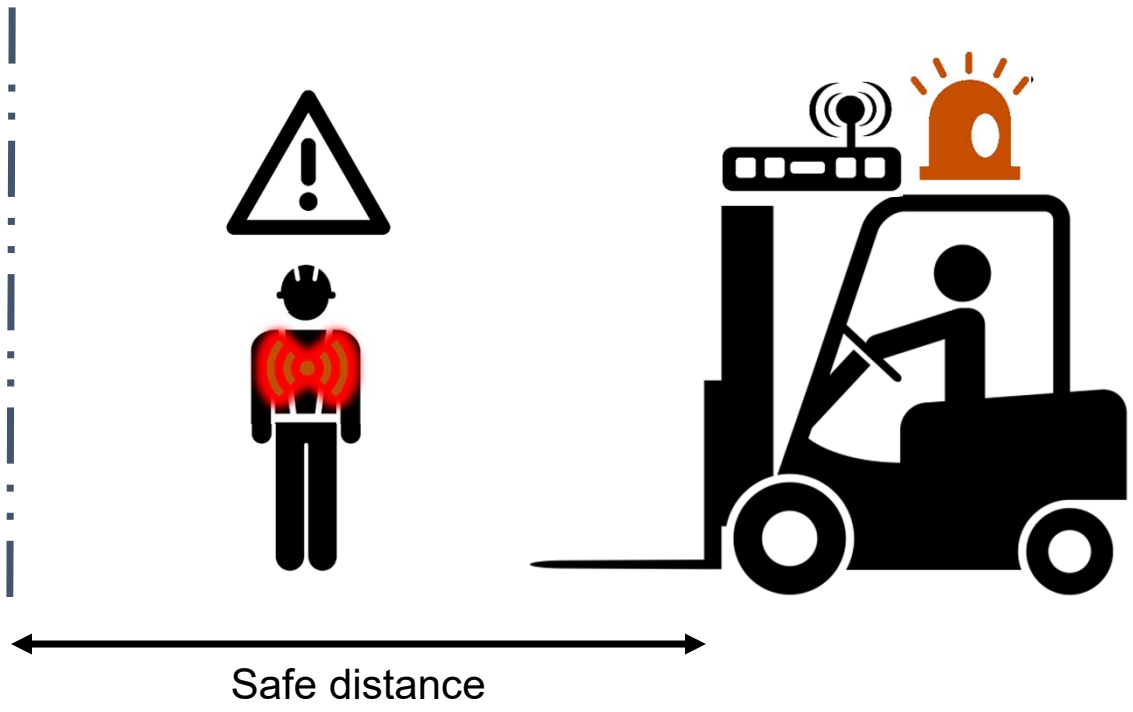
WORKER SAFETY

Step 4 : alarm activated according to the measured value and the safe distance required.



WORKER SAFETY

Step 5: alarm activation.



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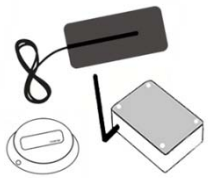

ACCESS CONTROL

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Traceability for Train Washing Process

- Each **train** has follow a **weekly washing automatic process**.
- The **washing stations** are placed on **dedicated railways** among tens in the **SNCF maintenance center.**
- Client requirement : to provide **an automated traceability of the washing process** for each train by eliminating any human action

RTLS & ASSET TRACKING

- Technical constraints :
  - **The device or label must be placed inside the train's cabin.**
  - **The solution must garantee the correct train's ID with the correct washing station.**
  - **The distance between each railway is around 4 meters**

RTLS & ASSET TRACKING

ELA Solution : the PUCK DOT

- An active tag **PUCK DOT** placed inside the cabin.
- A **TAG ACTIVATOR** placed by the railwayside. Each TAG ACTIVATOR has a specific ID.
- The TAG ACTIVATOR's magnetic field is configured not to cross the others railways (< 4m)
- One **unique active RFID reader** with a powerful directional antenna

RTLS & ASSET TRACKING

ELA Solution : the principle

1. A train follows **one of the lanes with a washing station**

2. The train enters into the **LF field generated by the TAG ACTIVATOR**

3. The **PUCK DOT** placed inside the train's cabin detects and measures this LF field.

4. The PUCK DOT sends its 433MHz frame, **including the TAG ACTIVATOR's ID and the LF field's value**.

RTLS & ASSET TRACKING

ELA Solution : the principle

5. The Active RFID reader placed at the monitoring center receives the PUCK DOT frame, including the **PUCK DOT's ID, the TAG ACTIVATOR's ID,** the LF RSSI and the UHF RSSI.

Conclusions : thanks to the PUCK DOT, the monitoring solution automatically associates in real time the washing process done a given lane with the correct train's ID.

ELA Innovation
The DOT products

- Very accurate LF detection : + / - 50cm
- Long range UHF transmission : around 100m
- Industrial design (robust, waterproof, long lifecycle, …)
- Adjustable distance of detection : up to 7m for single antenna, up to 15m for powerful LF panel antenna
- 2 modes : UHF transmission only in LF field or continuous UHF transmission

AVAILABLE SOON . . .

2017 roadmap

- ELA Active RFID ARDUINO SHIELD
- PUCK MAG
- COIN LUX
- New COIN MOV (with 3-axis accelerometer)
- Bluetooth Low Energy (BLE) based PUCK ID & PUCK T
- Bluetooth based COIN X
- NFC empowered COIN ID & PUCK ID

Please visit www.rfid-ela.eu
Thanks for your attention
Any question ?

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