

Simon Fraser University, School of Mechatronic Systems Engineering
MSE 910, Industrial Internet of Things (I-IoT)
Fall 2023, Course Project-1

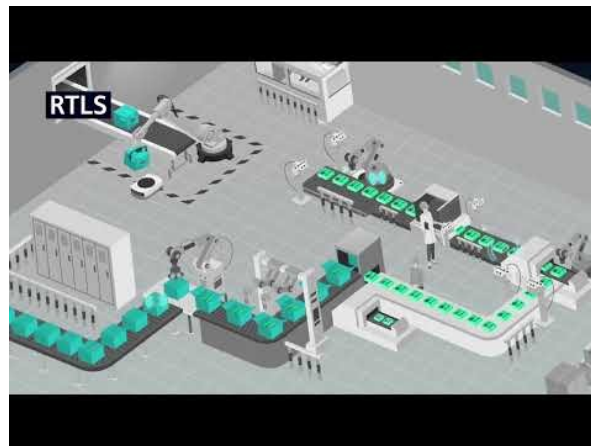
Real-time Locating Systems (RTLS)

Introduction

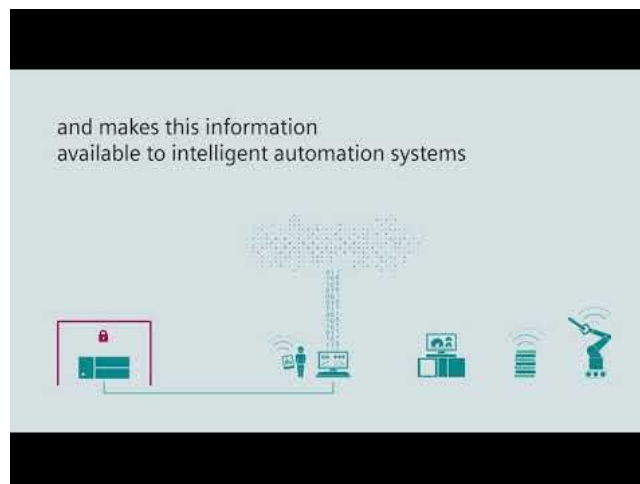
Real-time locating systems, also known as real-time tracking systems, are used to automatically identify and track the location of objects or people in real-time, usually within a building or other contained area.

Example:

<https://www.youtube.com/watch?v=EvMKvDkOkOg>



<https://www.youtube.com/watch?v=R68OJop8Gp0>

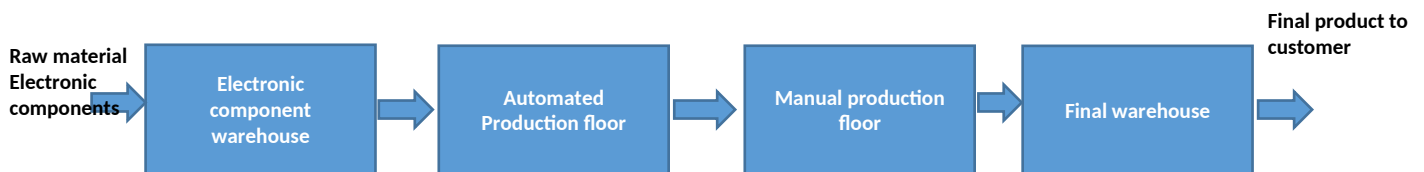


Project Title

Applications of Real-Time Locating Systems (RTLS) in Electronic Manufacturing

Commercially available RTLS in the market that can be used in electronic manufacturing

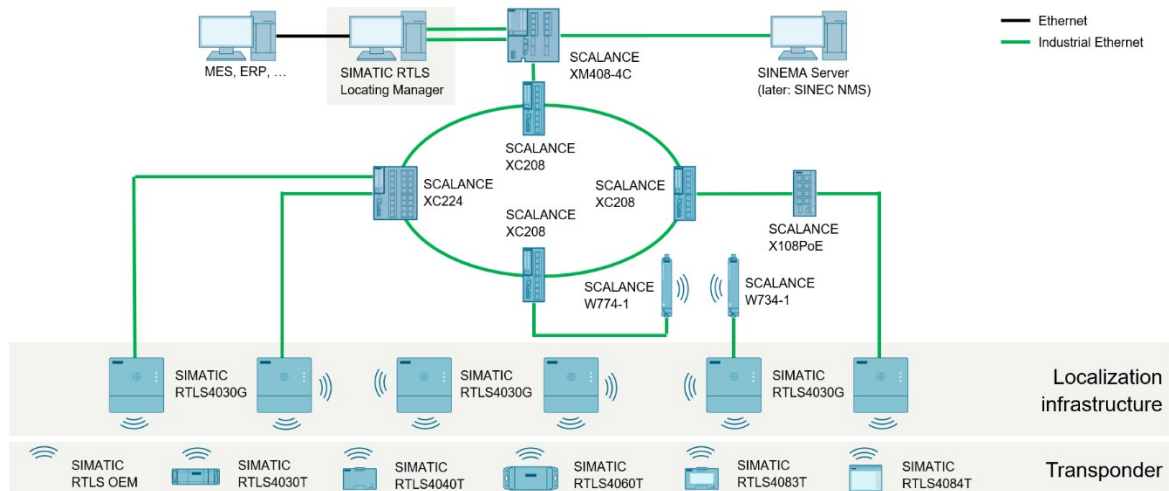
- List of commercially available RTLS in the market for indoor use
- Tabular comparison of the available RTLS technologies (Ultra-Wide Band, UWB, RFID, Bluetooth Low Energy (BLE), Wi-Fi, camera, and GPS) based on accuracy, power consumption, range, and localization method
- Which RTLS vendor do you recommend (recommend three vendors) to be used in the electronic component warehouse, production floor, and final dispatching warehouse



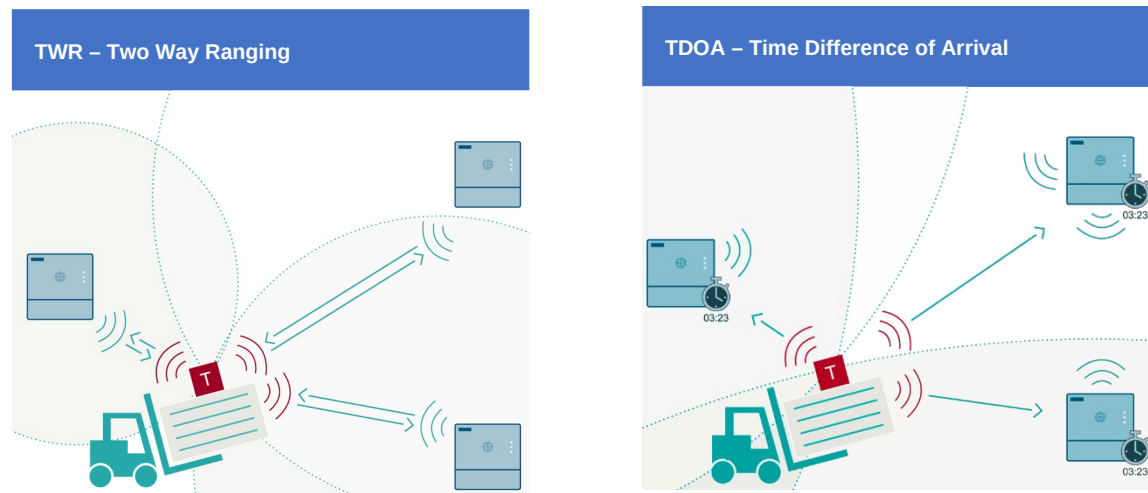
- What features of the RTLS do we need to consider when purchasing and deploying them for electronic manufacturing applications?
- Can we use the same RTLS technologies for warehouses and production floors? Please note that the electronic components are stocked on tape or reel in the warehouse

Network architecture and infrastructure (hardware and software) needed for implementing RTLS in an electronic manufacturing company

- Network architecture for each technology and each application (warehouses and production floor) if they are different. For instance, the network architecture used for an RTLS system based on Siemens:



Localization Methods



Benefits of RTLS in Smart Manufacturing of PCB/PCBA

- How RTLS increases the efficiency, throughput, productivity, transparency, and safety of the above procedures in electronic manufacturing
- What is the driving force behind using RTLS in electronic manufacturing with mixed low-volume production?
- How we can calculate or estimate the Return on Investment (ROI) when using an RTLS system?

Students should prepare a PowerPoint presentation using the following resources:

- Websites of RTLS vendors
- Website of vendors (partner section), partners provide complementary technologies to RTLS systems such as integration of the localization software to MES and ERP
- White papers from vendor websites
- Datasheets, catalogs, and brochures of the above elements
- YouTube channels and videos
- Webinars
- Scientific papers (Journal/conference papers) from 2017 to present.

Project presentation

- 1- Projects can be done in a group of two or a maximum of three students.
- 2- Students should make sure that they fully address the above-discussed points
- 3- The project and presentation due dates are Nov. 27 and 29.
- 4- Each group should submit a PowerPoint presentation.
- 5- Each presentation should be done in 15 min.
- 6- Each group should study at least three scientific papers to know the state-of-the-art RTLS.
- 7- Each presentation should cover 20 slides.