Module 6 – RFID Applications

RFID can be used to support many different types of commercial, government and academic activities from commercial supply chains to tracking research laboratory samples. But which type of RFID is used in any application is dependent upon how well the characteristics of the type of RFID being used matches the needs of the application it is to support.
The selection of RFID types for specific industries or applications over time has led to a natural grouping of RFID types for those industries and/or applications. This does not mean that a type of RFID is never used for anything else, only that it is often used for such an application.

Main Objectives:

1. Know what applications each of the types of RFID are typically used for.
2. Know why a specific type of RFID is the most suitable for the application it is typically used for.

- **Low Frequency (LF)** - 125 kHz – short read range but really great penetration of liquids and moist materials

    o Animal tracking – livestock tracking (ear tags), pet tracking (injected chip)

    o Car immobilizers – short read range, works when key gets inserted into the ignition

- **High Frequency (HF)** - 13.56 MHz – short read range, low cost, good performance around water and liquids

    o Building security and access control (access cards/passes)

    o Tracking pharmaceuticals

    o Library book tracking

    o Laundry tracking

- **High Frequency/ Near Field Communication** - 13.56 MHz – short read range, secure element

    o Payment systems – NFC Cards, NFC enabled smart phones

- **Ultra-High Frequency (UHF)** - 860-960 MHz – longer read range, low cost in high volumes, easy slap-and-ship deployment, mandates (Walmart)

    o Supply chain, inventory tracking – case, pallet tracking

    o Asset tracking, returnable asset tracking

    o Retail item tracking

    o Uniform tracking, laundry tracking

- **Ultra-High Frequency (UHF)** - 433 MHz – very long read range, active RFID, high cost tags for high value items, used by DoD for many years, tags can carry sensors (container seal sensor, temperature sensor, etc.)

    o Ocean container tracking

    o Logistics and container tracking over land

    o High value asset tracking

    o Military asset and supplies tracking (DoD)

- **Microwave** - 2.45 GHz – very fast data transfer rates, short distance when passive but long distance when active, often used in Wi-Fi RTLS systems

    o Patient tracking

    o Real Time Location Systems

    o Toll roads

- **Ultra Wide Band (UWB)** - 5 GHz – very fast data transfer rates, very accurate location

    o Equipment and asset location

    o Real Time Location Systems

Study List

For additional information, please review:
What is RFID
Frequencies
NFC – Introduction to Contactless Payment
RFID Solutions
RFID Technology in Industry Verticals
Uniform Tracking