DCS
Power To Design The Desired

CENTRE FOR SKILL AND ENTREPRENEURSHIP DEVELOPMENT

TOPIC – RFID

IIOT - 3

TECHNOLOGY PARTNER

DASSAULT SYSTEMES ptc Mastercam

WHAT IS RFID - INTRODUCTION

1. Radio Frequency Identification systems consist of an RFID tag (typically many tags) and an interrogator or reader.

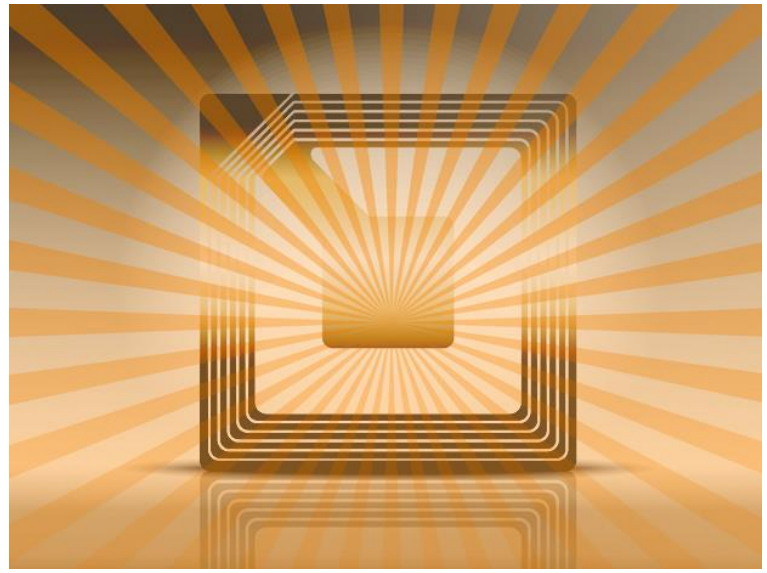
   The interrogator emits a field of electromagnetic waves from an antenna, which are absorbed by the tag.

   A. Tag

   B. Reader

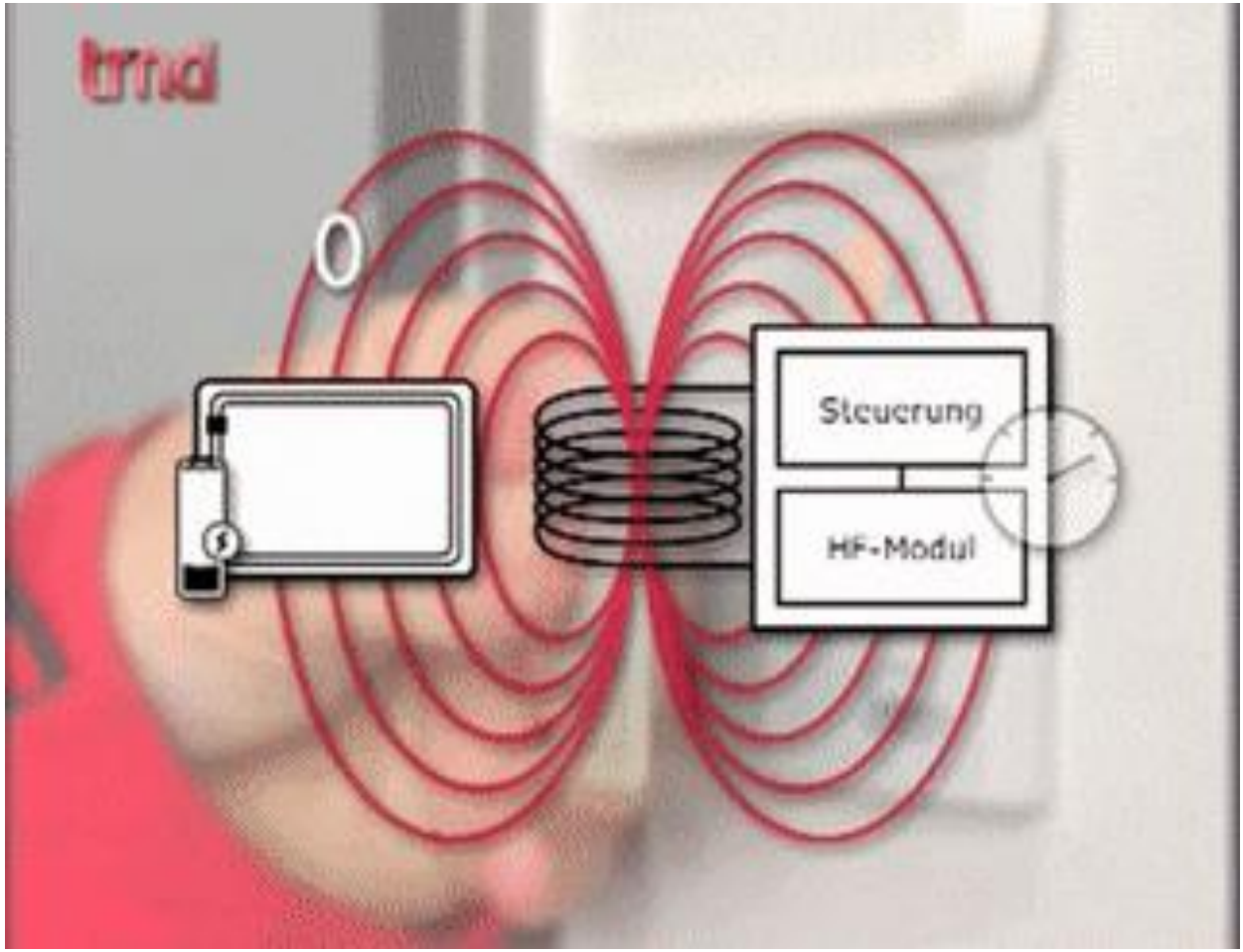
WHY RFID REQUIRED

1. To identify the things without physical contact
2. Sense the things during run time – Automatic toll tax collection



HOW DOES RFID WORK?

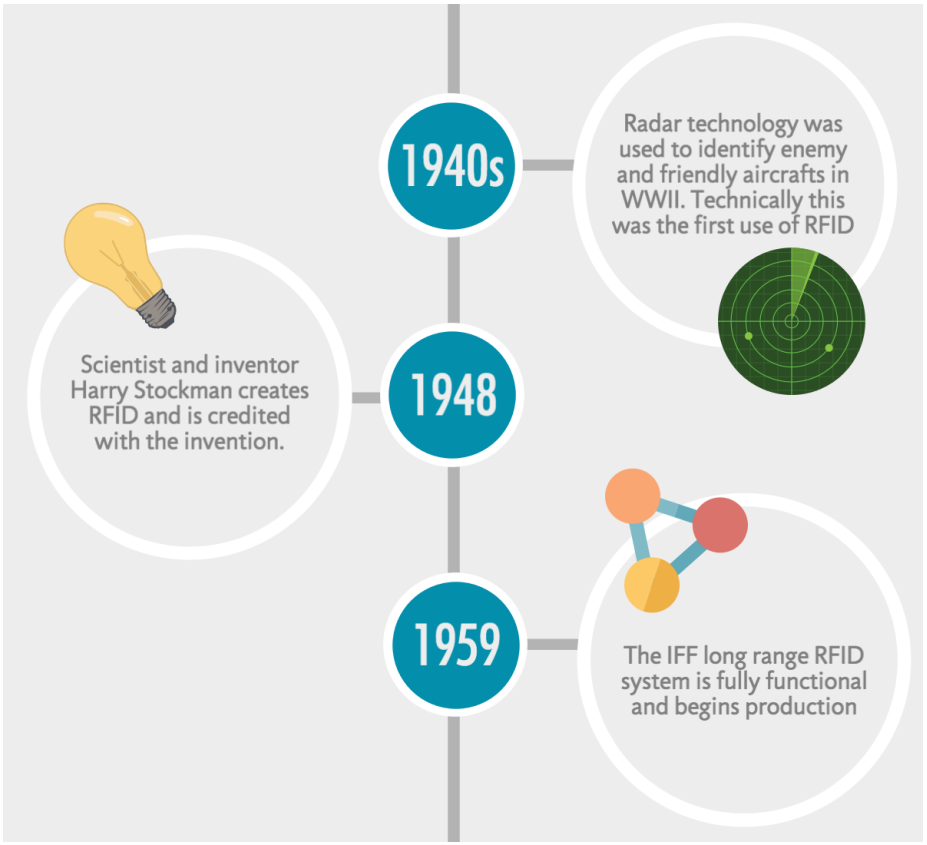
RFID is technology which works on radio frequency and it is used for the auto-identification for the different objects. The RFID system mainly consists of two parts. ... If the object, on which this RFID tag is attached is within the range of this radio waves then it sends the feedback back to this RFID reader

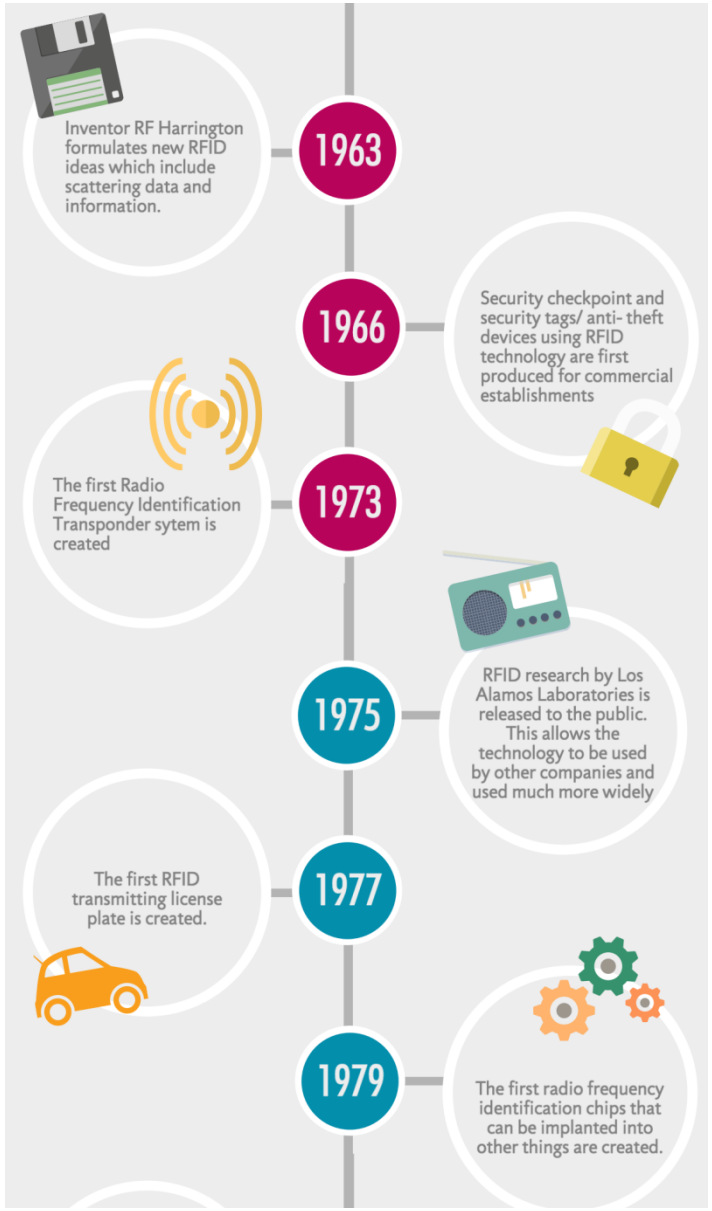


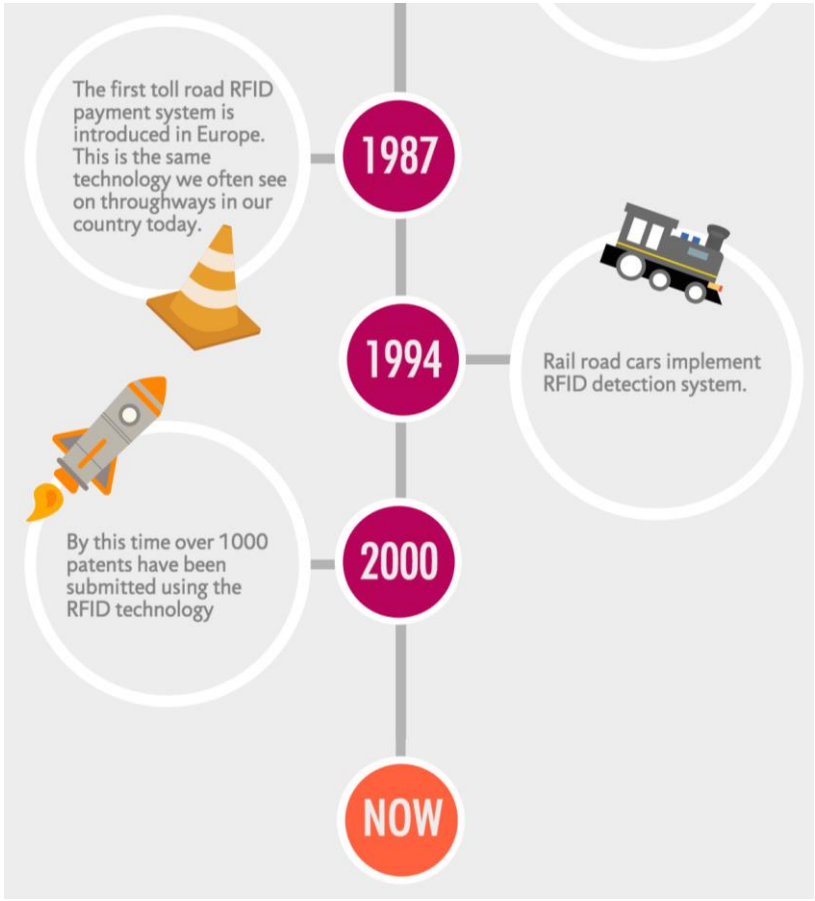
HISTORY OF RFID

1. 1940's - Radar technology was used to identify enemy and friendly aircrafts in WWII. Technically this was the first use of RFID
2. 1948 - Scientist and inventor Harry Stockman creates RFID and is credited with the invention.
3. 1963 - Inventor RF Harrington formulates new RFID ideas which include scattering data and information
4. 1977 - The first RFID transmitting license plate is created.
5. 2000 - By this time over 1000 patents have been submitted using the RFID technology

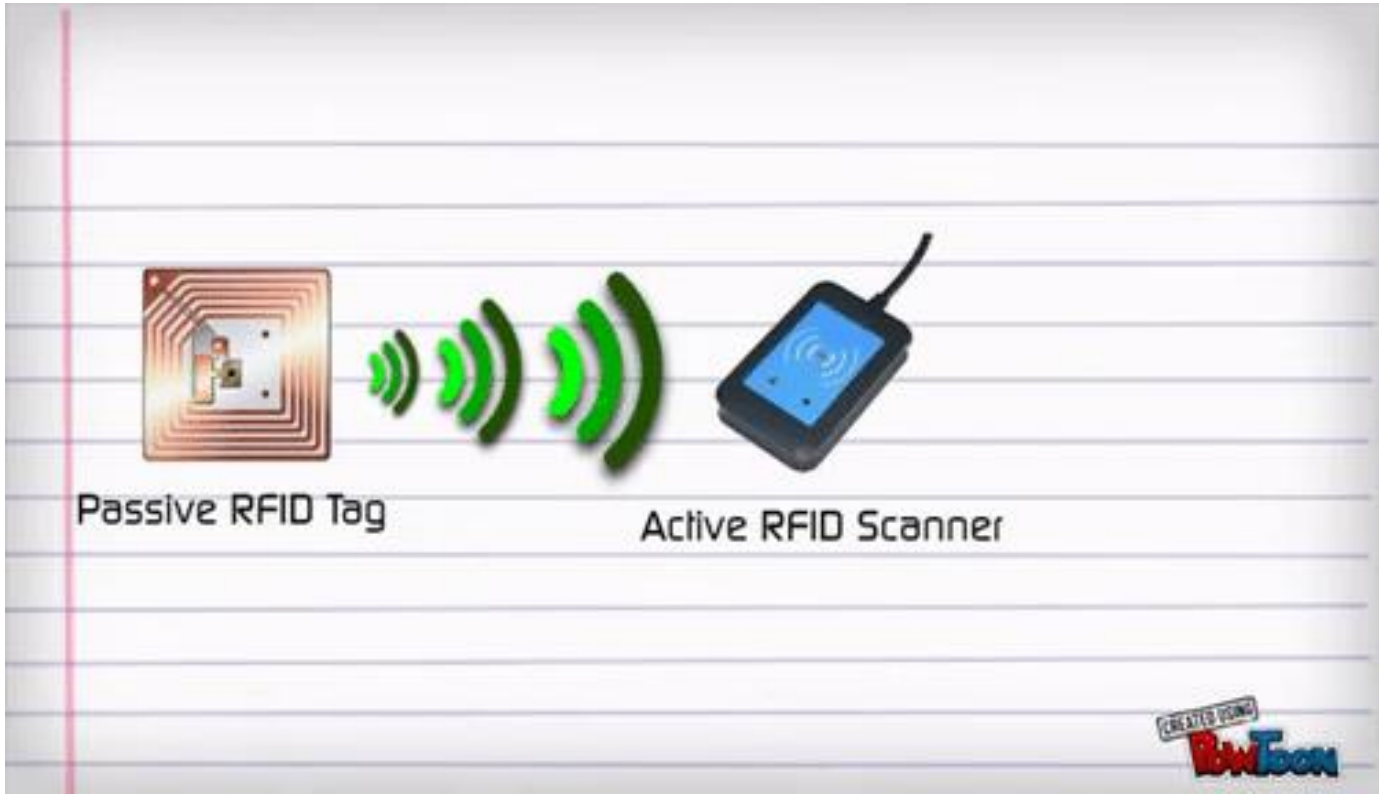
HISTORY OF RFID



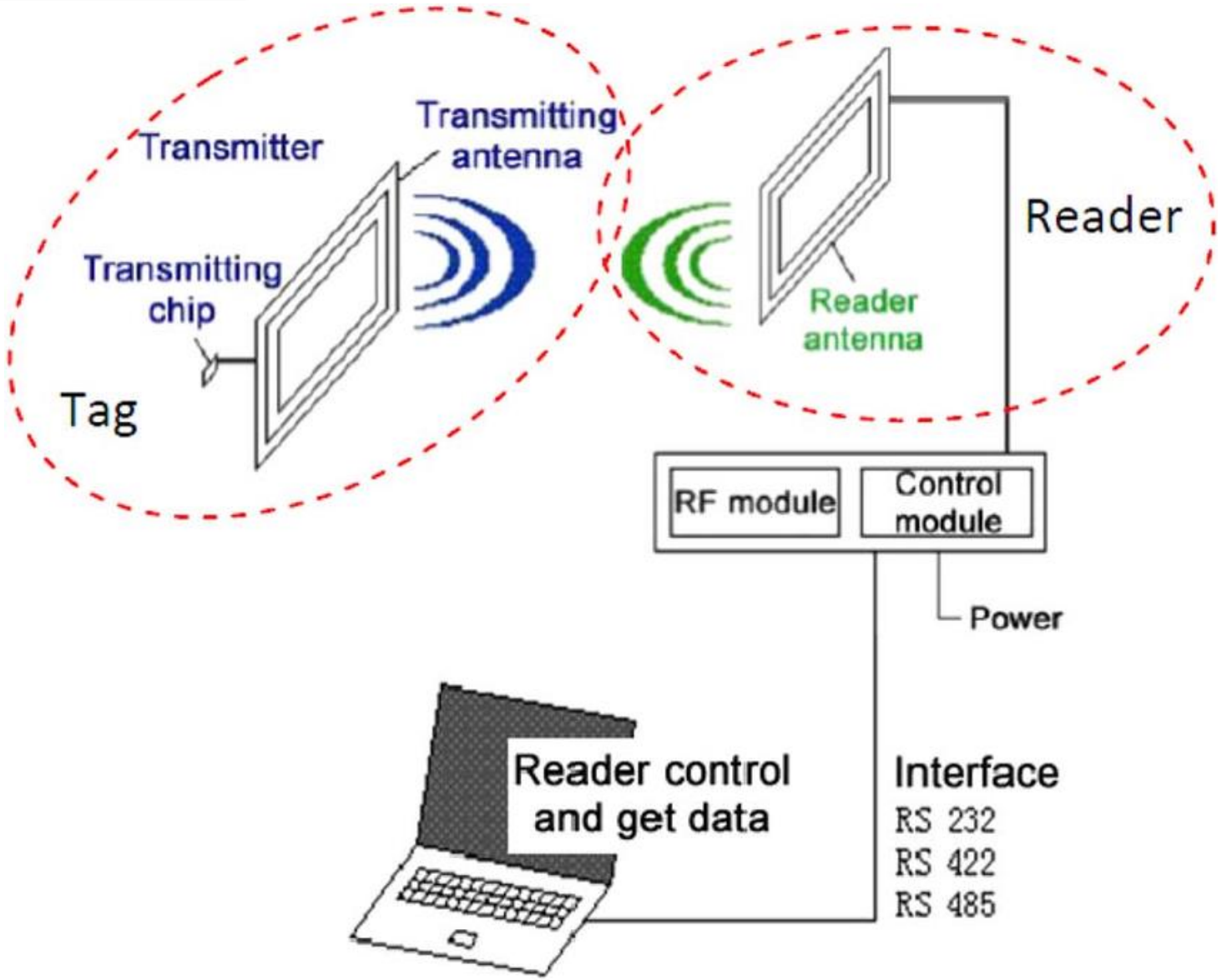




HOW RFID WORK



HOW RFID WORK



ELECTROMAGNETIC SPECTRUM

* The orange text denotes that this frequency is authorized for use with RFID applications

TYPES OF RFID - LOW FREQUENCY

1. General Frequency Range: 30 - 300 kHz
2. Primary Frequency Range: 125 - 134 kHz
3. Read Range: Contact - 10 Centimeters
4. Average Cost Per Tag: 5-30 Rs.
5. Applications: Animal Tracking, Access Control, Car Key-Fob, Applications with High Volumes of Liquids and Metals
6. Pros: Works well near Liquids & Metals, Global Standards
7. Cons: Very Short Read Range, Limited Quantity of Memory, Low Data Transmission Rate, High Production Cost

HIGH FREQUENCY

1. Primary Frequency Range: 13.56 MHz
2. Read Range: Near Contact - 30 Centimetres
3. Average Cost Per Tag: 20-100 Rs.
4. Applications: DVD Kiosks, Library Books, Personal ID Cards, Poker/Gaming Chips, NFC Applications
5. Pros: NFC Global Protocols, Larger Memory Options, Global Standards
6. Cons: Short Read Range, Low Data Transmission Rate

ULTRA-HIGH FREQUENCY

1. General Frequency Range: 300 - 3000 MHz
2. Primary Frequency Ranges: 433 MHz, 860 - 960 MHz

ACTIVE RFID

1. Primary Frequency Range: 433 MHz, (Can use 2.45 GHz - under the Extremely High Frequency Range)
2. Read Range: 30 - 100+ Meters
3. Average Cost Per Tag: 100-500 Rs.
4. Applications: Vehicle Tracking, Auto Manufacturing, Mining, Construction, Asset Tracking
5. Pros: Very Long Read Range, Lower Infrastructure Cost (vs. Passive RFID), Large Memory Capacity, High Data Transmission Rates
6. Cons: High Per Tag Cost, Shipping Restrictions (due to batteries), Complex Software may be Required, High Interference from Metal and Liquids; Few Global Standards

PASSIVE RFID

1. Primary Frequency Ranges: 860 - 960 MHz
2. Read Range: Near Contact - 25 Meters
3. Average Cost Per Tag: 15-25 Rs.
4. Applications: Supply Chain Tracking, Manufacturing, Pharmaceuticals, Electronic Tolling, Inventory Tracking, Race Timing, Asset Tracking
5. Pros: Long Read Range, Low Cost Per Tag, Wide Variety of Tag Sizes and Shapes, Global Standards, High Data Transmission Rates
6. Cons: High Equipment Costs, Moderate Memory Capacity, High Interference from Metal and Liquids

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QUERY & DOUBT SESSION