

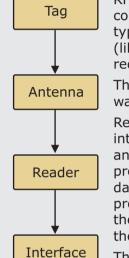
Radio Frequency Identification (RFID)

Introduction

Radio-Frequency Identification (RFID): is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. An RFID tag is an object that can be applied to or incorporated into a product, animal, or person for the purpose of identification and tracking using radio waves. Some tags can be read from several meters away and beyond the line of sight of the reader.

There are generally two types of RFID tags: active RFID tags, which contain a battery, and passive RFID tags, which contain a battery, and passive RFID tags. Which have no battery, Today, RFID is used in enterprise supply chain management of improve the efficiency of inventory tracking and management.

RFID System Components



RFID Tag sends pertinent information to the antennas. It consists of an integrated circuit (IC) attached to an antennatypically small coil of wires-plus some protective packaging (like a plastic card) as determined by the application requirements.

The Antennas pick up the information from the tags via radio waves, then send that information to the reader.

Reader (now more typically referred to as an RFID interrogator) is basically a radio frequency (RF) transmitter and receiver, controlled by a microprocessor or digital signal processor. The reader, using an attached antenna, captures data from tags, then passes the data to a computer for processing. The Reader interpret the information, organize it, then send it to the interface software. The reader also controls the antennas.

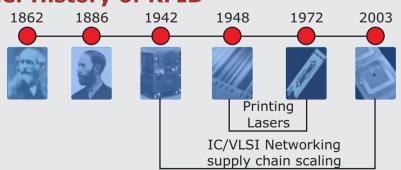
The Interface software (middleware) formats the information so that it can talk to the user's computer/network.

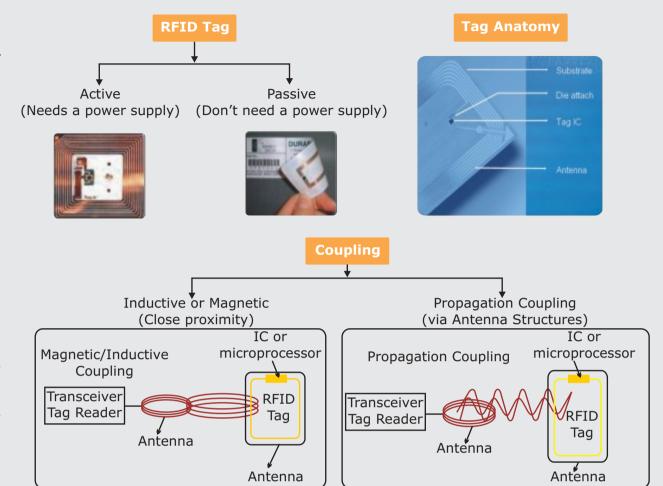


Dr. Jerry Landt: is god father of Radio Frequency Identification (RFID) technology. He is one of the five scientists from Los Alamos National Laboratories that developed this technoloy for the federal Government. As Trans Core's chief scientist, Landt is responsible for leading the technical developments of radio frequency identification systems. In 1984, Landt was one of the five co-founders of Amtech Corporation and served as vice

president of research and development. He served on the Amtech board of directors from May 1989 to August 1998. Landt has authored more than 60 technical papers and been awarded twelve U.S. Patents. Before joining Amtech, Landt worked for nine years at the Los Alamos National laboratory in New Mexico. Nandt earned a Ph. D. In electrical engineering from Stanford University, a master of science degree and a bachelor of science degree in electrical engineering from the South Dakota School for Mines and Technology.

A Brief History of RFID





Different types of Tags



Different types of Readers

Frequency Bands & Applications

Frequency Band	Characteristics	Typical Applications
Low 100-500KHz		Access control, animal identification, inventory control car immobilizer
Intermediate 10-15MHz	Medium read range, potentially Inexpensive, medium reading speed	Access control, smart cards
High 850-950 Mhz 2.4-5.8 GHz	Long read range, High reading speed C Line of sight required, Expensive	ar monitoring, toll collection systems.

Applications

Animal Management Goods Management



Library Management

Race Timing





RFID Passport





Advantages of RFID over Barcode technology

- No line of sight requirement
- The tag can stand a harsh environment
- Long read range
- Portable database
- Multiple tag read/erite
- Tracking people, items, and equipment

Technical Problems with RFID

- RFID standards: No global standards
- RFID system can be easily disrupted
- RFID Reader/Tag Collision
- Security, privacy and ethics problems with **RFID**

The Future of RFID

- RFID tags on frozen foods instruct the microwave how to cook them
- Shoppers wall through an antenna bay are automatically checked out
- Milk notifies the refrigerator when it's expiration data has hit.
- RFID Tags on cloths instruct the washing machine on how to wash them.
- RFID Tags on drug bottles are now being used as anti-counterfeiting devices
- Prescription bottles that remind you if you forget to take a pill
- RFID Tags could replace the postage stamp.



10006 PC Based Motorised Antenna Trainer



Antenna Trainer







Motorised Antenna Trainer



10203 Satellite Communication Trainer



10204 Radar Trainer



10212 **GPS Trainer**



10917

RFID Trainer





52072A Arduino Development Board