SNS COLLEGE OF ENGINEERING

Kurumbapalayam(Po), Coimbatore – 641 107
Accredited by NAAC-UGC with 'A' Grade
Approved by AICTE, Recognized by UGC & Affiliated to Anna University, Chennai

Department of AI & DS

Course Name – Internet of Things & AI
III Year / V Semester

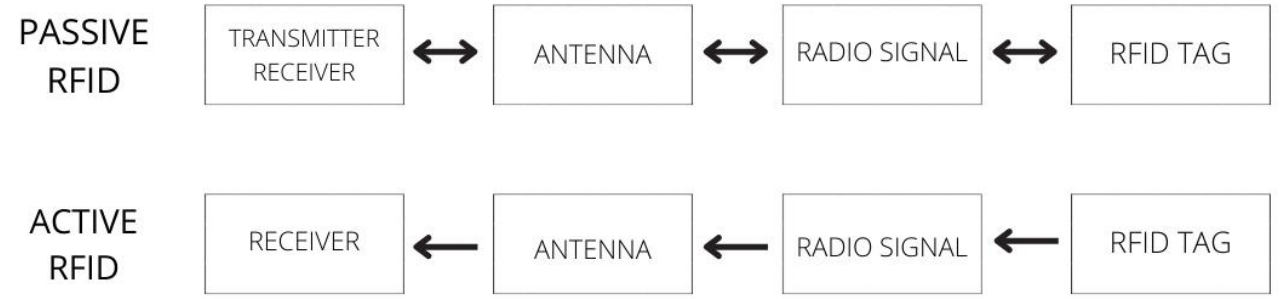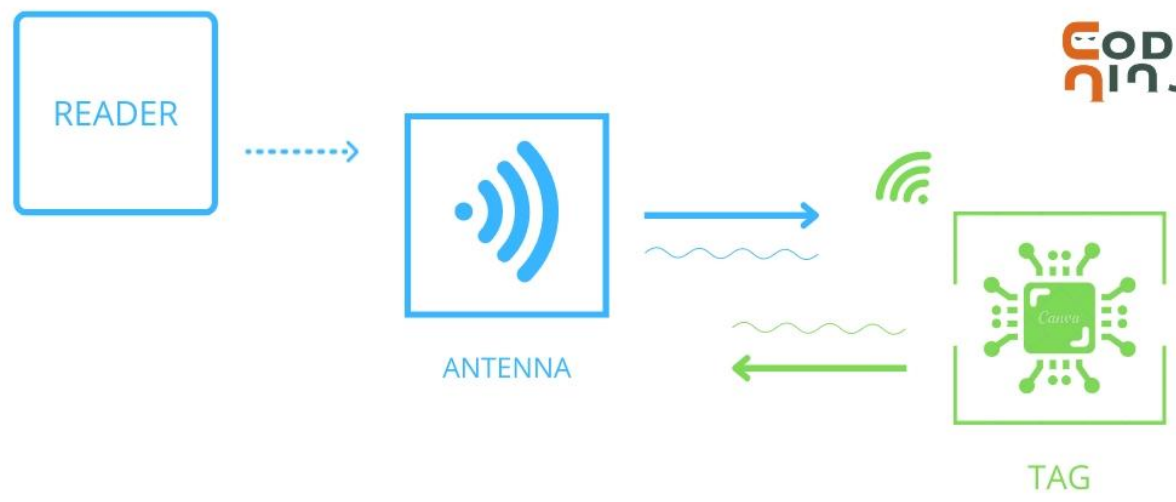## CONNECTIVITY TECHNOLOGIES AND COMMUNICATION PROTOCOLS

RFID PROTOCOL

- RFID (Radio Frequency Identification) is a type of wireless communication that uses electromagnetic or electrostatic coupling in the radio frequency spectrum to uniquely **identify an object, animal, or human.**

- It is a technology used for automatically identifying and recording data about an object via a tiny, uniquely identifiable microchip tag connected to the object. A built-in antenna on the RFID tag interacts with a scanning device that can remotely read the tag's data.

- The scanning device scans the tag when it comes in range. After that, the data is sent from the scanning equipment to an application program. With the help of the application, the user will store and send it wherever he desires

Working of RFID

● RFID, or radio frequency identification, is a technique for automatically identifying and capturing data about an object that has been stored in a small microchip tag attached to the object. An antenna built into the RFID tag communicates with a scanning device that reads the data remotely.

● This data is then transferred from the scanning device to the data-housing enterprise application software. Each RFID tag has a unique identification number.

● RFID can be used to track and control asset and personnel movement. RFID tags can be found on the back of library books and even in the new biometric passports. It simplifies the management of assets contained in boxes or pallets.

PASSIVE RFID	TRANSMITTER RECEIVER	⟷	ANTENNA	⟷	RADIO SIGNAL	⟷	RFID TAG
ACTIVE RFID	RECEIVER	←	ANTENNA	←	RADIO SIGNAL	←	RFID TAG

- RFID uses radio waves to perform AIDC function. AIDC stands for Automatic Identification and Data Capture technology which performs object identification and collection and mapping of the data.

- An antenna is an device which converts power into radio waves which are used for communication between reader and tag.

- RFID readers retrieve the information from RFID tag which detects the tag and reads or writes the data into the tag.

- It may include one processor, package, storage and transmitter and receiver unit.

RFID COMPONENTS

01
RFID TAG

02
RFID READER

03
RFID SOFTWARE

- **The RFID tag:** The RFID tag comprises an integrated circuit, a substrate, and an antenna. If the tag has an active power source and thus can support a sensor, it is called an active RFID tag. If the tag doesn't have an active power source, it is called a passive RFID tag.

- **The RFID reader**: It is a device that reads RFID tags and gathers data about the connected object. It can be both wired and wireless. It can use many technologies to communicate with the software, including USBs and Bluetooth connections.

- **The RFID software:** The software monitors and tracks the object connected to the RFID tags. It can be called data exchange and management software.

Applying RFID to IoT Devices

- RFID tags are helpful in cameras, GPS, and other smart sensors when used in IoT. They can aid in the identification and location of objects. It is a low-cost way to make household objects "smart," .

- RFID tags are being used by some healthcare systems to track patients and their medical records.

- RFID is used in transportation systems to read passenger data, control traffic, and update transportation systems.

- Radio Frequency Identification technology is one of the three main components of IoT, along with the Savant system and the Internet.

- RFID tags are generally used to enable ordinary things to interact with one another and with the central hub and report their status.

- These features serve as the building blocks for an IoT system. To put it another way, RFID technology allows IoT to connect items to a network and will enable them to produce and deliver data.

Operating frequency

- **The system is mainly used in three frequency bands.**

  1) Low-frequency band(LF):

- General Frequency Range: 30 – 300 kHz

- Primary Frequency Range: 125 – 134 kHz

- Read Range: Contact – 10 Centimeters

- **2) High-frequency band (HF):**

- Primary Frequency Range: 13.56 MHz

- Read Range: Near Contact – 30 Centimeters

- **3) Ultra-high frequency band:**

- General Frequency Range: 300 – 3000 MHz

- Primary Frequency Ranges: 433 MHz, 860 – 960 MHz

SWATHIRAMYA,AP