

## **NIELIT, Gorakhpur**

**Course Name: A-level (1<sup>st</sup> Sem.)**

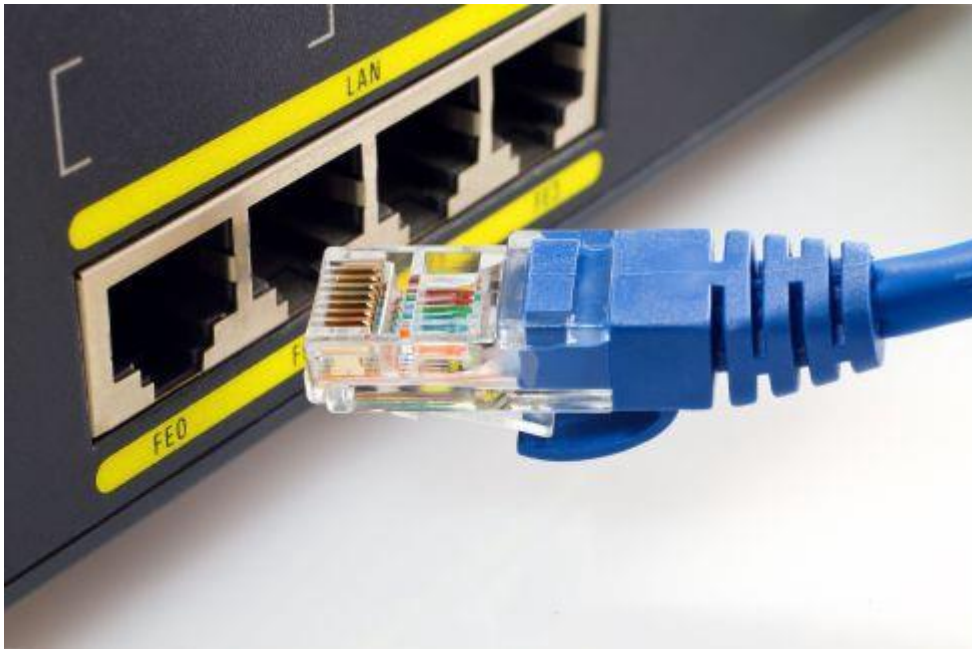
**Subject: IoT**

**Topic: Wired and Wireless communication cont. Date: 26.05.2020**

### **External Communication**

#### **1)Ethernet :**

A system for connecting a number of computer systems to form a local area network, with protocols to control the passing of information and to avoid simultaneous transmission by two or more systems. The first widely used LAN technology was developed in the mid-1970s by researchers at the Xerox Palo Alto Research Centers (PARC). Its simpler and cheaper than token LANs and ATM. Every Ethernet network interface card (NIC) is given a unique identifier called a MAC address. The MAC address comprises of a 48-bit number. Within the number the first 24 bits identify the manufacturer and it is known as the manufacturer ID or Organizational Unique Identifier (OUI) and this is assigned by the registration authority.



#### **Advantages and Disadvantages of Ethernet:**

##### **Advantages :**

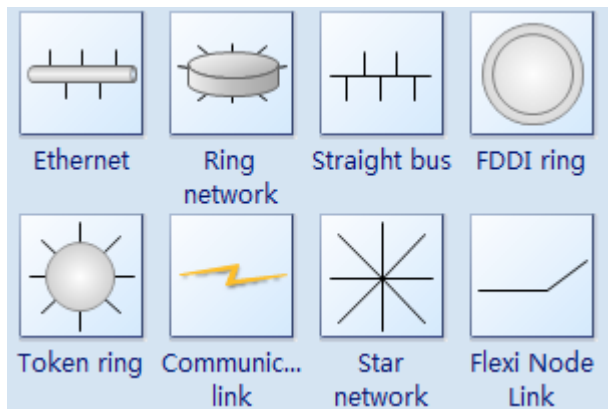
- Network start with it and end with it.
- Reliable and can be used within a building , doesn't matter how many floor.
- It will be needed switch to keep network.
- It is basically used for making LAN.

##### **Disadvantages :**

- Can't be used for long distance network. copper or Fiber will help here.
- In a building network , you have to connect Ethernet to switch and then Ethernet again which makes such network, a hell (with presence of lot of cables)which is very irritating and tough to manage.

### Application of Ethernet :

- Cloud Computing
- Site to Site Access
- Video Applications
- Distributed Storage Area Networks
- CCTV
- Copper cable
- Fiber optic cable



### 2)RS-232 :

RS-232 stands for **Recommended Standard 232**. It is basically an interface standard. It is commonly used in computer serial ports. The standard defines the electrical characteristics and timing of signals. The current version of the standard is TIA-232-F, issued in 1997.

### Advantages and Disadvantages of RS-232:

#### Advantages :

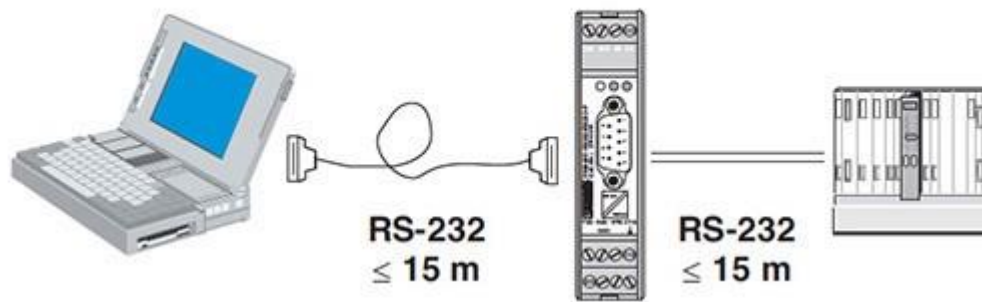
- Simple wiring and connectors
- Widely available
- Low cost
- Most embedded processors include this interface
- Software to implement a serial port is easy

#### Disadvantages :

- Not as commonly used
- Less standardized connectors and terminology
- Half-duplex master-slave operation

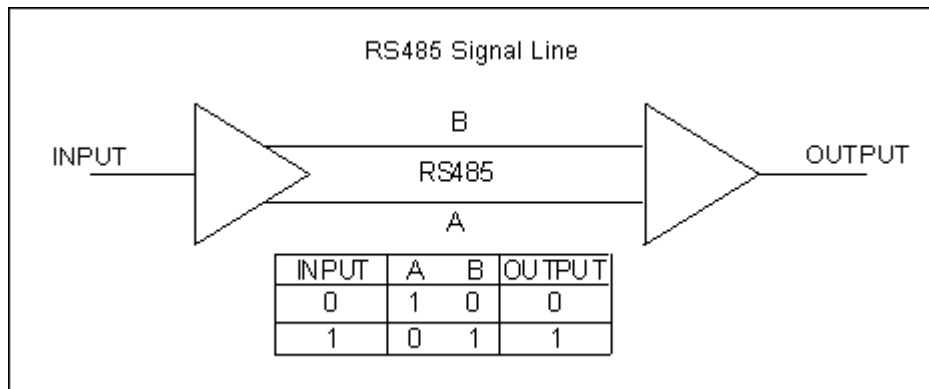
### Application of RS-232 :

- Serializes data to be sent to modem
- De-serializes data received from modem



### 3)RS-485 :

RS-485 (EIA-485 Standard) is an improvement. It increases the number of devices from 10 to 32 and defines the electrical characteristics necessary to ensure adequate signal voltages under maximum load. It can create networks of devices connected to a single RS-485 serial port. The noise immunity and multi-drop capability make RS-485 the serial connection of choice in industrial applications. RS-485 hardware may be used for serial communication with up to 4000 feet of cable.



### Advantages and Disadvantages of RS-485:

#### Advantages :

- Low cost
- Immune to noise
- Multipoint applications
- Operates on a single pair of wires

#### Disadvantages :

- Not as commonly used
- Less standardized connectors and terminology
- Half-duplex master-slave operation

#### Application of RS-485 :

- RS-485 signals are used in a wide range of computer and automation systems.
- RS-485 is used as the physical layer underlying many standard and proprietary automation protocols used to implement Industrial Control Systems
- RS-485 is also used in building automation as the simple bus wiring and long cable length.
- It is also used in model railway.