

## # Communication :

Communication is the process of establishing link or connection between two points for information exchange. It is simply a basic process of exchanging information.

## # Communication System:

The electronic equipments which are used for communication purpose are called communication equipments. Different communication equipments when assembled together form a communication system. The block diagram of a communication system or a telemetry system is as shown below:

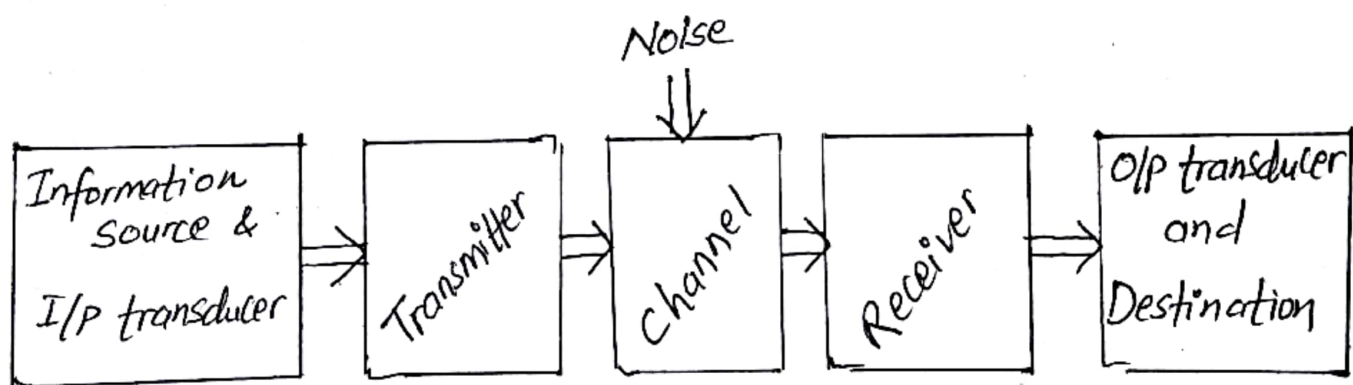


Fig: Block diagram of Communication System

### 1) Information Source and Input transducer :

Information or message is produced or generated by information source. In general, these can be various messages in the form of words, group of words, code, symbol, audio, video, etc. The message from the source may or may not be in electrical form. An input transducer converts the message into corresponding electrical signal. For eg: a microphone converts audio signal into electrical signal.

### (2) Transmitter:

The crude signal generated from the information source is not suitable for transmission because of its low strength. The equipment used to modify the signals into transmittable form is transmitter. In this process, the message signal is superimposed with the carrier wave of suitable frequency. This process is called modulation. Amplification, modulation, encoding, etc are done in transmitter. Then the signal is transmitted to the channel.

### (3) Channel:

Channel is a medium through which the signal travels. It is the link bet<sup>n</sup> transmitter and receiver. Channel may be wired (twisted pair of cable, Co-axial cable, optical fibre, waveguide) or wireless (infra red, bluetooth, Satellite communication, microwave). Channel is highly susceptible to noise and can distort the message signal.

### (4) Receiver:

The receiver reproduces the message signal in electrical form. Demodulation is done in this unit. It performs various operations opposite to that of transmitter. Demodulation, decoding, filtering is performed in receiver unit.

### (5) Output transducer and destination:

The o/p transducer converts the electrical signal into the original form. Now the original signal is extracted at the user side. For eg: Loudspeaker is the best example of o/p transducer which converts the electrical signal into the audio signal which can be used/understood by the destination.

## # Optical Fiber Communication System:

The general block diagram of optical fibre communication system is as:

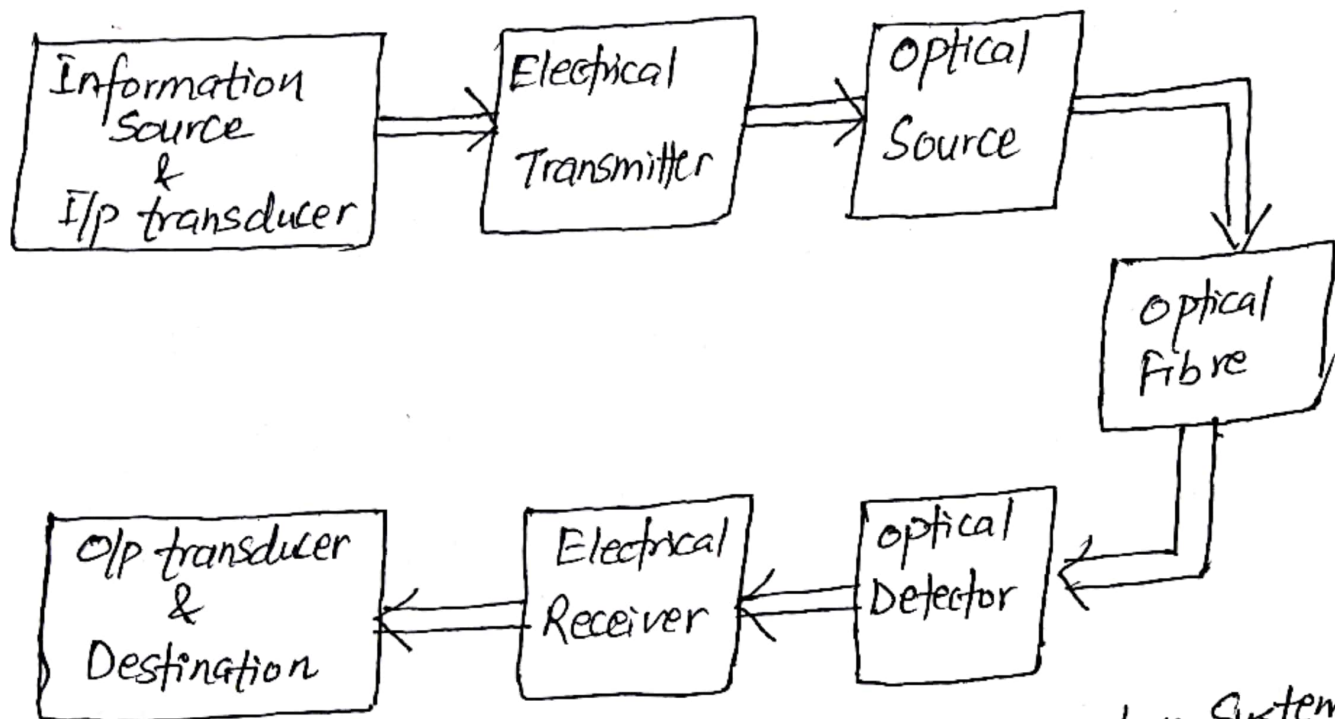


Fig: Block diagram of optical Fibre communication System.

Optical Source: The electrical signal produced by the transmitter cannot propagate through optical fibre. It is necessary to convert the electrical signal into light wave by using optical source. LED and LASER are the optical sources used to convert the electrical signal into its corresponding light wave.

Optical detector: The light wave coming from the optical fibre cannot be processed by electrical receiver. So, it is necessary to convert the light wave into electrical form. Photodiode, phototransistors are the optical detectors used to convert the light wave into corresponding electrical signal.



## # Advantages of optical fibre over copper wires:

- (1) The system has no electromagnetic interference, cross talk, noise and short circuits as the data get transmitted via optical fibre in the form of light.
- (2) The transmission is more secure and private.
- (3) It has extremely high bandwidth. (up to GHz)
- (4) The data rate of optical fibre is extremely high upto several Gbps.
- (5) The repeaterless distance for optical fibre is 100 km.
- (6) It is not effected by the drastic environmental conditions.
- (7) It is small in size and less in weight.