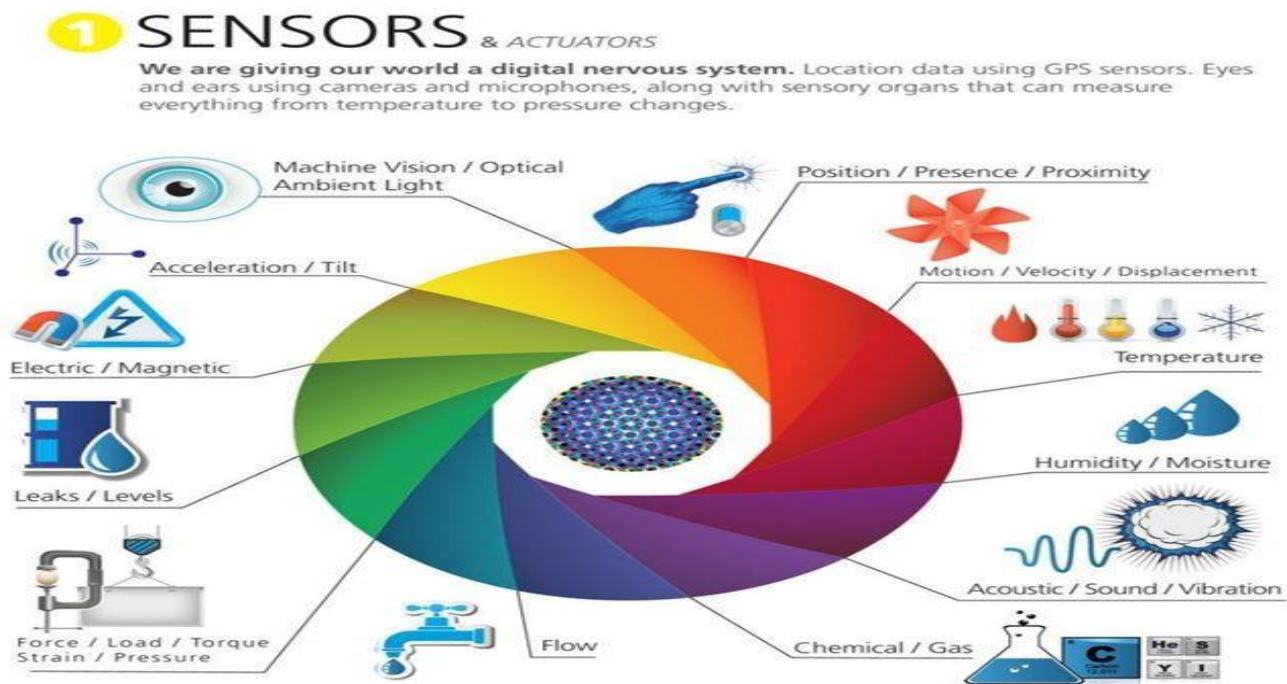


Introduction to sensors:

A sensor is a device that measures a physical quantity and converts it into a signal which can be read by an observer or by an instrument

Different Types of sensors:-



Properties of Sensor:-

- Accuracy
- Resolution
- Output Type
- Linearity
- Repeatability, Dead Bands, & Hysteresis
- Temperature
- Usable Temperature – What is the min/max temperature that the sensor can be used at?
- Storage Temperature – What is the min/max the sensors can be before it gets damaged?
- Field of View (FOV)

2.1.2) Introduction to Actuator:

An Actuator is a component of a machine that is responsible for moving or controlling a mechanism or system. An actuator requires a control signal and a source of energy. The control signal is relatively low energy and maybe electric voltage or current, pneumatic or hydraulic pressure or human power.

- Hydraulic Actuators
- Pneumatic Actuators
- Electric Actuators

Hydraulic Actuators:-

- Hydraulic systems are used to control and transmit power.

Different Types of Sensors



- An actuator is used to convert the energy of fluid back into mechanical power.
- The amount of output power developed depends upon the flow rate, the pressure drop across the actuator, and its overall Efficiency.

Pneumatic Actuators:-

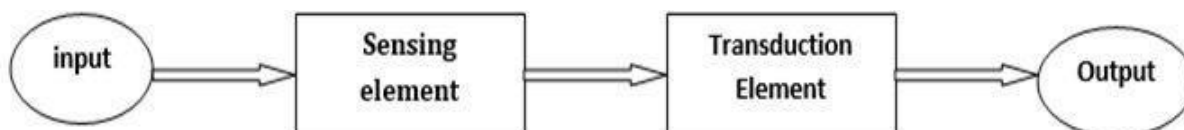
- Their chief limitation is that the elastic nature of the compressed air makes them unsuitable for powering movement where steady forces or motions are required applied against a fluctuating load, or where extreme accuracy of feed is necessary.
- Pneumatic cylinders can be used to get linear, rotary, and Oscillatory motion. There are three types of pneumatic actuator: they are
 - i) Linear Actuator or Pneumatic cylinders
 - ii) Rotary Actuator or Air motors
 - iii) Limited angle Actuators

Electric Actuators:-

- An electric actuator is a geared motor.
- The motor can be of various voltages and is the primary torque- generating component.
- To prevent heat damage from overwork or excessive current draw, electric actuator motors are usually equipped with a thermal overload sensor embedded in the motor windings.

2.1.3) Introduction to Transducers:-

- The transducer is divided into two parts as shown on the part is the Sensing element/Detector/Sensor and the other part is the Transduction element. The sensing element is sensing any physical quantity.



- The transduction element is Measurably used for converting the non- electrical quantity to the electrical quantity. So broadly in electrical instrumentation, the Transducer is a device that can convert nonelectrical quantity to the electrical quantity.

The workflow of Transducer in a system

Types of Transducers:-

- Electrochemical Transducers
- Electroacoustic Transducers
- Electromagnetic Transducers
- Electromechanical Transducers
- Other types of Transducers
 - Photoelectric Transducers
 - Thermoelectric Transducers
 - Geiger-Muller tube
 - Quartz Crystal

Classification of Transducers:-

- Primary transducer
- Secondary transducer
- Analog transducer
- Digital transducer
- Electrical transducer
- Mechanical transducer
- Active transducer
- Passive transducer