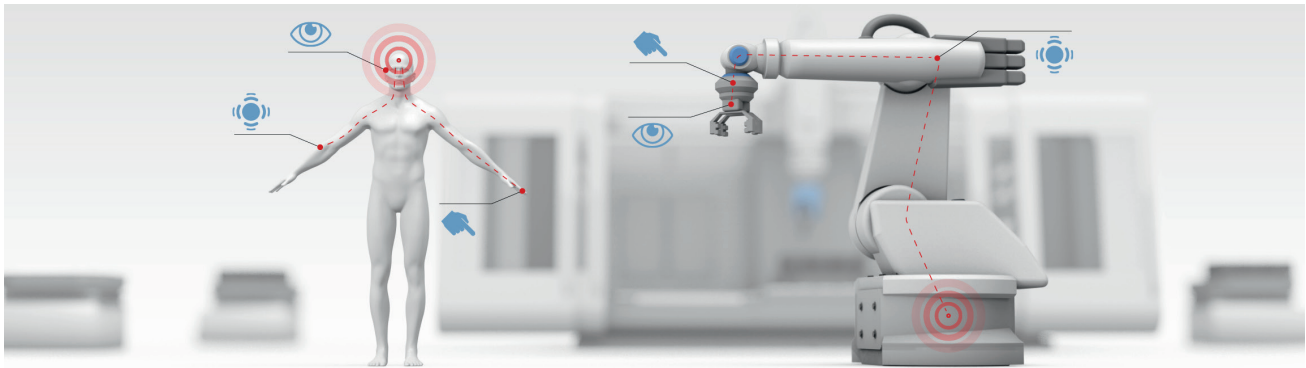


## Fundamentals of automation – An introduction

# WHY SENSORS ARE SO IMPORTANT FOR MACHINES

A machine works – to put it simply – like a person. Just as we humans perceive our surroundings using our sensory organs, a machine detects its environment using sensors, devices and distance measurement systems. The machine continually picks up signals and sends them over the network to the controller. The controller interprets them as input signals and sends them as output signals to the actuators. For example to valves, drives or stack lights which in turn trigger an action and set the machine in motion.



Man and machine function essentially the same way

When you pick up an object, your sense of sight verifies the hand motion and your sense of touch the necessary force. And the muscles increase the pressure – if needed.

Carrying this over to the machine world, a photoelectric distance sensor and a pressure sensor on a robot for example control the motion of the vacuum gripper and robot arm. The photoelectric sensor continuously determines their position. And the pressure sensor ensures proper gripping by monitoring the pressure of the vacuum suction.

The controller processes the sensor signals and passes them onto the actuators, which can make corrections as needed.

### OUR BODY AND ITS TECHNICAL COUNTERPART

- **Sense of sight, taste, smell, touch** – Vision, pressure, photoelectric, inductive, capacitive sensor, position/distance measurement system
- **Sense of hearing** – RFID read head, ultrasonic sensor
- **Nerves** – Network, cable, connector
- **Brain** – Controller, PLC
- **Language** – RFID read head, horn, SmartLight
- **Muscles** – Valve, drive, motor, stack light, horn



Photoelectric sensor for object detection using light/laser



Pressure sensor for detecting pressure in liquids and gases



Network module for connecting to the controller



Valve connector for linking valves to the controller

We offer a wide variety of industrial solutions for automating your production. They range from sensor technology to RFID to industrial networking and connectivity.