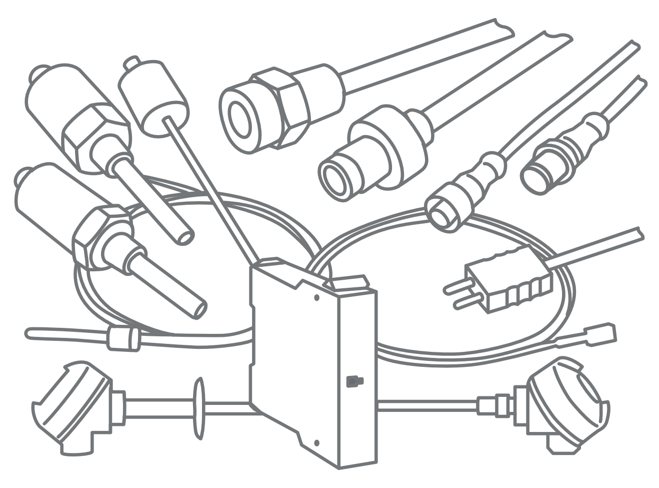
SENSORS FOR INDUSTRIAL AUTOMATION

Make Your Operation More Intelligent

If the ability to collect, analyze, communicate, and respond to real-time data and information is the foundation of Industry 4.0, then automation sensors are the concrete that holds the foundation together.

Sensors play a crucial role in enabling intelligent production and automated processes. They allow industrial manufacturers to measure, monitor, analyze, and process changes on machines that range from security, location, and motion to temperature and pressure.



WHAT'S DRIVING THE SENSOR MARKET?

Miniaturization of sensors makes it easier for machine builders to integrate the devices.

As sensors become more powerful, manufacturers can use them for **decentralized control**, similar to switching relays.

Predictive maintenance
To minimize downtime, sensors are used to gauge equipment performance and alert manufacturers to maintenance needs before there is a problem.

Cloud connectivity
Advances in edge computing are made possible by field-level sensors, giving manufacturers access to more insights.

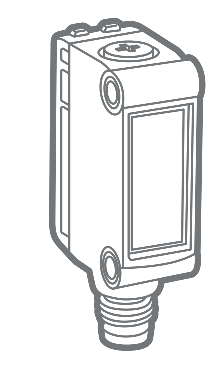
New developments in technologies like 3D vision, RADAR, LIDAR, etc., are extending the use case for sensors.

Machine vision
To improve the quality of products coming off the assembly line, operators rely on sensors to find defects and communicate in real time.

Sensors have become more integrated into industrial **Ethernet networks** to support advanced connectivity features.

Technological advances in **digitalization** and machine learning/ artificial intelligence have increased the sensor count per machine.

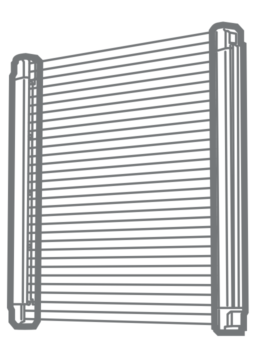
FOUR TYPES OF SENSORS
USED IN INDUSTRIAL SETTINGS



POSITION SENSORS

What they do: Detect the movement of an object or an object's position and convert this data into signals suitable for processing, transmission, or control

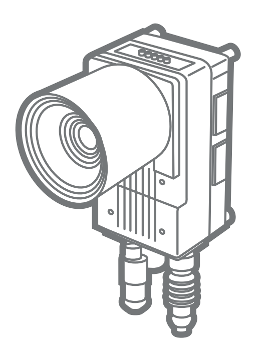
How they are used: To control equipment in automated processes and production lines



SAFETY SENSORS

What they do: Check the status or position of an object or a human, then use that information to stop the machinery to prevent accidental contact with other machines or humans

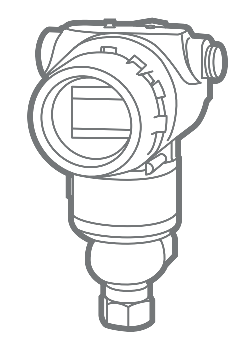
How they are used: To quickly disconnect machines in automated processes and production lines



MACHINE VISION

What it does: Uses sensors and processing hardware and software algorithms to automate complex or mundane visual inspection tasks and precisely guide handling equipment during product assembly

How it is used: Positioning, identification, measurement, and flaw detection in manufacturing facilities



PROCESS INSTRUMENTATION

What they do: Incorporated into measuring instruments used for indicating, measuring, and recording physical quantities

How they are used: On instrumentation that controls the parameters of industrial production processes

THE INNER WORKINGS OF
AUTOMATION SENSORS

ANALYZE

Sensors review the information/data.

PRINTED CIRCUIT BOARD (PCB) INTERCONNECT
KEY COMPONENTS:

- **PCB interconnect**
  Enables complex and compact PCB setups inside the sensor
- **Identification**
  Apply durable identification and product information
- **Precision resistors**
  Enabling high-precision electronics
- **Switching/relays**
  Support several Ampere of output current
- **Switches/buttons**
  Enable simple sensor setup and programming

LEARN MORE ▸

COMMUNICATE

Sensors communicate data signals to the system.

COMMUNICATION & I/O CONNECTIVITY
KEY COMPONENTS:

- **Signal I/O connectors**
  More reliable and easy-to-use connectivity between sensing device and controller
- **Ethernet connectivity**
  Enabling rugged standard data connectivity
- **Cord set**
  More reliable connection of sensors
- **Field-installable connectors**
  Improved wiring flexibility and easier installation
- **Cable glands/ terminal blocks**
  Enable individual wiring with essentially no connectors
- **Special applications**
  Adapt sensors to special customer requests

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REACT

Sensors signal a response or reaction for the machine to perform.

COMPUTING & SWITCHING DEVICES
KEY COMPONENTS:

- **Switching/relays**
  Enable more reliable relay outputs of switching devices
- **Safe switching/ force-guided relays**
  Enable safer switching
- **Signal connectors/ terminals**
  Enable more reliable signal connectivity for each use case
- **Ethernet connectors**
  Enabling rugged standard data connectivity
- **Power connectors**
  Compact and more reliable power distribution for field I/Os
- **PCB interconnect**
  Enable compact and modular setups in harsh environments
- **Precision resistors**
  Enabling high-precision electronics
- **Switches/buttons**
  Enable simple sensor setup and programming

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YOUR PARTNER FOR
AUTOMATION SENSORS

Our deep application expertise allows us to consult with top manufacturers and suppliers to bring excellent solutions to market.

TE Connectivity will support you with:

- Compact and cost-efficient Ethernet connectivity to the sensor level — including Single Pair Ethernet (SPE)
- Sensor application expertise with engineering support in design and customization
- Highly engineered connectivity solutions that support virtually uninterrupted operations for power, signal, and data
- Small pitch board connectors that reduce sensor size
- Integrated solutions that help simplify complex manufacturing processes
- More reliable high-speed connectivity of 1 Gbit/s and beyond for data-intensive applications (e.g., vision)

Top Automation Sensor Components

- M8/M12 connectors and cordsets
- Force-guided relays
- Signal and power relays
- Board-to-board connectivity
- Industrial M12 X-coded Field Installable
- RJ45 connectors
- Single Pair Ethernet (SPE)
- Precision resistors

CONNECT WITH US

TE Connectivity makes it easier to take your automation sensor goals to the next level. Visit **te.com/support** to chat with a product information specialist and find the expert support you need.

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