

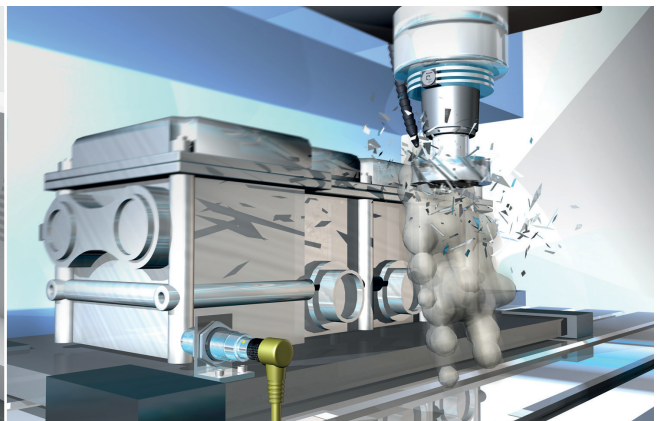
## Detection – an introduction

# USING SENSORS TO DETECT, COLLECT AND POSITION

There are many ways in automation to detect, collect and position objects. You can use magnetic fields, permittivity – a material property –, light and sound to detect metals, non-metals, magnets, solids and liquids without contact. And you can do it over distances from 1 mm up to 60 m.



Parts are checked for presence, location and completeness during transport.



In an automated machining center the end position of a workpiece is acquired.

You can reliably detect and inspect parts during transport with the help of suitable sensors – even under difficult conditions. Depending on the requirement you select inductive, photoelectric, capacitive or ultrasonic sensors. Photoelectric and ultrasonic sensors are usually used to detect objects located at greater distances (> 50 mm). Inductive or capacitive sensors are best suited for objects at a closer distance from the sensor (< 50 mm).



Inductive sensors will detect any metallic object.



Capacitive sensors detect the presence or level of virtually any material or liquid.



Photoelectric sensors use light to detect almost any object.



Ultrasonic sensors use sound to detect virtually any object regardless of color or composition.

Various technologies can be used depending on the application area:

- **Inductive sensors** for detecting any metallic object at close range
- **Capacitive sensors** for detecting the presence or level of almost any material and liquid at close range
- **Photoelectric sensors** as diffuse, retro-reflective or through-beam detect virtually any object over greater distances
- **Ultrasonic sensors** for detecting, virtually any object over greater distances