

Distance sensors

Measurement from 10 mm to 250 m

Optical distance sensors

from Page 197

FT 10 IO-Link

- Operating range (scanning distance) from 10 mm to 70 mm
- Laser short-range distance sensors using the triangulation principle
- Minimal dimensions
- Measurement value output via IO-Link

from Page 201

FT 25 IO-Link

- Operating range (scanning distance) from 20 mm to 200 mm
- Laser- and LED short-range distance sensors using the triangulation principle
- Miniature housing for simple integration
- Analogue output 1 ... 10 V and measurement value output via IO-Link

from Page 217

FT 55-RLAM IO-Link

- Operating range up to 1 m
- Excellent sensor qualities at long ranges
- Laser distance sensor using the triangulation principle
- Analogue output and digital output of measurement values via IO-Link

from Page 207

FT 50

- Operating range from 30 to 300 mm
- Proven laser distance sensor using the triangulation principle
- High absolute accuracy
- Analogue output and digital output of measurement values via RS485



Rapid and precise measurement, accurate positioning, and detection of the most varied of materials – distance measurement is a central requirement in many areas of automation technology. Whether for checking the winding of coils with millimetre accuracy, the detection of double sheets, or the accurate positioning of storage and retrieval machines – distance sensors from SensoPart are reliable tools for many purposes in the following sectors:

- The automotive and supplier industries
- Mechanical engineering and special machine construction
- Assembly and handling
- The packaging industry
- Handling and warehousing systems
- The steel industry
- The textile and paper industries
- The wood industry

The technologies used are as varied as the applications.

Our optical sensors use the triangulation process for operating ranges below 1 m, and time-of-flight measurement for longer operating distances. Apart from optical sensors, ultrasonic sensors are also used for transparent or strongly reflective materials, in particular, and inductive sensors are employed for metal objects at close-range and in harsh operating conditions.



Determining the exact position of parts on an assembly line



Detection of double layers on printed-circuit boards

from Page 225

F 55

- Laser distance sensors using the time-of-flight principle
- Scanner versions up to measurement distance of 5 m
- Reflector versions up to 70 m range
- Various interfaces (analogue and  IO-Link)



from Page 233

FR 85 Rail Pilot

- Distance sensors using the time-of-flight principle
- Specialised solution for anti-collision applications on monorails
- Cornering also possible
- Large aperture angle, thus long detection range



Ultrasonic distance sensors
from Page 565

- Distance sensors using the ultrasonic time-of-flight principle
- Cubic and cylindrical housings
- Large portfolio for differing measurement ranges
- Reliable operation with all surfaces and colors – and especially with transparent objects



Inductive distance sensors
from Page 615

- Long switching distances up to 10 mm with accurate linear measurement range
- Distance measurement on metals according to the inductive principle
- Various housings
- High accuracy and long linear measurement range



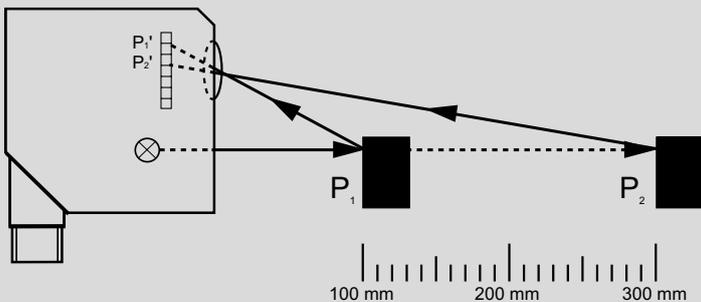
Distance sensors

System description

Distance measurement using triangulation

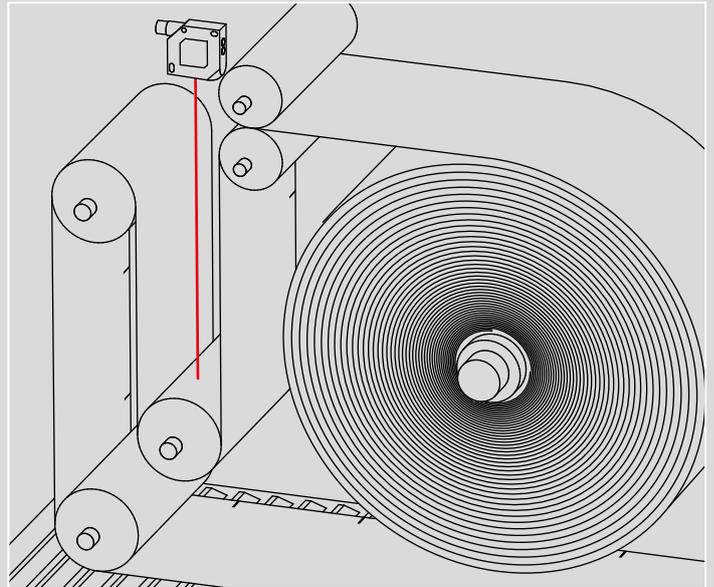
The measurement principle of optical triangulation is suitable for the precise determination of distances at close range. With the help of special receiver optics and a position-sensitive detector (e.g. a photodiode line), the sensor can determine the object distance regardless of its reflectivity (see illustration below). The color and surface properties (e.g. highly reflective) thus have practically no effect on measurement accuracy.

The FT 50 RLA laser distance sensor provides a signal proportional to the distance, transmitted via the analogue output (e.g. 4 ... 20 mA) or a serial RS485 interface. The switching range of the digital outputs can be set to any zone within the operating range using teach-in.



The triangulation process: with the help of a line-shaped position-sensitive detector, the distance sensor measures the distance to the object regardless of the quantity of light reflected.

The light reflected back from the object (P_1) hits the line at point P_1' . The sensor determines the distance signal from this. The light correspondingly hits the detector at a different point (P_2') at object distance P_2 .



Dancer roll control using the FT 50 RLA-220 laser distance sensor

Collision prevention sensors for monorails

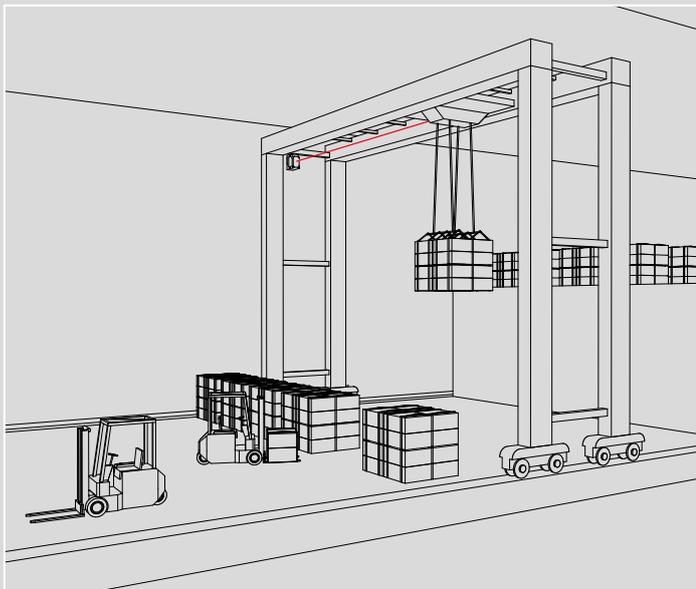
Collision prevention on monorail systems in car production is a special distance measurement task. The FR 85 series was specially developed for this application. These sensors provide excellent measurement results regardless of the reflectivity of the target object, and their comprehensive range of functions is impressive.

The FR 85 offers high measurement accuracy and immunity to ambient light because it is based on time-of-flight technology. A long measurement range (up to 6 m) and flexibly adjustable protection field geometries allow adaptation to the situation on site, even when cornering.

Distance measurement using time-of-flight

SensoPart uses time-of-flight technology to measure longer distances. The sensor emits pulsed laser light that is reflected by the target object. The distance to the object is determined by the time taken between emission and reception of the light.

The use of pulsed light provides reliable background suppression and very high immunity to ambient light. The distance sensors of the FT/FR 55-RLAP series, using time-of-flight technology, measure distances of up to 70 m with a high level of accuracy. The sensors are particularly suitable for use on production lines and in handling and warehousing systems due to their reliable detection and long ranges or scanning distances.



Crane positioning with FR 55-RLAP distance sensor

Inductive analogue sensors

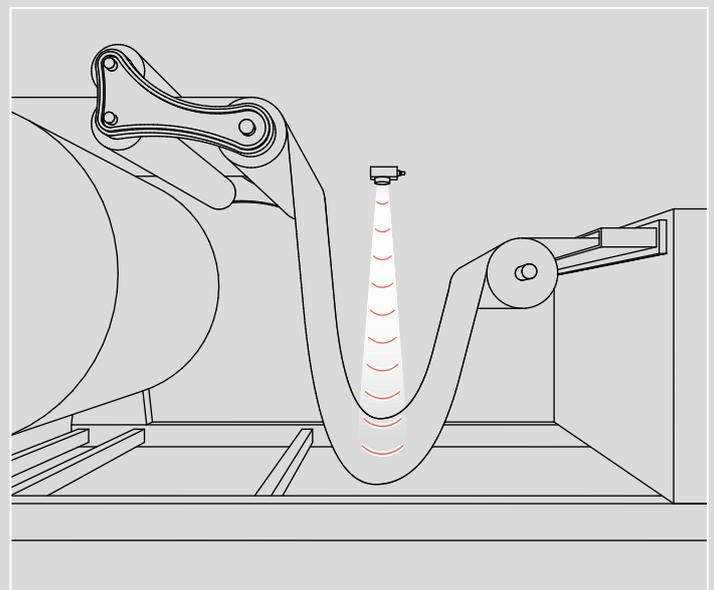
The reasonably priced solution for metallic objects. Compared to optical or ultrasonic sensors, inductive distance sensors have only limited ranges. They are still used under harsh conditions, in particular, as a result of their great robustness.

- Inductive distance sensors with analogue output of 4 ... 20 mA
- Operating range of 0 ... 6 mm to 4.5 ... 12 mm
- Falling characteristic line on approach
- Robust metal housings

Ultrasonic sensors

Ultrasonic sensors are the right choice for materials with which optical systems cannot be reliably operated. Ultrasonic sensors work using the time-of-flight of sound. The sensor emits ultrasonic pulses. The target object reflects the sound. The sensor measures the time-of-flight of the pulse and calculates the distance value. This value is transmitted to the controller as a current or voltage signal.

- Operating ranges from 20 ... 6000 mm
- Operating range and analogue output adjustable via teach-in
- Analogue output 0 ... 10 V / 4 ... 20 mA



Monitoring throughput with the UT 20 ultrasonic sensor