Leading edge detection on conveying equipment
SCALABLE SOLUTIONS
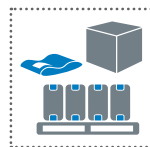
SICK
Sensor Intelligence.

Storage and conveyor technology

Leading edge detection is used to optimize object distances during zero pressure accumulation. The signals from the sensors enable precise speed monitoring of the individual conveyor belt segments. The different objects must be reliably detected in the process. SICK provides the right solution for all conveyor types for this purpose.
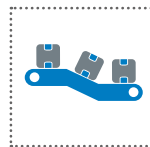
Smooth process sequences on the conveying equipment

Increased throughput thanks to reliable detection of different objects

www.sick.com/storage_and_conveyor

CHALLENGES WITH LEADING EDGE DETECTION

Various sensors such as photoelectric sensors for direct detection, reflex light barriers and light grids can be used for leading edge detection. Essentially, the appropriate solution is selected based on the reflective properties of the object to be detected and the required distances between the objects. In addition, the conveyor speed, object size and any secondary packaging also play an important role.

Thanks to their high repeatability and quick response times, sensors from SICK ensure that objects are detected with very high accuracy.

www.sick.com/storage_and_conveyor

Speed and throughput

For some solutions, the size of the minimum detectable object (MDO) increases with increasing speed. The processing time of the sensor can also limit the maximum throughput and the minimum distance between subsequent containers under certain circumstances.

Vibration

Vibration can be caused by drives, the mechanics or the conveyed material itself. Sensors from SICK are designed to meet this requirement. Low-vibration mounting supports the precise detection capability of the sensors.

Object parameters

In addition to the dimensions of an object, its color, reflections, transparency and shape may strongly influence the detection rate, depending on the sensor technology used. The smaller the object, the more challenging it is. The more precisely the different object parameters are defined, the higher the detection rate will be.
Highly reflective, dark or textured object surfaces increase signal noise with certain technologies. The use of several container types with varying size, color, and shape can pose a challenge.

LEADING EDGE DETECTION FROM BELOW


ROLLER SENSOR BAR - YOUR BENEFITS

- Mounting between the rollers and conveyor elements

- Detection of objects with straight and irregular leading edges

- Optimized sensor performance thanks to configuration of the beam separation with millimeter precision

- Enlargement of the detection area through avoidance of sensor blind zones

- Leading edge and object overhang detection reduces the formation of conveyor jam and increases efficiency

- Spring-loaded mounting at the factory reduces installation costs

- Lower commissioning costs, since teach-in and alignment of the sensor are not required

www.sick.com/Roller_Sensor_Bar

SENSOR SOLUTIONS FOR LEADING EDGE DETECTION OF VARIOUS OBJECTS
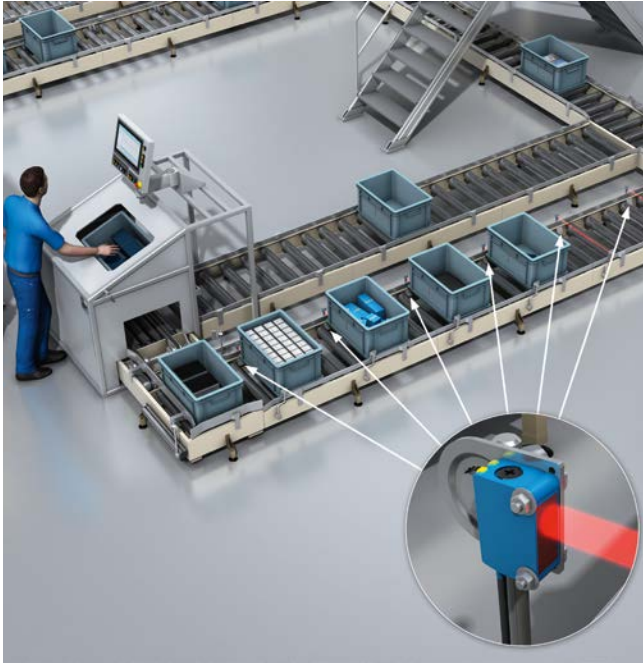
Containers

Containers are often used on roller conveyors in logistics centers. Leading edge detection of containers is used to optimize object distances during zero pressure accumulation. The reflective properties and the quality of different container surfaces must be taken into account to ensure stable leading edge detection. The G6 miniature photoelectric sensor or the ZoneControl MultiTask photoelectric sensor reliably handle these applications.
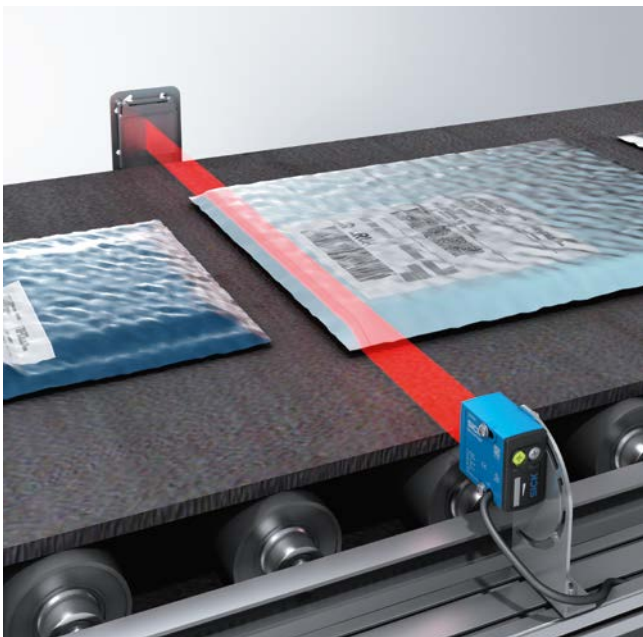
- G6 miniature photoelectric sensor
- ZoneControl MultiTask photoelectric sensor

→ www.sick.com/G6

→ www.sick.com/ZoneControl

Polybags

When sending small parts, it is becoming increasingly common to use polybags in order to optimize the transport volumes and costs. These present great challenges to conveying systems, in particular singulation and accumulation conveyors, because it is necessary to precisely determine their leading edge. This is needed to guarantee the object separations required by downstream processes. Various reflex array photoelectric sensors reliably detect the leading edge of polybags depending on the requirements.

- Reflex Array MultiTask photoelectric sensor
- Roller Sensor Bar MultiTask photoelectric sensor

→ www.sick.com/Reflex_Array

→ www.sick.com/Roller_Sensor_Bar

Palettes

Goods are often transported on wooden pallets in high-bay warehouses. Wood, a natural material, has irregularities such as knotholes. Parts of the pallet may also be damaged, smeared with oil or surrounded by foil residues. With the use of the G10 small photoelectric sensor, pallets can be reliably detected in spite of the wide range of requirements. As an alternative, the ZoneControl MultiTask photoelectric sensor also can be used for reliable leading edge detection of pallets.

• G10 and G20 small photoelectric sensors
• ZoneControl MultiTask photoelectric sensor

➜ www.sick.com/G10

➜ www.sick.com/ZoneControl

Irregularly shaped objects

Ensuring error-free processes on the conveying equipment is the number one priority. Irregular load-shapes on carriers must be detected reliably to avoid problems in downstream processes. Depending on the application, this task can be solved using photoelectric retro-reflective sensors or switching automation light grids. A simple alternative is the TiM5xx 2D LiDAR sensor.

• SLG-2 switching automation light grid
• TiM5xx 2D LiDAR sensor

➜ www.sick.com/SLG-2

➜ www.sick.com/TiM5xx

RANGE OF SOLUTIONS

FOR LEADING EDGE DETECTION

Detection category	Product family	Object types				Type of light
		Containers	Polybags	Pallets	Irregularly shaped objects	
Single-beam monitoring	G6					RT/IR
	ZoneControl RL, IRL, RT, IRT	X	X	X		RT/IR
	G10	X	X	X		RT
Simple area monitoring	RSB	X	X	X		IR
	RAY10 / RAY26	X	X	X		RT/RT
High-resolution area monitoring	SLG-2 light grid				X	IR
	TIM100 / TIM300				X	IR

ZoneControl
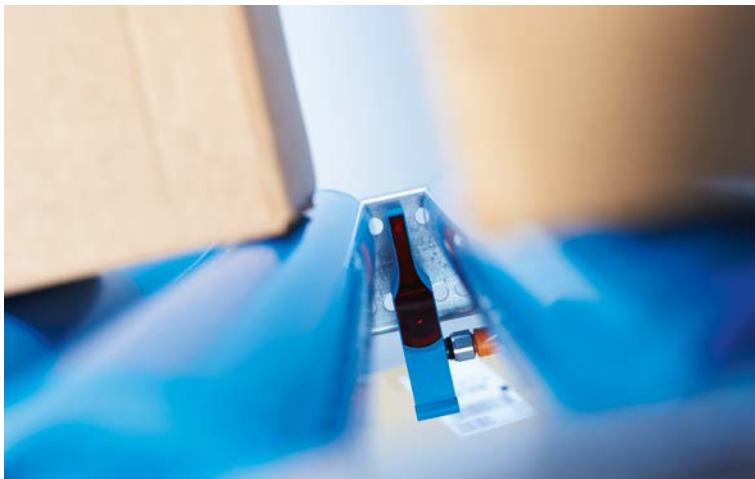
Roller Sensor Bar

Technical data					
Laser class	Sensing distance/Scanning range/Detection range	Resolution/Small object	Field height length	Angular resolution	Response time
1	0.08 m - 12 m			-	
1		3.5 mm	-	-	< 0.6 ms
1	0.15 m - 12 m			-	
1	2 mm - 300 mm	50 mm	25/20-55	-	1 ms
1/1	1.5 m / 4.5 m	5/1		-	0.5 ms / 0.5 ms, 3 ms
	70 mm - 6,000 mm	< 1 mm - 54 mm	100 mm - 2,400 mm	-	2 ms - 16.7 ms
	0.05 - 3 m	-	-	1°	70 ms

SLG-2 light grid

SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 11,000 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents, and preventing damage to the environment.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what the customers need. In application centers in Europe, Asia, and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes SICK a reliable supplier and development partner.

Comprehensive services round out the offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

That is "Sensor Intelligence."

Worldwide presence:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and further locations ➜ **www.sick.com**

SICK AG | Waldkirch | Germany | www.sick.com

SICK
Sensor Intelligence.