



STEEL INDUSTRY

METAL FORMING AND FINISHING PROCESS

Giving the final shape and touch - precision holds all the aces

SICK
Sensor Intelligence.



TASKS IN THE STEEL INDUSTRY

At the end, the quality has to be right. To achieve this, some things need to be observed, including the correct position and alignment of semifinished and finished products on roller tables and the optimal distance between finished products in order to avoid damage. Flexible processes and interactions between humans and machines require safety technology. Protective facilities are necessary to not only secure danger zones but also to optimize production. Time is money – this also applies here. Monitoring the flow and dosage of bulk materials optimizes the throughput and reduces maintenance times. The regulations for emissions monitoring and data transmission to the authorities are increasing; this includes the steel industry. SICK delivers sensor solutions for almost every application so that reliable products are delivered to customers in the end.



→ www.sick.com/Metal_and_steel



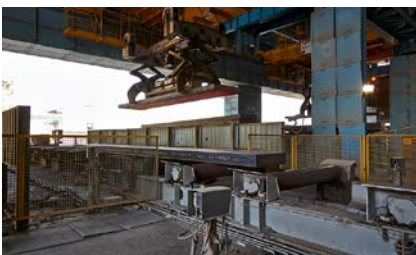
Positioning

Encoders, LiDAR sensors, distance and presence sensors from SICK make the highly precise alignment and positioning of semi-finished and finished products easier – even for ladle cars, transfer cars, industrial cranes and torpedo cars. The sensors are available in various designs and with different interfaces.



Quality control

The product quality has to be consistently ensured in the production chain. Solutions from SICK ensure that the required quality level of finished products is achieved – from measuring the sheet thickness to galvanization, from profiling and adjustment to warpage detection.



Security and protection

It's not just the protection of people that is important, but also the protection of the plant and machines from damage and loss. SICK offers solutions for collision protection, access control in risk zones and accident prevention within and outside the production building.



Material flow optimization

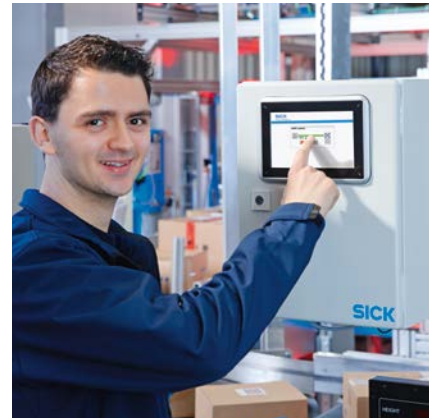
LiDAR sensors measure the volume flow on conveyor belts. Encoder and presence sensors control the dosing process. Level sensors monitor silo contents and material discharge hoppers. Even material management benefits from sensor technology from SICK: production efficiency increases.

FROM A SINGLE DEVICE TO A COMPLETE ANALYSIS SYSTEM

SICK's capabilities do not end with the sale of a single product. We employ an extensive team of custom system planning and project engineers as well as detail engineers with expertise in electrical and mechanical engineering. SICK's

system engineers plan and design tailor-made solutions including the complete range of peripheral equipment such as walk-in shelters, PLC connections, calibration gas distribution and data handling and evaluation. All solutions are

designed and built in accordance with recognized international standards. An experienced project manager follows the project from initial order through to site acceptance test and hand over to local field service specialists.



Analyzers and measurement systems supply monitoring and control-relevant information and protect people and systems. When optimally integrated and maintained, these components and sys-

tems guarantee safe processes, constant product quality and protect people and the environment. From the outset and over many years, SICK LifeTime Services provide suitable services for all

aspects of your measurement systems and plants: from planning and conception to commissioning and ongoing operations, all the way to conversions and upgrades.

MATERIAL HANDLING



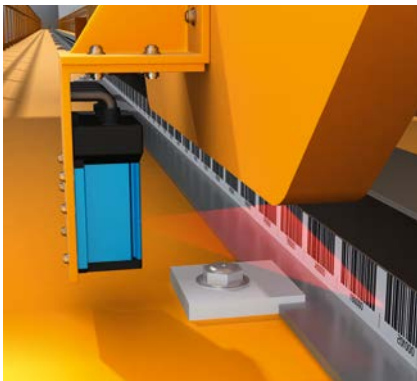
Vertical positioning of cranes in stock yards

Vertical cranes are used in post-production warehouse for small items. These cranes retrieve parts by traveling vertically along shelving. To ensure proper retrieval, a mid range distance sensor, such as the compact DL50 Hi, helps properly position the crane. The sensor delivers exceptional performance up to 50 m and its high-definition distance measurement technology provides excellent repeatability. A red laser light ensures precise alignment and its tough metal housing is ideal for the environment.

- Dx50 mid range distance sensor



→ www.sick.com/Dx50



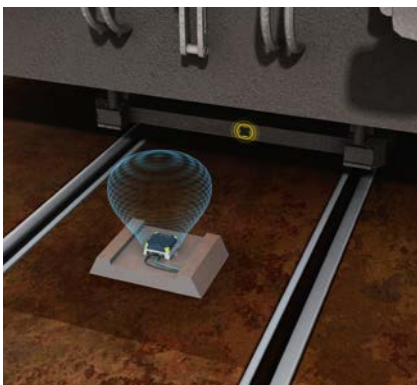
Positioning of multiple indoor cranes

Positioning of multiple indoor cranes during material handling is an important task for ensuring proper positioning and avoiding overhead collisions. To best manage this process, an OLM200 linear measurement sensor determines the crane's current position using bar code tape mounted along the length of the crane's track. The bar code tape can be placed along a curve, free roaming path, incline, decline or straight line. The OLM200 accurately determines the crane's correct position with an excellent repeatability of up to 0.15 mm – even if multiple cranes are on the same runway.

- OLM200 linear measurement sensors



→ www.sick.com/OLM200



Tracking and tracing products on automatic transfer cars

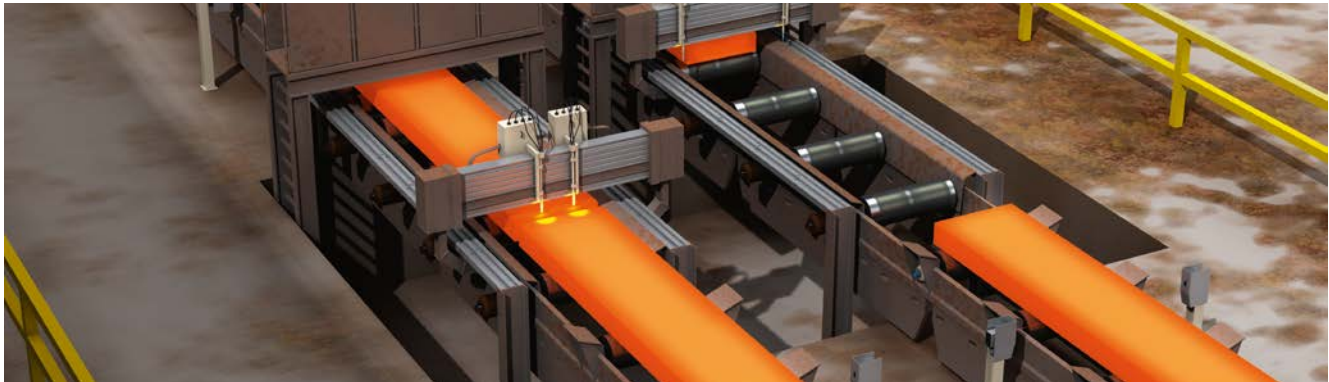
Tracking and tracing products loaded on automated transfer cars is an important task in industrial production processes. Radio Frequency Identification Devices (RFID) offer a modular concept for flexible and cost effective solutions when tracking material on vehicles in automated areas. The RFU620 is a compact device with an integrated antenna making the sensor ideal for solving tasks in logistic automation areas. Whether in the steel mill or the warehouse, the RFU620 is an ideal solution for tracking goods outfitted with transponders.

- RFU62x RFID read/write device



→ www.sick.com/RFU62x

CONTINUOUS CASTING



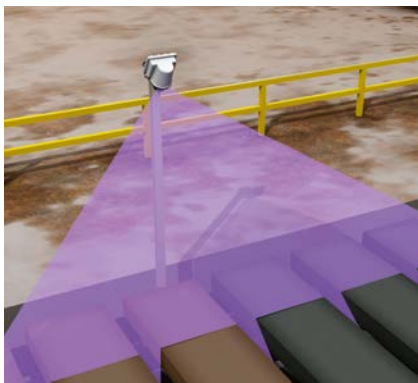
Measuring the slab length

Hot steel slabs are singulated by means of an oxygen cutting torch. In order to cut the slabs to the desired length and control the oxygen cutting torch, the DT1000 records the position of the fronts of the hot slabs on the roller without any contact. By determining the dimensions, the end products can be classified and managed. In post production logistics, the DT1000 long range distance sensor determines the length and width of steel slabs, for example.

- Dx1000 long range distance sensor



→ www.sick.com/Dx1000



Positioning and measurement of slabs

Steel slabs are positioned and measured on rolling beds during the continuous casting process to aid in the classification process, time subsequent process steps and ensure that the operation is running constantly and without incident. To achieve these tasks, a 2D LiDAR sensor can be used wherever long range object detection is required. Two-dimensional contour data of the steel slab can be processed in combination with other known information, such as the conveyor's speed, to provide precise data on the object's location and size.

- LD-LRS 2D LiDAR sensor



→ www.sick.com/LD-LRS



Monitoring level and pressure of cooling water during continuous casting

Continuous casting machines and equipment require constant monitoring of cooling water, hydraulic fluids and coolants' levels and pressures. Robust level and pressure sensors are ideal for these monitoring tasks. A pressure switch offers various programmable switching functionalities and up to three outputs in a single device. A level sensor measures independently of installation conditions.

- LFP Inox level sensor
- PBS pressure sensor

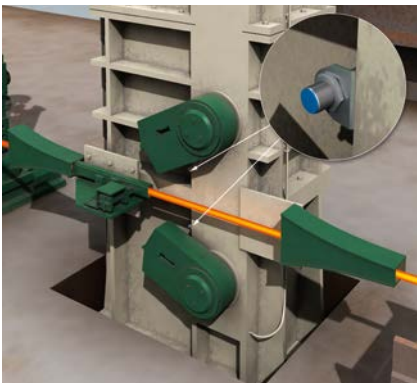


→ www.sick.com/LFP_Inox



→ www.sick.com/PBS

HOT ROLLING PROCESS



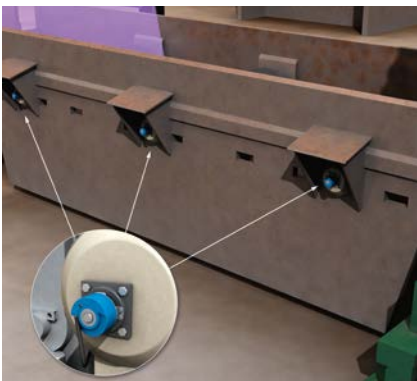
Determining the position of actuator on shear

In the rolling process, a shear cuts the steel sheeting or wire which passes through the machine while the actuator indicates the position of the shear. An inductive sensor easily determines the position of an actuator on a shear by detecting the indicating lever's position. The success factors for this task include the proximity sensor's immunity to dust, vibration and dirt and its robustness in very harsh environments.

- IMB inductive proximity sensor



→ www.sick.com/IMB



Checking the speed of an object

Incremental encoders can control the motor of the hot roller table and therefore also the speed at which steel bars move within the rolling mill train. Controlling the train's speed helps to ensure product quality and to optimize the rolling process. The advantages and success factors of an incremental encoder include robustness, compactness and programmability. The high enclosure rating, wide temperature range and large ball bearing distance make the DFS60 the ideal encoder for the rolling mill's harsh environment.

- DFS60 incremental encoder



→ www.sick.com/DFS60



Monitoring hot objects during the rolling process

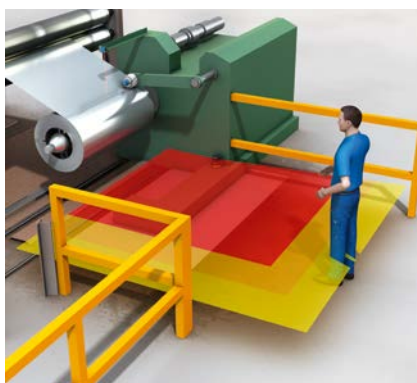
Monitoring hot objects during the rolling process is important for steel production optimization and planning purposes. Overseeing the objects as they travel along the roller bed requires a LiDAR sensor, which not only monitors but also measures the bars to ensure proper positioning for the next task in the hot rolling process. The scanner's efficient performance operates well in adverse environmental conditions due to its multi-echo technology. Additionally, its ability to synchronize multiple sensors allows for the integration of complex solutions in the rolling process.

- LMS5xx 2D LiDAR sensor



→ www.sick.com/LMS5xx

STRIP PROCESSING



Protecting personnel in close proximity to dangerous movements

The protection of personnel in the direct vicinity of dangerous movements of winders and let-off machines is an important aspect in rolling mills. microScan3 safety laser scanners attached to wrapping machines protect the hazardous points in accordance with type 3 of IEC/EN 61496-3. The rugged, modular design of microScan3 is ideally suited for the rough environments of steel mills. The fields to be monitored can be configured easily and flexibly using the Safety Designer PC software.

- microScan3 safety laser scanner



→ www.sick.com/microScan3_Core



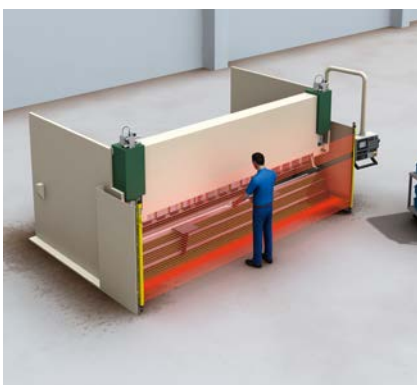
Positioning of coils before and after the coiling machine

Detecting steel coils as they pass through a finishing machine so that they can be subsequently queued for successive finishing processes, is a simple task solved with a photoelectric retro-reflective sensor. The through-beam photoelectric sensor operates reliably in steel mill environments with temperature fluctuations, such as the finishing department.

- W24-2 compact photoelectric sensor



→ www.sick.com/W24-2



Protecting profiling, bending, and finishing benches

Safety light curtains safeguard those who work with profile straightening, bending, or finishing benches. A deTec4 Prime safety light curtain protects personnel and machines in these automated production areas while at the same time help to optimize work processes. Safety light curtains can be mounted vertically, horizontally or diagonally in order to safeguard workers or equipment from movement potential hazards.

- deTec safety light curtain



→ www.sick.com/deTec

SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 9,700 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