



HANDLING AND ASSEMBLY TECHNOLOGY

EFFICIENT APPLICATION SOLUTIONS

SICK
Sensor Intelligence.



CHALLENGES IN HANDLING AND ASSEMBLY TECHNOLOGY

Many industries such as automotive, electronics, metal, machine tools, and medical engineering can be identified as the driving force behind handling and assembly technology. They rely heavily on automated handling and assembly processes that in turn contribute to streamlining high quality and accuracy and improving productivity and PSDI times. Developing more intelligent machines by using a larger number of sensors leads to new applications, improved quality assurance, and even more flexible production. At an early stage, SICK recognized the trend towards implementing more intelligence and functionality in the field level, making its sensor technology ideal for meeting the requirements of handling and assembly applications.



Learn more about sensor solutions for handling and assembly technology
[→ www.sick.com](http://www.sick.com)



Detecting and measuring

The automation of assembly and handling processes under the most stringent accuracy requirements needs high resolution positioning systems, flexible production lines, and high diagnostic abilities. Modern, intelligent sensors from SICK are able to store settings, use automatic teach-in and diagnostic capabilities, and independently evaluate and relay the sensor data in the process, thus making a significant contribution towards meeting these challenges.



Protecting

Linking automated production equipment with semi-automated assembly cells requires intelligent and flexible safety concepts. SICK safety solutions ensure the protection of operating personnel, optimize production, and reduce the machine footprint and downtime.



Monitoring and controlling

Assembly processes are strongly influenced by the product and require flexibility and openness to develop and implement individual processes. Reliability is an important requirement for each of these different processes, posing a highly challenging task for quality control. SICK's distance sensors, vision sensors and systems support nearly every type of monitoring.

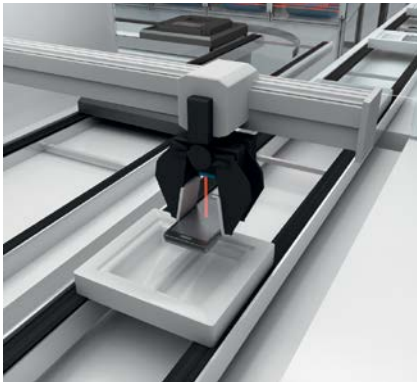


Data management and identification

Reliable identification of objects is a prerequisite for a smooth production flow, and lays the foundations for traceability and continuous quality improvement. SICK offers a wide range of both permanently installed and mobile readers for bar codes, 2D codes, and RFID technology.

DETECTING AND MEASURING

Presence – position – speed – contour



Detecting transparent objects

Grippers are always in motion when picking up objects, therefore sensors attached to the gripper must be small and light. The WT2S-2 subminiature photoelectric proximity sensor with its very compact housing size of 7.6 x 20.6 x 12.5 mm, represents the ideal solution. With a response time of 0.4 ms, it is perfect for high acceleration robot applications. The new W2S-2 with miniature reflectors can detect objects such as films and displays.

- Miniature photoelectric sensor



→ www.mysick.com/en/W2S-2



Fiber-optic presence detection for challenging applications

The WLL180 fiber-optic sensor is even able to monitor the presence of parts in singulation section when the space available is severely limited. Objects being processed at speeds up to 31,250 objects per second can be reliably detected without losses due to the incredibly short response time of 16 µs. Additionally, the WLL180 is stable while operating close to vibrating bowl feeds, or in other environments with a lot of vibration.

- Fiber-optic sensor



→ www.mysick.com/en/WLL180T



Monitoring of gripper functionality

The MZ2Q-T magnetic cylinder sensor monitors the pneumatic cylinder in the gripper. The sensor has two switching points. This means that both end positions of the short stroke cylinder can be monitored with just one sensor and one connecting cable. The IME08 inductive proximity sensor detects the end position of the flap axis integrated into the gripper.

- Magnetic cylinder sensor
- Inductive proximity sensor



→ www.mysick.com/en/MZ2Q-T
→ www.mysick.com/en/IM_Standard



Conveying speed of a roller conveyor

The conveying speed is controlled using the position detection of a programmable incremental encoder. With its high 16-bit resolution, the encoder ensures maximum repeatability. The encoder can be easily coupled to the roller conveyor via a belt drive. There are numerous versions available to accommodate nearly all mechanical and electrical interfaces.

- Incremental encoder



→ www.mysick.com/en/DFS60
→ www.sick.com/dfs-video

PROTECTING

Hazardous point – access – safety controller



Safety with a camera system

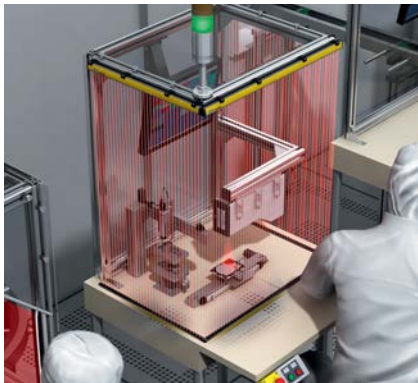
Handling robots work at high speeds. In the past, it was necessary to shield personnel from these robots using tall, expensive protective enclosures to prevent injuries.

With the V300 Work Station Extended safety camera system, operator safety is maintained while using smaller enclosures. This simplifies access for material loading and maintenance work considerably. Using only a camera and reflective tape, the V300 offers various layout options in terms of machine design and access area.



- Safety camera system

→ www.mysick.com/en/V300_Work_Station_Extended
→ www.sick.com/v300-video



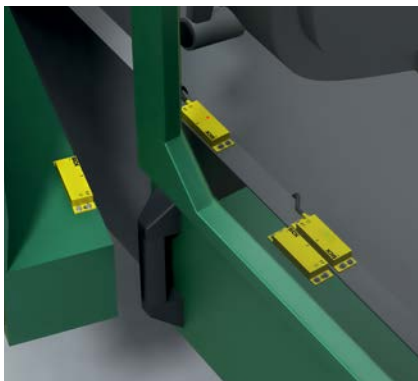
Safety down to the smallest detail

Miniaturized parts require sensor systems that are equally small. The miniTwin safety light curtain has the world's smallest design, making it the perfect solution for such applications. The sender and the receiver are housed in a single stick, reducing the number of components, and built-in alignment LEDs aid in installation and setup. When used in combination with the Flexi Soft safety controller, SICK offers a complete machine safety solution.



- Safety light curtain

→ www.mysick.com/en/miniTwin



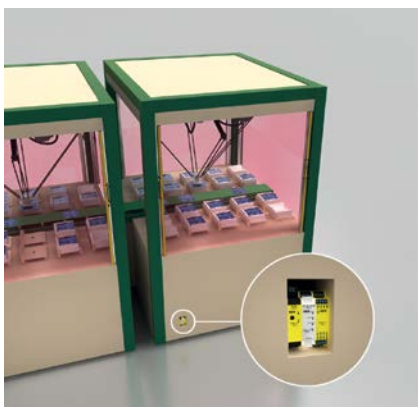
Monitoring of safety doors

Any door that has a protective function can be monitored by the non-contact RE1 or RE2 safety switches. Together with the Flexi Soft safety controller, these switches ensure that a machine cannot be started if any doors are open, and that a running machine is stopped or continues at a reduced speed (in conjunction with the Safe Drive Monitor) whenever a door is opened. Different designs and contacts are available, depending on the application.



- Non-contact safety switch

→ www.mysick.com/en/RE1



Safety for humans and machines

For certain types of assembly machines, operators must intervene to introduce material or correct a problem. The miniTwin safety light curtain detects the intrusion, which forces the robot or gripper to stop or slow down. Typically, individual cells are connected together and synchronized to form an assembly system. The Flexi Soft safety controller can monitor each tool remotely, allowing adjacent machines to continue working. The safe signals from the individual machines can be connected using the Flexi Line expansion concept, and cascaded or diagnosed with the Flexi Loop safe sensor cascade.

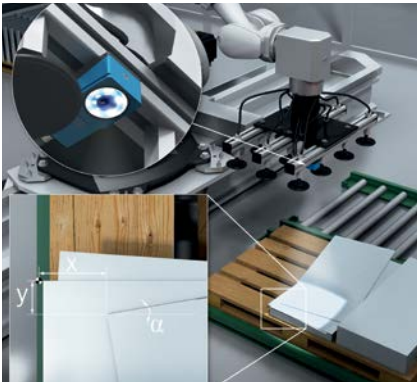


- Safety controller

→ www.mysick.com/en/Flexi_Soft
→ www.sick.com/flexiline-video
→ www.sick.com/drivemonitor-video

MONITORING AND CONTROLLING

Quality – processes – systems



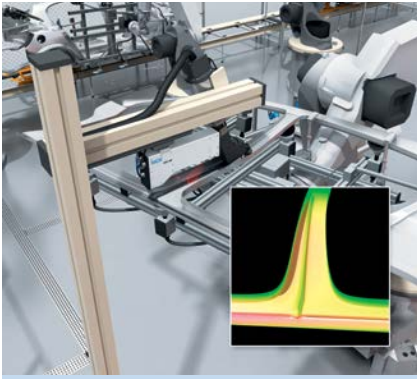
Parts removed from pallets automatically

Sheet parts are stacked on pallets in accordance with the production order and removed by a robot with a vacuum gripper. The Inspector PI50 vision sensor detects the position and alignment of the sheet parts and sends the position data to the robot.

- Vision sensor



→ www.mysick.com/en/Inspector
→ www.sick.com/inspector-video



Inspecting gluing tasks

The inline quality inspection for glue – from applying the glue to detecting gaps, bulges, and constrictions to monitoring for bubbles – is one of the main tasks in the gluing process. With the IVC-3D smart camera, demanding 3D contour testing can be achieved reliably, and all individual measurements and test data can be saved for subsequent statistical analyses.

- Smart camera



→ www.mysick.com/en/IVC-3D



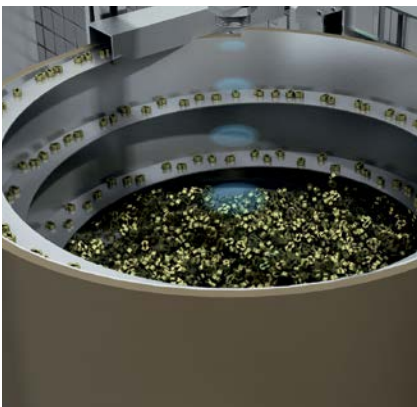
Automated pallet handling

A wide range of small parts are fed to a palletizing system via a belt. The Ranger high-end 3D camera precisely detects the different shapes and their positions even at a high rate of throughput. This enables robots to place the parts on the correct pallets in a targeted manner.

- High-end camera



→ www.mysick.com/en/Ranger



Checking the fill level in the bowl feeder

To ensure that the vibration drives of a bowl feeder and the linear conveyors connected to it are not continually in operation, the presence and fill level of the bulk materials must be detected. The UM30 ultrasonic level sensor is used to check how full the bowl feeder is. Depending on the measured fill level, the bowl feeder is switched on or off.

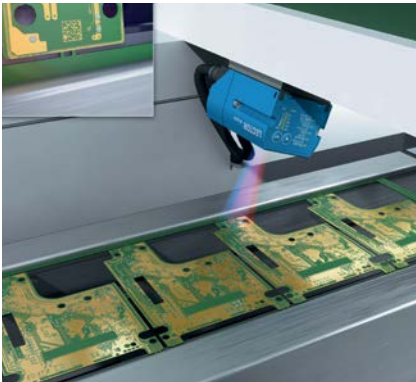
- Ultrasonic level sensor



→ www.mysick.com/en/UM30

DATA MANAGEMENT AND IDENTIFICATION

Code – plain text – data carriers



Advanced identification technology

The LECTOR® 620 image-based code reader is used for the reliable identification of directly marked 2D data matrix codes on various work piece carriers. The smart identification algorithms recognize low-contrast or damaged codes. The efficient auto setup function ensures quick and easy commissioning. For integration into a system, the device offers the following common fieldbus technologies: Ethernet TCP/IP, PROFINET, EtherNet/IP, serial interfaces, and CAN.

- Image-based code reader



→ www.mysick.com/en/LECTOR62x
→ www.sick.com/lector-video



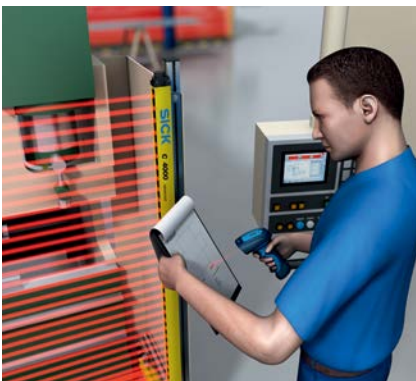
Identifying objects

When it comes to identifying classic bar codes (1D), the CLV620 bar code scanner delivers outstanding read rates with its SMART 620 code reconstruction technology – even for damaged bar codes. Integrated pushbuttons, an LED bar graph, and smart auto setup make setup extremely easy, even without a PC. The scanner features integrated serial interfaces, CAN, and Ethernet. The optional expansion interface can be used to provide solutions for specific customer needs.

- Bar code scanner



→ www.mysick.com/en/CLV620



Hand-held identification solutions

The rugged IDM160 hand-held scanner is used to read a bar code from an order sheet; this bar code contains all the information required to configure the assembly station for a work-piece to be produced. The data is wirelessly transferred to the base station. A majority of the assembly station conversion is completed automatically. The operator receives all the information required for the production batch on the display.

- Hand-held scanner



→ www.mysick.com/en/IDM16x



Provision of assembly components

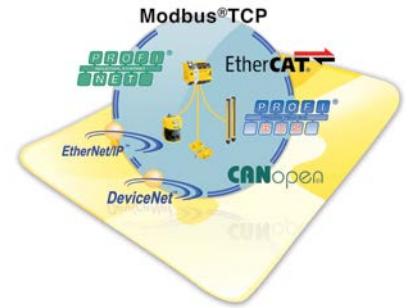
The workpiece carrier identification via RFID and the order-related control of picking using pick-to-light help to ensure that all the necessary components for the assembly process have been picked and the assembly station is supplied with the correct parts for the job. RFID technology also offers various transponders and many benefits in the area of product tracking. In addition, the RFH620 UHF read/write device also offers a wide range of diagnostic functions.

- RFID sensor



→ www.mysick.com/en/RFH620

SAFETY CONTROL SOLUTIONS

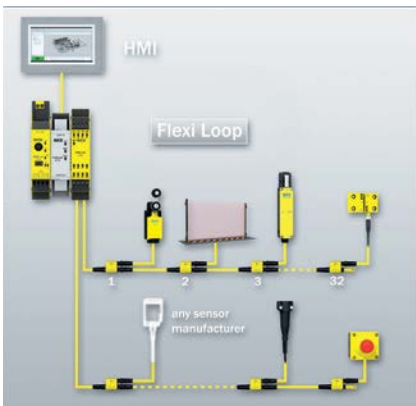


Flexi Line – Safe networking of safety control systems without device addressing

The Flexi Line enables the networking of up to 32 Flexi Soft stations simply by using a 2-wire standard cable – no additional hardware is required. Thanks to the unique global process image definition (96-bit data transfer rate), specific addressing of the individual stations is no longer necessary. This allows easy modification or expansion of the whole system at any time.



- www.mysick.com/en/Flexi_Soft
- www.sick.com/flexiline-video

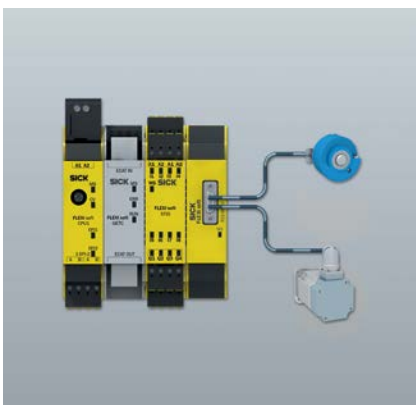


Flexi Loop – The safe sensor cascade with diagnostic functionality

The Flexi Loop enables the cascading of up to 8 sensor cascades each with up to 32 dual-channel safety sensors and switches. Safety switches and sensors can be used, independent of a particular manufacturer, while maintaining the PL e performance level. Detailed diagnostic information is also available for each sensor, indicating which sensor was switched and why. Integrated switching signals allow for the use of interlocks, switches, and lamps. Less wiring work and fewer safety inputs in the control cabinet are necessary, resulting in a cost-optimized solution.



- www.mysick.com/en/Flexi_Soft
- www.sick.com/flexiloop-video



Motion control – safe drive monitor

In assembly plants, handling stations or robot cells, the Drive Monitor safely monitors the machine's speed, downtime, movement direction, and stop function. When it detects an intrusion into the safety light curtain or when the safety doors are opened, its drives are switched to a "safe" energy-free or special operating mode. During setup and maintenance, e.g., at a safely reduced speed, it is possible to access the machine manually with minimal risk of injury. This allows the Drive Monitor to improve the machine's productivity significantly.



- www.mysick.com/en/flexi_soft_drive_monitor
- www.sick.com/DriveMonitor
- www.sick.com/drivemonitor-video

SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for factory, logistics, and process automation. With more than 6,000 employees and over 40 subsidiaries worldwide, we are always close to our 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.

We have extensive experience in various industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our 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 us a reliable supplier and development partner.

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

For us, that is “Sensor Intelligence.”

Worldwide presence:

Australia, Austria, Belgium/Luxembourg, Brazil, Czech Republic, Canada, China, Denmark, Finland, France, Germany, Great Britain, Hungary, India, Israel, Italy, Japan, Mexico, Netherlands, Norway, Poland, Romania, Russia, Singapore, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Turkey, United Arab Emirates, USA

Please find detailed addresses and additional representatives and agencies in all major industrial nations at: www.sick.com