INDUSTRY GUIDE

Efficient Solutions for the Electronics and Solar Industry

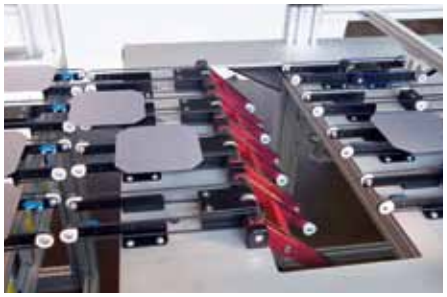
Achieve more with intelligent sensors

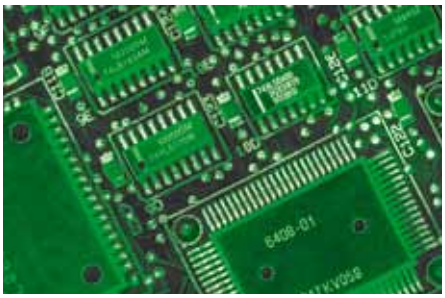
SICK
Sensor Intelligence.

Groundbreaking solutions

Top production performance

For a long time SICK has played a major role in optimizing industrial processes worldwide, as a leading developer and manufacturer of intelligent sensors.
We contribute solutions from the simplest photoelectric sensor, to the most advanced 3D vision systems on the market – all with the goal of safer, faster, and more cost-effective production.
Our goal is to exceed our customer's expectations by providing the most advanced sensors to reduce risks of damage and sources of error. We design our products to accelerate manufacturing while increasing quality control.
SICK understands automation and draws from an extensive practical knowledge base to bring efficiencies to every aspect of production – from the smallest detail to the large-scale integration of the sensing environment.





Strong performance

Sample solutions

Sensor Intelligence is our promise

SICK sensor solutions for industrial automation are the result of exceptional dedication and experience. From development all the way to service: The people at SICK are committed to investing all their expertise in providing with the very best sensors and system solutions possible.

A company with a culture of success

Approximately 5,000 people are on staff, with products and services available to help SICK sensor technology users increase their productivity and reduce their costs. Founded in 1946 and headquartered in Waldkirch, Germany, SICK is a global sensor specialist with more than 50 subsidiaries and representations worldwide. Our exemplary corporate culture fosters an optimum work-life balance, thus attracting the best employees from all over the world. SICK is one of the best employers – we have been among the winners of the prestigious German “Great Place to Work” award for many years in succession.

Innovation for the leading edge

SICK sensor systems simplify and optimize processes and allow for sustainable production. SICK operates thirteen research and development centers all over the world. Co-designed with customers and universities, our innovative sensor products and solutions are made to give a decisive edge. With an impressive track record of innovation, we take the key parameters of modern production to new levels: reliable process control, safety of people and environmental protection.

A corporate culture for sustainable excellence

SICK is backed by a holistic, homogeneous corporate culture. We are an independent company. And our sensor technology is open to all system environments. The power of innovation has made SICK one of the technology and market leader – sensor technology that is successful in the long term.

Sensor Intelligence for all requirements

SICK is a renowned expert in many industries, and is entirely familiar with the critical challenges they face. While speed, accuracy and availability take center stage in all industries, technical implementations vary greatly. SICK puts its vast experience to use to provide with precisely the solution you need.

For applications worldwide

Hundreds of thousands of installations and applications go to prove that SICK knows the different industries and their processes inside out. This tradition of uncompromising expertise is ongoing: As we move into the future, we will continue to design, implement and optimize customized solutions in our application centers in Europe, Asia and North America. You can count on SICK as a reliable supplier and development partner.

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For your specific industry

With a track record of proven expertise in a great variety of industries, SICK has taken quality and productivity to new heights. The automotive, pharmaceutical, electronics and solar industries are just a few examples of sectors that benefit from our know-how. In addition to increasing speed and improving traceability in warehouses and distribution centers, SICK solutions provide accident protection for automated guided vehicles. SICK system solutions for analysis and flow measurement of gases and liquids enable environmental protection and sustainability in, for example, energy production, cement production or waste incineration plants.

For performance across the board

SICK provides the right technology to respond to the tasks involved in industrial automation: measuring, detecting, monitoring and controlling, protecting, networking and integrating, identifying, positioning. Our development and industry experts continually create groundbreaking innovation to solve these tasks.

www.sick.com/Industries

For safety and productivity: SICK LifeTime Services

SICK LifeTime Services is a comprehensive set of high-quality services provided to support the entire life cycle of products and applications from system design all the way to upgrades. These services increase the safety of people, boost the productivity of machines and serve as the basis for our customers' sustainable business success.

Benefit from an array of services

Each of our products and solutions is accompanied by a comprehensive range of services tuned precisely to the requirements of the product or solution – along its entire life cycle. Backed by extensive industry know-how and more than sixty years of experience, LifeTime Services stand for maximum availability and an exceptional service life of our products and solutions.

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Training & Education

- User training
- Seminars
- WebTraining

Product & System Support

- Commissioning
- Spare parts and repairs
- Remote support
- Hotline

Verification & Optimization

- Barcode checks
- Consulting/Engineering service
- Inspection
- Maintenance
- Accident analysis
- Stop time measurement
- Noise measurement

Consulting & Design

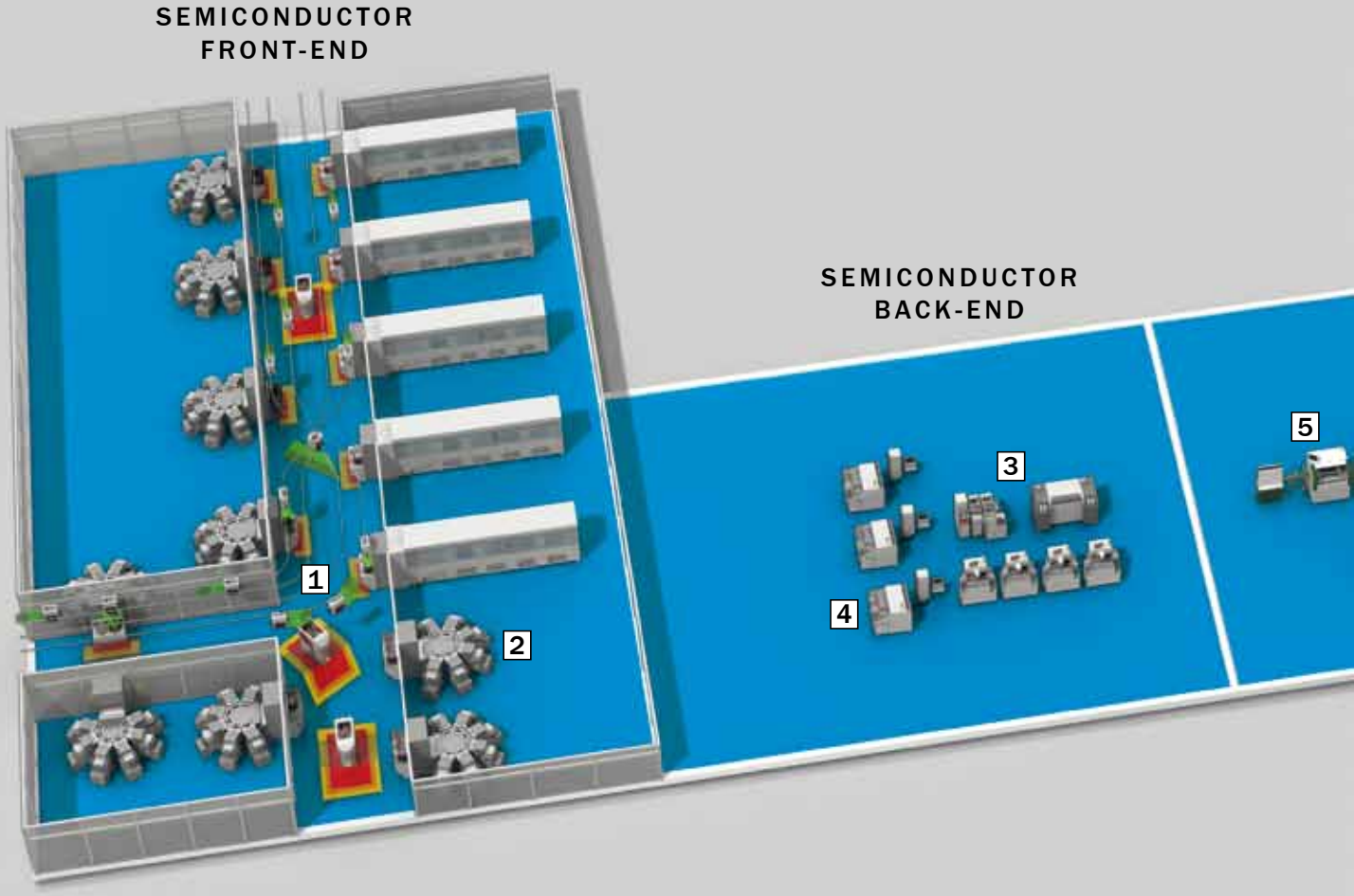
- System inspection
- Risk assessment
- Safety concepts
- Feasibility studies
- Software and hardware design

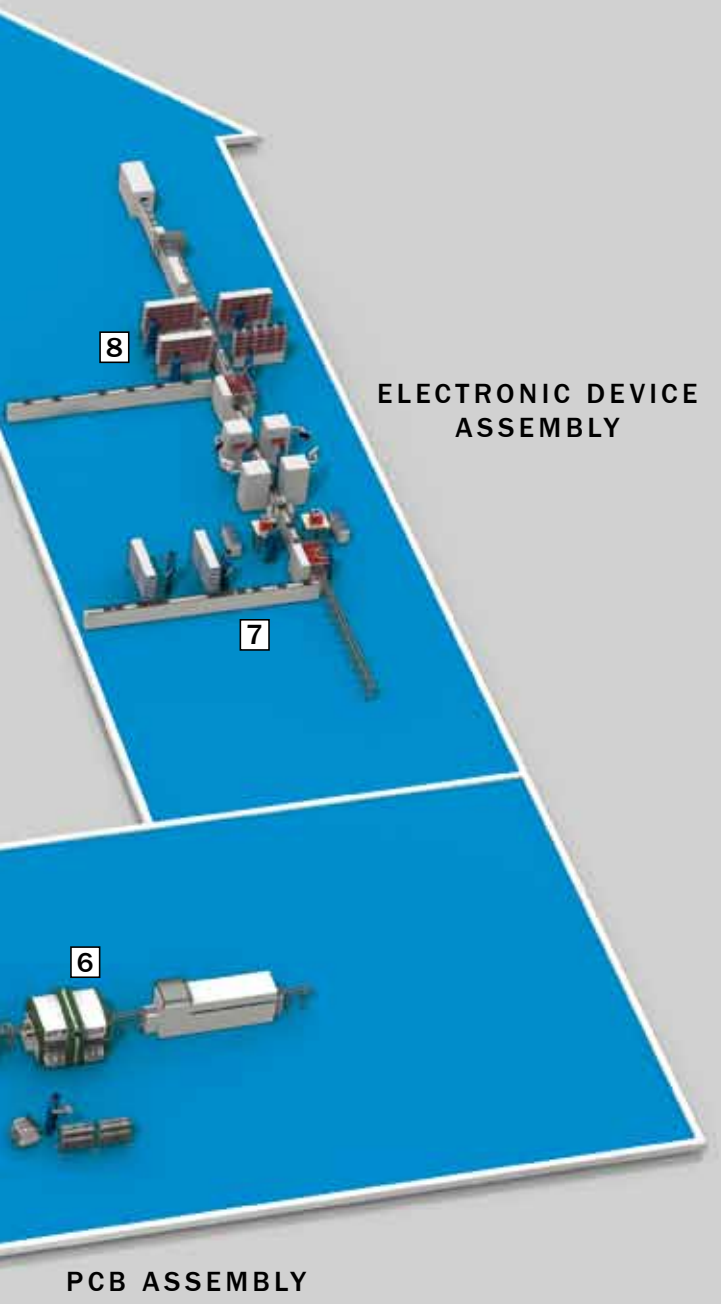
Upgrade & Retrofits

- Machine conversion
- Sensor upgrades
- Sensor replacements
- Retrofitting of technology

www.sick.com/service

Sensor solutions for the electronics industry



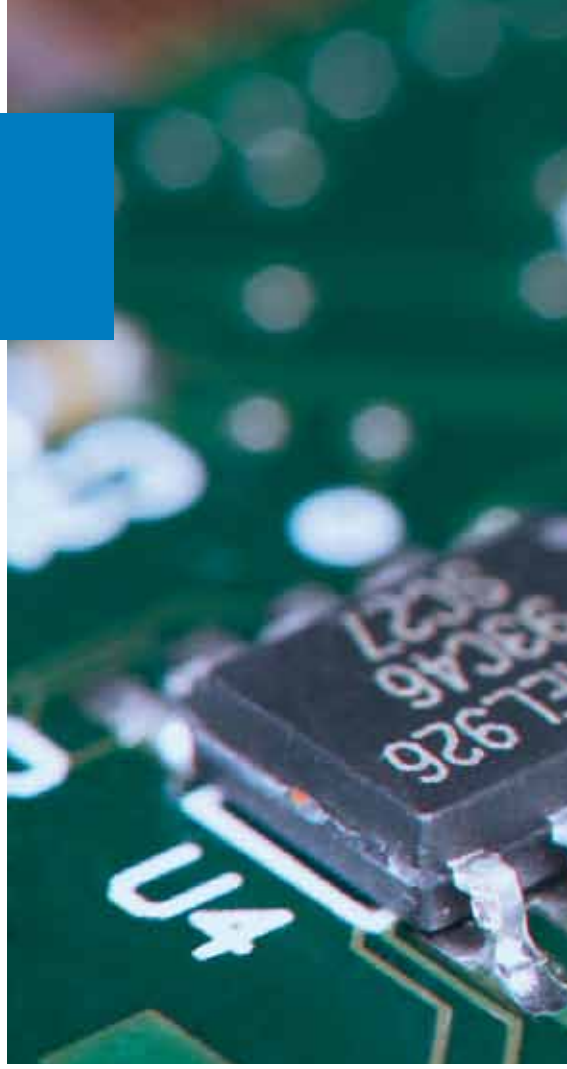


ELECTRONIC DEVICE ASSEMBLY

PCB ASSEMBLY

The following pages contain application examples of SICK products used in different stages of production – from semiconductor manufacturing to the final assembly of electronic devices.

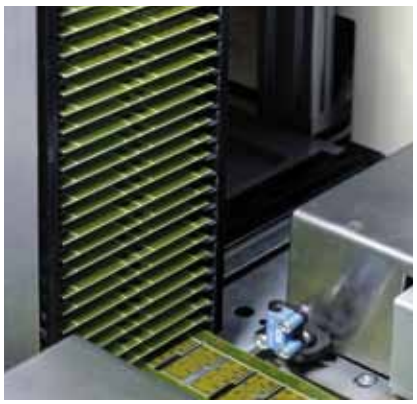
Electronics industry – Challenges



SICK sensor highlights

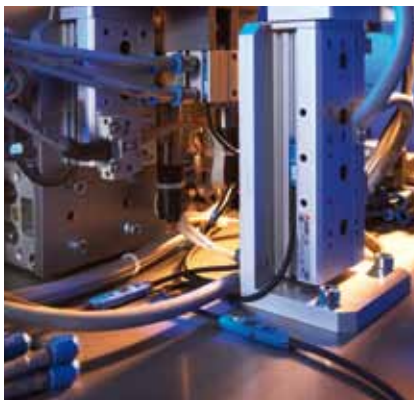
High-tech electronics are at the forefront of industrial progress yet face the most difficult market pressures. They must lead innovation and time to market, leaving little room for error.
Manufacturers must take advantage of a tight window of opportunity for their product ideas with rapid, reliable, and economical production. Machines and production plants with the state-of-the-art technologies must be equipped with the most advanced sensors to achieve the quality and profitability the market demands.
SICK sensor technology has proven itself worldwide in every area of the electronics industry – from chip production through the complexities of automated assembly and packaging of computers, mobile phones, and TVs. This Industry Guide presents real-world examples from the universe of SICK sensors that demonstrate we have the solutions for your production processes whether off the shelf, or tailored exactly to meet your unique requirements.

Ask the application experts at SICK!



Smart detection

SICK sensors control the production of electronic components and devices where the sensing is required. They are designed to operate in tight spaces, vacuums, and wet chemical environments.



Flexible production

Electronic devices have short life cycles. Production lines should be flexible. SICK IO-Link technology allows changes to sensor settings without requiring manual intervention.

Track and trace

The smooth running of production processes is dependent on reliable identification of parts. SICK offers a wide range of hand-held and fixed barcode, 2D, and RFID readers.

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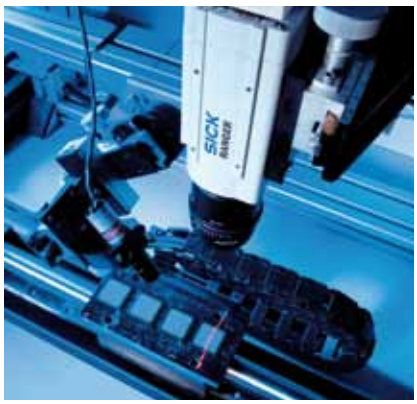
Safety

The increasing sizes of wafers and their carriers increase safety hazards. SICK safety solutions insure operator safety while optimizing production, minimizing down-time and reducing equipment footprints.



Quality control

The electronic content is increasing in cars, appliances ... At the same time, the expectation on reliability are increasing. This is setting very high requirements on quality control. SICK distance measurement and vision systems can solve nearly any inspection.

Monitoring

Equipment is deployed worldwide. Remote diagnostics, and preventive maintenance are key initiatives to control service costs. SICK Sensor Intelligence solutions allow remote monitors to adjust their settings when required.

Focus 1:
Semiconductor fab automation

Collision prevention using safety scanners

Floor space is extremely expensive in clean rooms. Dynamically adjusted collision zones keep AGVs safe as speeds vary, allowing a more closely spaced working environment. Here, the S3000 safety laser scanners dynamically adjust their collision and safety zones based on directional and velocity data from two DFS60 incremental rotary encoders installed on the AGV. Once arriving, human operators are protected from robot movements by the same safety scanners.

▼

Overhead transportation control

Collisions are avoided with a miniature laser scanner that requires no external computer for operation. Instead, pre-programmed fields are activated as the route requires. Low-power consumption allows the vehicle to operate longer on it's battery. More vehicles can operate in the same space, improving automation efficiency.

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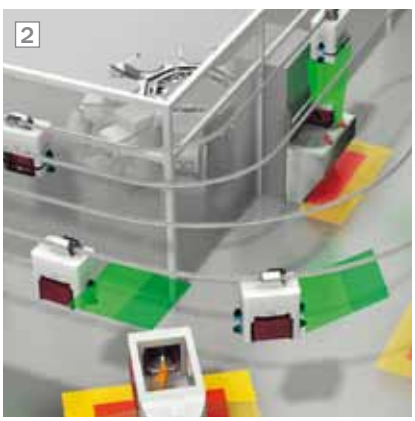

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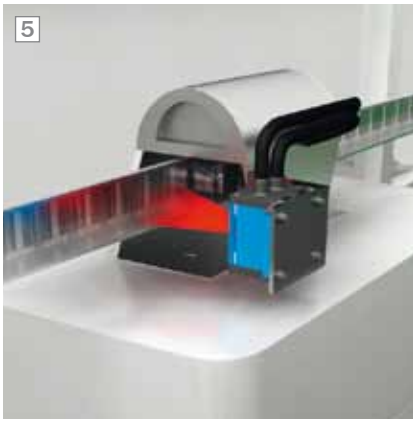
Absolute vehicle positioning ▸

The OLM linear measurement sensor with a 10 km range and 0.5 mm resolution is the ideal solution to monitor the exact position of vehicles on the overhead transport system. Four redundant illumination LEDs offer long MTBF.

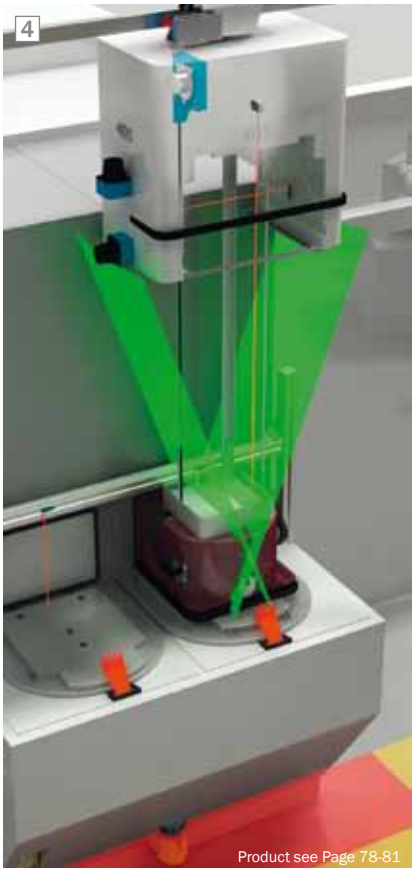


Automatic port loading ▸

The FOUP wafer delivery system must minimize risk of damage to the valuable wafer payloads. Not only the pod position has to be known, but excessive sway during delivery is a source of damage. The SICK WL100L laser photoelectric retro-reflective sensor can quickly detect out-of-bounds motion throughout the range of travel, and, as a class 1 laser sensor, can be mounted in any position without personnel risk. The lightweight (180 g), low-power (3 W) Ecoline wire draw encoder provides the exact pod position.

Lot tracking

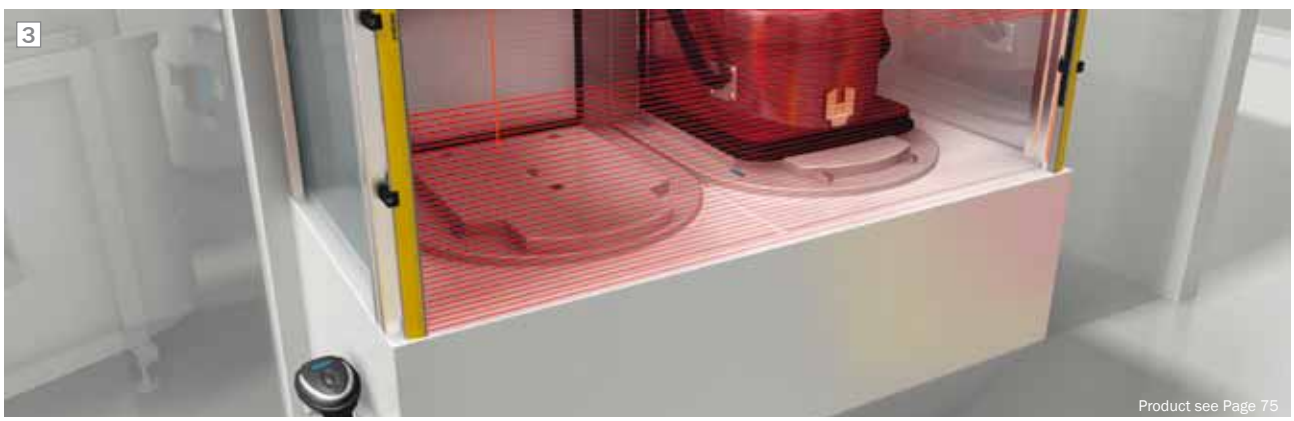
Process control requires precise knowledge of wafer carrier locations. Though methods can vary from RFID to 1D and 2D code reading, the SICK ID*pro* product family shares the same connectivity and user interface, allowing seamless incorporation in production environments.



Semi-automatic port loading

Light curtains allow human operators safe entry to potentially dangerous operations. The ideal hazardous point protection involves minimizing ergonomic restraints and maximizing secure detection. SICK has pioneered safety light curtains, such as the miniTwin, which prove themselves daily in manufacturing processes worldwide. ▾

The load port is quite compact and must move rapidly. The position sensor choice must meet these constraints of form factor and speed. SICK's miniature IQ05 inductive proximity sensor is a precision sensor with a very low form factor (3.5 mm height). Its 1-mm sensing range delivers the precise start and end drawer position data required.



Focus 2:
Process tool automation

Harsh environment presence detection
The WS/WE4-3 through-beam photoelectric sensor with a Teflon® housing (IP 69-rated) is designed for long-term immersion in harsh chemical environments. SICK has a long experience in delivering sensor solutions with long MTBF.

Teflon® is a registered Trademark by DuPont™.

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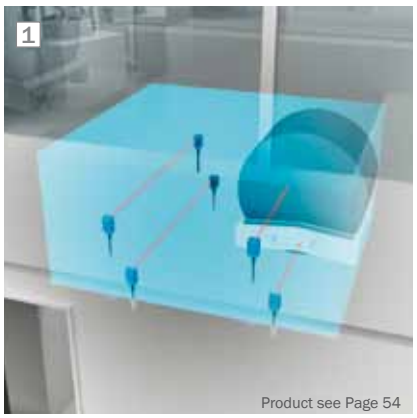

Product see Page 54

Wafer boat position monitoring
The position of the carrier is controlled by an AFS60 singleturn absolute encoder on the vertical axis and an A3M multiturn absolute encoder for the horizontal axis. The encoders come with Fieldbus and Industrial Ethernet connectivity for easy and cost-effective integration into the control system.

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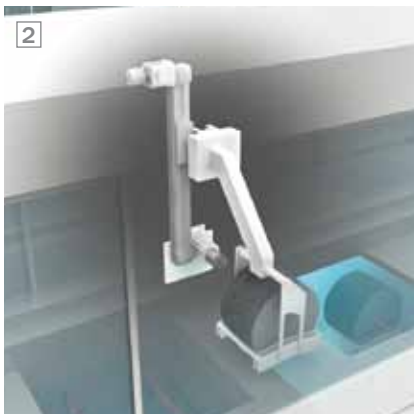

Corrosive chemical level measurement
Measuring levels of corrosive chemicals present unique problems. SICK understands that its sensors cannot be points of failure or contamination. The UP56-2 PTFE-coated ultrasonic level sensor with industry-standard couplings, is safe and long-lasting. Simple mechanical and electrical integration, with both analog and digital outputs standard.

▼

Product see Page 71

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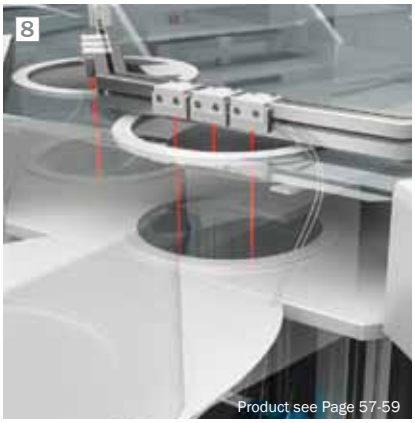
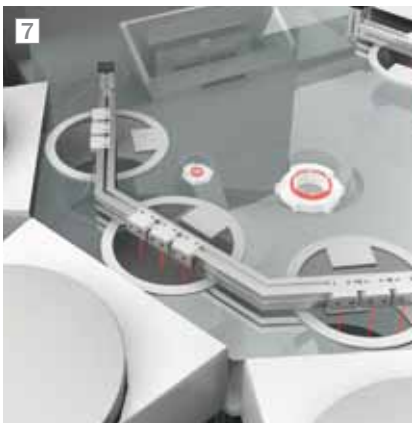
Smart leak detection of chemicals
Dangerous chemicals are safe when contained properly. Small leaks may merely require maintenance, while major leaks require an emergency purge, destroying valuable work in progress. Multiple WLL180 fibre-optic sensors with LL3-DW02 PTFE-coated leak detection fibers quickly report the extent of the leak to the Flexi Soft controller, which incorporates end user programmable decision tree functions to trigger the appropriate response. Hazardous spills are reliably identified.

High-speed and precise wafer detection
The precise position of the wafer on the robot arm can be determined by monitoring the outputs of multiple sensors. High-speed, low-jitter sensors and precise light spots are essential for this operation. The WLL180 fiber-optic sensor with 16 µs response time together with small aperture LL3-TH fiber-optic cables are highly accurate, cost-effective, and fit the machine constraints.



Wafer robot position monitoring using torque motor feedback systems
Non-contact SEK hollow-shaft motor feedback system from SICK offers simple, robust structures with virtually no mechanism for failure. Very low weight, inertia, and profiles (< 10 mm) simplify integration with a large variety of shaft diameters. Some models offer 0.001° of resolution, while all offer absolute output over 360° rotation.



Notch detection
Wafer processes depend on exact substrate orientation. A fiber-based system based on the WLL190T-2 analog fiber-optic sensor uses LL3-TS fiber-optic cables in a light array to quickly and precisely center the substrate and report the notch position.

Wafer mapping with proximity sensors
Here, a pair of WT12L laser proximity switches map wafers.

Focus 3:
Semiconductor back-end of line

Inspection and positioning solutions in the bonding machines

The Inspector vision sensor is an ideal complement to the sophisticated vision systems in bonding machines. Improper glue placement can waste perfectly good dies, and must be discovered before the chip is placed. Relying on the bonding head vision system increases the analysis burden on the system. The Inspector can define up to 32 different inspection areas, each with its own pass/fail threshold. The Inspector, with a unique dome illumination, is ideal for reflective surfaces. Dies are picked and placed at extreme speeds and need extreme accuracy throughout the process. The TTK70 non-contact linear encoder is designed to quickly report these large relative movements with µm accuracy. The HIPERFACE® interface delivers ultra high speed servo control.

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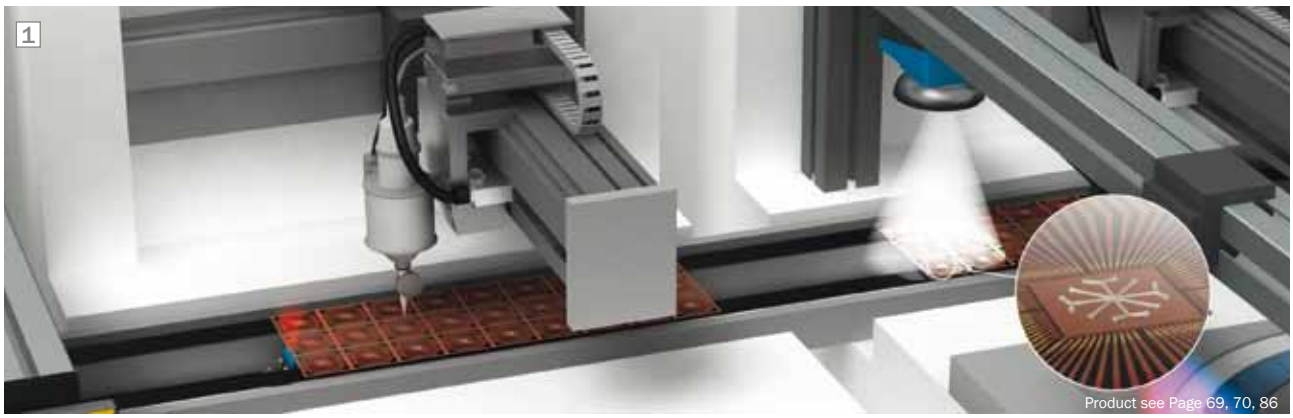

Product see Page 69, 70, 86

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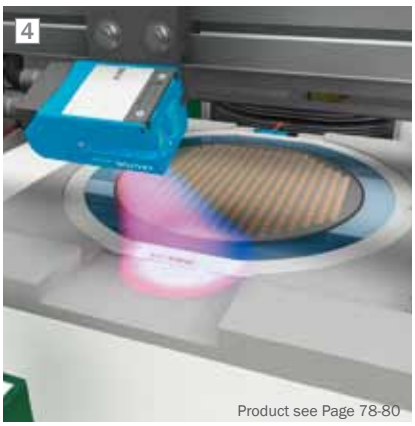
Safety improves production yields

Die bonders operate at blazing speeds, but must pause often for human operator access. The miniTwin safety light curtain shrinks handling time while fully preserving operator safety. The miniTwin has no blind zone, thus easily cascades to create an “L”-shaped guarded opening for easy operator access to the load/unload area.

Product see Page 75

Wafer frame identification

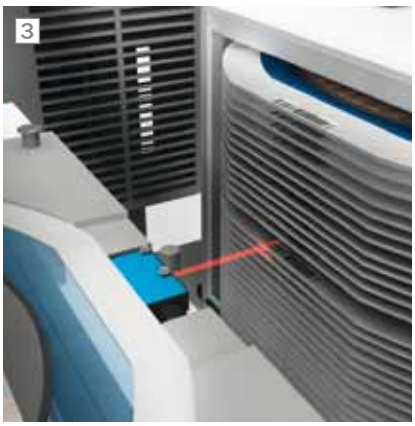
The LECTOR®620 image-based code reader identifies the wafer using the 1D or 2D codes attached to the wafer frame. Both codes can be read omnidirectionally with this extremely compact design. Optical aiming aids make these scanners extremely user-friendly.



Product see Page 78-80

Precise edge detection

The WT9L laser photoelectric proximity sensor has an extended sensing distance from 30 mm to 120 mm. Of course, superior background suppression is built in, and it is field proven for the reliable detection of a wide variety of wafer frames.



Wire bonder automation solutions

Here, the fiber-optic solution works best. The area near the bonding head is hot. The WLL180 fiber-optic sensor with a 16-µs response time together with the precise light array of the LL3-DH fiber cable provide a precise edge detection signal to the controller. The grippers must move fragile substrates at very high speeds with high precision to minimize bonding head idle time. The dual TTK70 linear encoder read heads operate at speeds up to 10 m/s with µm accuracy, contributing substantially to machine throughput. The W2S photoelectric proximity sensor with diffused light spot ensures the absence of substrate before allowing the cassette to move to the next slot.

Product see Page 57-59, 70, 55

Focus 4:
Semiconductor testing and sorting

Orientation and position

Products delivered on trays and reels destined for machine insertion must be machine ready, and faulty orientation here has costly results. The stand-alone Inspector I40 vision sensor is a lower cost yet as effective in this application, compared to traditional CCD/ frame grabber solutions.

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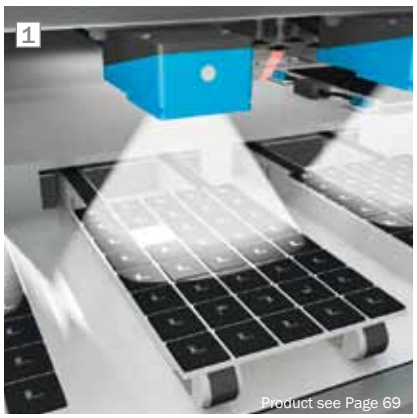

Product see Page 69

Reliable detection using laser-like photoelectric sensors

Small misalignments can cause major losses, and detecting these small errors is often expensive and complex. SICK developed the WT2 miniature photoelectric sensor to offer superior accuracy and simple alignment without the costs and risks of laser solutions. PinPoint LED technology employs a focused, intense light spot comparable to laser accuracy in many applications, and with double the lifespan.

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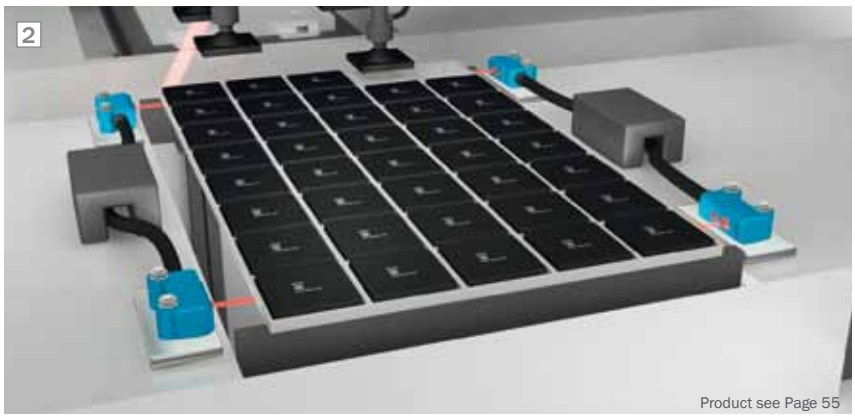

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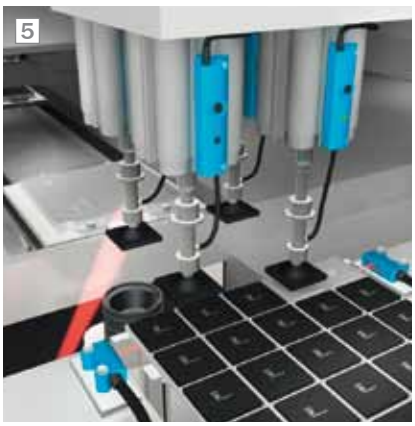
Advanced 3D vision

The final inspection involves sophisticated inspections for mechanical integrity such as BGA quality, contact damage, and co-planarity before packaging for shipment. The Ranger 3D vision camera system allows for inspection of over 10,000 components per hour at industry required precision.

SICK engineers solutions for the most difficult 3D vision applications, using its expertise in optics, electronics, and software.

Flexible cylinder positioning

Non-contact sensing is not always best. In this pick-and-place process increasingly involving very thin components, the MPS cylinder sensor resolves the component height to 0.05 mm with excellent repeatability. Simple and cost-effective.



Machine safety made simple

SICK developed the Flexi Soft safety controller with the goal of “10 Minutes to Green”. Safety personnel having no experience with Flexi Soft Designer software can assemble a functional safety logic program in 15 minutes or less.

Once the safety logic is simulated and proven for its functionality, the Flexi Soft Designer outputs diagrams and reports suitable for certification. Customers can focus on their core competencies, and maintain the highest safety standards. To demo Flexi Soft Designer, go to www.sens-control.com.

Presence detection

The WLL180T fiber-optic sensor checks for presence of components on the tray.

Product see Page 74

Product see Page 57-59

Focus 5:
PCB handling and printing

Inspection and positioning solutions for fast product changeover

Screen printing machines accommodate PCBs of different sizes, but need accurate (± 10 µm) position data. The TTK70 absolute linear encoder doesn't require a new initialization process for size changes. Two Inspector P30 vision sensors with dome lights detect the fiducial marks on the PCB to precisely control its alignment with the screen which is an absolutely must in high flexible high volume PCB assembly.

Reliable detection

Often, background shapes and movements interfere with accurate detection. The ultrasonic UC4 ultrasonic sensor delivers superior resolution (0.18 mm) and detection, even when the placement head is millimeters away from the target PCB.

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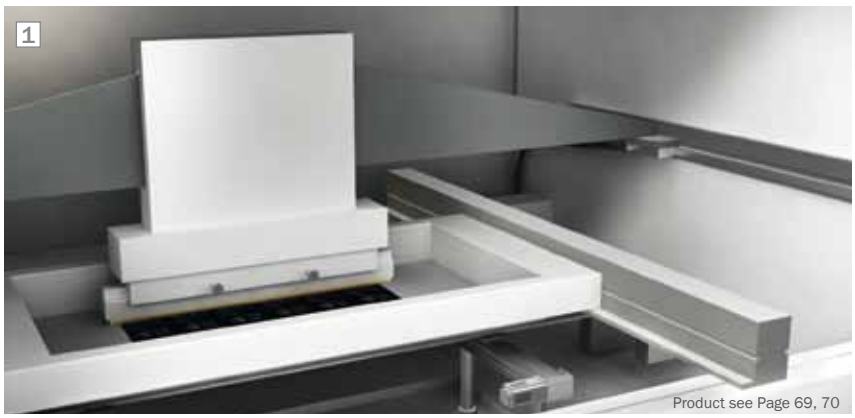

Product see Page 69, 70

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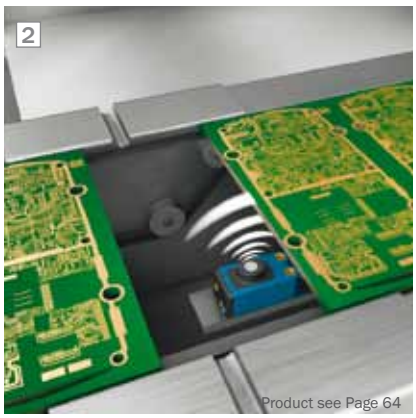

Product see Page 64

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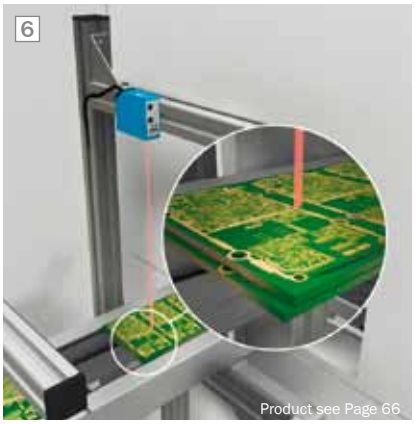
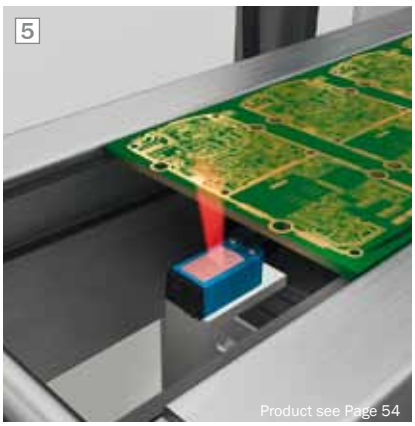
High-speed 3D inspections
Determining the amount of solder paste on a PCB is a trade-off between throughput and resolution. The Ranger 3D camera pushes the boundary with Z-axis resolution of 5 µm at speeds of 90 cm²/s. With SICK, 3D vision is not a bottleneck in production speed.

Intelligent identification of PCBs
The ID*pro* family of automatical identification products read 1D and 2D codes via integrated Ethernet, Serial, and CAN interfaces. Built-in smart reconstruction technology recovers codes even if partially obscured or damaged. Additional bus interfaces are available via an optional CDF connection box.

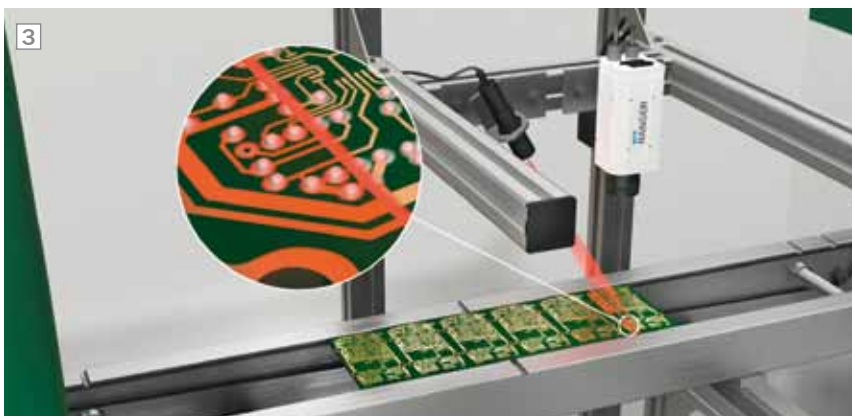
Height control by distance measurement
Multilayer PCBs vary greatly in thickness, yet processes can accommodate these variations with data from sensors. The OD Value short range distance sensors come with an analog output to report thickness and planarity, and a switching output to warn of stacked PCBs. The sensor head can be mounted at the distance required to size the light spot diameter for the application.



Reliable detection of odd-form PCBs
PCBs can have many slots and large holes that can mislead edge detectors. WTV4-3 Line photoelectric sensor uses a stretched beam that compensates for these variations, and delivers the precise edge position. This one sensor can be deployed wherever ambiguous conditions exist, thus lowering the cost of ownership.



Position detection of adjustable conveyors
The IQ10 inductive proximity sensor provides precise start and stop positions.



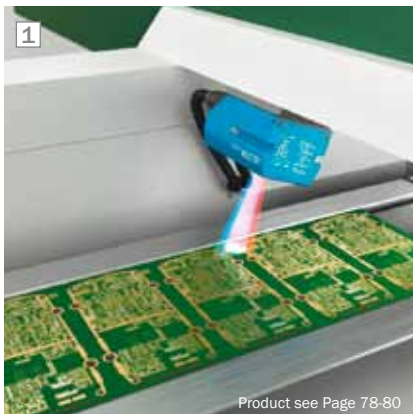
Focus 6:
Pick and Place

Advanced identification technologies

The ID*pro* family of products read 1D and 2D codes and communicate the results via common industrial interfaces. Built-in smart reconstruction technology recovers codes even if partially obscured or damaged. Additional bus interfaces are available via an optional connection modules.

Smart safety solutions

Sometimes safety doors must remain closed until a process or machine has shut down. The i14 Lock prevents unsafe access, and is integrated into the machine control with the Flexi Classic safety controller. As pick-and-place machines become more modular and thus more complex, the Flexi Classic system will scale to future safety demands.



Product see Page 78-80

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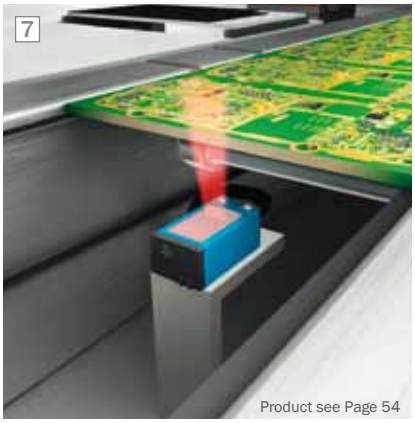
Edge detection of irregular PCBs

The placement machine needs data unaffected by holes or slots. A photoelectric sensor with background suppression is not subject to variations. The WTV4-3 Line photoelectric proximity sensor uses PinPoint LED technology coupled with advanced optics to project a line on to a sufficient portion of the board to ensure an accurate edge detection.



Product see Page 54

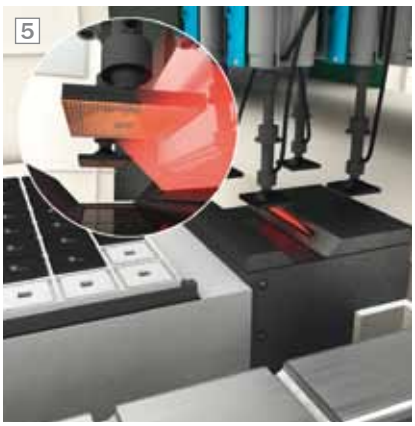
Component check

The OD Value distance sensor is light enough to be mounted directly on the placement head. It measures component height and paste height in advance, providing the missing Z data to the 2D vision system in the placement head.

Product see Page 66

High-speed component inspections

Subsequent handling of delicate components can cause subtle damage. SICK 3D vision systems rapidly (> 200 mm/s) evaluate complex electronic components such as BGAs. Machine throughput and quality increase, and risky handling is reduced.



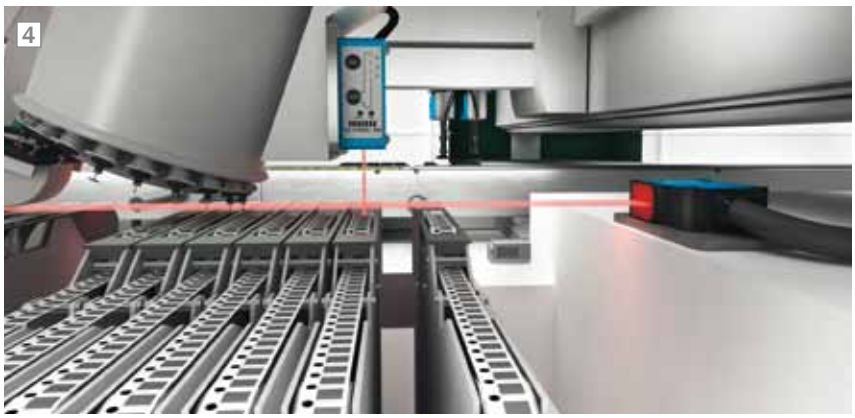
Mobile identification for instant confirmation

Handheld devices control costs by eliminating operator error during reel loading. Reconstruction algorithms reduce tedious manual typing, while 500 scans/sec, identify codes quickly, even at arm length distances. The IDM handheld scanner is available with Bluetooth or WLAN applications, as well as PS/2, USB, and RS-232.

Product see Page 80

Check feeder clips using a single photoelectric reflex sensor

A fast, but vital check to ensure all feeder clips are locked can be done with just one WL27 reflex array sensor. Its 50 mm light array monitors any deviation from securely closed positions, avoiding expensive damage to the placement head.



Focus 7:
Device assembly

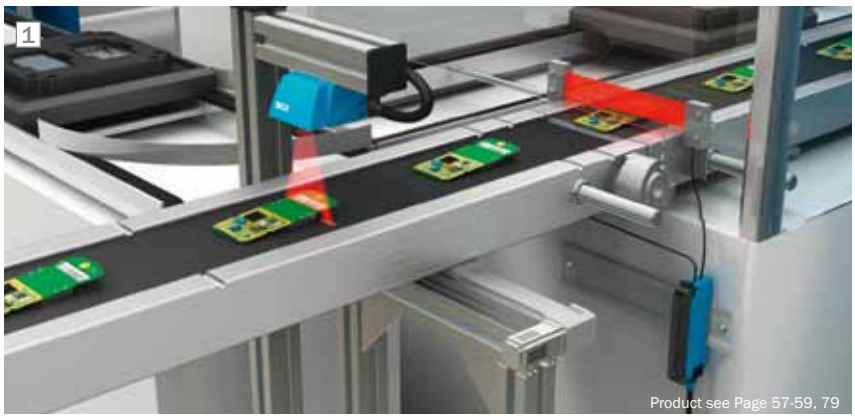
Object detection and intelligent identification

Light arrays are an effective method to detect the leading edge of objects on conveyors. An elegant solution comprised of the WLL180T-2 fiber-optic sensor with the LL3-TS fiber-optic cable creates the light array which provides real-time position data. The DFS60 incremental encoder reports the belt position. At the same time, the CLV620, featuring SMART620 code reconstruction, reads even damaged bar codes on the PCB, with the highest read rates in its class. It comes complete with Serial, Ethernet TCP/IP, and CAN network support. An optional expansion interface is available for OEMs requiring custom solutions.

Smart inspection

The last inspection of the unit prior to cover installation by an IVC-3D smart camera ensures that even the smallest parts are correctly installed, for example controls gasket presence and measures screw height. The camera immediately signals when a failure has been detected.

▼



Product see Page 57-59, 79

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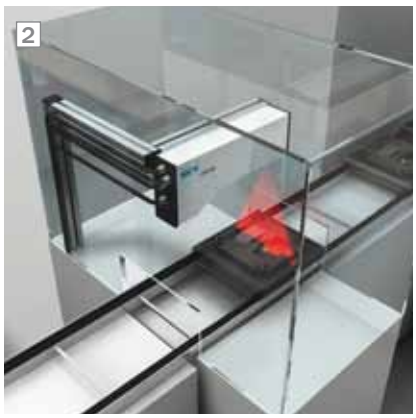

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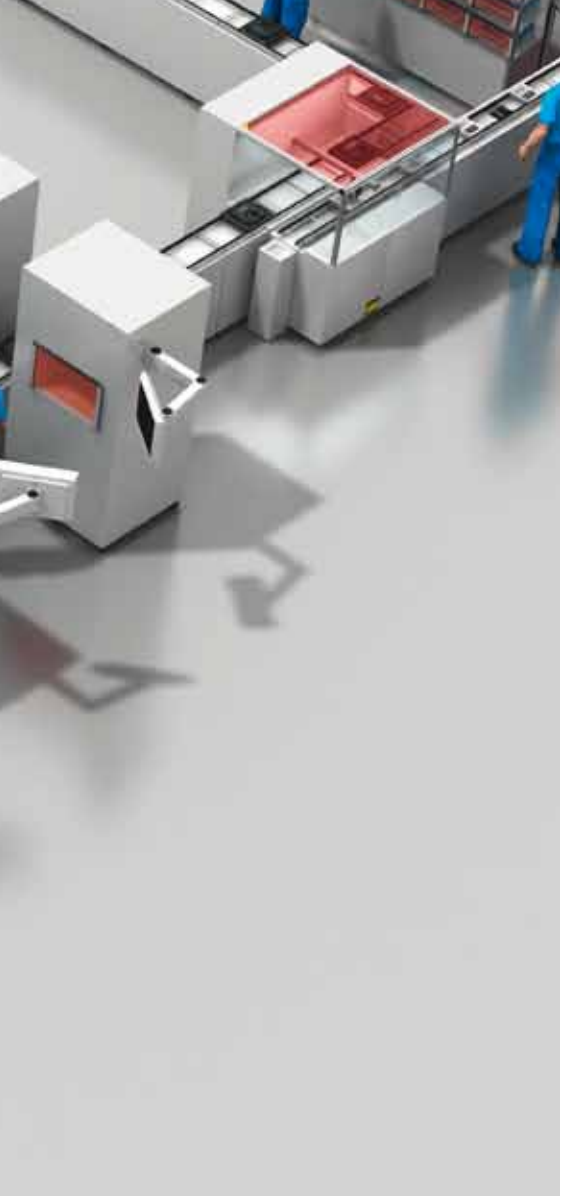


Trace work in progress

RFID offers many advantages for tracking products, in addition to a unique identifier. Product information and individualized instructions can be read and stored on the tag via the RFH620 interrogator.

Pick-to-Light

SICK is a long time innovator in Pick-to-Light systems. The PLG Pick2Light light grid guides the worker to the correct part in the storage box with a job LED on the light grid. Choosing the wrong part triggers an optical and acoustic response.

Tray detection

An IME12 inductive proximity sensor controls the presence of trays along the production line. SICK unique production process insures all sensors are calibrated to exhibit the same behavior within 1 %.

Safety and speed

Often safety and productivity are polar opposites, yet both are essential to efficient processes. The miniTwin safety light curtain can construct a safety “U”, ideal for ergonomics. In conjunction with the Flexi Soft safety controller, photo-sensitive device activation (PSDA) can be used to automatically start the process when the operator clears.

Camera safety

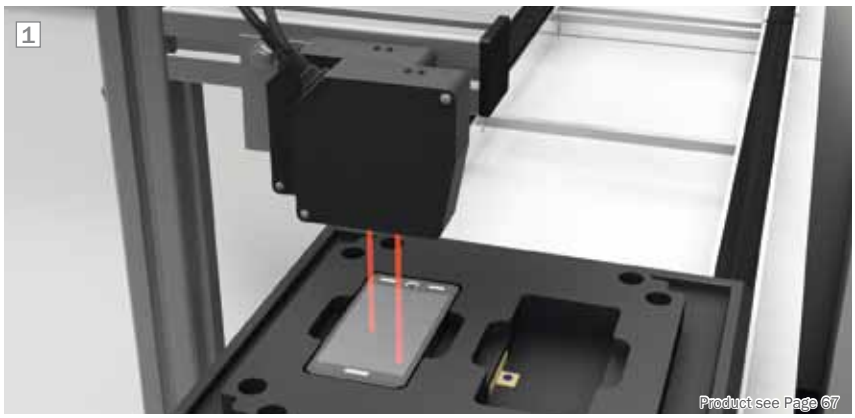
Material handling robots move far too quickly for human reactions. Traditionally for safety, these robots were isolated by high walls. The V300 safety camera system allows lower walls, simplifying replenishment and maintenance. This reduces the machine volume, significantly reducing freight cost.

Focus 8:
Final test and packaging

Glass thickness measurement
Single sensors can struggle with thickness measurements on transparent objects. The OD Precision short range distance sensor requires only one read head for this challenge, and can accommodate up to three independent read heads for additional testing, such as planarity.

Device detection in gripper
Grippers often make large movements to grab their objects. The ideal sensors to mount on the gripper must be small and light-weight. The sub-miniature (7.6 x 20.6 x 12.5 mm) WT2 Slim photoelectric proximity sensor is the answer.

▼



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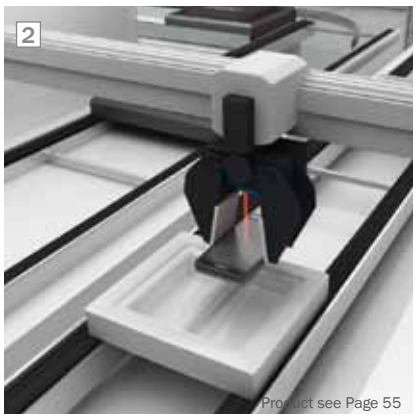

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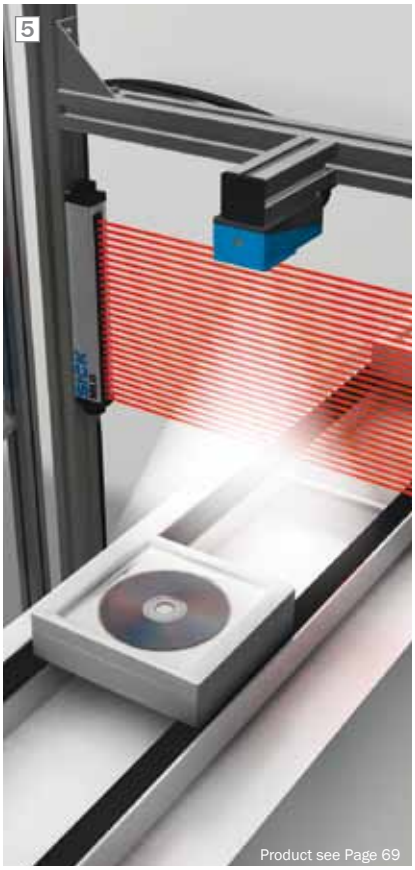
Ensure complete packaging ▸

In systems that accommodate multiple packaging styles, the arriving contents must be positively identified for the proper fit. With a MLG automation light grid, each light beam in the curtain communicates its state over the field bus (user choice) to the controller which determines content height. The Inspector vision sensor will determine the exact width and length and even verify the contents are correct. The Inspector is easy to set-up, and no vision processing expertise is required.



Product see Page 69

Package detection ▸

A CM18 capacitive proximity sensor detects the presence of the package. Capacitive sensors are the right choice when the scanning distance is short, the target is non-metallic, and when response time and position accuracy are not critical.

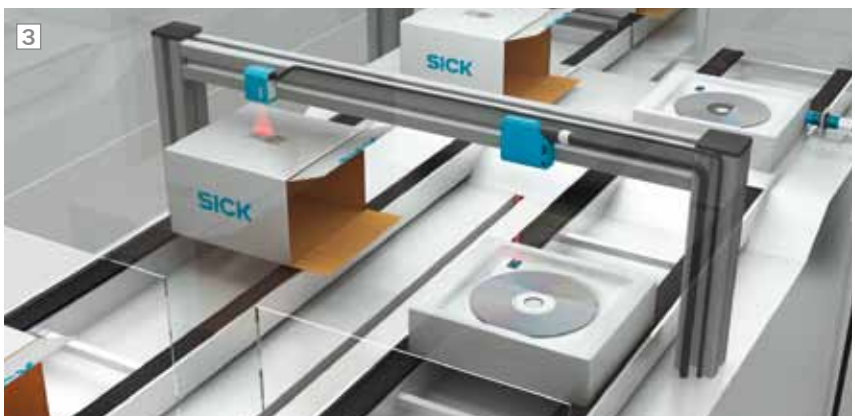
Product see Page 60

Bar code reading

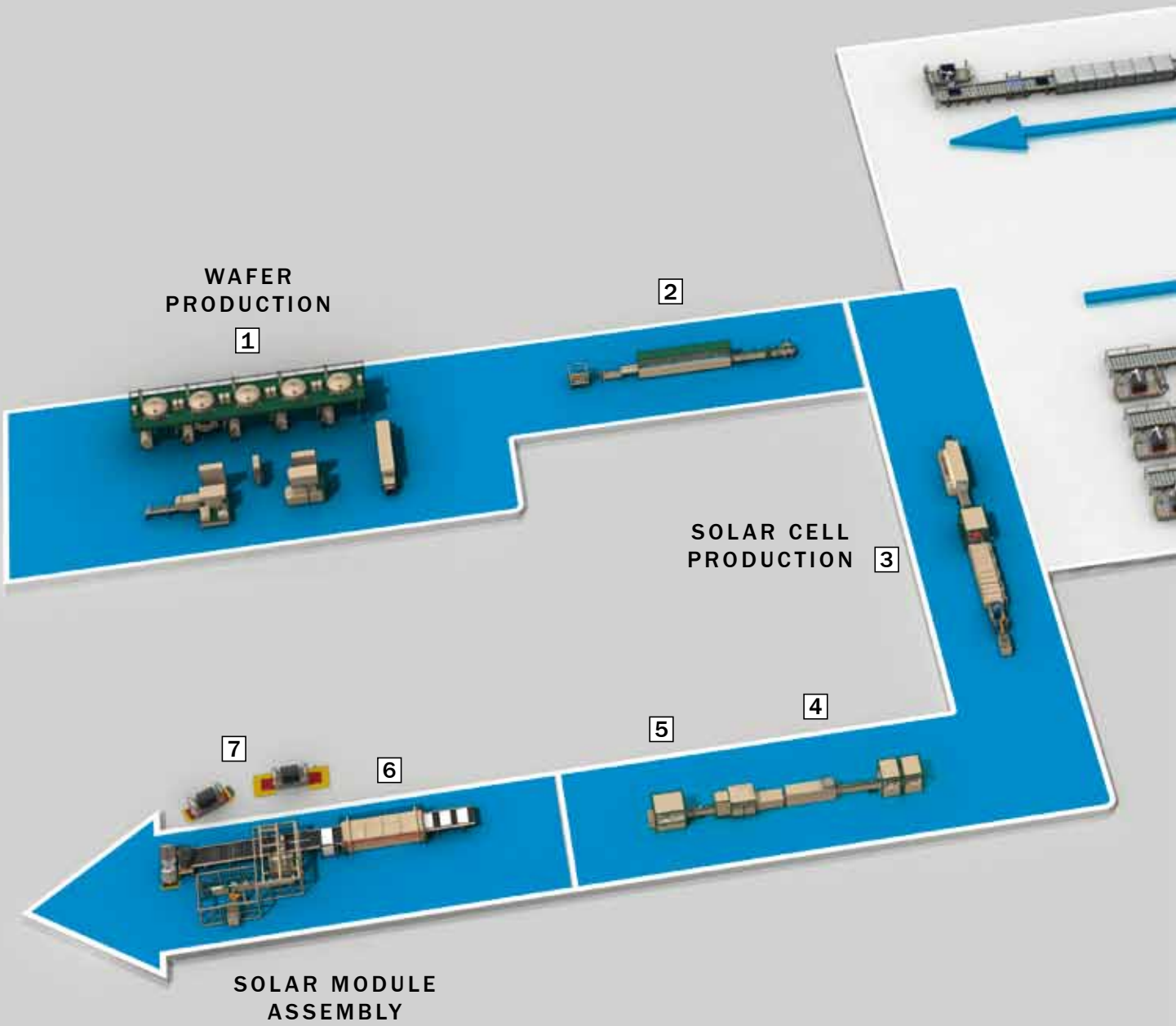
Consumers expect electronics to be perfect. Gathering final information on product peripherals such as batteries can be essential when defects can present recall or liability issues. Bar codes are often the label of choice. SICK offers the CLV505 miniature bar code scanner that easily integrates (via USB) into the final inspection station process.

A WT12 photoelectric proximity sensor controls the presence of the valuable memory card before the package is inserted in the box. Cost-effective and simple.

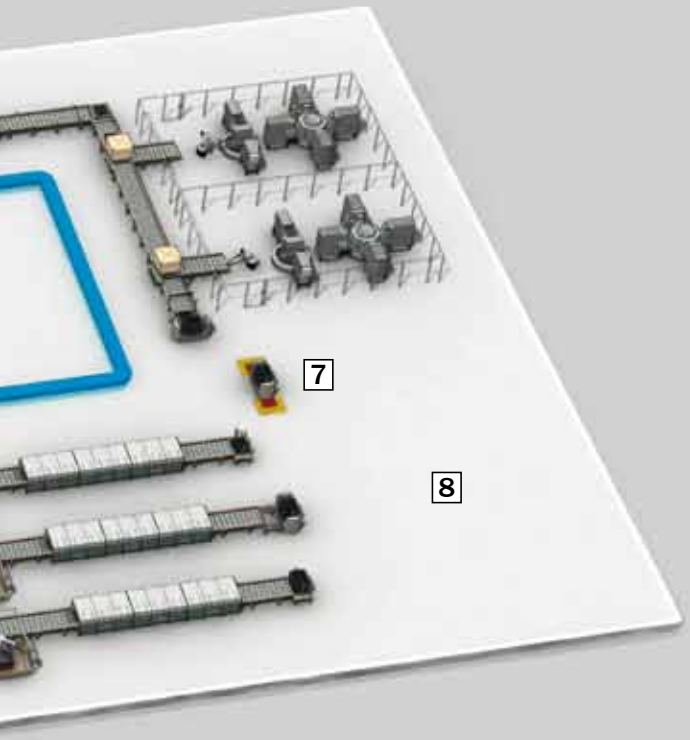
▾



Sensor solutions for the solar industry



THINFILM PRODUCTION



The following pages contain application examples of SICK products used in different stages of solar cell manufacturing – from ingot production to the final module.

Solar industry – Challenges

SICK sensor highlights

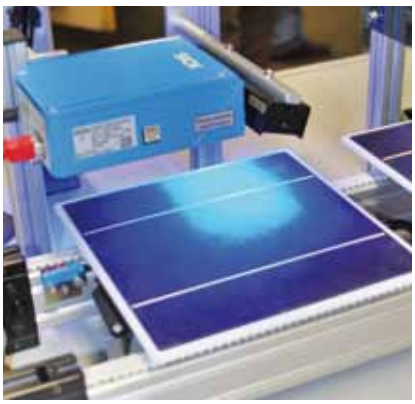
Fossil fuels are still the energy choice when price alone is the benchmark, but that environment is changing quickly. Grid parity is within reach – where the cost of producing solar electricity will be competitive without requiring government subsidies. However, this will require increasing solar module efficiency, improving automated processes, and reducing waste. SICK leads this trend by continuously developing industry solutions.
Thin, fragile wafers break easily during fast machine handling without intelligent position sensors and encoders.
Advanced cameras and software are designed for the ultra-low contrast media of solar cells and modules.
Traceability to the wafer level is an important step in quality control and process improvement. SICK leads in code reading applications throughout the manufacturing process.
SICK also has the Eco line of products for applications requiring less sophisticated sensing, but superior quality.
Ask the application experts at SICK!

Smart detection

The ever increasing efficiency of solar cells and modules translates into ever reduced light re-emission in the visible spectrum. SICK offers sensors and cameras operating in the infrared and ultraviolet spectra, ensuring reliable detection now and into the future.

Precise production

Keys to solar cell efficiency are processes involving precise positioning. Accurate screen printing alignment, laser edge isolation, and layout of the interconnect string all contribute greatly to final output. SICK expertise and its wide range of distance sensors offer solutions to virtually any positioning task.



Track and trace

Traceability through the production line is a key to optimizing the yield of high-efficiency solar cells and modules. SICK's range of ICR image-based code readers allows the detection of the smallest codes on low contrast silicon wafers and glass panels.

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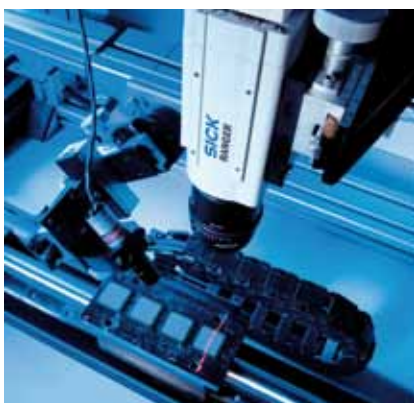
Safety

Modern high-speed robot handling of wafers and glass can be hazardous to workers. SICK safety solutions provide maximum work safety while optimizing productivity. Smart safety solutions reduce equipment foot prints.



Quality control

Thin silicon wafers are fragile. When one wafer breaks, fragments left on machines can cause following wafers to break as well. SICK's economical and compact Inspector vision sensors check wafer integrity at the critical production steps.

Monitoring

Solar equipment is deployed worldwide. Remote diagnostics, and preventive maintenance are key initiatives to control service costs. SICK Sensor Intelligence solutions can adjust sensor settings as required, and allows for remote monitoring.

Focus 1:
Wafer production
Ingot casting, inspection and cutting

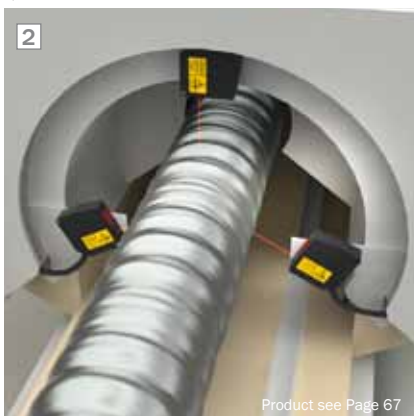
Flow measurement for controlled cooling

Hot silicon ingots must be cooled along a gradual curve (30+ hrs.) or yield and quality will be compromised. The cooling cycle depends on controlling water flow, and the SICK FFU ultrasonic flow sensors provide real-time data for precise control. The IO-Link adds bi-directional update capability, a key automation advantage.

Ingot diameter measurement

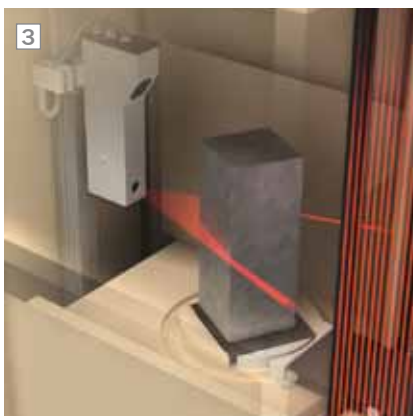
Optimizing wafer yield from a valuable and fragile silicon ingot is not an easy task. Step one is accurately sizing an irregular and glossy object.

Choose an OD Precision distance sensor, set in differential/mirror mode. Surface variations don't require time consuming recalibration.



Silicon brick inspection

In the challenge to maximize wafer yields, 3D data is essential in the decision process. The IVC-3D camera integrates advanced image processing software on-board. Now, surface defect evaluation on low contrast ingots can be successfully automated, and accurate dimensioning can be gathered by the same device.



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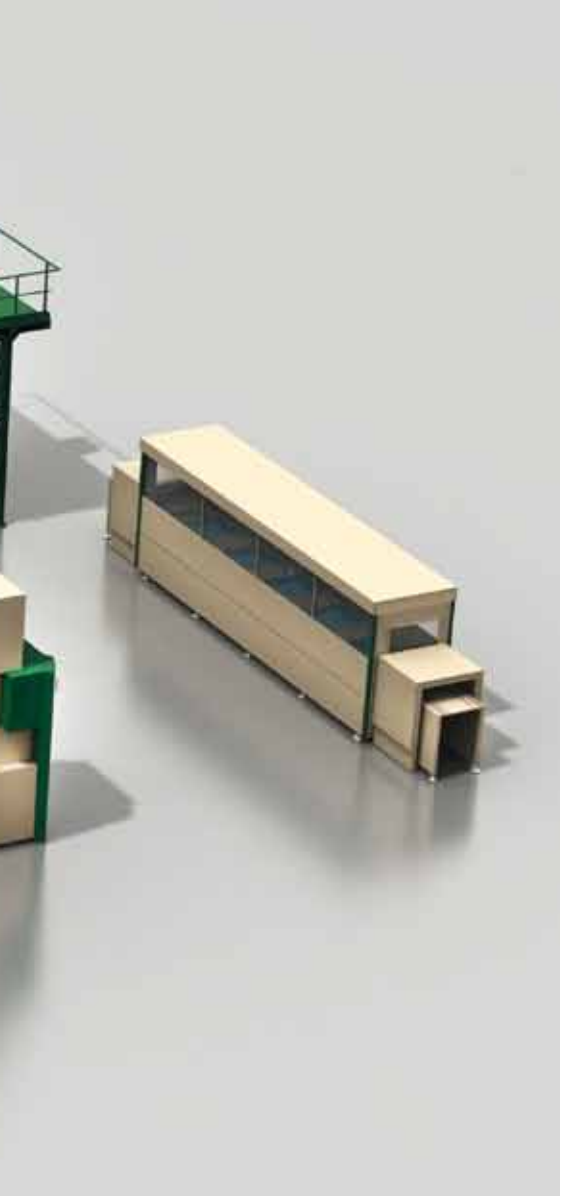


Ergonomic safety solution for block inspection

Silicon bricks are heavy; from 10 to 20 kg. Safety devices have to function without interfering with ergonomic movements.
The miniTwin safety light curtain has no blind zone, making a continuous “U” protection barrier easy.

Product see Page 75

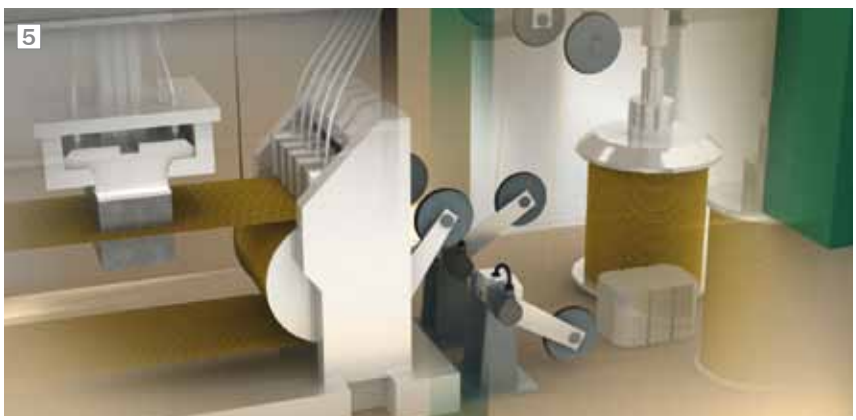
Pressure monitoring of abrasive media

Thanks to a hermetically sealed stainless steel membrane, the SICK PFT or PBS (with a rotating display) pressure sensor operates in caustic environments with no long-term degradation. There are no moving parts to wear – virtually maintenance free!

Product see Page 72

Saw wire control by positioning encoders

Wire saws are only as accurate as their encoders. With multiturn absolute encoders, precise control of position minimizes wafer damage by supplying data at the resolution required for the process. This series can reproduce the characteristics of different encoders, simplifying maintenance and stocking requirements.



Focus 2:
Wafer production
Singulation, cleaning and inspection

Double wafer detection

Wafers are light and thin, and stick easily, especially during the cleaning process. Stuck wafers must be detected quickly, as they will likely break and damage others. SICK's WLL180T-P474 fiber-optic sensor coupled with wide bandwidth fibers (LL3-TW01), use a 1450 nm infrared beam to penetrate the wafer, instantly detecting stacked wafers.

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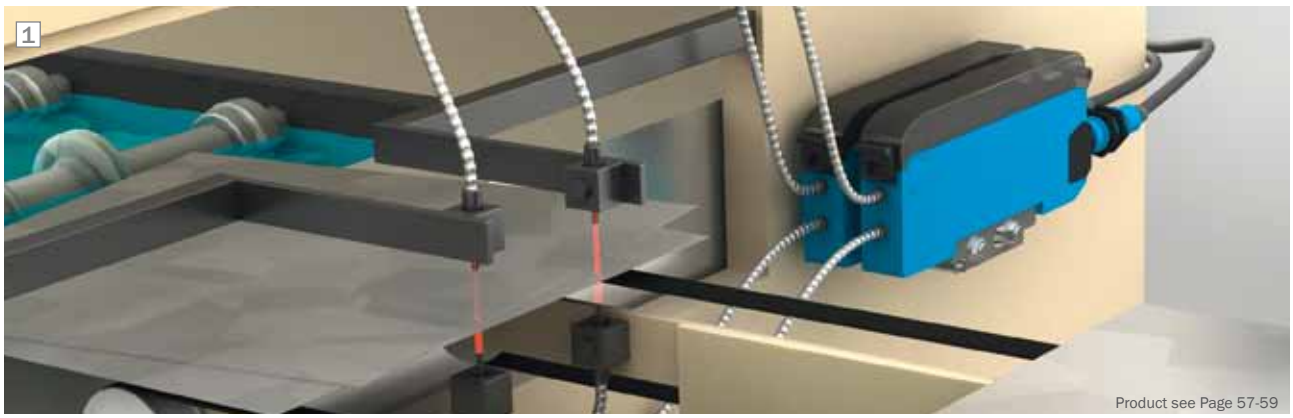

Product see Page 57-59

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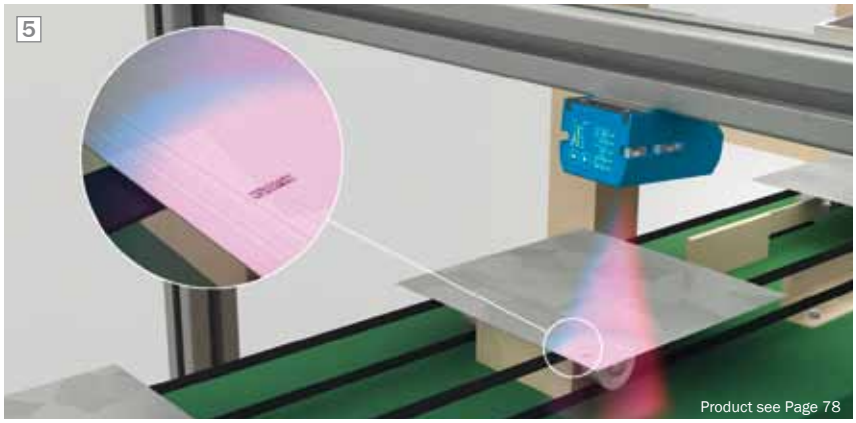
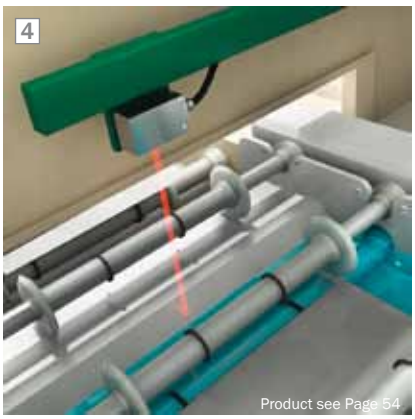
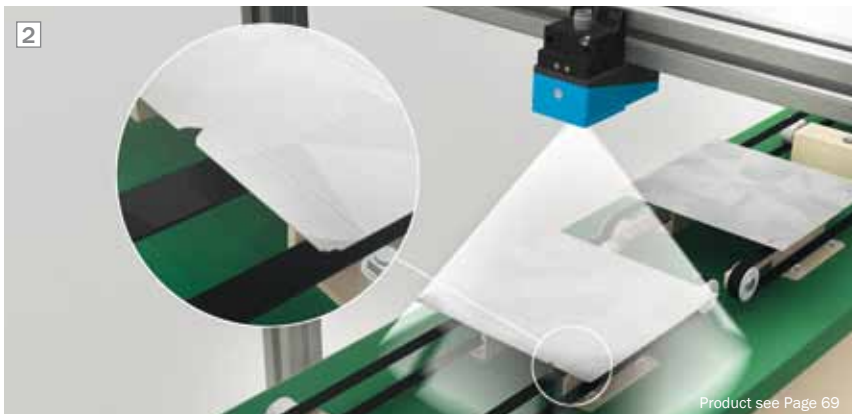


Challenging 2D code identification
Directly marking each wafer provides traceability, and thus the feedback for process improvement. The code, however, must be as small as possible to not degrade performance. As the wafer progresses through manufacturing, this code must be read in ever more difficult optical environments. The LECTOR®620 was precisely developed for such tough applications.

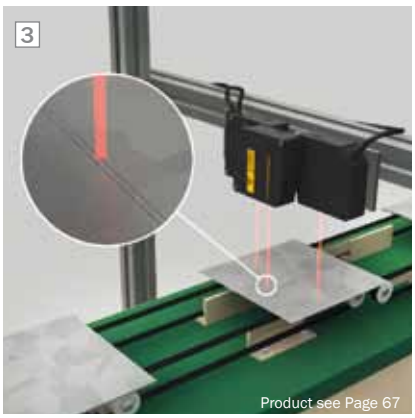
Detection in harsh environment
After wire sawing, the wafers are covered with abrasive coolant that will damage any unprotected device, and can obscure sensor windows. The WT4S-3 Inox photoelectric sensor is imperious to contamination.
With the optional IO-Link interface, sensor window contamination can be continuously monitored, reducing machine downtime.



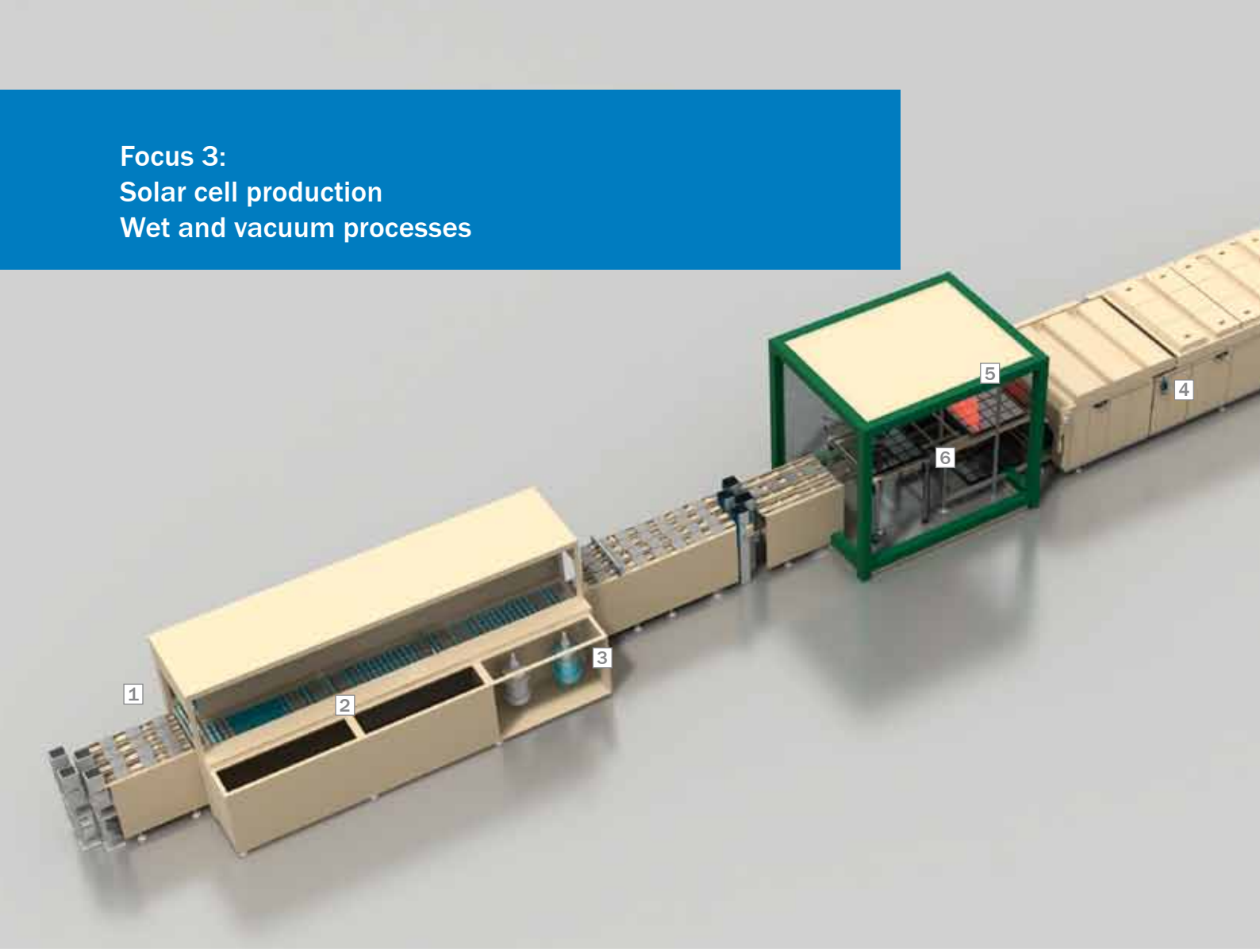
Wafer edge damage inspection
Wafers suffer from minor damage that can also affect their neighbors. An Inspector is a stand-alone vision sensor requiring no external processing to quickly signal a wafer edge defect or broken pieces on the belt.



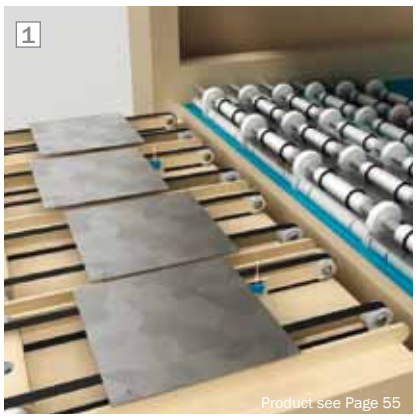
Saw mark inspection with 1 µm repeatability
The wire saw process can gouge the wafer surface, and as the depth increases, so does the risk of breakage. The OD Precision laser short range distance sensor can measure depth with greater than 1 µm repeatability. Three read heads can be connected to one evaluation unit, a cost-effective and elegant method to reduce waste.



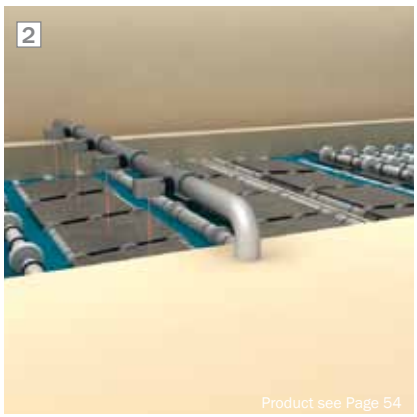
Focus 3:
Solar cell production
Wet and vacuum processes



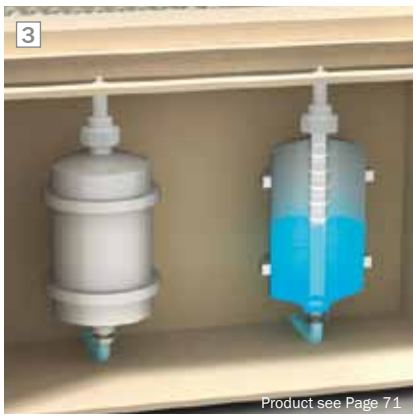
Smart wafer presence detection
Sometimes the machine operator needs an unobstructed view. The ideal location for presence sensors in this instance is beneath the wafers, looking up into ambient light. Thanks to SICK's unmatched background suppression algorithms, both the operator and the W2 Slim photoelectric sensor can work without interference.



Wafer detection in harsh environment
The harsh chemicals used in many processes will damage unprotected sensing devices. The W4S-3 Inox photoelectric sensor is impervious to deterioration, and the large optical window reduces its sensitivity to droplets, a particular issue with fiber-optic solutions.



Corrosive chemical level measurement
Measuring levels of corrosive chemicals present unique problems. SICK understands that its sensors cannot be points of failure or contamination. The UP56-2 PTFE-coated ultrasonic sensor with industry standard couplings, is safe and long lasting. Simple mechanical and electrical integration, with both analog and digital outputs.



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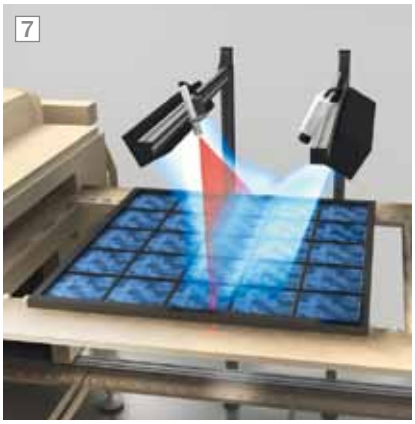
Wafer box tracking

Trace wafer boxes and magazines quickly and accurately with RFID. A SICK RFH620 is an ideal interrogator; fast, easily integrated with a complete range of industrial interfaces, and is compatible with all OPC compliant SCADA systems.

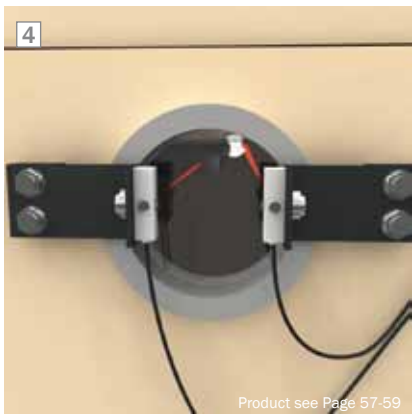
Color and 3D tray inspection

Aesthetics counts, in particular for solar modules mounted on rooftops. Color inspection is challenging, especially in the low contrast, low reflectivity realm of solar wafers, where nm variations make a large difference. 2D cameras require expensive, uniform lighting of the entire wafer surface, while the ColorRanger E, as a scanning camera, requires homogenous lighting on just the current line. Its 2D and 3D capabilities reduce costs and improve performance.



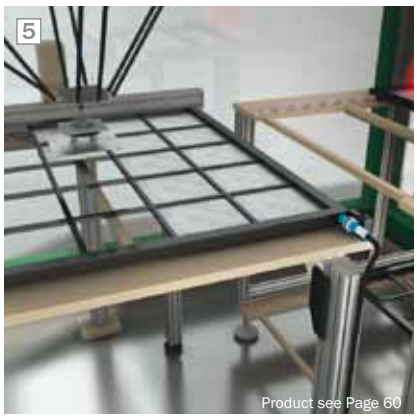
Optical detection without interference

When multiple sensors operate in the same space, mutual interference is a serious problem. The WLL180T fiber-optic sensor in bus version anticipates the problem with a cross-talk immune solution, allowing all the sensors to report accurate data.



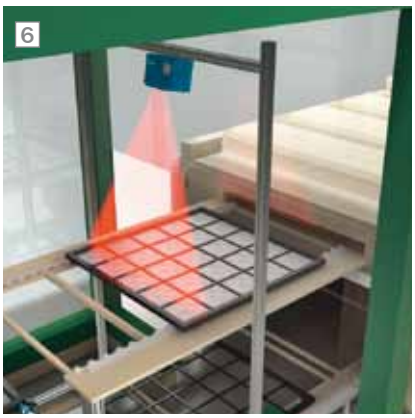
Tray presence detection – economically

SICK understands manufacturing. We are always searching and refining our products for maximum efficiency and minimum cost of ownership. In this application, a simple approach with the CM18 capacitive proximity sensor suffices. It is easy to mount, economical, low maintenance, and reliable.

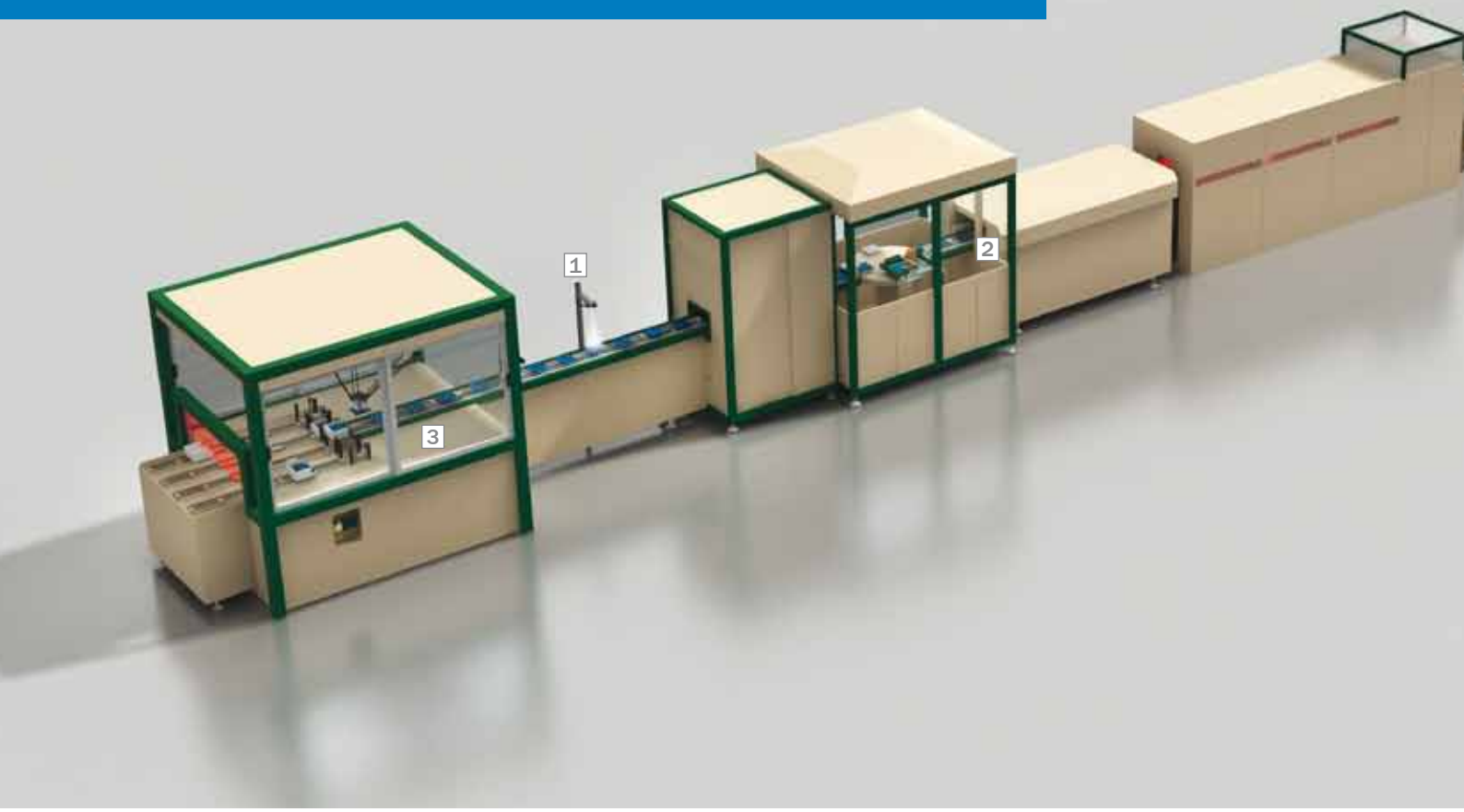


Precise wafer positioning in trays

Large trays carry many wafers on a conveyor to the deposition process, which requires no Z-axis (height) misalignment. To ensure the wafers lie flat, only one LMS400 laser (class 2) measurement sensor is required, saving significantly cost and space compared to alternative multiple short range distance sensors or 3D vision solutions.



Focus 4:
Solar cell production
Metalization



Quality check at every step

As cells progress through manufacturing, it makes sense to check for damage at every opportunity. The Inspector vision sensor is capable of communicating alignment information over Ethernet and detecting edge breakage – an example of a low-cost solution with added intelligence.

Easy-to-use alignment and positioning

Operators must clean and reinstall print-screens regularly, and repeat the critical alignment steps. An Inspector P30 vision sensor quickly reports proper XY positioning, while the OD Value laser short range distance sensor returns the important Z parameter.

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Product see Page 69

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Product see Page 66, 69

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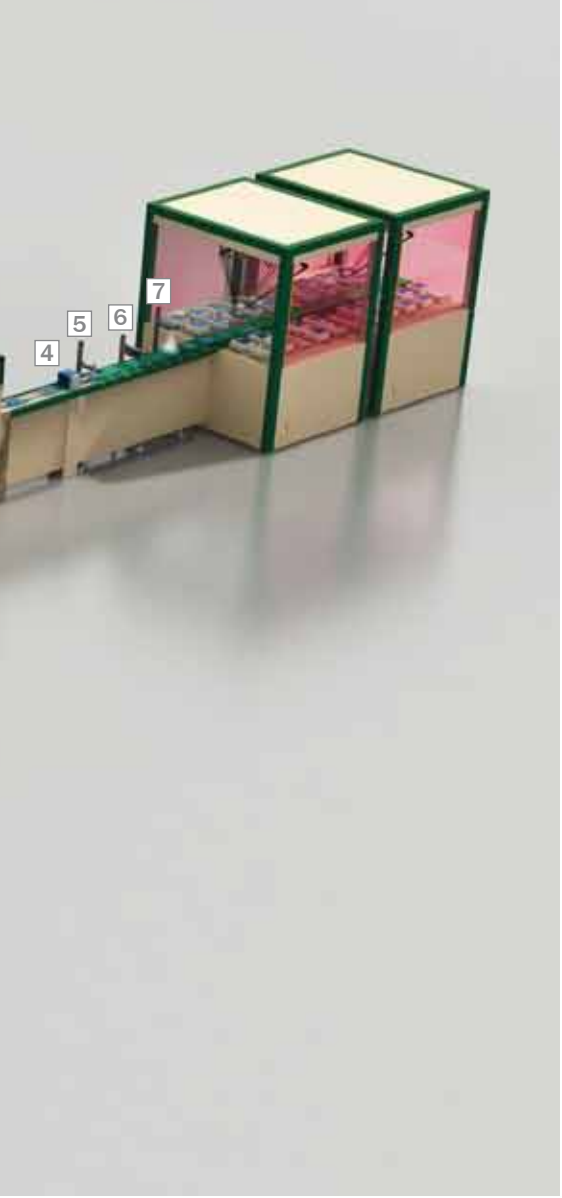
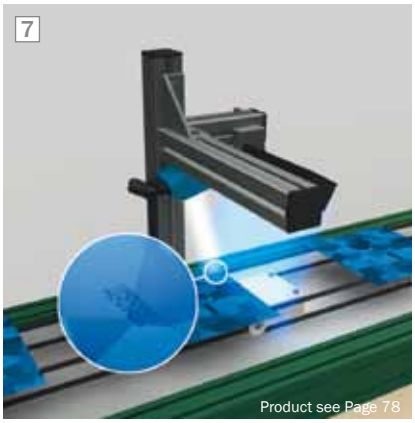
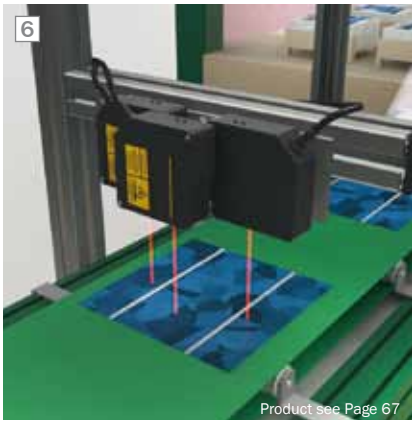


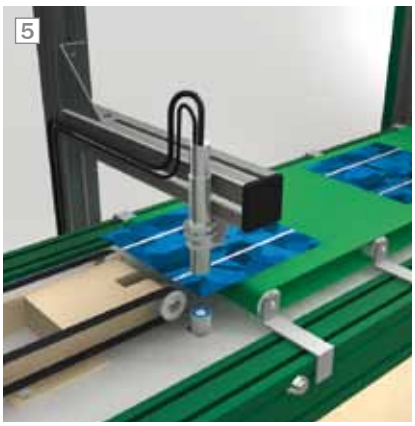
Advanced identification of 2D codes at challenging contrast conditions
2D codes are easy to apply, but difficult to read through the anti-reflective coating, as little visible light is trapped. SICK continuously develops powerful algorithms to reliably read low-contrast, small codes. Deploy the LECTOR®620 image-based code reader throughout the facility.



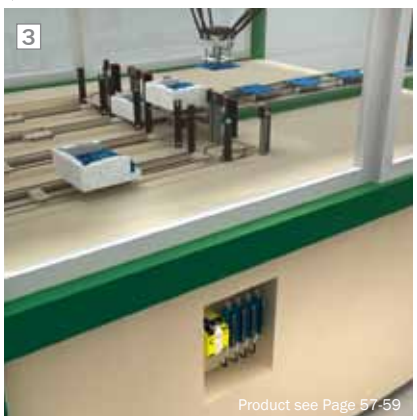
Height monitoring for quality control
Thermal expansion differences between the silicon wafer and its metal plating can cause cells to bow during the firing process. The OD Precision has an integrated smart controller with teach-in that easily detects out-of-tolerance products. No external processing required!



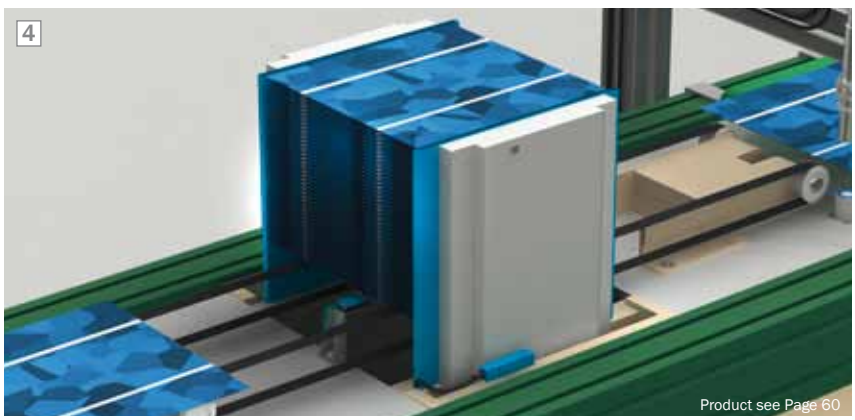
Double wafer detection
Thin wafers can accidentally stick together, and will break in later processes. SICK's UM18-20012 ultrasonic sensor has double sheet detection built in, and works on printed wafers. Another example of SICK's commitment to sense where the process requires it.



Exact wafer detection at pick-up position
Robot grippers must pick thin, fragile, and expensive wafers quickly off a stack. The WLL180 fiber-optic sensor monitors the stack height within 0.1 mm even with low reflective materials. Reduced mechanical stress optimizes the process.



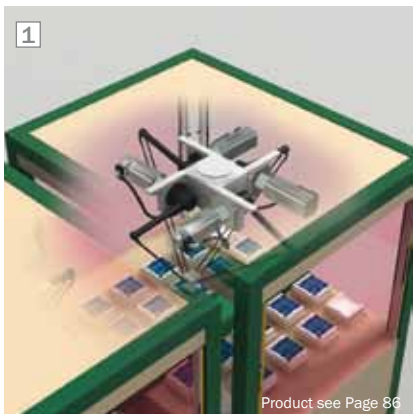
Short distance detection
Solar cell buffer magazines may have some empty slots, but the close spacing can interfere with reliable presence detection. Even as the cell surface changes in processing, the capacitive sensing technology in the CQ28 capacitive proximity sensor remains unaffected, and detects presence of glass or silicon within 7 mm.



Focus 5:
Solar cell production
Handling

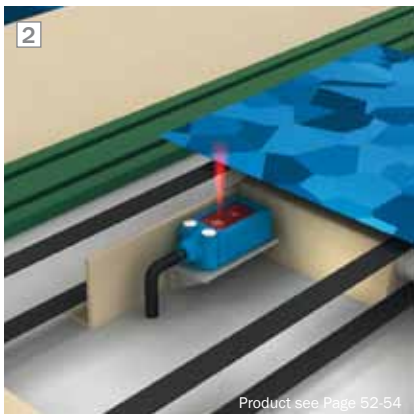
The servo drive digital evolution

Robot handlers must be nimble and precise, and this requires optimizing mechanical and electronic behaviors. HIPERFACE® DSL motor feedback system offers more data and control, with half the connector and cabling overhead. Machinery operates completely in the digital domain and advances process control to a new level of automation.



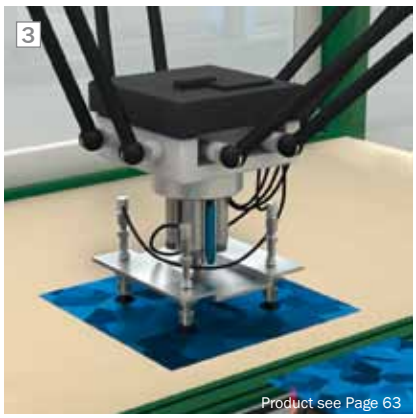
Advanced and reliable solar cell detection

The anti-reflective coatings applied to solar cells capture visible light, rendering standard photoelectric sensors useless. SICK WTV4-3 infrared photoelectric sensors use PinPoint LEDs to generate 25x the energy required to detect cells with the most efficient coatings currently in use. Only one sensor is required, even in the most demanding environments.



One sensor – two switching positions

Destacking fragile cells with a Delta Robot once required two sensors and tedious adjustment, as the very thin cells demanded switching points in very close proximity (e.g. 200 µm). The MZ2Q addresses our customer's needs with two programmable switching points in one cylinder sensor. The positions are repeatable within 0.1 mm.



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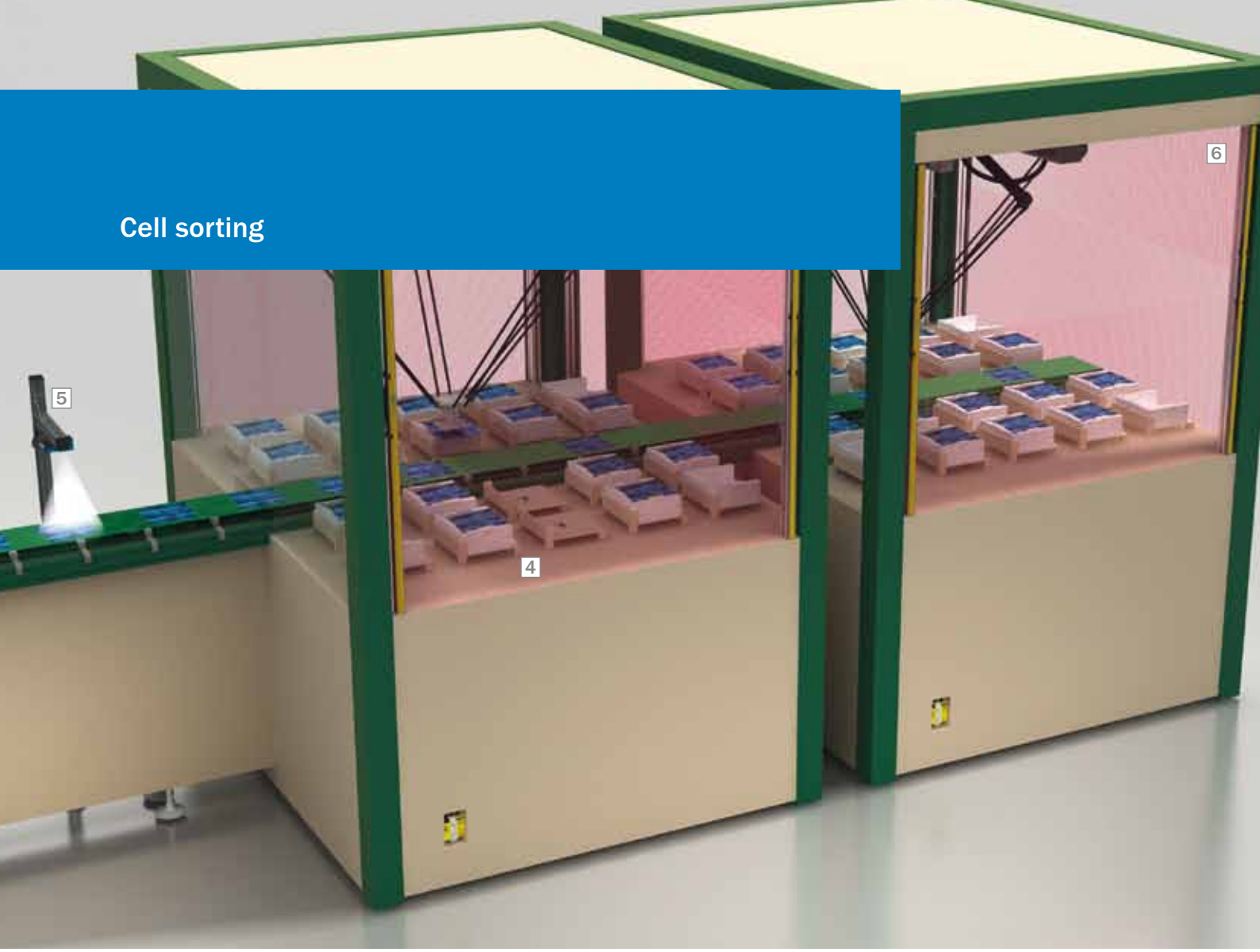
Cell sorting

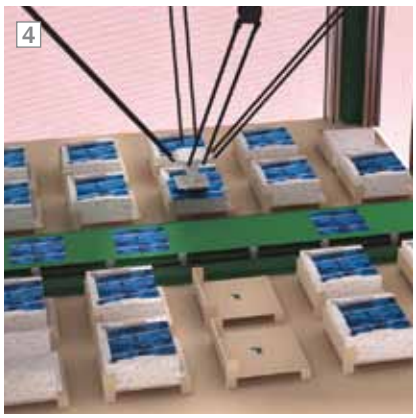


Detection in narrow installation situations
Cells are graded and boxed accordingly. The slim form factor of the WT2F (3.5 mm) photoelectric proximity sensor allows ideal placement to detect box presence, and powerful background suppression abilities allow robots to operate in close proximity without false triggering.

Reliable damage detection
Solar cells absorb more and more visible light as the manufacturing process progresses, rendering visible spectrum based detectors ineffective. SICK developed the Inspector I20-UV vision sensor with an integrated UV light source, saving space and eliminating the need for backlight illumination.

Humans and machines co-exist safely
Human operators spontaneously intervene in solar cell processes, requiring robots to safely slow or stop. The miniTwin safety light curtain quickly detects a work area intrusion, triggering an appropriate system response. A Flexi Soft controller is an ideal local safety supervisor, allowing adjacent robots to proceed with their tasks.

▼



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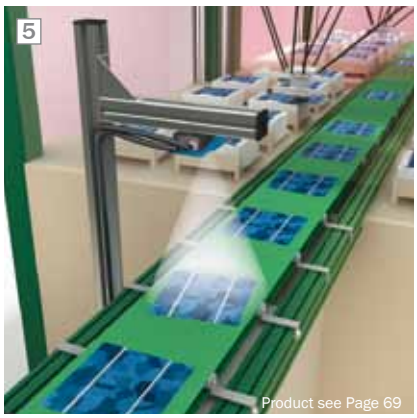

Product see Page 69

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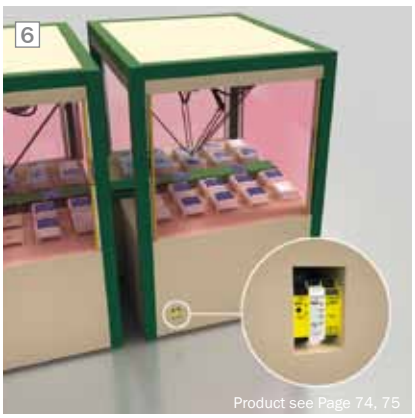
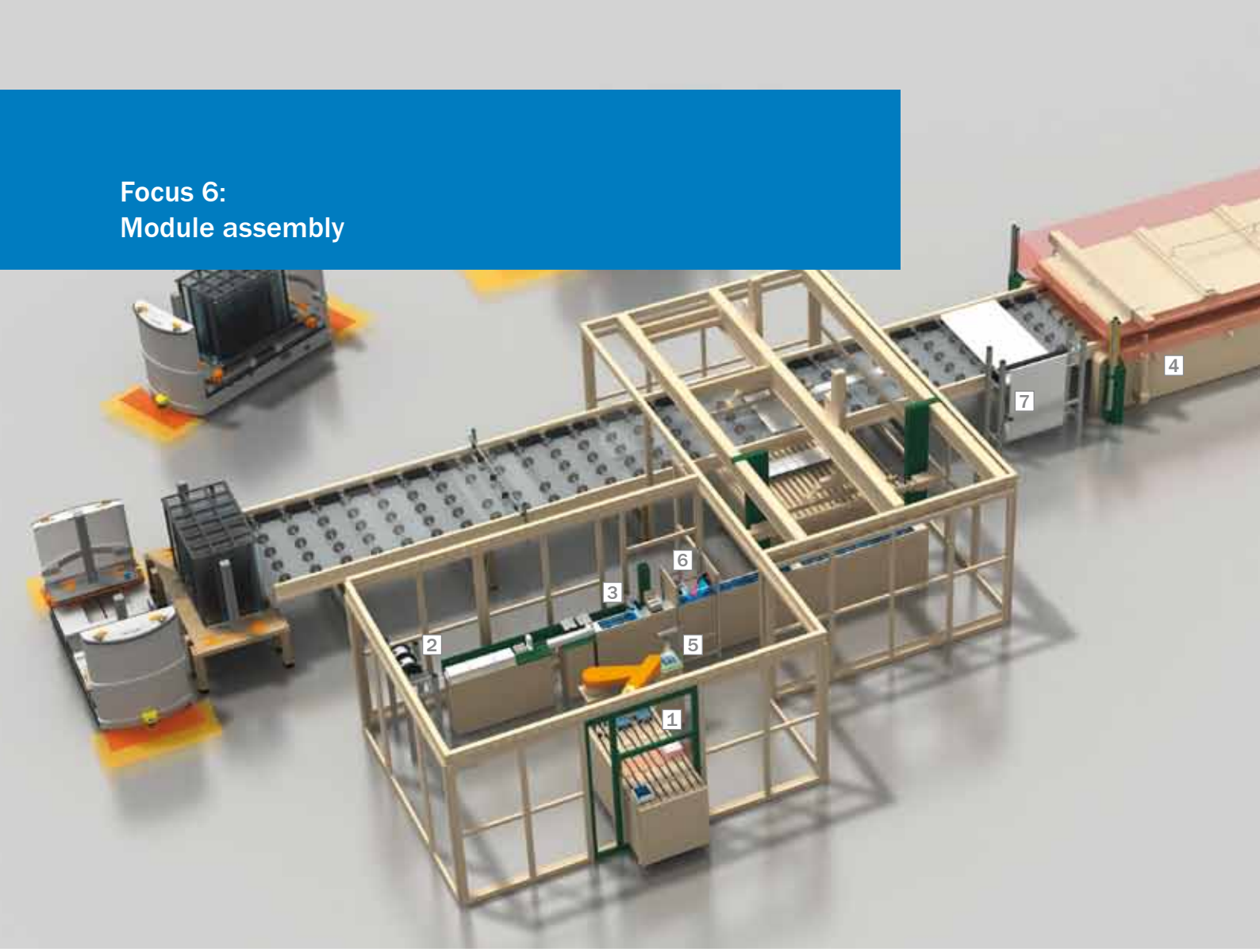


Product see Page 74, 75

Focus 6:
Module assembly



Safe access in tight quarters

The miniTwin safety light curtain can detect human intervention in small areas as well. Starting at 120 mm, with commissioning LEDs to guide alignment, the miniTwin is perfect to protect a process with as little interruption as possible. When incorporated into a Flexi Soft safety network, advanced controls extend the possibilities for even more intelligent production equipment responses, such as safe slowdowns and machine operating constraints in interrupted areas only.

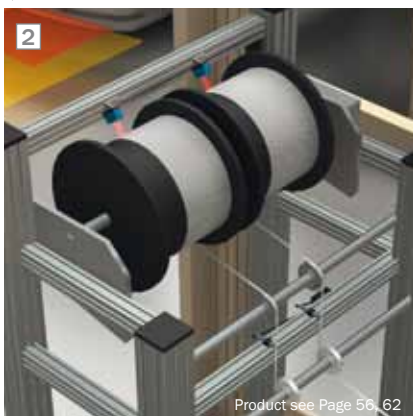
End of spool detection

SICK has an elegant and cost-effective solution in the G6 energetic photoelectric proximity sensor. It easily installs 90° to the spool and detects the contrast between the dark spool and the shiny metallic string. The IME08 inductive proximity sensor detects wire breakage.

▼

Product see Page 74, 75

▼



Product see Page 56, 62

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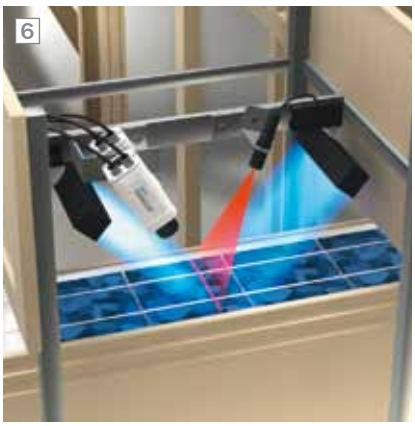
EVA foil web guidance by one sensor only ▸
The plastic foil must be precisely aligned with the low contrast module. Here, the AT20 array sensor excels in repeatability and accuracy. Capable of operating with a reflector if necessary, it installs simply on existing designs.

Product see Page 65

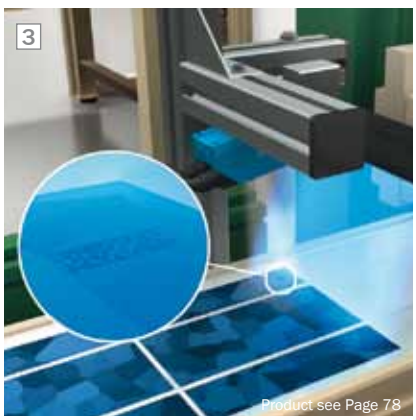
Microcrack detection ▸
The soldering process can create flaws such as lifted or dislocated string wires, or microscopic surface cracks that require both 2D and 3D imaging to detect. The Ranger E, with its unique MultiScan capability, provides all of this in one package!



Combine position detection with inspection ▸
Fragile cells can arrive with small defects that are best detected before future processing. The Inspector vision sensor can detect edge damage to several millimeters, while controlling the position of a 156 x 156 mm wafer within several hundred microns. Self contained – simple to commission.

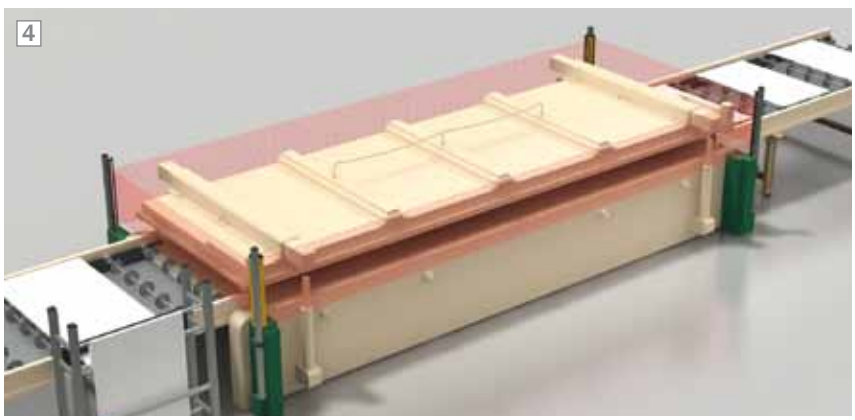
Product see Page 69

Solar cell tracking
The transition from wafer to the module in the cell loading step is an important milestone in the solar cell process. As wafers are combined, the SICK LECTOR®620 can read the individual 2D codes at this limited contrast stage. Communicate the data via a large selection of interfaces (RS-232, fieldbus or industrial Ethernet).
▾



Product see Page 78

Maximum access while preserving maximum safety
Operators need plenty of access to the laminator when placing modules. The C4000 safety light curtain can protect up to 20 m, and with a mirror, allow two pairs to protect a large area.
▾

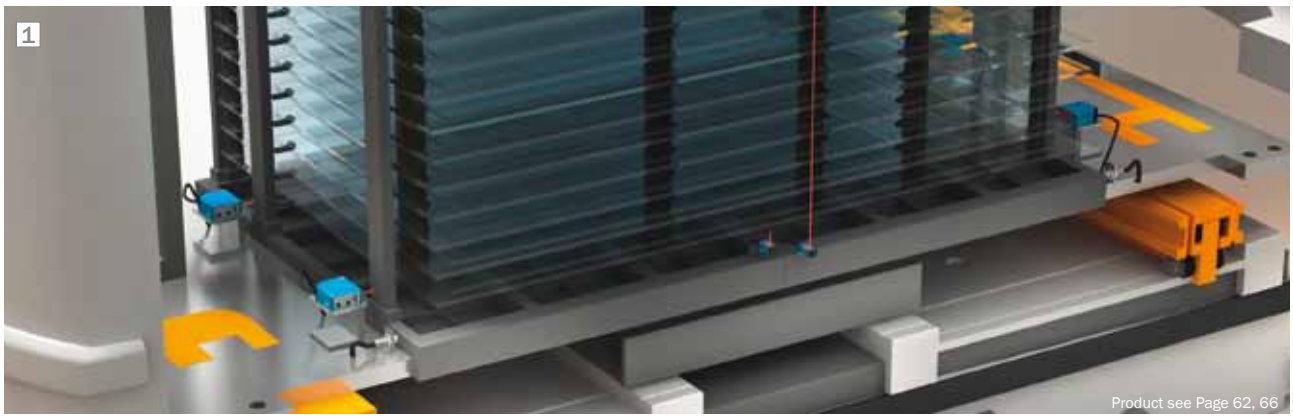


Focus 7:
Glass buffering

Magazine positioning solutions

As the magazine transports the glass to different operations, the handling process adds risk to ever more valuable modules. A SICK integrated environment controls the risks with stable and cost-effective solutions. Here, an OD Value laser short range distance sensor indexes the panels, and reports their size and orientation. The IME12 inductive proximity sensor is responsible for sensing the beginning and end positions of the magazine.

▼



Product see Page 62, 66

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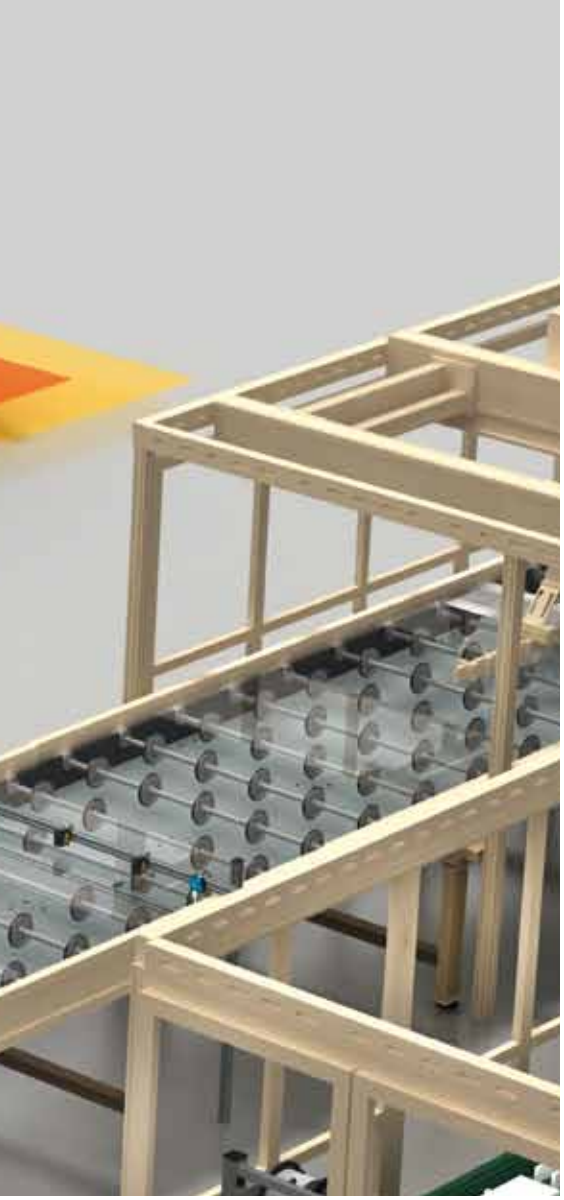


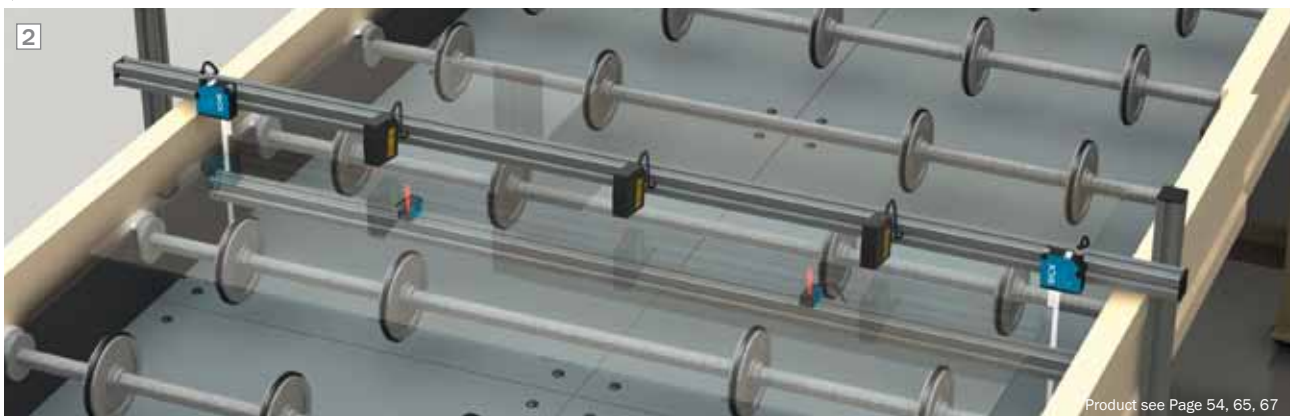
Automated guided vehicle (AGV) safety ▸
Dynamically adjusted collision zones keep AGVs safe as speeds vary, allowing a more closely spaced working environment. The SICK S3000 safety laser scanners are intelligent – adjusting their behavior to reach their destination quickly and safely, while protecting personnel.

Glass panel overhang detection ▸
The WTV4-3 photoelectric proximity sensor monitors the often difficult to detect glass as the buffer loads/unloads. After the process, the glass may not reload into the magazine correctly, breaking the glass in transport. A WLG4 photoelectric retro-reflective sensor guards against overhanging panels.

Product see Page 54

Geometry and position
The AL20 array sensor outputs a ready-to-use standard analog signal (either 4–20 mA or 0–10 V). Local controllers can quickly realign modules with unprecedented accuracy without the overhead of central data processing. The OD Precision laser short range distance sensor reports the thickness and bow of the glass, rejecting defective panels prior to the sensitive lamination process. Edge detection of glass is a specialty of the WTV4 photoelectric proximity sensor. It can precisely detect the leading edge, ignoring ambient light thanks to superior background suppression.

▾



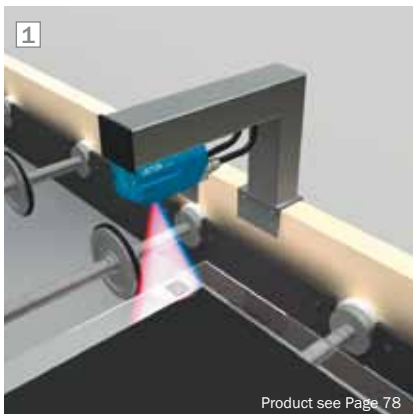
Product see Page 54, 65, 67

Focus 8: Thinfilm

Identify 2D codes on difficult surfaces

Substrate glass changes from transparent to dark during the manufacturing process. The LECTOR®620 image-based code reader uses advanced detection algorithms that deliver results even in the most adverse, low contrast conditions. Built-in setup tools simplify installation. After configuration, clone it via the SD card slot.

▼



Product see Page 78

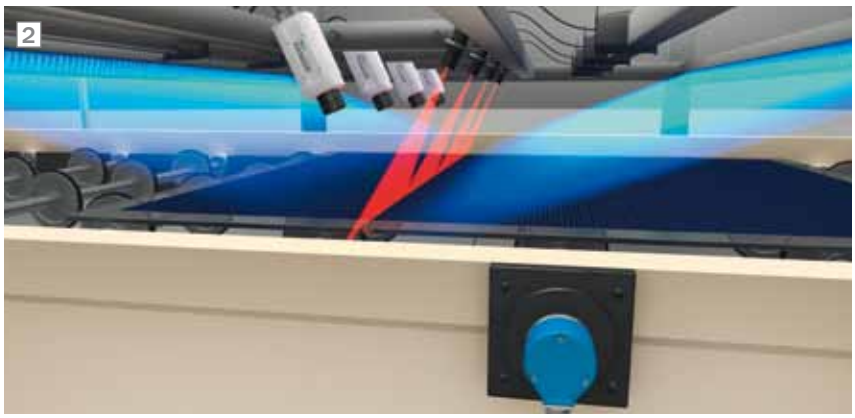
3D/2D inspection

The solar industry runs on planar glass. 2D and 3D imaging each have their place in monitoring, so SICK doubles the technology in one package. 2D imaging for surface defects – 3D for depth and scribing defect information. Simultaneously.

Out of tolerance substrates cause deposition processes to fail and can jam machines that must run with 99 % uptime. Laser scribing fails QC. 3D inspection works fast and accurately. Inspected glass migrates through many sequential processes – each requires high precision evaluation. 3D uncovers surface defects 2D misses.

The solar industry needs both. The 3D ColorRanger E is both – in one package.

▼



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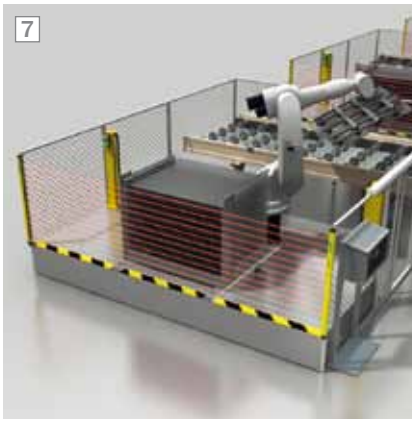
Glass panel mapping
The low-profile WT2 Slim photoelectric proximity sensor fits perfectly as gripper arms become thinner. Bulky cameras are not required and the sensing takes place close to the product. Result? Lower operating costs.

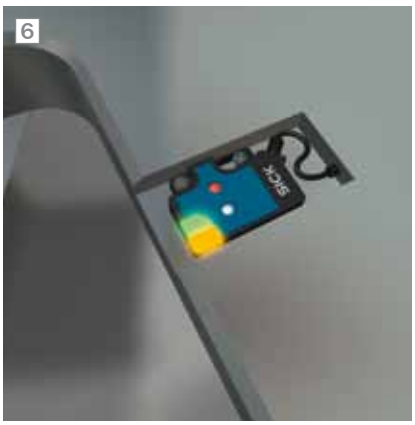
SICK knows machine safety ▸
Solar modules are fabricated in plants worldwide, each with different and sometimes conflicting safety standards. When customers use SICK Safexpert CE compliance software, they demonstrate that the safety assessment was carried out in a professional, thorough and well documented manner. When standards change and new directives are released, SICK software updates are issued to meet the new requirements. Avoid unpleasant surprises and expensive delays.

7



Ideal thin gripper arm sensor ▸
The low-profile WT2 Flat photoelectric proximity sensor fits perfectly as gripper arms become thinner. This sensor, only 3.5 mm thick, is part of the W2 series of low-profile sensors intended to fit in small areas without comprising mechanical operations.

6



Precise solutions for robot handling ▸
Handling of fragile glass substrates requires communicating exact position to the controls. The OD Precision laser short range distance sensors can use up to three independent read heads, each with different characteristics. No special calibration is required, and customers are free to choose the appropriate head.

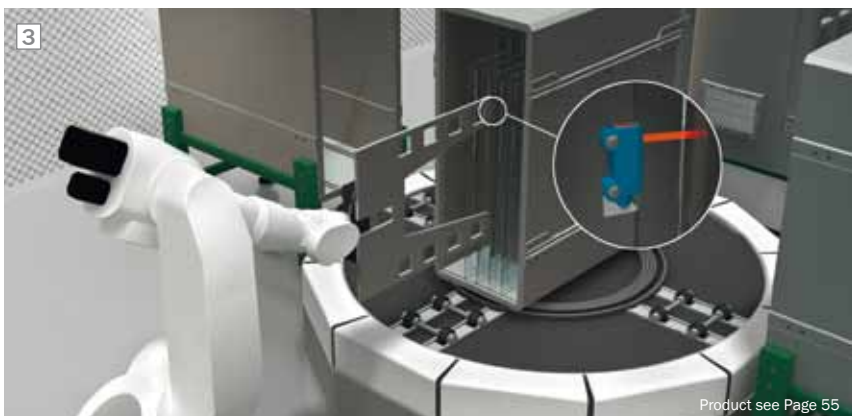
5


Product see Page 67

Protection with physical guards
i14 Lock safety locking devices and ES21 emergency stop pushbutton on a process tool.

▾

3


Product see Page 55

▾

4

Versatile product range for industrial automation

From the simple acquisition task to the key sensor technology in a complex production process: with every product from its broad portfolio, SICK offers a sensor solution that best combines cost effectiveness and safety.

www.sick.com/products

Industrial sensors

- Photoelectric sensors
- Inductive proximity sensors
- Capacitive proximity sensors
- Magnetic proximity sensors
- Magnetic cylinder sensors

Identification solutions

- Bar code scanners
- Image-based code readers
- Hand-held scanners
- RFID

Detection and ranging solutions

- Laser measurement technology
- Image-processing measurement technology

System solutions

- Volume measurement systems
- Code reading systems
- Dimension weighing scanning systems

Fluid sensors

- Level sensors
- Pressure sensors
- Flow sensors
- Temperature sensors

Registration sensors

- Contrast sensors
- Color sensors
- Luminescence sensors
- Fork sensors
- Array sensors

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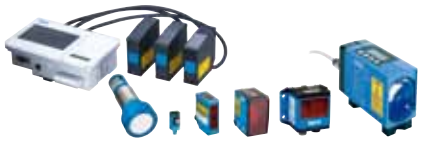
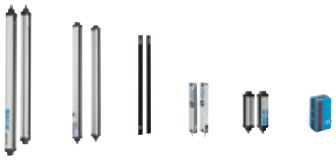
Distance sensors



- Short range distance sensors (displacement)
- Mid range distance sensors
- Long range distance sensors
- Linear measurement sensors
- Ultrasonic sensors
- Double sheet detector
- Optical data transmission
- Position finders

Automation light grids



- High end automation light grids
- Standard automation light grids
- Smart light grids

Vision

- Vision sensors
- Smart cameras
- 3D cameras
- Vision illuminations

Opto-electronic protective devices

- Safety laser scanners
- Safety camera systems
- Safety light curtains
- Multiple light beam safety devices
- Single-beam photoelectric safety switches
- Mirror and device columns
- Outdoor safety systems
- Upgrade kits

Safety switches

- Electro-mechanical safety switches
- Non-contact safety switches
- Safety command devices

sens:Control – safe control solutions

- Safety relays
- Safety controllers
- Network solutions

Motion control sensors

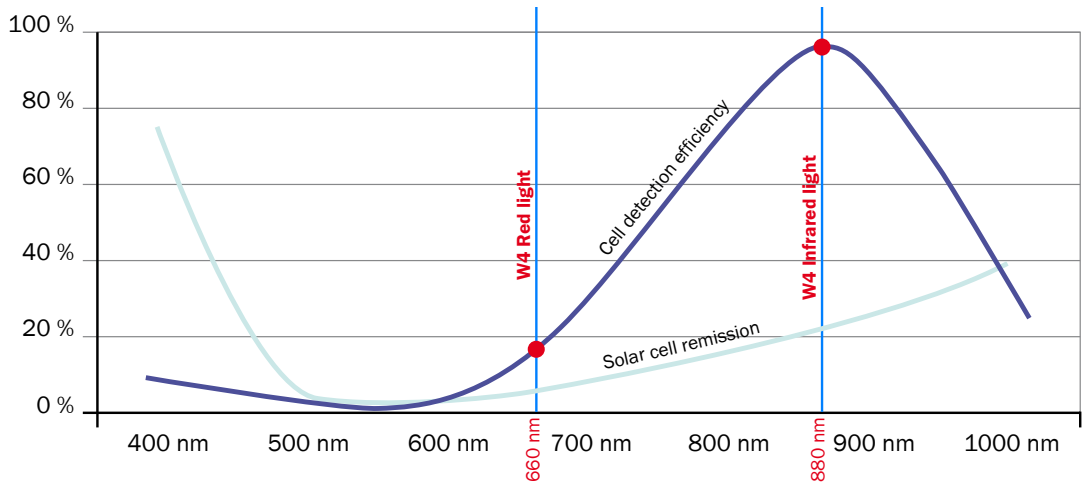
- Motor Feedback Systems
- Encoders

Solar cell detection

3 features that make the WTV4 IR the solar cell sensor:

Feature 1: Infrared light

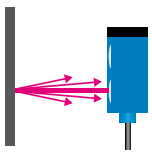
Modern solar cells re-emit less visible light in their drive for efficiency.
This trend requires a new detection approach.



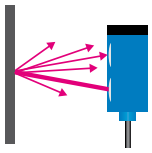
The solar cell re-emits 3 times more IR light (880 nm) than visible (660 nm). Combined with the high sensitivity of silicon based sensors, 880 nm is the "sweet spot" for detecting low re-emissive solar cells.

Feature 2: V-optics

V-optics use an inclined light beam to direct more reflected light into the receiver. More energy is received when in close proximity to the target.



Standard straight beams greatly reduce the energy at the receiver.



Feature 3: PinPoint

PinPoint technology increases light intensity.

Standard LED have a bonding wire shadow in the center, thus less homogeneous light.

The result is future proof detection

The WTV4 IR was tested on today's high efficiency cells and received 25x more energy than the switching threshold required. SICK is prepared for the solar cell efficiencies of tomorrow.

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Photoelectric proximity sensors – Selection guide

SICK takes proximity mode switching to a bright future with advanced background suppression. Balance range, speed, and accuracy for your application.

Sensor	Type	Response time	Spot size		Gray wafer	Blue cells	PCB	Clear glass
Photoelectric proximity sensor								
WTB4-3, red spot Range 4 to 150 mm	PNP: WTB4-3P2271 NPN: WTB4-3N2171	0.5 ms		Ø 7 mm @ 50 mm	✔			
WTV4-3, V-optic, red line Range 3 to 50 mm	PNP: WTV4-3P2271 NPN: WTV4-3N1171	0.5 ms		2 x 15 mm @ 30 mm	✔		✔	✔
WTV4-3, V-optic, infrared line Range 3 to 50 mm	PNP: WTV4-3P3222 S57	0.5 ms		2 x 15 mm @ 30 mm	✔	✔	✔	✔
WTV4-3 V-optic, infrared spot Range 3 to 70 mm	PNP: WTV4-3P1321 NPN: WTV4-3P3121	0.5 ms		Ø 10 mm @ 40 mm	✔	✔	✔	✔
WTB4S-3 Inox, red spot Range 3 to 280 mm	PNP: WTB4S-3P2204V S02	0.5 ms		Ø 2.5 mm @ 100 mm	✔			
WTB4T-3 PTFE, red spot Range 3 to 180 mm	PNP: WTB4T-3P1264 NPN: WTB4T-3N1264	0.5 ms		Ø 7 mm @ 50 mm	✔			
Capacitive proximity sensor								
CQ28 Range 1 to 7 mm 10 mm on grounded metal	PNP: CQ28-10NPP-KW1 NPN: CQ28-10NNP-KW1	300 ms		20 x 30 mm	✔	✔	✔	✔
Ultrasonic sensor								
UC4 Range 13 to 150 mm	PNP: UC4-11341 NPN: UC4-11345	30 ms		30 x 30 mm @ 100 mm	✔	✔	✔	✔

Additional information

www.mysick.com/products

At a glance

- Different housing shapes provide quick and compact integration into the machine
- PinPoint technology in all models
- Integrated threaded inserts for mounting
- Precise background suppression (best in class)
- Teach-in via IO-Link, externally via cable, potentiometer, or teach-in button
- Photoelectric retro-reflective sensor for transparent objects, with automatic adaptation of switching threshold
- A range of light spot geometries, specially tailored to applications

Your benefits

- Secure and precise setting with 5-turn potentiometer or teach-in button
- High process reliability, even with jet black objects, such as solar wafers and black textiles, will be detected reliably
- Easy and accurate alignment of the sensors, with PinPoint technology, makes the light spot clearly visible
- Photoelectric proximity sensors with a line-shaped light spot allow reliable detection of textured objects such as electronic circuit boards
- Detection of reflective and clear materials

Ordering information

Other models available at www.mysick.com/products

Sensor principle	Detection principle	Housing material	Sensing range max.	Output type	Connection	Model name	Part no.
Photoelectric proximity sensor	Background suppression	Plastic	3 mm ... 50 mm [1]	PNP	Connector M8, 4-pin	WTV4-3P2271 [2]	1046644
				NPN	Cable, 4-wire	WTV4-3N1171 [2]	1046898
				PNP	Cable with plug, M8, 4-pin	WTV4-3P3222S57 [2] [3]	1050786
			4 mm ... 50 mm [1]	PNP	Cable, 3-wire	WTV4-3P1321 [3]	1029888
			4 mm ... 50 mm	PNP	Cable with plug, M8, 3-pin	WTV4-3P3121 [3]	1042191
		Stainless steel	3 mm ... 280 mm [1]	PNP	Cable with plug, M8, 4-pin	WTB4S-3P2204VS02	1047652
Through-beam photoelectric sensor	–	Teflon	0 m ... 3 m	NPN	Cable, 3-wire	WSE4T-3E1430	1029648
				PNP	Cable, 3-wire	WSE4T-3F1430	1029647

[1] Object with 90 % reflectance (referred to standard white DIN 5033).

[2] Line-shaped light spot.

[3] Infrared light.

Recommended accessories

Description	Sheath material	Material	Model name	Part no.
Mounting brackets wall mounted	–	Stainless steel (1.4571)	BEF-W4-A	2051628
			BEF-W4-B	2051630
Female connector M8, 3-pin, IP 67, cable length 2 m, cable alignment straight	PVC	–	DOL-0803-G02M	6010785
	PUR halogen free	–	DOL-0803-G02MC	6025888

At a glance

- Sturdy overmolded housing with metal sleeves for M3 fixing bolts
- BGS proximity sensor with laser-like light spot
- PinPoint LED in all models
- Fast response time of just 0.6 ms

Your benefits

- Operators can rest assured – the extremely robust miniature housing on the W2 Slim meets the highest demands for leak-tightness and vibration resistance enabling process-oriented or direct in-process use
- Universal use of PinPoint LEDs and the resultant small-sized light spots enable precise recognition of objects with a high level of repeat accuracy
- Robust metal sleeves for M3 fixing screws enable simple, time-saving integration in the machine environment

Additional information

www.mysick.com/products

Ordering information

Other models available at www.mysick.com/products

- **Connection:** Cable, 3-wire

Sensor principle	Detection principle	Sensing range max.	Output type	Switching mode	Model name	Part no.
Photoelectric proximity sensor	Background suppression	1 mm ... 15 mm	NPN	Light switching	WT2S-N111	1022662
		1 mm ... 30 mm	NPN	Light switching	WT2S-N131	1022663
		1 mm ... 15 mm	PNP	Light switching	WT2S-P111	1022660
		1 mm ... 30 mm	PNP	Light switching	WT2S-P131	1022661
Through-beam photoelectric sensor	–	0 m ... 1.2 m	NPN	Dark switching	WS/WE2S-E113	1022669
			PNP	Dark switching	WS/WE2S-F113	1022668

Recommended accessories

Mounting system type	Material	Model name	Part no.
Mounting bracket	Steel, zinc coated	BEF-W2S-A	4034748
		BEF-W2S-B	4034749

Additional information

www.mysick.com/products

At a glance

- PinPoint LED for an extra bright, precise light spot
- Robust metal inserts with inner thread
- SICK-ASIC – the result of decades of experience in photoelectric sensors
- Large, user-friendly setting screws
- Bright, large-sized indicator LEDs
- Enclosure rating IP 67

Your benefits

- Easy-to-align and precise detection with highly visible PinPoint light spot
- Easy-to-mount with maximum robustness due to metal inserts with inner thread
- SICK-ASIC for performance and reliability
- Easy-to-adjust with large, user-friendly setting screws
- Easy-to-monitor due to extra bright, large-sized indicator LEDs
- Easily installed with SICK accessories

Ordering information

Other models available at www.mysick.com/products

- **Switching mode:** Light/Dark switching
- **Connection:** Connector M8, 4-pin

Sensor principle	Detection principle	Sensing range max.	Output type	Model name	Part no.
Photoelectric proximity sensor	Energetic	≤ 300 mm [1]	NPN	GTE6-N4212	1051782
			PNP	GTE6-P4212	1051781
Photoelectric retro-reflective sensor	Standard optics	≤ 7.2 m [2]	NPN	GL6-N4112	1051778
			PNP	GL6-P4112	1051777

[1] Object with 90 % reflectance (referred to standard white DIN 5033).

[2] With reflector PL80A.

Recommended accessories

Description	Cable alignment	Sheath material	Model name	Part no.
Female connector M8, 4-pin, IP 67, cable length 2 m	Straight	PVC	DOL-0804-G02M	6009870
	Angled	PVC	DOL-0804-W02M	6009871

Additional information

www.mysick.com/products

At a glance

- Selectable response time up to 16 µs
- Sensing range up to 20 m, sensing distance up to 1400 mm
- Bus-compatible with anti-interference
- 2 x 4-digit display
- Adjustable hysteresis
- Rotatable display screen
- High-resolution signal processing
- Programmable time delays

Your benefits

- Extremely rapid processes are detected reliably
- Workpieces are detected reliably even under the most difficult ambient conditions such as dust, spray or mist
- No mutual effects from fiber-optic heads mounted in close proximity due to bus communication
- Easy monitoring of process parameters
- Hysteresis can be adapted to suit the application, e.g. when detecting tiny or transparent objects
- The display is easy to read, even under difficult installation conditions
- Tiny objects can be detected due to the high-resolution signal processing
- Time delays can be adjusted individually to suit the application

Ordering information

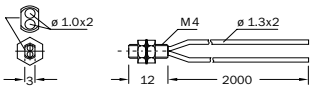
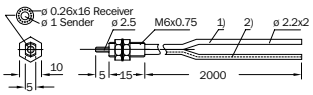
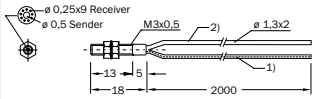
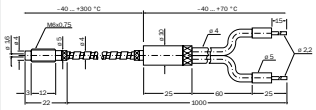
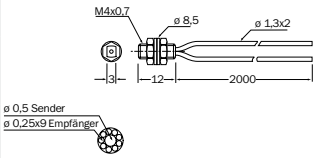
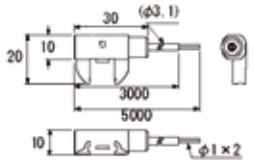
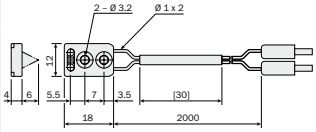
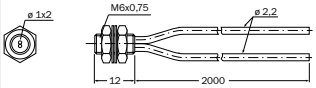
Other models available at www.mysick.com/products

Device type	Switching output	Connection	Model name	Part no.
Stand-alone	NPN	Connector M8, 4-pin	WLL180T-N434	6039096
	PNP	Connector M8, 4-pin	WLL180T-P434	6039095
			WLL180T-P474	6039618
Base unit [1]	NPN	Cable, 4-wire	WLL180T-L432	6039099
	PNP	Cable, 4-wire	WLL180T-M432	6039097
Expansion unit	NPN	Cable, 2-wire	WLL180T-E232	6039100
	PNP	Cable, 2-wire	WLL180T-F232	6039098

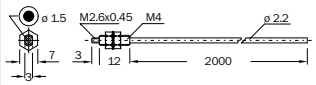
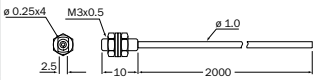
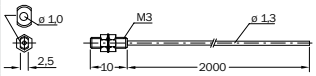
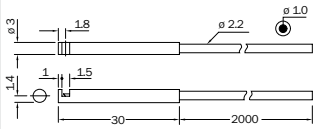
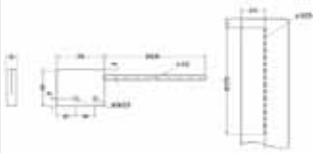
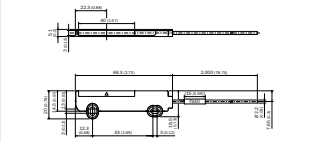
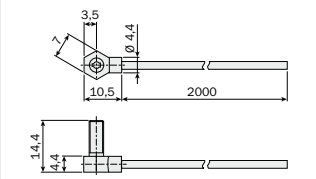
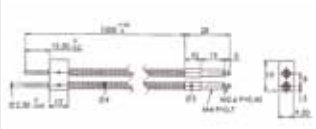
[1] Up to 15 expansion units can be connected.

Recommended accessories

Description	Cable alignment	Sheath material	Material	Model name	Part no.
Endcap for block installation on DIN-Rail mounting	–	–	–	BF-EB01-W190	5313011
Mounting bracket	–	–	Steel, zinc coated	BEF-WLL170	5306574
Female connector M8, 4-pin, IP 67, cable length 2 m	Straight	PVC	–	DOL-0804-G02M	6009870
	Angled	PVC	–	DOL-0804-W02M	6009871

Type and Model name	Features	WLL 180 – scanning distance in mm [mm]	Minimum bend radius	Minimum object size	LL3 length	Part no.
LL3-DM01 	• Standard type • Mounting sleeve M4	Response time: 16 µs **75** Response time: 70 µs **255** Response time: 250 µs **420**	R25 mm	Ø 0.015 mm	2 m	5308071
LL3-DB01 	• Coaxial cable • Mounting sleeve M6	Response time: 16 µs **90** Response time: 70 µs **280** Response time: 250 µs **500**	R25 mm	Ø 0.015 mm	2 m	5308074
LL3-DT01 	• Coaxial cable • Mounting sleeve M3	Response time: 16 µs **40** Response time: 70 µs **130** Response time: 250 µs **200**	R15 mm	Ø 0.015 mm	2 m	5308076
LL3-DH83 	• Heat resistant up to 300 ˚C • Core: Glass • Sheath: 1.4305 stainless steel • Mounting sleeve M6	Response time: 16 µs **85** Response time: 70 µs **250** Response time: 250 µs **400**	R25 mm	Ø 0.015 mm	1 m	5313032
LL3-DM02 	• Coaxial cable • Mounting sleeve M4	Response time: 16 µs **40** Response time: 70 µs **130** Response time: 250 µs **200**	R15 mm	Ø 1.3 mm	2 m	5308077
LL3-DW02 	• Leak detector • Teflon® housing and Teflon® cabeling 3 m		R20 mm		5 m	5325608
LL3-DC38 	• Fix focus • Flat housing 18 x 12 x 4 mm • V-optic • Solar cell detection	Response time: 16 µs **6** Response time: 70 µs **6** Response time: 250 µs **6**	R25 mm	Ø 0.02 mm	2 m	5322472
LL3-DK67 	• Super flexible • Mounting sleeve M6	Response time: 16 µs **90** Response time: 70 µs **300** Response time: 250 µs **500**	R2 mm	Ø 0.015 mm	2 m	5313025

Teflon® is a registered Trademark by DuPont™.

Type and Model name	Features	WLL 180 – scanning distance in mm [mm]	Minimum bend radius	Minimum object size	LL3 length	Part no.
LL3-TB01 	• Standard type • Mounting sleeve M4	Response time: 16 µs **300** Response time: 70 µs **950** Response time: 250 µs **1700**	R30 mm	Ø 0.5 mm	2 m	5308050
LL3-TR02 	• Flexible cable • Mounting sleeve M3	Response time: 16 µs **60** Response time: 70 µs **175** Response time: 250 µs **330**	R4 mm	Ø 0.1 mm	2 m	5308053
LL3-TM01 	• Smallest end sleeve • Mounting sleeve M3	Response time: 16 µs **220** Response time: 70 µs **680** Response time: 250 µs **1200**	R25 mm	Ø 0.2 mm	2 m	5308068
LL3-TS08 	• Integrated 90 degrees deflection • Mounting sleeve Ø 3 mm	Response time: 16 µs **170** Response time: 70 µs **500** Response time: 250 µs **1000**	R25 mm	Ø 0.2 mm	2 m	5308061
LL3-TS14 	• Fiber-optic cable array • Housing size 19 x 25 x 5 mm • Mounting sleeves Ø 3 mm	Response time: 16 µs **130** Response time: 70 µs **400** Response time: 250 µs **800**	R25 mm	Ø 0.5 mm	2 m	5313039
LL3-TS40 	• Fiber-optic cable array with 40mm height • Housing size 69.3 x 20 x 5.1 mm • Mounting sleeves Ø 3 mm	Response time: 16 µs **100** Response time: 70 µs **700** Response time: 250 µs **1700**	R2 mm	Ø 0.4 mm	2 m	5323971
LL3-TV07 	• Integrated 90 degree deflection • Superflexible cable • Housing size 8 x 10.5 x 14.4 mm	Response time: 16 µs **340** Response time: 70 µs **1000** Response time: 250 µs **1800**	R2 mm	Ø 0.4 mm	2 m	5322548
LL3-TW01 	• For double solar wafer detection with WLL180T-P474/-N474 only • Core: Glass • Sheath: 1.4305 st. steel • Heat resistant up to 220 °C • Mounting sleeve M4	Response time: 16 µs **60** Response time: 70 µs **150** Response time: 250 µs **230**	R25 mm	Ø 0.5 mm	1 m	5315233

Additional information

www.mysick.com/products

At a glance

- Detects liquids and solids
- Extremely high electromagnetic immunity
- Sensitivity adjustment with potentiometer (CM18/30, CQ35)
- Teach-in via pushbutton or remote input (CQ28)
- Enclosure rating IP 67 (CM18/30, CQ35) or IP 68 (CQ28)
- Diverse mounting options (CQ28)
- Programmable output function (CQ28) or complementary design (CM18/30, CQ35)
- Also available with PTFE (Teflon) housing (CM18)

Your benefits

- Non-contact level measurement possible even through walls
- Tough and reliable in harsh industrial applications
- Quick and easy adjustment of the switching point
- Can be used for a very wide range of media

Ordering information

Other models available at www.mysick.com/products

Housing	Installation	Housing material	Output function	Sensing range	Switching mode	Connection	Model name	Part no.
28 mm x 46 mm x 5.5 mm	–	Plastic	NC or NO	10 mm	PNP	Cable, 4-wire	CQ28-10NPP-KW1	6030132
					NPN	Cable, 4-wire	CQ28-10NNP-KW1	6030133
35 mm x 15 mm x 57.5 mm	–	Plastic	Complementary	25 mm	PNP	Cable, 4-wire	CQ35-25NPP-KW1	6020478
					NPN	Cable, 4-wire	CQ35-25NNP-KW1	6021463
M18 x 1	Non-flush	Plastic	Complementary	12 mm	PNP	Connector M12, 4-pin	CM18-12NPP-KC1	6020410
					NPN	Connector M12, 4-pin	CM18-12NNP-KC1	6021458
	Flush	Teflon	Complementary	8 mm	NPN	Cable, 4-wire	CM18-08BNP-TW0	6026194
					PNP	Cable, 4-wire	CM18-08BPP-TW0	6026195

Recommended accessories

Description	Cable alignment	Sheath material	Material	Model name	Part no.
Female connector M8, 4-pin, IP 67, cable length 2 m	Straight	PVC	–	DOL-1204-G02M	6009382
	Angled	PVC	–	DOL-1204-W02M	6009383
Mounting clamp for cylindrical sensors M18 without mechanical stop	–	–	Plastic (PA12), glass fiber reinforced	BEF-KH-M18	2051481

At a glance

- Flat design
- Greater operating distances of up to 7 mm
- Small and compact
- Can be secured using just a single screw in many cases

Your benefits

- Extremely stable and durable
- For applications with limited space
- No restrictions on machine design
- Quick mounting without readjustment

Additional information

www.mysick.com/products

Ordering information

Other models available at www.mysick.com/products

- **Installation:** Flush
- **Switching mode:** PNP
- **Output function:** NO

Housing	Sensing range	Connection	Model name	Part no.
8 mm x 16 mm x 4 mm	1.5 mm	Cable, 3-wire	IQ04-1B5NSKW2S	6042019
			IQ04-1B5PSKW2S	6042017
10 mm x 30 mm x 6 mm	3 mm	Cable, 3-wire	IQ06-03BNSKU2S	6042024
			IQ06-03BPSKU2S	6042022
10 mm x 16 mm x 37 mm	3 mm	Connector M8, 3-pin	IQ10-03BNS-KT1	7900206
			IQ10-03BPS-KT1	7900205
20 mm x 32 mm x 8 mm	7 mm	Cable with plug, M8, 3-pin	IQ20-07BNSDP0S	6042044
			IQ20-07BPSDP0S	6042043
25 mm x 50 mm x 10 mm	5 mm	Cable, 3-wire	IQ25-05BPSDU2S	6042046

Recommended accessories

Connector type	Cable alignment	Sheath material	Model name	Part no.
Female connector M8, 3-pin, IP 67, cable length 2 m	Straight	PVC	DOL-0803-G02M	6010785

Additional information

www.mysick.com/products

At a glance

- Precise operating distances due to ASIC technology
- Extra tough thanks to high tightening torque and hot melt adhesive filling
- Enclosure rating IP 67
- Operating temperature from –25 to +75 °C
- Operating distance from 1.5 mm to 20 mm
- Sizes M08 to M30 available
- DC, AC and AC/DC versions available
- Customer-specific models available

Your benefits

- Less machine downtime
- Less mechanical damage
- Less costs due to longer service life
- High resistance to shock and vibrations

Ordering information

Other models available at www.mysick.com/products

- **Installation:** Flush
- **Output function:** NO

Housing	Switching mode	Sensing range	Connection	Model name	Part no.
M8 x 1	NPN	1.5 mm	Connector M8, 3-pin	IME08-1B5NSZT0S	1040846
	PNP	1.5 mm	Connector M8, 3-pin	IME08-1B5PSZT0S	1040838
	NPN	2 mm	Connector M8, 3-pin	IME08-02BNSZT0S	1040878
	PNP	2 mm	Connector M8, 3-pin	IME08-02BPSZT0S	1040870
M12 x 1	NPN	2 mm	Connector M12, 4-pin	IME12-02BNSZC0S	1040740
	PNP	2 mm	Connector M12, 4-pin	IME12-02BPSZC0S	1040732
	NPN	4 mm	Connector M12, 4-pin	IME12-04BNSZC0S	1040772
	PNP	4 mm	Connector M12, 4-pin	IME12-04BPSZC0S	1040764

Recommended accessories

Description	Cable alignment	Sheath material	Material	Model name	Part no.
Mounting bracket	–	–	Steel, zinc coated	BEF-WN-M08	5321721
				BEF-WN-M12	5308447
Female connector M8, 3-pin, IP 67, cable length 2 m	Straight	PVC	–	DOL-0803-G02M	6010785
Female connector M12, 4-pin, IP 67, cable length 2 m	Straight	PVC	–	DOL-1204-G02M	6009382

IO-Link

Additional information

www.mysick.com/products

At a glance

- Magnetic cylinder sensor for pneumatic cylinders with C/T-slot
- One sensor with two adjustable switching points
- Detection zone up to 50 mm stroke
- IO-Link communication

Your benefits

- One sensor, two switching points: only one slot required
- Saves time, space, and costs – greatly reducing mounting and cabling requirements
- Maximum flexibility: detection zone up to 50 mm stroke
- Allows precision pneumatic applications due to simple and precise definition of two switching points

Ordering information

Other models available at www.mysick.com/products

- **Switching mode:** PNP
- **Output function:** NO

Slot	Festo slot	SMC Slot	Connection	Model name	Part no.
C-slot	–	I	Cable, 4-wire	MZ2Q-CSSPSKU0	1042237
	I	–	Cable with plug, M8, 4-pin	MZ2Q-CFSPSKP0	1042242
	–	I	Cable with plug, M8, 4-pin, with knurled screws	MZ2Q-CSSPSKR0	1042239
	I	–	Cable with plug, M8, 4-pin, with knurled screws	MZ2Q-CFSPSKR0	1042243
T-slot	I	I	Cable, 4-wire	MZ2Q-FTZPS-KU0	1029845
			Cable with plug, M8, 4-pin, with knurled screws	MZ2Q-FTZPS-KR0	1041322
	I	I	Cable with plug, M12, 4-pin	MZ2Q-TSLPSKQ0 [1]	1042228

[1] IO-Link.

Recommended accessories

Mounting system type	Material	Model name	Part no.
Mounting adapters	Die-cast zinc	BEF-KHZ-PT1	2022702
	Aluminum	BEF-KHZ-ST1	2022703

Additional information

www.mysick.com/products

At a glance

- Integrated time-of-flight technology detects objects such as glass, liquids and transparent foils, independent of color
- Proximity, window and reflector modes
- Immunity to dirt, dust, and fog
- One PNP/NPN switching output
- Excellent background suppression

Your benefits

- Mini housing allows for quick and easy integration, even in the most confined spaces
- Immunity to dirt and dust ensures reliable object detection, even in challenging environmental conditions
- Integrated temperature compensation ensures high measurement accuracy
- Various switching outputs provide application flexibility, which increases reliability and productivity
- Full mechanical compatibility to photoelectric sensors increase application flexibility without machine modification
- Economical version available for simple, cost-sensitive applications
- Fast machine setup due to easy-to-use teach-in button

Ordering information

Other models available at www.mysick.com/products

Limiting range	Repeatability [1]	Response time	Switching outputs (max. output current) [2]	Model name	Part no.
150 mm	± 0.15 %	30 ms	1 x PNP (200 mA) [3]	UC4-11341	6034667
250 mm	± 0.15 %	30 ms	1 x PNP (200 mA) [3]	UC4-13341	6034669
150 mm	± 0.15 %	30 ms	1 x NPN (200 mA) [4]	UC4-11345	6034668
250 mm	± 0.15 %	30 ms	1 x NPN (200 mA) [4]	UC4-13345	6034670

[1] Referring to current measurement value.

[2] Output Q short-circuit protected.

[3] PNP: HIGH = Vs – (< 2 V), LOW = 0 V.

[4] NPN: HIGH = < 2 V, LOW = Vs.

Recommended accessories

Description	Sheath material	Cable alignment	Material	Model name	Part no.
Female connector M8, 3-pin, IP 67, cable length 5 m	PVC	Straight	–	DOL-0803-G05M	6022009
		Angled	–	DOL-0803-W05M	6022010
Plate H for universal bar clamp	–	–	Steel, zinc coated	BEF-KHS-H01	2022465
Articulated mounting	–	–	Plastic	BEF-GH-MINI01	2023160

Additional information

www.mysick.com/products

At a glance

- Proximity contrast line sensor in a compact housing
- Application-specific sensor functions
- Detect position of edge of material
- Diameter, width and gap detection of different objects
- Very high reproducibility of 0.03 mm
- Large measurement range: 30 mm
- Visible white LED light spot to enable accurate alignment
- Simple setup, no teach-in necessary

Your benefits

- Cost-effective solution to reliably determine edge position and width measurement
- Easy-to-integrate, compact housing can be mounted over the web, so less down-time is required for maintenance
- No reflector is required, reducing maintenance and providing greater product reliability. Reduces downtime. Only array sensors available in diffuse mode, making them ideal for environments where dirt and dust can interfere with other types of solutions that require a reflector.
- High reproducibility of 0.03 mm and industry-leading resolution enable greater accuracy and quality control
- Highly visible white LED light spot ensures fast and accurate alignment, reducing time-consuming fine adjustment
- No teach, program or menu activities make setup virtually hassle free

Ordering information

Other models available at www.mysick.com/products

- **Switching output:** Q (PNP) (active when object detected)

Functional principle	Sensing distance	Measurement range	Reproducibility [1]	MDO [2]	Model name	Part no.
Edge detection, proximity and reflector	25 mm	20 mm	0.03 mm	0.8 mm	AT20E-PM111	1044484
	100 mm	30 mm	0.05 mm	1.6 mm	AT20E-PM331	1045990
Edge detection, reflector	25 mm	20 mm	0.03 mm	0.8 mm	AL20E-PM111	1046463
	100 mm	30 mm	0.05 mm	1.6 mm	AL20E-PM331	1046462
Diameter detection, proximity and reflector	25 mm	20 mm	0.03 mm	0.8 mm	AT20D-PM111	1046464
	100 mm	30 mm	0.05 mm	1.6 mm	AT20D-PM331	1046465

[1] With respect to sensing distance.

[2] Minimum detectable object.

Recommended accessories

Description	Sheath material	Cable alignment	Material	Model name	Part no.
Mounting bracket	–	–	Stainless steel (1.4301)	BEF-WN-DT20	4043524
Female connector M12, 5-pin, IP 67, cable length 2 m	PVC	Straight	–	DOL-1205-G02M	6008899
		Angled	–	DOL-1205-W02M	6008900
Reflector	–	–	–	REF-AX001	2049250

CDRH

Additional information

www.mysick.com/products

At a glance

- Several measurement ranges from 26 mm ... 34 mm to 100 mm ... 400 mm
- CMOS receiving element for measurement independent of surface, brightness or color
- Fast setup, LED-based user interface
- Wide range of models and four different output styles
- Safe, Class II laser technology for precise measurement of very small objects
- Compact stand-alone device
- Excellent price/performance ratio

Your benefits

- Reliable measurement independent of surface, minimizes machine downtime
- Extremely simple sensor teach-in makes setup faster and more cost-effective
- Minimal space requirements and less wiring due to its compact, stand-alone design
- Many measurement ranges and output interfaces make it ideal for cost-effective integration into any production environment – ideal for OEMs
- Low investment costs make consistent, regular quality inspection possible
- Non-contact measurement technology from a safe distance allows the inspection to be carried out directly during the production process without the need for recalibration
- Wear and damage-free inspection, due to non-contact measurement

Ordering information

Other models available at www.mysick.com/products

Measuring range 6 % ... 90 % remission	Repeatability 6 % ... 90 % remission	Inputs and outputs	Data interfaces	Model name	Part no.
26 mm ... 34 mm	6 µm [1]	PNP	–	OD2-P30W04I0	6036580
		NPN	–	OD2-N30W04I0	6036572
40 mm ... 60 mm	15 µm [1]	PNP	–	OD2-P50W10I0	6036597
		NPN	–	OD2-N50W10I0	6036588
65 mm ... 105 mm	30 µm [1]	PNP	–	OD2-P85W20I0	6036613
		NPN	–	OD2-N85W20I0	6036605
60 mm ... 180 mm	90 µm [1]	PNP	–	OD2-P120W60I0	6036629
		NPN	–	OD2-N120W60I0	6036621
100 mm ... 400 mm	225 µm [1]	PNP	–	OD2-P250W150I0	6036645
		NPN	–	OD2-N250W150I0	6036637
		PNP	RS-422	OD2-P250W150A2	6036644

[1] At set averaging medium and constant conditions. When calibrated in the application regularly.

Recommended accessories

Description	Cable alignment	Sheath material	Model name	Part no.
Female connector M12, 8-pin, IP 67, cable length 2 m	Straight	PVC	DOL-1208-G02MF	6020663

CDRH

Additional information

www.mysick.com/products

At a glance

- Many measurement ranges from 24 mm ... 26 mm up to 300 mm ... 700 mm
- CMOS receiving element for measurement independent of surface
- High measuring accuracy and frequency
- Glass thickness measurement with just one sensor head
- Different light spot sizes
- Integrated calculations for up to three sensors
- Stand-alone use via RS-422

Your benefits

- Non-contact measurement improves quality inspection during production
- Surface-independent measurement algorithms ensure minimum machine down-time, regardless of surface gloss or color
- Reduced processing times as a result of the high measuring frequency of up to 10 kHz
- Simple, cost-effective solution for challenging measuring tasks due to a variety of sensor models
- Optional stand-alone measurement via RS-422 means the OD Precision offers maximum performance at lower investment costs
- High visibility LC display enables simple, cost-effective setup
- Range of interfaces for simple integration into an existing production environment

Ordering information

Other models available at www.mysick.com/products

Measuring range 6 % ... 90 % remission	Repeatability 6 % ... 90 % remission	Inputs and outputs	Data interfaces	Typ. light spot size (distance)	Model name	Part no.
24 mm ... 26 mm	0.06 µm [1]	PNP/NPN	RS-422	25 µm x 35 µm [2]	OD5-25T01	6035975
				100 µm x 700 µm [2]	OD5-25W01	6035976
25 mm ... 35 mm	0.6 µm [1]	PNP/NPN	RS-422	30 µm x 100 µm [3]	OD5-30T05	6035977
				260 µm x 1,000 µm [3]	OD5-30W05	6035978
65 mm ... 105 mm	3 µm [1]	PNP/NPN	RS-422	70 µm x 290 µm [4]	OD5-85T20	6035979
				260 µm x 1,200 µm [4]	OD5-85W20	6035980
250 mm ... 450 mm	15 µm [1]	PNP/NPN	RS-422	700 µm x 2,400 µm [5]	OD5-350W100	6035981
300 mm ... 700 mm	30 µm [1]	PNP/NPN	RS-422	1,000 µm x 3,700 µm [6]	OD5-500W200	6035982
–	–	PNP	RS-232, USB	–	AOD5-P1	6035985
		NPN	RS-232, USB	–	AOD5-N1	6035984

[1] At set averaging 4096 and constant conditions.
[2] At 25 mm.
[3] At 30 mm.
[4] At 85 mm.
[5] At 350 mm.
[6] At 500 mm.

Recommended accessories

Cable length	Model name	Part no.
2 m	DSL-1212-G02M	6035986

Additional information

www.mysick.com/products

At a glance

- Variable monitoring lengths from 120 mm up to 600 mm (in 160 mm increments)
- Set parameters via teach-in with no PC
- Maximum range 4 m
- Response time 18 ms
- 25 mm detection resolution with 40 mm beam spacing possible
- Simple teach-in setup
- Highly immune to sunlight up to 150,000 lux
- Small dead zone <11 mm

Your benefits

- Small, slim and sleek design enables easy integration into applications
- Capacitive teach-in button and LEDs make commissioning easier for complex solutions
- Slim and flat models offer flexible mounting options and optimize space while reducing damage
- Customize preset configurations or set parameters via one-touch teach-in with no PC
- Optical synchronization eliminates the need to lay cables, saving time
- Auto-teach and auto-muting enable Plug & Play. And, an alignment aid and “Click & Go” provide faster installation.

Ordering information

Other models available at www.mysick.com/products

- **Optical light exit:** Slim
- **Working range:** 3 m

Detection height	Switching output voltage	Model name	Part no.
120 mm	NPN	SAS4-S012N3PS1T00	1047009
	PNP	SAS4-S012P3PS1T00	1047364
280 mm	NPN	SAS4-S028N3PS1T00	1207707
	PNP	SAS4-S028P3PS1T00	1047063
440 mm	NPN	SAS4-S044N3PS1T00	1207708
	PNP	SAS4-S044P3PS1T00	1045019
600 mm	NPN	SAS4-S060N3PS1T00	1207709
	PNP	SAS4-S060P3PS1T00	1047587

Recommended accessories

Model name	Part no.
BEF-SLG-SET2	2056518
DOL-0804-G02MC	6025894
DOL-0804-G05MC	6025895
VZA-SLG	2048519

CE

Additional information

www.mysick.com/products

At a glance

- High-speed part inspection
- Robust pattern match to locate part independent of position, rotation and scale
- Multi-reference object teaching and multi-feature inspections
- Unique, homogeneous dome illumination or high power ring light
- Easy-to-use step-by-step configuration in PC including emulator
- Log, statistics and record
- Industrial Ethernet
- Large selection of adjustments and accessories

Your benefits

- The high-speed part inspection ensures you quality assurance without production overhead
- The robust pattern match algorithm guarantees high quality result even at your toughest production conditions
- The unique, homogenous dome illumination performs perfect result even for glossy objects which give you a compact solution
- The easy-to-use configuration in SOPAS, including emulator for offline configuration and testing, will reduce downtimes in production to a minimum
- The included Industrial Ethernet for configuring and monitoring over network will reduce installation complexity and enhance flexibility in the production line
- The large selection of adjustments and accessories makes the Inspector the excellent choice for your production plant with needs for a variety of application tasks

Ordering information

Other models available at www.mysick.com/products

Product name	Field of view internal illumination	Light source	Task	Optics	Model name	Part no.
Inspector I10 Standard	20 x 20 mm² ... 72 x 72 mm²	White ring light	Inspect, locate	Fixed	VSPI-1R111	1042779
Inspector I20 Flex	20 x 20 mm² ... 72 x 72 mm²	White ring light	Inspect, locate	Exchangeable	VSPI-2F111	1046732
Inspector I20-UV Flex	20 x 20 mm² ... 72 x 72 mm²	UV ring light	Inspect, locate	Exchangeable	VSPI-2F121	1048353
Inspector I40 Flex	22 x 15 mm² ... 79 x 58 mm²	White ring light	Inspect, locate	Exchangeable	VSPI-4F2111	1047913
Inspector P30 Flex	20 x 20 mm² ... 72 x 72 mm²	White ring light	Position	Exchangeable	VSPP-3F1122	1051982

Recommended accessories

Description	Model name	Part no.
Inspector angle bracket	BEF-WK-EPA	2045167
Power IO cable 2 M, M12	DOL-1212-G02MAS01	6036555
Inspector Flex Dome	Inspector Flex dome	2050678
Ethernet cable, 3 m, RJ45	SSL-2J04-G03ME	6029630
Inspector Viewer	VSPV-22222	2057556

Additional information

www.mysick.com/products

At a glance

- Non- contact determination of the absolute position
- Small and compact read head
- Standard SSI interface with SinCos output
- Standard HIPERFACE® interface
- Different fieldbus interfaces with separate bus adapter available
- Measuring lengths up to 4 meters
- High accuracy (± 10 µm)
- High system resolution (1 µm with SSI, 3.906 µm with fieldbus)
- High movement speed up to 10 m/s

Your benefits

- High possibility for integration because it is the smallest absolute linear encoder with fieldbus interfaces
- Change of fieldbus interface without changing the encoder
- High process dynamic because of compact housing, light weight and high movement speed
- 100 % operational availability
- Insensitive to dirt and condensation
- Real-time capability of the SSI version because of SinCos output
- Standard HIPERFACE® interface enables easy implementation

Ordering information

Other models available at www.mysick.com/products

Measuring length	Electrical interface	Resolution	System part	Model name	Part no.
4,000 mm	HIPERFACE®	0.244 µm [1]	Read head	TTK70-HXA0-K02	1037434
	4.5 V ... 30 V, SSI	1 µm	Read head	TTK70-AXA0-K02	1038033
	10 V ... 30 V, PROFIBUS	3.906 µm	Read head and interface adapter	TTK70-PXH0-K02	1037875
	10 V ... 30 V, CANopen®	3.906 µm	Read head and interface adapter	TTK70-CXH0-K02	1037877
	10 V ... 30 V, DeviceNet	3.906 µm	Read head and interface adapter	TTK70-DXH0-K02	1037876
	–	–	Magnetic tape 0.5 m	MVM-0M5-2MC-MKLB	6037415
			Magnetic tape 1.0 m	MVM-01M-2MC-MKLB	6037417
			Magnetic tape 4.0 m	MVM-04M-2MC-MKLB	6037423
			Magnetic tape 2.5 m	MVM-2M5-2MC-MKLB	6037420

[1] Measurement step at interpolation of the sine/cosine signals with e.g., 12 bit.

Recommended accessories

Description	Cable alignment	Sheath material	Model name	Part no.
–	–	–	PGT-03-S	1034252
Female connector M12, 8-pin, IP 67, cable length 2 m	Straight	PVC	DOL-1208-G02MAC1	6032866
	Right angled	PVC	DOL-1208W02MAC1	6037724

At a glance

- Non-contact level measurement up to 3.4 m operating distance / 8.0 m limit scanning distance
- Pressure resistant up to 6 bar (87 psi)
- Transducer protected by PVDF cover for increased resistance
- 3-in-1: continuous level measurement, level switch and display
- Analog output switchable between 4 mA ... 20 mA and 0 V ... 10 V
- Process connector thread G1 and G2
- IP 67 enclosure rating
- Easy to set parameters, also via connect+

Your benefits

- Non-contact measurement in pressurized containers – no wear over time
- Easy-to-set parameters, saving time
- Flexible measurement system for different container sizes – standardization and stock reduction
- One product for point level and continuous applications, reduces the number of sensors required

Additional information

www.mysick.com/products

Ordering information

Other models available at www.mysick.com/products

- **Output signal:** 1x PNP + 4 ... 20 mA / 0 ... 10 V
- **Process temperature:** –25 °C ... +70 °C
- **Process pressure:** 0 bar ... 6 bar
- **Electrical connection:** M12 x 1, 5-pin
- **Enclosure rating:** IP 67

Process connection	Housing material	Operating distance	Limiting scanning distance	Model name	Part no.
G1 A PN 6	Stainless steel 1.4571, PBT, TPU	30 mm ... 250 mm	30 mm ... 990 mm [2]	UP56-211118	6041658
D40 GF union [1]	PTFE, PBT, TPU	85 mm ... 350 mm	85 mm ... 1,500 mm [2]	UP56-212203	6044539
G1 A PN 6	Stainless steel 1.4571, PBT, TPU	85 mm ... 350 mm	85 mm ... 1,500 mm [2]	UP56-212118	6041659
		200 mm ... 1,300 mm	200 mm ... 5,000 mm [2]	UP56-213118	6041660
G2 A PN 6	Stainless steel 1.4571, PBT, TPU	350 mm ... 3,400 mm	350 mm ... 8,000 mm [2]	UP56-214118	6041693
	PVDF, PBT, TPU	350 mm ... 3,400 mm	350 mm ... 8,000 mm [2]	UP56-214178	6039866

[1] Useable also in immersion tube D40.

[2] At 6 bar gauge.

Recommended accessories

Brief description	Model name	Part no.
Configuration software	CPA connect Plus	6037782
Weld-in flange G1 made from 316L for ultrasonic sensors UP56-211, UP56-212 and UP56-213	BEF-FL-316G10-UP56	4064295
Weld-in flange G2 in 316L for ultrasonic sensors UP56-214	BEF-FL-316G20-UP56	4063263

IO-Link

Additional information

www.mysick.com/products

At a glance

- Measurement ranges from 0 bar ... 1 bar up to 0 bar ... 600 bar
- Gauge, absolute, and compound measurement ranges
- No moving parts: No mechanical wear, fatigue-proof, maintenance-free
- Stainless steel membrane
- Various programmable switching functions
- Digital outputs PNP or NPN, analog output signal 4 mA ... 20 mA or 0 V ... 10 V
- Min/max pressure memory
- Password protection
- Selection of different pressure units for the display
- IO-Link optional

Your benefits

- Compact size takes up less space
- Dual rotatable housing ensures flexible installation
- Quick and easy setup and operation due to three large buttons and bright display
- Wide range of applications
- Resistant against corrosive media due to circularly welded, hermetically sealed stainless steel membrane
- Available in a wide selection of configurations, enabling a perfect match to individual customer requirements
- IO-Link technology provides time and cost savings by enabling parameter adjustments, for example, upon product changeover to be performed remotely

Ordering information

Other models available at www.mysick.com/products

- **Pressure type:** Gauge pressure

Process connection	Sealing	Electrical connection	Output signal	Measuring range	Model name	Part no.
G 1/4 A according to DIN 3852-E	NBR	Plug M12 x 1, 4-pin, IP 67	2x PNP	–1 bar ... 9 bar	PBS-CB010SG1SSNAMA0Z	6038870
				0 bar ... 10 bar	PBS-RB010SG1SSNAMA0Z	6038862
				0 bar ... 100 bar	PBS-RB100SG1SSNAMA0Z	6038865
				0 bar ... 250 bar	PBS-RB250SG1SSNAMA0Z	6038866
			1x PNP + 4...20 mA	–1 bar ... 9 bar	PBS-CB010SG1SSNBMA0Z	6038896
				0 bar ... 10 bar	PBS-RB010SG1SSNBMA0Z	6038888
				0 bar ... 100 bar	PBS-RB100SG1SSNBMA0Z	6038891
				0 bar ... 250 bar	PBS-RB250SG1SSNBMA0Z	6038892
		Plug M12 x 1, 5-pin, IP 67	2x PNP + 4...20 mA	0 bar ... 10 bar	PBS-RB010SG1SSND5A0Z	6038678
G 1/4 female	Without sealing	Plug M12 x 1, 4-pin, IP 67	2x PNP	0 bar ... 10 bar	PBS-RB010SG2SS0AMA0Z	6039110
				0 bar ... 100 bar	PBS-RB100SG2SS0AMA0Z	6039614
				0 bar ... 250 bar	PBS-RB250SG2SS0AMA0Z	6039615
			1x PNP + 4...20 mA	0 bar ... 10 bar	PBS-RB010SG2SS0BMA0Z	6039121
		Plug M12 x 1, 5-pin, IP 67	2x PNP + 4...20 mA	0 bar ... 10 bar	PBS-RB010SG2SS0D5A0Z	6039123
				0 bar ... 100 bar	PBS-RB100SG2SS0D5A0Z	6042526
				0 bar ... 250 bar	PBS-RB250SG2SS0D5A0Z	6041527

At a glance

- Flow sensor for conductive and non-conductive liquids
- Compact design with no moving parts
- Process temperature up to 80 °C, process pressure up to 10 bar
- High chemical resistance due to seal-free sensor design
- Large display with membrane keyboard
- Integrated teaching tube detection

Your benefits

- Reduced maintenance costs
- Adjustable measuring ranges reduces the number of variants
- Ability to be used with conductive and non-conductive liquids reduces variants and lowers storage costs
- Straight measuring tube reduces pressure loss, thus reducing energy costs
- Sensor without seals increases process reliability and availability
- Flexible measurement system for all industries

Additional information

www.mysick.com/products

Ordering information

Other models available at www.mysick.com/products

Process pressure	Process connection	Nominal width measuring tube	Maximum flow	Model name	Part no.
Max. 10 bar	G 1/2	NW 10	0 l/min ... 21 l/min	FFUS10-1G1I0	6041737
	G 3/4	NW 15	0 l/min ... 36 l/min	FFUS15-1G1I0	6041249
Max. 6 bar	G 1	NW 20	0 l/min ... 60 l/min	FFUS20-1G1I0	6041738
	G 1 1/4	NW 25	0 l/min ... 240 l/min	FFUS25-1G1I0	6041739

Recommended accessories

Description	Model name	Part no.
Cable, M12, 5-pin, straight connector female with molded cable, 2 m, PVC	DOL-1205-G02M	6008899
Cable, M12, 5-pin, angled connector female with molded cable, 2 m, PVC	DOL-1205-W02M	6008900

Additional information

www.mysick.com/products

At a glance

- Modularly expandable (12 ... 144 inputs/outputs)
- Intuitive configuration software: easy operation, simulation mode, wiring diagrams, download free of charge
- Configuration memory in the system plug
- Safely link up to four Flexi Soft safety controllers via EFI
- Integration into all common fieldbus systems
- Enhanced sensor functionalities via EFI interface
- 38 TÜV certified function blocks

Your benefits

- Prevention of redundant inputs and outputs saves money
- Fast commissioning via a system plug that saves and stores system configurations
- Less downtime due to gateways, e.g., PROFINET IO, PROFIBUS-DP, EtherCAT, CANopen, Modbus TCP, Ethernet (TCP/IP)
- Safe communication without additional hardware saves time, space and money
- Standard RS-232 diagnosis via the main module enables real-time diagnostics for quick commissioning, faster troubleshooting and reduced downtime
- Fast electronic installation via complete wiring diagram
- Simulation mode allows a user to verify the safety functions before installation
- Fast hardware selection by drag and drop from a list of simple to understand element icons

Ordering information

Other models available at www.mysick.com/products

Number of EFI interfaces	Number of inputs	Number of N/O contacts	Connection type	Fieldbus	Model name	Part no.
2	–	–	–	–	FX3-CPU130002	1043784
–	8 single-channel	–	Dual-level spring clamp terminals	–	FX3-XTIO84002	1044125
					FX3-XTDI80002	1044124
	–	2	Dual-level spring clamp terminals	–	UE410-2RO4	6032677
		4	Dual-level spring clamp terminals	–	UE410-4RO4	6032676
		–	–	EtherNet/IP	FX0-GENT00000	1044072
				PROFINET IO	FX0-GPNT00000	1044074
				EtherCAT	FX0-GETC00000	1051432

Recommended accessories

Description	Remark	Packing unit	Input voltage	Output voltage	Model name	Part no.
Memory plug	–	–	–	–	FX3-MPL000001	1043700
Configuration software	–	–	–	–	Flexi Soft Designer	2045931
Power supply units, maximum output current 3.9 A	–	–	100 V AC ... 240 V AC	24 V DC	Power supply	7028790
Configuration connection cable, M8 x 4, SUB-D 9-pin, cable length 5 m	Connects the configuration connection to the PC	–	–	–	DSL-8D04G02M-025KM1	6021195
Terminal connector, spring terminal plug, 4-pole, double entry	–	4	–	–	Spring terminal plug	2045890

At a glance

- Compact device with no dead zones
- Cascadable twin stick design – sender and receiver in a single housing
- Alignment and diagnostics via color LEDs
- Automatic beam coding
- External device monitoring (EDM) and reset function (RES)
- Intelligent, software-free configuration
- M12, 5-pin connection device

Your benefits

- Its small design, cascadable features and incremental protective field heights enable a flexible adjustment to the machine design
- Standardization saves time and resources because of more straightforward logistics, order entry and service
- Simplified handling and setup: Software-free, almost fully automatic commissioning and intuitive operation guided by a LED-display
- End-to-end coverage in cascadable applications eliminates dead zones and shortens the safety distance, increasing productivity
- Application-specific brackets provide increased flexibility and reduce installation time

Additional information

www.mysick.com/products

Ordering information

Other models available at www.mysick.com/products

Safety category	Scanning range	Resolution	Protective field height	Connection cable length	Model name	Part no.
Type 4 (IEC 61496)	0 m ... 4 m	14 mm	120 mm	160 mm	C4MT-01214ABB03BE0	1207094
			180 mm	160 mm	C4MT-01814ABB03BE0	1207097
			240 mm	350 mm	C4MT-02414ABB03DE0	1207098
			360 mm	350 mm	C4MT-03614ABB03DE0	1207100
			480 mm	350 mm	C4MT-04814ABB03DE0	1207102
			600 mm	700 mm	C4MT-06014ABB03FE0	1207104
			720 mm	700 mm	C4MT-07214ABB03FE0	1207106
			900 mm	700 mm	C4MT-09014ABB03FE0	1207109
			1,200 mm	700 mm	C4MT-12014ABB03FE0	1207114

Recommended accessories

Description	Direction of cable outlet	Cable length	Model name	Part no.
Laser alignment aid	–	–	AR60	1015741
	–	–	Adapter AR60 for miniTwin	4064710
Stand-alone system plug, with 1 connecting cable, stripped	–	10 m	–	2051290
Cascade system plug, with 2 connecting cables and 1 plug and 1 socket M12 x 4 + FE	–	160 mm	–	2046452
		350 mm	–	2046454
		700 mm	–	2046456
Connecting cable, socket M12 x 5	Straight	5 m	DOL-1205-G05M	6009868
		10 m	DOL-1205-G10M	6010544

Additional information

www.mysick.com/products

At a glance

- Extremely compact design
- Up to 8 switchable protective/warning fields
- 2 m protective field range
- 270° scan angle
- Certified for vertical use
- Enhanced measured data output (depending on type)
- Configuration memory in the system plug

Your benefits

- Compact design for easy integration
- Economic safety solution due to its 270° scanning angle for wide area coverage
- Ability to connect to SICK safety controllers provides modular, expandable system with increased flexibility
- Easily adjusts to fit the requirements of individual applications
- Personnel protection and navigation in one device (depending on type)
- For every speed the right field size

Ordering information

Other models available at www.mysick.com/products

Model name	Part no.
S30B-2011BA	1026820

Recommended accessories

Description	Cable length	Property	Assembly	Remark	Model name	Part no.
Mounting systems	–	Mounting brackets	–	–	Mounting kit 1a	2034324
					Mounting kit 1b	2034325
			Cross-wise adjustment possible	Only in conjunction with mounting kit 1a or 1b	Mounting kit 2	2039302
		Mounting plate	Longitudinal adjustment possible	Only in conjunction with mounting kit 2	Mounting kit 3	2039303
System plug without cable	–	–	–	Not for use with incremental encoders	SX0B-A0000G	2032807
System plug, pre-assembled	5 m	–	–	–	SX0B-B1105G	2032859
	10 m	–	–	–	SX0B-B1110G	2032860
	20 m	–	–	–	SX0B-B1120G	2032861
Configuration connection cable , M8 x 4, SUB-D 9-pin	2 m	–	–	Connects the configuration connection to the PC	DSL-8D04G02M-025KM1	6021195
	10 m	–	–	Connects the configuration connection to the PC	DSL-8D04G10M-025KM1	2027649

Additional information

www.mysick.com/products

At a glance

- Protective field sizes from 1 m x 1 m to 1.5 m x 1.5 m
- Resolution 20 mm, 24 mm, and 34 mm
- One device only: integrated sender and receiver
- Intuitive one-button teach
- Automatic alignment
- Synchronization of 2 systems
- Restart/Reset, EDM integrated
- SIL2 (IEC 61508, EN 62061) and PL d (EN ISO 13849)

Your benefits

- Flexible and individual definition of protective fields
- Quick commissioning without additional software
- Intuitive, time-saving operation
- No variants: one-device concept for all aperture sizes
- Reduced storage, logistics and commissioning costs
- No expert knowledge for commissioning required
- High machine availability and simple maintenance

Ordering information

Other models available at www.mysick.com/products

Model name	Part no.
V30W-0101000	1041542

Recommended accessories

Description	Input voltage	Output voltage	Maximum output current	Model name	Part no.
Configuration tools for V200 Work Station, V300 Work Station	–	–	–	Teach-in pin	4052939
Mounting systems	–	–	–	Mounting kit	2045375
Power supply units	100 V AC ... 240 V AC	24 V DC	3.9 A	Power supply	7028790
Resolution sets, reflective tape 2 x 1.0 m with test rod, 20 mm diameter	–	–	–	Resolution set 20 mm	2051336
Resolution sets, reflective tape 2 x 1.2 m with test rod, 24 mm diameter	–	–	–	Resolution set 24 mm	2051338
Resolution sets, reflective tape 2 x 1.5 m with test rod, 30 mm diameter	–	–	–	Resolution set 30 mm	2051339
Connecting cable, M12 x 7 + FE, direction of cable outlet straight, cable length 5 m	–	–	–	DOL-127SG05ME-25KM0	6020354

Additional information

www.mysick.com/products

At a glance

- Decoding of most popular code types: 1D, 2D, direct part marking
- Automatic focus teach-in for quick setup
- Easy integration with industrial networks: serial, Ethernet, PROFINET, PROFIBUS and CAN
- Auto setup with function button and aiming laser – does not require PC
- Compact design and industrial housing with swivel connector
- Analysis tools include live image capturing, code verification and read rate view

Your benefits

- Intelligent decoding algorithms provide reliable reading performance for improved read rates and throughput
- ID*pro* facilitates integration with most popular industrial networks
- Intuitive setup with function button, auto setup and aiming laser reduces training and installation time and costs
- Compact design and flexible swivel-mount make it easy to install in reduced spaces
- Quick analysis of read rate performance and code quality allows for efficient control
- Cloning back-up systems ensure low machine downtime in the event of unexpected incidents
- SICK LifeTime Services gives you peace of mind

Ordering information

Type	Reading field	Model name	Part no.
LECTOR®620	Side	ICR620S-T11503	1050589

Recommended accessories

Brief description	Model name	Part no.
Small connection module for one sensor, 4 cable glands, base for CMC600	CDB620-001	1042256
Mounting angle with 2 self-locking M5 x 8 screws	Mounting angle	2020410
Cable, M12 12-pin, to CDB620/CDM420/CDM425/CDF600 15-pin D-sub, 2 m (socket/plug)	Connecting cable (plug-socket)	2041834
Cable, M12 4-pin, Ethernet to Host RJ45, 2 m (plug/plug)	SSL-2J04-G02ME	6034414

Additional information

www.mysick.com/products

At a glance

- CAN, Ethernet TCP/IP, and EtherNet/IP available on board, no additional gateway needed (depending on variant)
- SMART620 code reconstruction technology
- Flexible sorting, filtering, and logical functions
- Advanced, easy-to-use SOPAS configuration software
- High scanning frequency of up to 1,200 Hz
- Small housing
- Advanced remote diagnostics and network monitoring capabilities available over Ethernet
- IP 65-rated

Your benefits

- High read rate on damaged and obscured codes using SMART620 code recognition technology
- Increased scanner intelligence enables sophisticated configuration of logical operations, reducing the control system programming effort. Data is then delivered in the desired format.
- No supplementary Ethernet gateway required with Ethernet models – lowers costs
- The CLV62x scanner can be used as a multiplexer in any CAN scanner network from SICK – no supplementary multiplexer necessary
- Real-time decoding at very high speeds
- Small size and simple setup enables fast installation, even in compact machines

Ordering information

Other models available at www.mysick.com/products

Focus	Type	Connection type	Reading field	Scanner design	Model name	Part no.
Fixed focus	CLV622 Short Range	Standard	Front	Line scanner	CLV622-0000	1041792
				Raster scanner	CLV622-1000	1041794
			Side (105°)	Line scanner	CLV622-2000	1041796
				Raster scanner	CLV622-3000	1041798
		Ethernet	Front	Line scanner	CLV622-0120	1041793
				Raster scanner	CLV622-1120	1041795
			Side (105°)	Line scanner	CLV622-2120	1041797
				Raster scanner	CLV622-3120	1041799
	CLV622 Electronics and Solar [1]	Standard	Front	Line scanner	CLV622-0000S01	1046168
			Side (105°)	Line scanner	CLV622-2000S01	1046169
		Ethernet	Front	Line scanner	CLV622-0120S01	1046170
			Side (105°)	Line scanner	CLV622-2120S01	1046171

[1] Special versions for Electronics and Solar industry for code resolutions from 0.075 mm at 70 mm reading distance.

Recommended accessories

Brief description	Model name	Part no.
Small connection module for one sensor, 4 cable glands, base for CMC600	CDB620-001	1042256
Bracket with adapter board	Mounting bracket	2042902
Cable, M12, 12-pin, to CDB620/CDM420/CDM425/CDF600 15-pin D-sub, 2 m (socket/plug)	Connecting cable (plug-socket)	2041834
Data connection cable (RS-232) for CLV/ICR/LECTOR/RFH/CDB/CDM to PC, 3 m, 3-wired, with 2 x 9-pin D-sub receptacle	Data connection cable (RS-232)	2014054
Cable, M12, 4-pin, Ethernet to Host RJ45, 2 m (plug/plug)	SSL-2J04-G02ME	6034414

Additional information

www.mysick.com/products

At a glance

- Identification of all popular 1D codes, with PDF version also stacked codes
- Scan rate up to 500 scans/second
- Identification of codes with 0.076 mm module width

Your benefits

- Increased productivity thanks to high scan rate
- Reliable identification reduces the need to manually input data
- Lightweight, ergonomic design ensures user comfort
- Cordless version provides flexibility

Ordering information

Other models available at www.mysick.com/products

Sub product family	Field of application	Type	Items supplied	Model name	Part no.
IDM120	General purpose	Short Range	PS/2 kit: contains hand-held scanner, 2 m straight PS/2 keyboard wedge cable and quick start guide	IDM120-01B K01	6036713
			USB keyboard kit: contains hand-held scanner, 1.8 m straight USB cable and quick start guide	IDM120-01B K02	6036714
			RS-232 power supply kit: contains hand-held scanner, 1.8 m straight RS-232 TTL cable, power supply and quick start guide	IDM120 RS232 Power Supply Kit	1046549
IDM140-2	General purpose	Mid Range	PS/2 kit: contains hand-held scanner, 2 m straight PS/2 keyboard wedge cable and quick start guide	IDM140-2 PS/2 Kit	6040982
			RS-232 power supply kit: contains hand-held scanner, 1.8 m straight RS-232 TTL cable, power supply and quick start guide	IDM140-2 RS232 Kit	6041017
			USB keyboard kit: contains hand-held scanner, 1.8 m straight USB cable and quick start guide	IDM140-2 USB Kit	6040983
IDM140-2 Blue-tooth	General purpose, cordless	Mid Range	Kit contains cordless scanner, battery, base station, interface cable, power supply and quick start guide	IDM140-2BT PS/2 Kit	6040990
				IDM140-2BT RS232 Kit	6040992
				IDM140-2BT USB Kit	6040991

Recommended accessories

Brief description	Model name	Part no.
Countertop stand	Countertop stand	6036724
Desk holder	Desk holder	6036723

Additional information

www.mysick.com/products

At a glance

- 13.56 MHz short range RFID interrogator
- Compact, industrial design with integrated antenna
- Suitable for all standard fieldbus and networks
- Application-specific modes: command, stand-alone and continuous
- Uses SICK SOPAS operating software
- Wide range of diagnostic functions
- Supports SICK cloning functionality via CMC600 or a SD Micro card

Your benefits

- Reliable identification ensures maximum throughput
- Adapts to changing needs, ensures investment over the long term
- Simple integration, saves installation time
- A wide range of functionality ensures a flexible solution
- Maintenance-free
- Compatible SICK connector technology

Ordering information

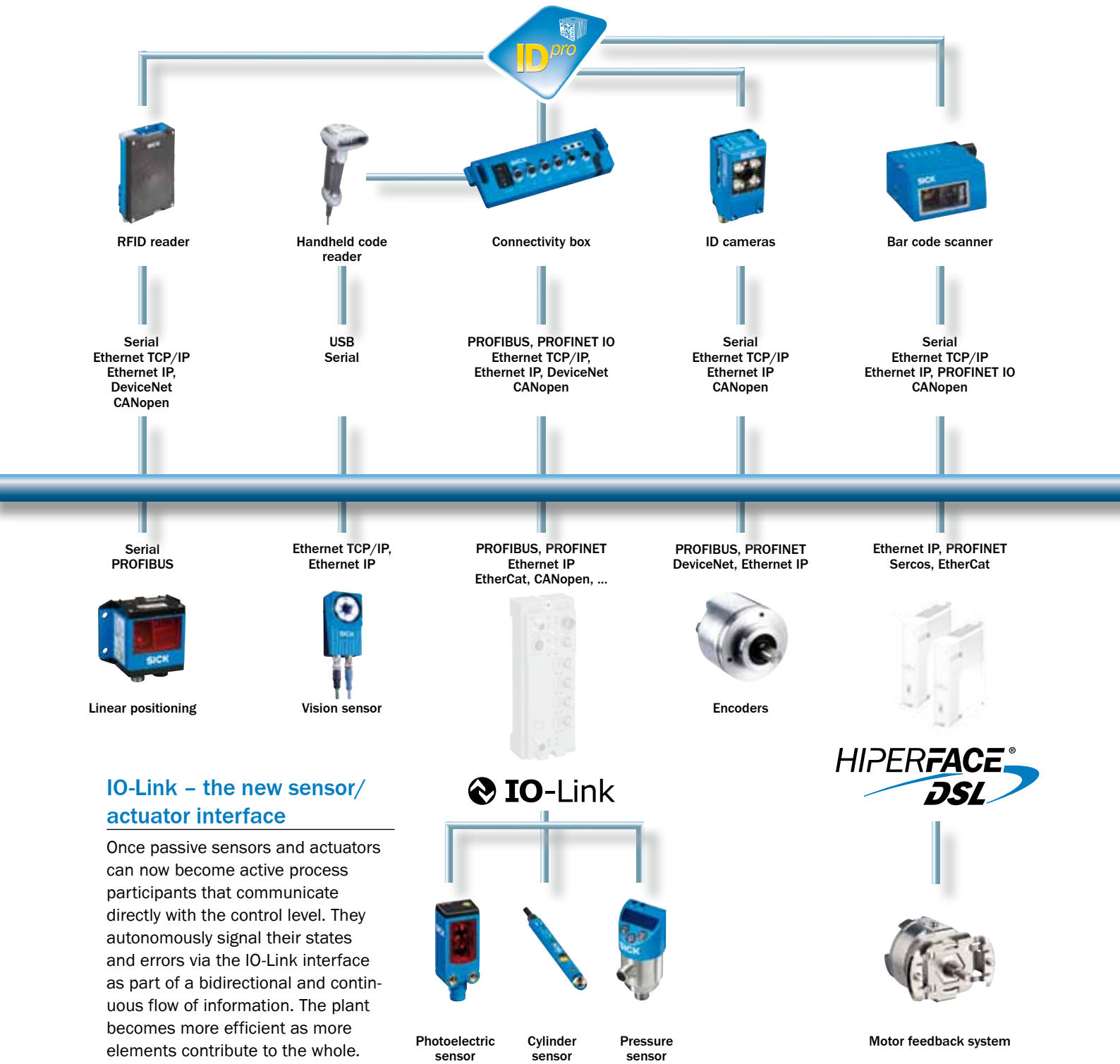
- **Frequency band:** HF (13.56 MHz)
- **Type:** Short Range

Connection type	Model name	Part no.
Standard	RFH620-1000001	1044838
Ethernet	RFH620-1001201	1044839

Recommended accessories

Brief description	Model name	Part no.
Small connection module for one sensor, 4 cable glands, base for CMC600	CDB620-001	1042256
External parameter memory for integration in CDB620/CDM42x	CMC600-101	1042259
Mounting bracket	Mounting bracket	2048551
Cable, M12 12-pin, to CDB620/CDM420/CDM425/CDF600 15-pin D-sub, 2 m (socket/plug)	Connecting cable (plug-socket)	2041834
Cable, M12 4-pin, Ethernet to Host RJ45, 2 m (plug/plug)	SSL-2J04-G02ME	6034414
Diameter 16 mm, thickness 2.9 mm, IC: NXP ICODE SLI SL2, –25 °C ... +70 °C, IP 68	RFID Coin (16 mm)	6041592
Diameter 30 mm, thickness 3 mm, IC: NXP ICODE SLI SL2, –25 °C ... +85 °C, IP 68	RFID Disc (30 mm)	6034740
Diameter 53 mm, thickness 12 mm, IC: NXP ICODE SLI SL2, –40 °C ... +140 °C	RFID Disc (High Temp)	6041594
Length 22 mm, diameter 4 mm, IC: NXP ICODE SLI SL2, –25 °C ... +85 °C, IP 68	RFID Glass Transponder	6039237
85.6 mm x 54 mm x 0,76 mm, IC: NXP ICODE SLI SL2, –35 °C ... +50 °C	RFID ISO card	6037848

SICK sensor systems: Powerful, flexible and open for all system environments.



IO-Link – the new sensor/actuator interface

Once passive sensors and actuators can now become active process participants that communicate directly with the control level. They autonomously signal their states and errors via the IO-Link interface as part of a bidirectional and continuous flow of information. The plant becomes more efficient as more elements contribute to the whole.

8008968/2011-03-15
Subject to change without notice

SafetyPLUS® is an all-inclusive concept of safety denominated products, services, and tools. Our safety product portfolio ranges from safety switches to advanced camera systems, and on to entire control solutions. SICK is dedicated to tightly integrate the worlds of safety and system processes.

Industrial Safety Systems.
Made by SICK.

safetyPLUS

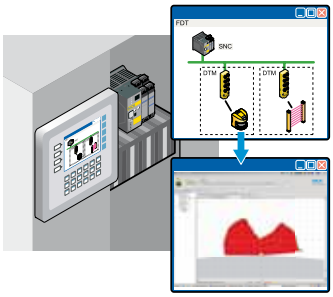
Function Blocks

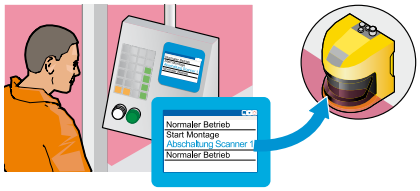
- Function blocks available for many popular PLCs, allow control and diagnostic software to function across network boundaries.
- Reduce risk of errors
- Reduce programming overhead

OPC Server

SICK is fully committed to the OPC platform by:
1.) Continuously increasing device participation in PLC networks, and
2.) Offering the SICK OPC Server as an alternative route direct to the sensor.
Now, customers can implement:

- Advanced GUIs and HMIs
- Simple access to data stored within the sensor





Products from the industrial sensors, industrial safety systems and automatic identification divisions can be used on almost all system platforms. The potential for integration in the controller technology, based on standards valid worldwide, make every solution an investment with a secured future.

- **PROFIBUS, PROFIsafe**
- **DeviceNet, DeviceNet Safety**
- **EtherCat**
- **AS-i, AS-i Safety at Work**
- **CANopen**
- **Ethernet**
- **and more**

I am PROFIsafe

AS-i Safety at Work

DeviceNet Safety

PROFIsafe
Ethernet TCP/IP
Ethernet IP
PROFINET

PROFIsafe for PROFINET IO

Safety laser scanner

PROFIsafe
PROFIBUS
PROFINET IO
CANopen
Ethernet TCP/IP

EFI gateways

DeviceNet Safety

Safety network solutions DeviceNet Safety

Safety camera system

Safety light curtain

Safety light curtain

Safety laser scanner

Safety light curtain

Safety position switch

Greater input. Greater output. Greater value.

Intelligent sensors from SICK.
Greater efficiency in automation.

Automation has fueled the growth of modern manufacturing, pushing the boundaries of speed, accuracy and miniaturization. These ever increasing demands for improvement require systems and their components to have simpler commissioning, more robust diagnostic abilities, and advanced flexibility.
Sensors and actuators are becoming more intelligent, and often have a lot to say. Until now, listening and responding to their information was a challenge requiring advanced expertise, and non-standard communication protocols. SICK became the driving force behind a consortium of leading automation manufacturers to develop a standard – IO-Link. This bidirectional information pathway between sensors, actuators, and their controllers is the foundation for significant improvements and innovations. Even standard sensors participate in the advantages of IO-Link.

The sensor communications of the future.

IO-Link

SICK – connecting ideas

Your competitive advantage

SICK sensors can do more than just switch. The logic embedded provides additional valuable data, e.g.:

- Object profile recognition
- Object speed calculations
- Event counting

The settings on SICK intelligent sensors can be edited quickly during operations in reaction to changing environmental or object characteristics. SICK developed optimized algorithms for filtering and background suppression, so the controller is free to act on clean, clear data.

SICK solutions are designed to interface easily with standard industry fieldbus implementations. With IO-Link, this interface becomes the data highway of the future.

Would you like to know more about intelligent sensors? Talk to us – we'll find a solution together!

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Reduced downtime

IO-Link establishes continuous, bidirectional communication between sensors and controllers. This interface finally creates the loop for preventive maintenance and intelligent response to sensors in the process.
IO-Link guarantees that devices can be replaced and commissioned error free, thanks to reproducible, centrally stored parameter settings that are sent directly to the devices.

Low maintenance costs

IO-Link is a pathway for greater use of predictive technology. Now, data is available from even simple sensors that will contribute to advance optimization techniques, such as preemptive replacement, and fast parameter adjustments in response to other process data.
Sensors and devices with IO-Link enabled offer unique security features. As the devices can continuously report their status, tampering or any accidental adjustment are instantly known to the controller.

Step-by-step retrofitting in existing systems

IO-Link can easily be integrated into existing fieldbus networks.
It offers innovation and security, firmly based on an open, universal standard. IO-Link is backward compatible with existing binary switching sensors, providing a step-by-step migration toward full utilization of the bidirectional IO-Link system. The sensor's IO-Link is activated on demand, and the sensors are fully capable of operating in traditional sensing modes.

Reduce spare part variety

In the past, devices with different characteristics were different physical units. Now, IO-Link can change the device parameters remotely, so one unit can behave exactly as the process requires. Simply install the replacement unit, and it will commission itself. The network knows the location, the unit ID, and its operating parameters. IO-Link guarantees universal connectivity and interfaces for all sensor variants.

HIPERFACE® DSL – the digital evolution

HIPERFACE® DSL leaves behind the need for analog circuitry, and places the motor control system entirely in the digital domain.

The challenge

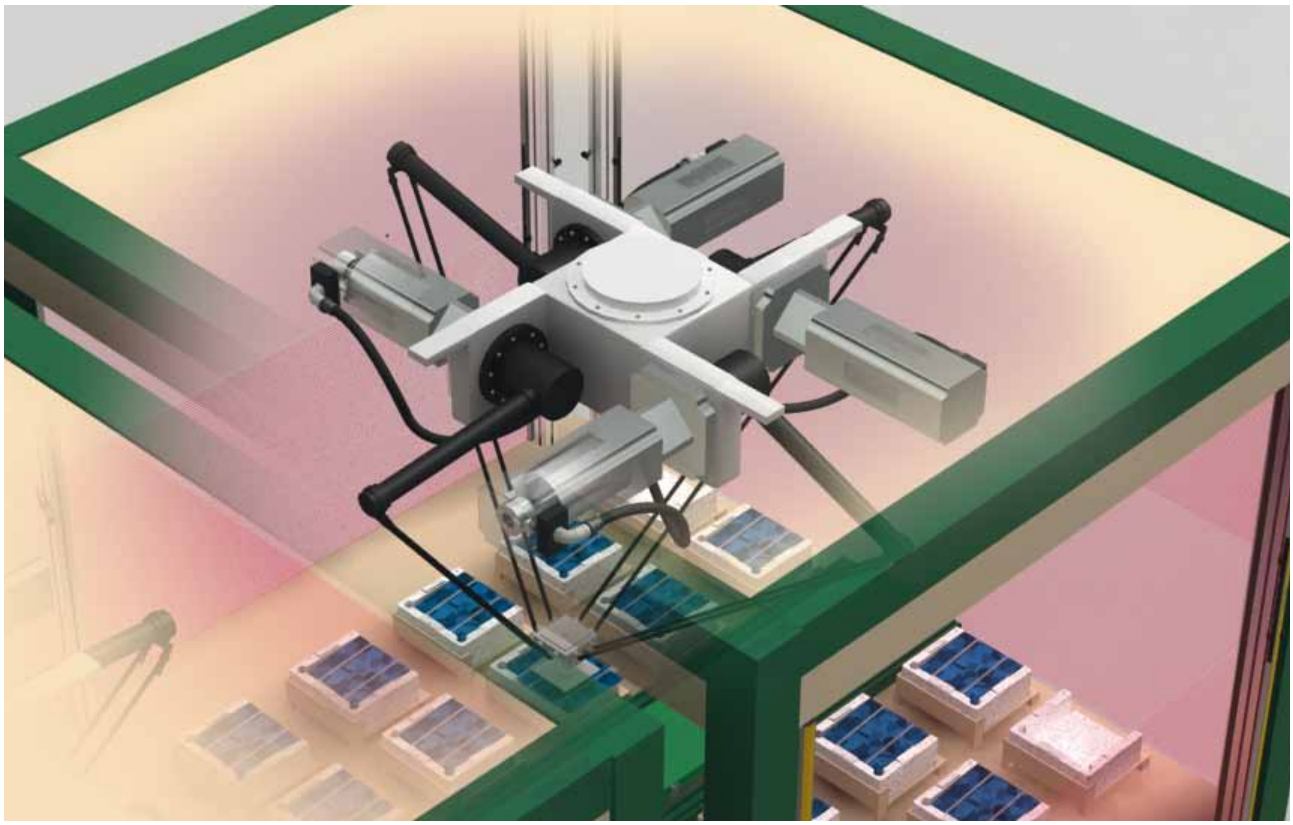
Develop a purely digital, 2-wire protocol that can share the motor power cable to provide bidirectional data between the drive and the servo motor.

The result

HIPERFACE® DSL supports a synchronous transmission speed of 9.216 Mbaud over standard cables to 100 meters.

Your competitive advantage

- Connection/cabling costs halved
- No analog to digital conversions required
- Automatic synchronization between the servo drive and motor
- Data communication certified up to SIL3, Performance Level e
- Up to 658 kbps reserved for user defined applications: e.g., extra temperature sensors, actuators, etc.



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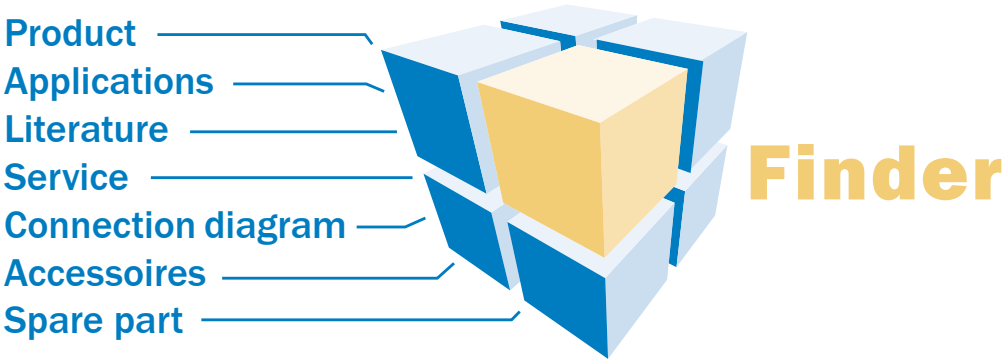
Search online quickly and safely with the SICK “Finders”



Product Finder: We can help you to quickly target the product that best matches your application.

Applications Finder: Select the application description on the basis of the challenge posed, industrial sector, or product group.

Literature Finder: Go directly to the operating instructions, technical information, and other literature on all aspects of SICK products.

These and other Finders at www.mysick.com

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Partner Portal
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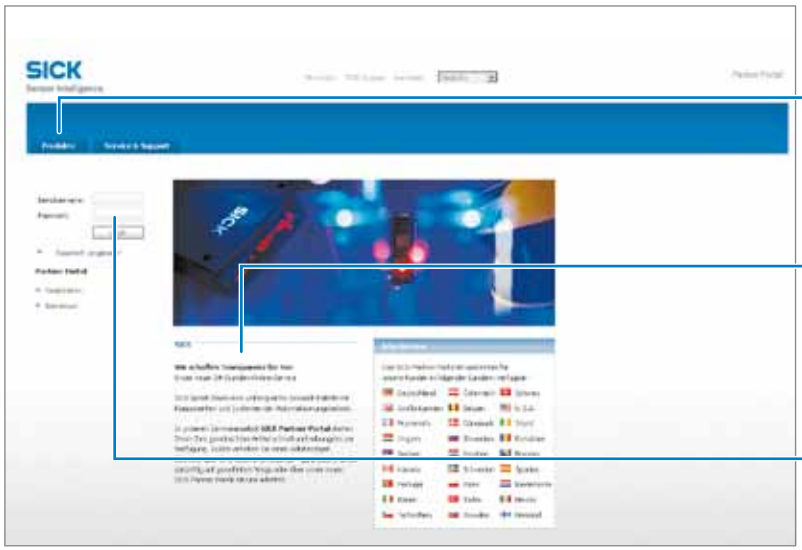

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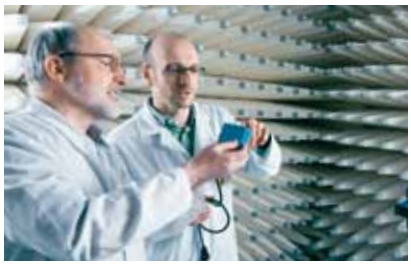
SICK at a glance



Leading technologies

With a staff of more than 5,000 and over 50 subsidiaries and representations worldwide, SICK is one of the leading and most successful manufacturers of sensor technology. The power of innovation and solution competency have made SICK the global market leader. No matter what the project and industry may be, talking with an expert from SICK will provide you with an ideal basis for your plans – there is no need to settle for anything less than the best.

Unique product range

- Non-contact detecting, counting, classifying and positioning of any type of object
- Accident and operator protection with sensors, safety software and services
- Automatic identification with bar code and RFID readers
- Laser measurement technology for detecting the volume, position and contour of people and objects
- Complete system solutions for analysis and flow measurement of gases and liquids

Comprehensive services

- SICK LifeTime Services – for safety and productivity
- Application centers in Europe, Asia and North America for the development of system solutions under real-world conditions
- E-Business Partner Portal
- www.mysick.com – price and availability of products, requests for quotation and online orders

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Sensor Intelligence.