



W4F

THE HIGHFLIER IN INTELLIGENT AUTOMATION

Photoelectric sensors

SICK

Sensor Intelligence.

THE HIGHFLIER IN OBJECT DETECTION

The intelligent automation of production plants is advancing at a rapid pace. The most important prerequisite: smart sensors that continuously monitor statuses, evaluate huge quantities of data, and provide relevant information to higher level systems.

Maximum power in a mini format

The W4F product family proves that the necessary intelligence is not a matter of size. It is comparable in performance to the W16 and W26 photoelectric sensors but will surprise you with its mini format housing. That makes the W4F the ideal solution for applications with limited installation space. And no longer do you need to worry about jet black, highly reflective, flat or transparent objects. Equipped with the SICK-specific ASIC technology SIRIC®, the small sensors are exceptionally insensitive to all known active and passive optical interference sources, for example as generated by modern LED lamps, and can be flexibly adapted to specialized automation applications.

The Smart Sensors in the W4F product family, which are powered by IO-Link, are ready for the most demanding Industry 4.0 applications. Practical features for intelligent monitoring and predictive maintenance ensure a very high reliability in operation.



MORE PERFORMANCE PER SENSOR

The W4F extends the SICK portfolio of photoelectric sensors for a broad range of applications. Despite its very compact dimensions, the sensor possesses features and performance parameters that only larger sensors could match in the past. Besides high performance, the W4F is characterized by its especially simple, convenient handling and rugged design.



PERFORMANCE PLUS THANKS TO NEW ASIC PLATFORM

With its W4F sensor, SICK is also bringing to the market a completely revised ASIC platform that delivers more performance and safety inside the housing. Safe digital signal processing is, after all, the foundation for high performance object detection. At the same time, the device is also insensitive to external influences. And another benefit: The new monitoring and diagnostic features expand the range of possible applications within automated plants.



BLUEPILOT

Aligned in a matter of seconds. Using the intuitive BluePilot operating concept, aligning the sensor is a quick, convenient and precise process assisted by visual feedback via the blue LEDs.



OPTICAL EXPERT

Whether it be transparent, especially flat or perforated objects, where other sensors hit their limits the W4F is in a whole new class of its own. The sensor delivers reliable values in virtually any application, regardless of the ambient conditions on site.



SMART SENSORS

The W4F Smart Sensor records numerous parameters that can be used for process control and machine optimization. Data such as temperature, operating hours or reflectance provide the foundation for automated sensor monitoring.



VISTAL®

When conditions get harsh: Thanks to its ultra-rugged VISTAL® housing, the W4F photoelectric sensor delivers reliable values even in areas where it is subjected to chemical, thermal or mechanical influences.

MULTIPIXEL RECEIVER WITH 127 PHOTODIODES

Thanks to its high sensitivity, the W4F detects jet black objects with pinpoint accuracy and reliably. The sensor also continuously records the distance to the object and transmits this information to the controller via IO-Link.

INTELLIGENT AUTOMATION

Digitalization of photocurrents directly at the pixel. This enables additional process and diagnostics data as well as supplementary information such as high speed counter values and object characteristics to be determined.

THE ONLY SENSOR ON THE MARKET WITH A DIFFUSE SENDER LED

With the help of a second sender LED and a second sender optics, the sensor is able to actively detect highly reflective objects within the detection area and suppresses their interfering light.

COMPACTLY PACKAGED IN A VISTAL® HOUSING

Well protected in a rugged and resistant housing made from VISTAL®, the new SICK technology performs its task unhampered in an industrial environment. Vibrations, shocks, chemical influences and temperatures up to 60 °C have no impact on the internals of the sensor.

THE BLUEPILOT OPERATING CONCEPT

The combination of teach-in button and potentiometer, supported by feedback from the blue LEDs, enables the sensor to be adjusted easily, quickly and reliably in a matter of seconds.

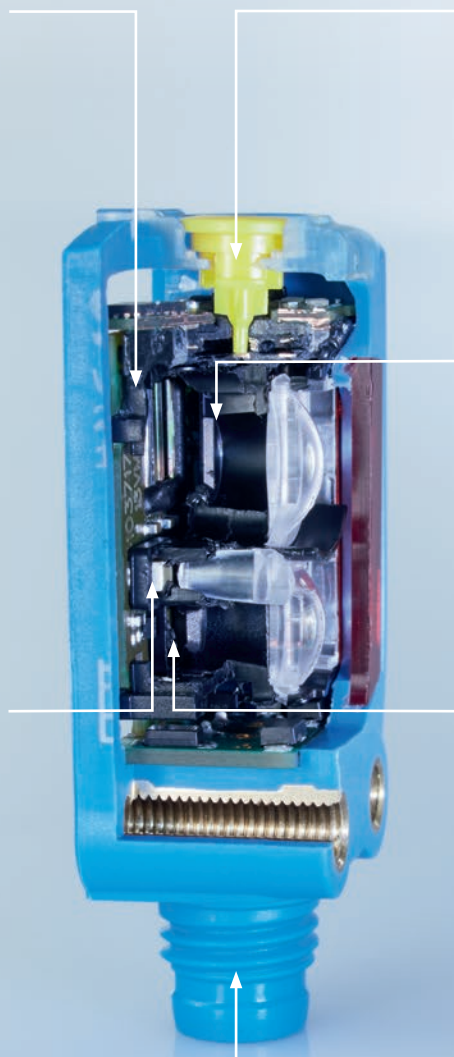
SELECTIVE AMBIENT LIGHT SUPPRESSION

With the help of the latest generation of ASIC technology from SICK, up to 6 ambient light sources can be blanked out in a targeted manner using digital filters.

HIGH PERFORMANCE LED TECHNOLOGY

In addition to the sender LED with diffuse light, the ASIC technology from SICK operates two high performance pinpoint LEDs. The power of the LEDs is adjusted in μs to the specific object, which enables the W4F to precisely detect both highly reflective as well as poorly remitting surfaces with no reflections and with adequate signal strength.

To be able to detect very flat and contrast-rich objects, the W4F photoelectric sensor uses a specially developed dual LED where the light spot is split into two halves. As a result of this splitting, the W4F delivers two data results which serves to increase the accuracy of the object detection.



OPTICAL EXPERTS

V-Optics

LESS IS MORE



With the help of its laser-like light spot, its V-optics, and its specially tailored optics design, the WTV4F V-Optics sensor can reliably detect even the most reflective or transparent objects such as wafers or displays. In applications that used to require reflectors, the W4F also utilizes the reflection from the surface of the object and thereby manages the task on its own. The sensor therefore requires less installation space, which provides more freedom in machine design.

Foreground suppression (FGS)

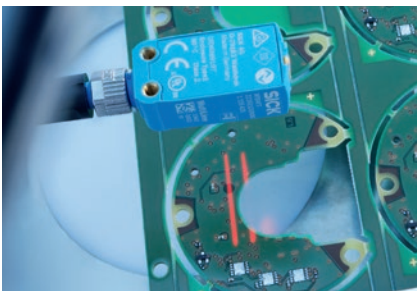
DETECTS FLAT OBJECTS SAFELY



Detecting very flat or highly reflective surfaces on conveyor belts used to be very challenging. Thanks to two LEDs and powerful foreground suppression, the WTF4F photoelectric proximity sensor is able to precisely detect thin displays or labels. And adjusting the photoelectric sensor is extremely easy via BluePilot.

DoubleLine

CONSISTENT RELIABILITY



The WTB4F DoubleLine photoelectric proximity sensor has been specially designed for the safe detection of perforated materials as well as objects with recesses or uneven surfaces. The two line-shaped light spots of the photoelectric proximity sensor ensure a continuous switching signal even for objects with holes or drillings. No additional controller capacity is required thanks to the integrated signal processing.

MultiSwitch

TWO SWITCHING POINTS – MANY POSSIBILITIES



In assembly processes, the WTB4F MultiSwitch monitors the correct mounting of components via two switching points. In beverage production, however, the switching points assist the sensor in differentiating between upright and horizontal packaging. The W4F photoelectric proximity sensor also has a distance value output feature that enables it to read the distance to the object via IO-Link and thereby check, for example, the fill level or roll diameter.

OVERVIEW OF SELECTED VARIANTS

Variant	Characteristic		Maximum sensing distance, best performance	User interface	Quality of alignment, Quality of run	Quality of teach	Current receiver level	Two switching points / distance information	Light spot details
Photo-electric proximity sensor with background suppression	WTB4FP	Allrounder with dot-shaped light spot	4 ... 220 mm 40 ... 140 mm	BluePilot: Teach-Turn adjustment, sensing range indicator		✓	✓		 Ø 4.2 mm (130 mm)
	WTB4FP Multi-Switch			BluePilot: Teach-in button, mode indicator		✓	✓	✓	
	WTB4FP	With focused dot-shaped light spot	4 ... 100 mm 30 ... 60 mm	BluePilot: Teach-Turn adjustment, sensing range indicator		✓	✓		 Ø 2 mm (50 mm)
	WTB4FP Multi-Switch			BluePilot: Teach-in button, mode indicator		✓	✓	✓	
	WTB4FT Double-Line	Two parallel line-shaped light spots	7 ... 120 mm 30 ... 80 mm	BluePilot: Teach-Turn adjustment, sensing range indicator		✓	✓		 1.2 x 17 mm (50 mm)
	WTV4FE V-Optics	V-optics with focused rectangular light spot	2 ... 50 mm 15 ... 30 mm	BluePilot: Teach-Turn adjustment, sensing range indicator		✓	✓		 Ø 0.5 x 1.9 mm (30 mm)
Photo-electric proximity sensor with foreground suppression	WTF4FD FGS	With two parallel focused light spots	0 ... 100 mm 30 ... 70 mm	BluePilot: Teach-Turn adjustment, sensing range indicator		✓	✓		 2 x 1 mm (50 mm)
Photo-electric retro-reflective sensor	WLD4FP	Dual lens with dot-shaped light spot	15 ... 5,000 mm 25 ... 4,500 mm	BluePilot: Teach-in button, alignment aid	✓	✓	✓		 Ø 38 mm (1 m)
Through-beam photo-electric sensor	WSE4FP	Allrounder with dot-shaped light spot	0 ... 8,000 mm 0 ... 5,000 mm	BluePilot: Alignment aid	✓	✓	✓		 Ø 100 mm (2 m)

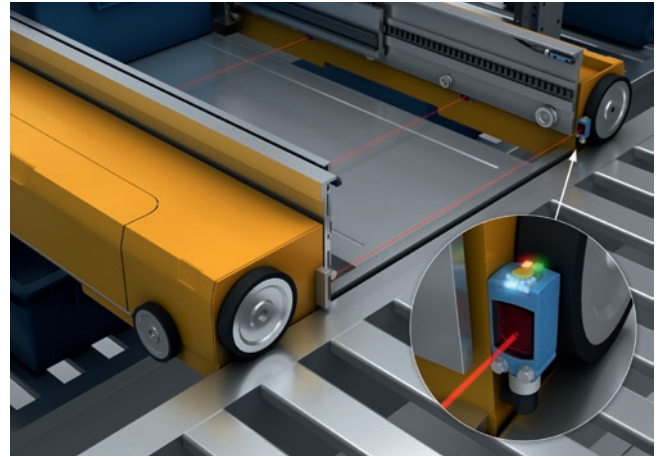
APPLICATIONS

The W4F product family is suitable for a wide variety of demanding industrial applications.



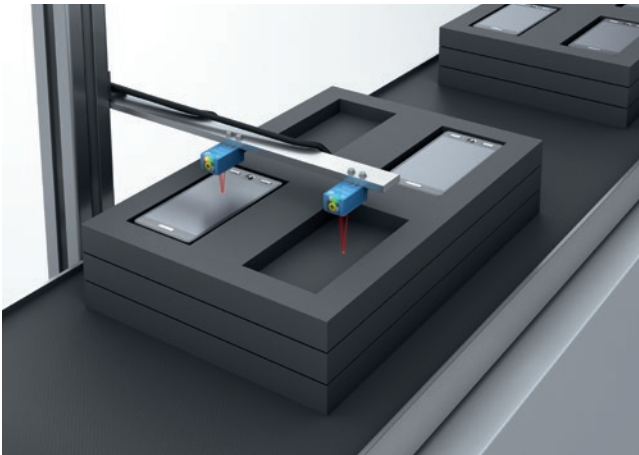
Detection in lane applications

In lane applications, the WTB4F MultiSwitch photoelectric sensor detects beverage packaging. Thanks to two different switching points, the sensor can detect whether the packaging is upright or horizontal.



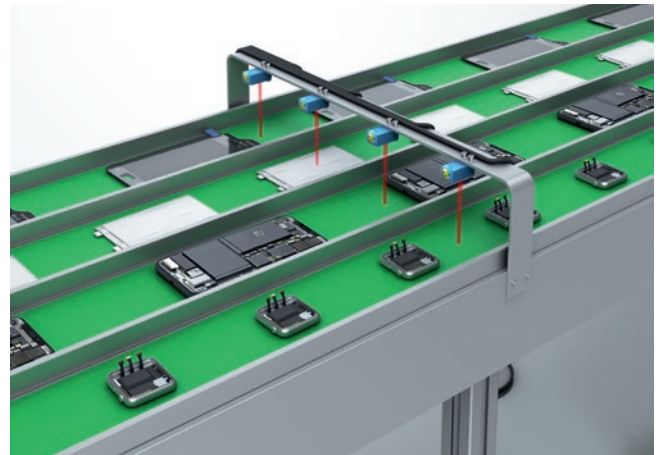
Checking of shuttle loads

The WLD4F photoelectric retro-reflective sensor detects plastic boxes on a shuttle to ensure that no boxes are projecting from the shuttle. This prevents collisions between the boxes in the production process.



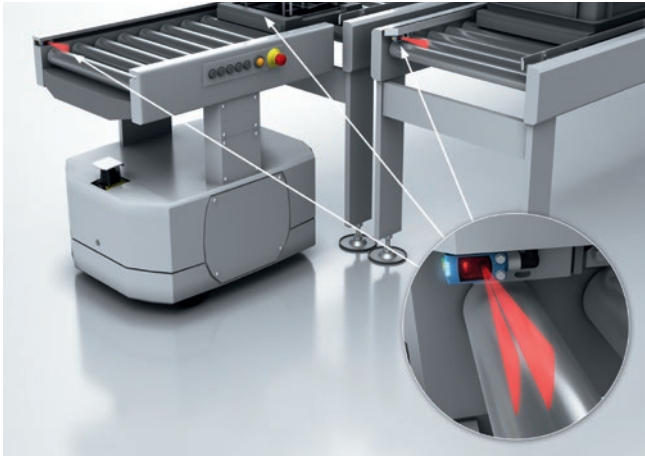
Occupation checking of trays

When transferring trays to a processing station, the WTV4F V-Optics checks whether the trays are occupied. The particular challenge in this case is the small distance between the object surface (smartphone) and the background (the bottom of the trays).



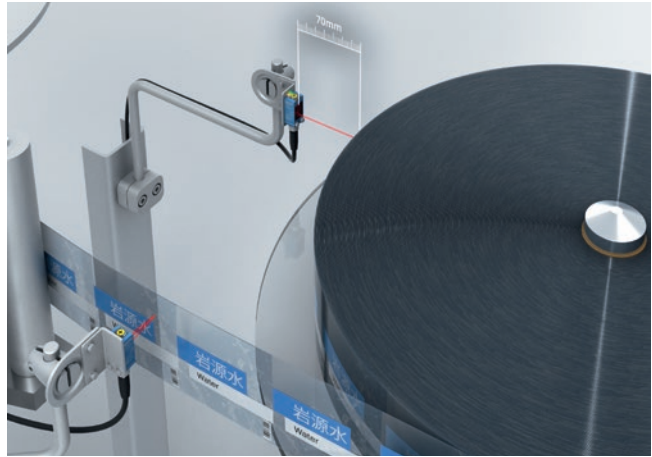
Detection of flat objects on conveyor belts

In the electronics industry, the WTF4F sensor with foreground suppression reliably detects objects on conveyor belts, e.g. printed circuit boards, displays, smartphones and assemblies. The detection is reliable and certain even for reflective, contrast-rich or jet black surfaces.



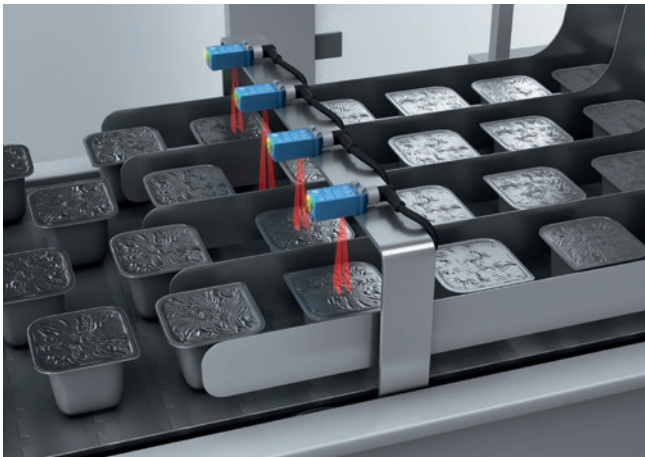
Safe detection of containers with recesses

In modern manufacturing plants for printed circuit boards, the PCBs and assemblies are transported in magazines or trays that have depressions and steps. The WTB4F DoubleLine photoelectric sensor uses two logically linked light lines to reliably detect the individual magazines and trays despite their uneven surface structure.



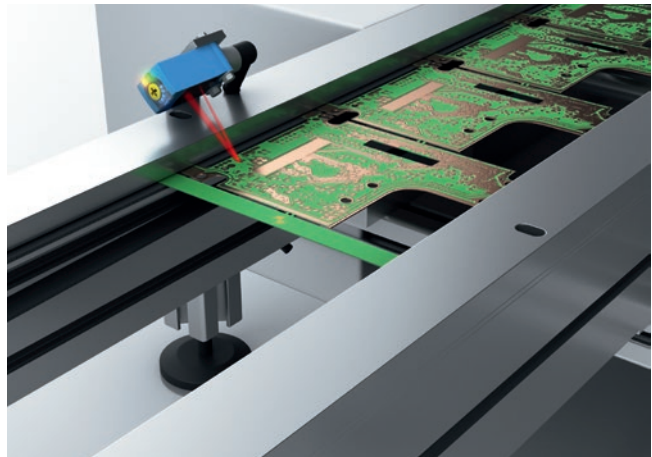
Feed monitoring of label films

The WTV4F V-Optics photoelectric sensor ensures correct feeding of the film rolls – including issuing a warning if the film is torn. The WTB4F MultiSwitch also delivers, through a distance value output and two independent switching points, information on the diameter of the roll so that it can be replaced in a timely manner.



Detection of flat, structured objects

In lane applications, the sensor needs to detect difficult surfaces from above. The WTB4F DoubleLine photoelectric sensor detects biscuits, gel packs, chocolate bars and soup pouches with irregular shapes and independent of their surface characteristics.



Crosswise detection of printed circuit boards

Crosswise detection of printed circuit boards is often necessary for process-related reasons but demanding as reflective surfaces can reflect away a large proportion of the emitted light. The WTB4F photoelectric sensor, however, ensures a reliable detection signal thanks to its highly precise, focused light spot and powerful receiver optics.

SMART SENSORS



The Smart Sensors from SICK are supporting plant operators in networking their production and control processes. Besides providing a stable data basis and efficient communication, the diagnostic functions and Smart Tasks in particular of the W4F product family make them intelligent assistants.



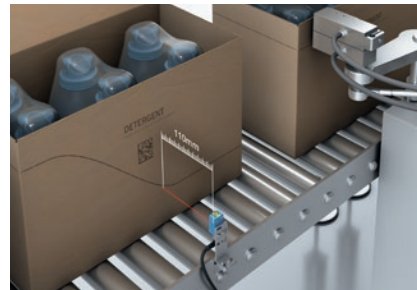
Enhanced Sensing

CONSISTENTLY STABLE PERFORMANCE

The Smart Sensors from SICK deliver safe and reliable detection and measurement results at all times. These sensors automatically detect faults during operation and actively troubleshoot problems that may arise. Many Smart Sensors even offer different operating modes, including manual adjustment of detection or measurement parameters, to enable them to be dynamically adapted to tasks if necessary.

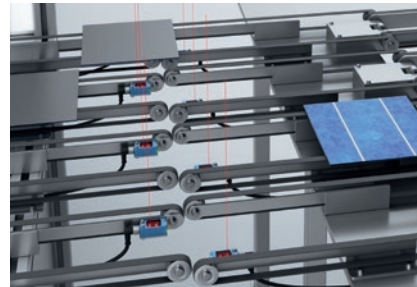
DISTANCE VALUE

Outputting precise distance values during detection significantly expands the application possibilities of photoelectric proximity sensors. These values can be used, for example, to optimally position objects for further process steps.



CURRENT RECEIVER LEVEL

The W4F photoelectric proximity sensor can determine the reflectance of the object surfaces being detected. These data form the basis for intelligent process control or quality monitoring.



QUALITY OF ALIGNMENT

Thanks to feedback on the alignment quality, the sensor can be commissioned quickly and easily and with maximum operational safety.



Monitoring and diagnostics

STAY IN FULL CONTROL

Knowing at all times the status of your machine and plant systems: the diagnostic functions of the W4F sensors make this possible. The sensor sends comprehensive data for monitoring purposes via IO-Link. In addition, it features automatic self-monitoring and autonomously reports when process parameters such as temperature or degree of contamination are incorrect. Device and plant maintenance can therefore be scheduled predictively and as required, which minimizes unexpected system downtimes. And should a problem nevertheless arise, the extensive diagnostic data enable the cause to be quickly identified.

DEVICE STATUS

The operator of a machine or system can stay informed in real time about the status of his W4F sensors via IO-Link. This allows condition-based maintenance, avoids downtimes, and saves costs.

OPERATING HOURS

The W4F photoelectric sensor comes with a resettable counter that precisely records the operating hours of the sensor.

TEMPERATURE

The sensor outputs its current temperature zone, which enables its status to be continuously monitored. If the device remains in a critical temperature zone over an extended period of time, it needs to be maintained before an unplanned production downtime occurs.



QUALITY OF RUN

If vibrations or contamination during operation lower the operational safety of the machine or plant systems, this can be detected early and rectified with no loss of performance.





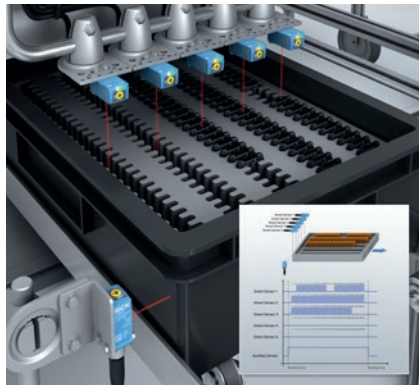
Smart Tasks

PROCESSED DATA FOR YOUR SYSTEM

Thanks to Smart Tasks, the W4F delivers exactly those data that the system requires for specific tasks. The remote processing of measurement data in the sensor speeds up their evaluation and makes it easier to provide the data to higher levels in the automation network. The Smart Tasks also eliminate the need for high performance and costly additional hardware, which ensures lean processes and reduces costs.

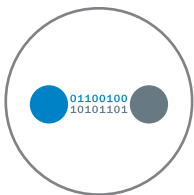
SPEED AND LENGTH MEASUREMENT

The intelligent W4F photoelectric proximity sensors enable the speed of objects to be measured precisely, regardless of any slippage of the conveyor belt. Based on the object length data, it is possible to implement simple sorting and classification in the process without additional measurement sensors.



LOAD MAPPING

Using a “Load Mapping” function, the W4F sensor detects the occupation of workpiece carriers while they are moving and transmits the information about the occupied and unoccupied locations to a higher control level, e. g., a robot controller.



Efficient communication

ENSURING TROUBLE-FREE DATA EXCHANGE



IO-Link allows trouble-free communication between the intelligent sensors and higher level systems – in real time. The continuous digital data transmission makes process control not only significantly more flexible, but also more efficient and economical. When replacing one sensor with another, for example, incorrect settings can be avoided by automatically transferring the control parameters of the previous sensor to the new sensor via IO-Link.

FAST COMMISSIONING

Manually retrofitting the W4F photoelectric sensor is child's play and completed in next to no time thanks to plug and play commissioning. Sensor parameterization via the controller avoids incorrect sensor settings and increases machine availability.

DIGITAL DATA TRANSMISSION USING IO-LINK IN AN AUTOMATION NETWORK



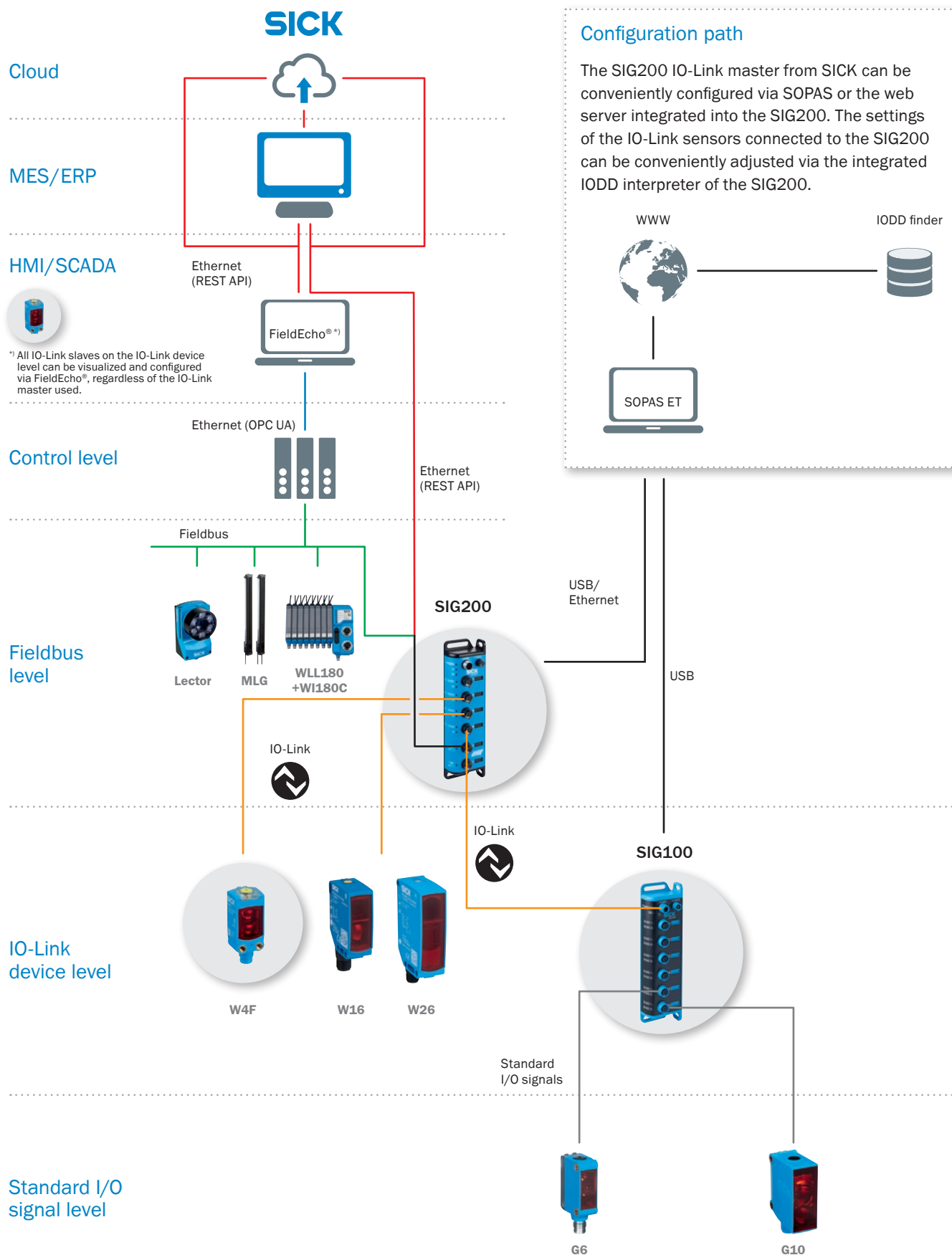
IO-LINK

The intelligent W4F photoelectric sensors offer additional utilization potential well beyond simple binary 0 and 1 switching signals. A consistent data communication concept right down to the lowest field level is crucial in exploiting the features and technologies of these Smart Sensors, and making machines and systems more productive as a result.

IO-Link has been used to define an open interface between sensors and actuators as well as input/output assemblies. IO-Link provides a point-to-point connection within any fieldbus network, which sensors such as the W4F can use to receive and send data fully digitally.

FULLY NETWORKED WITH SIG200 AND FIELDECHO®

Thanks to the SIG200 IO-Link master from SICK and FieldEcho®, Smart Sensors such as the W4F variants and arbitrary other IO-Link devices can be ideally integrated into the machine network and up to the cloud. This ensures maximum transparency, flexibility and reliability in automated production processes.



You can find SICK's comprehensive sensor portfolio at → www.sick.de

SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 10,000 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents, and preventing damage to the environment.

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

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

That is “Sensor Intelligence.”

Worldwide presence:

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

Detailed addresses and further locations → www.sick.com