SENSOPART

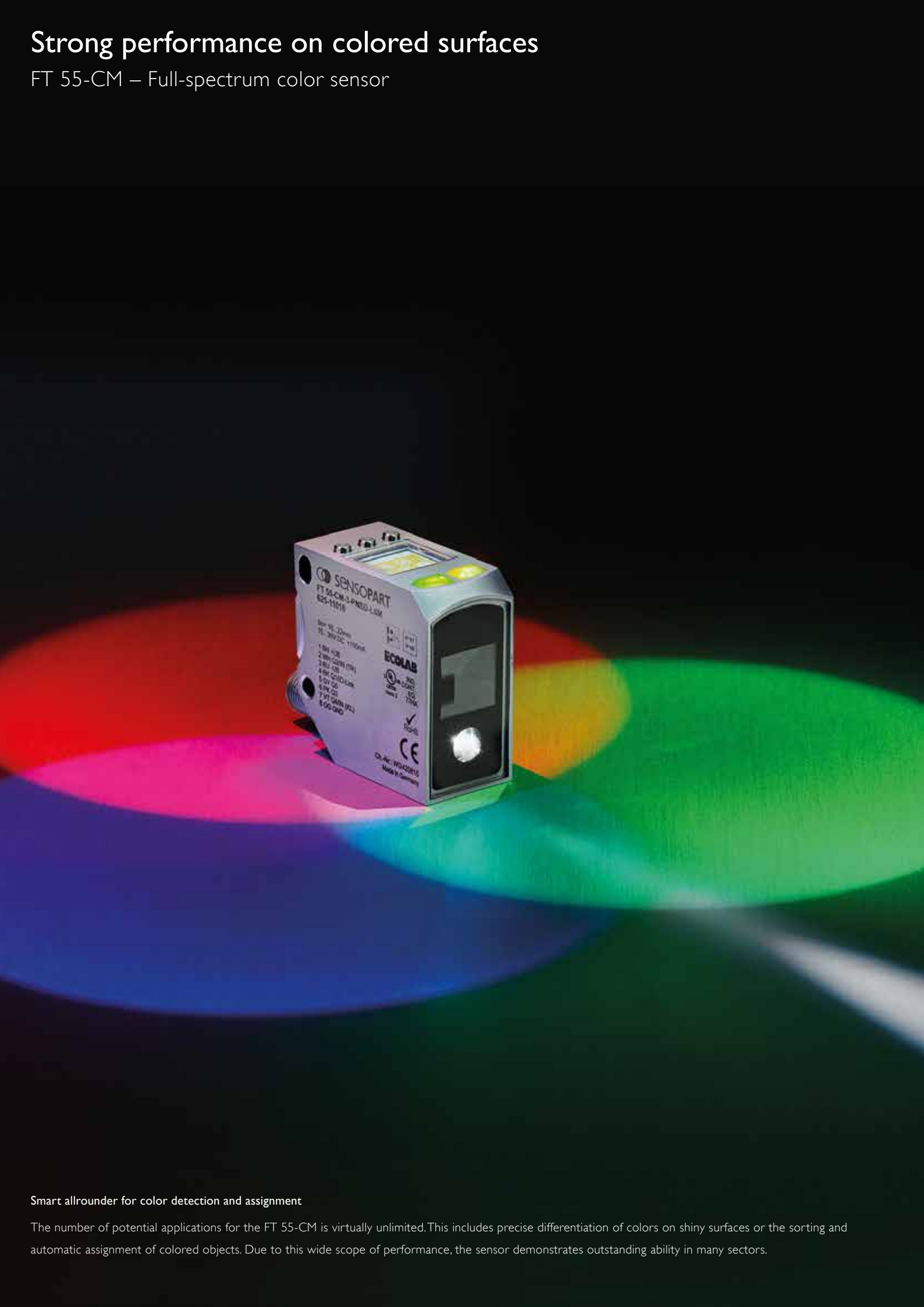
Product overview

Sensors for factory automation

Optical sensors | Ultrasonic sensors | Inductive sensors

Strong performance on colored surfaces

FT 55-CM – Full-spectrum color sensor



Smart allrounder for color detection and assignment

The number of potential applications for the FT 55-CM is virtually unlimited. This includes precise differentiation of colors on shiny surfaces or the sorting and automatic assignment of colored objects. Due to this wide scope of performance, the sensor demonstrates outstanding ability in many sectors.

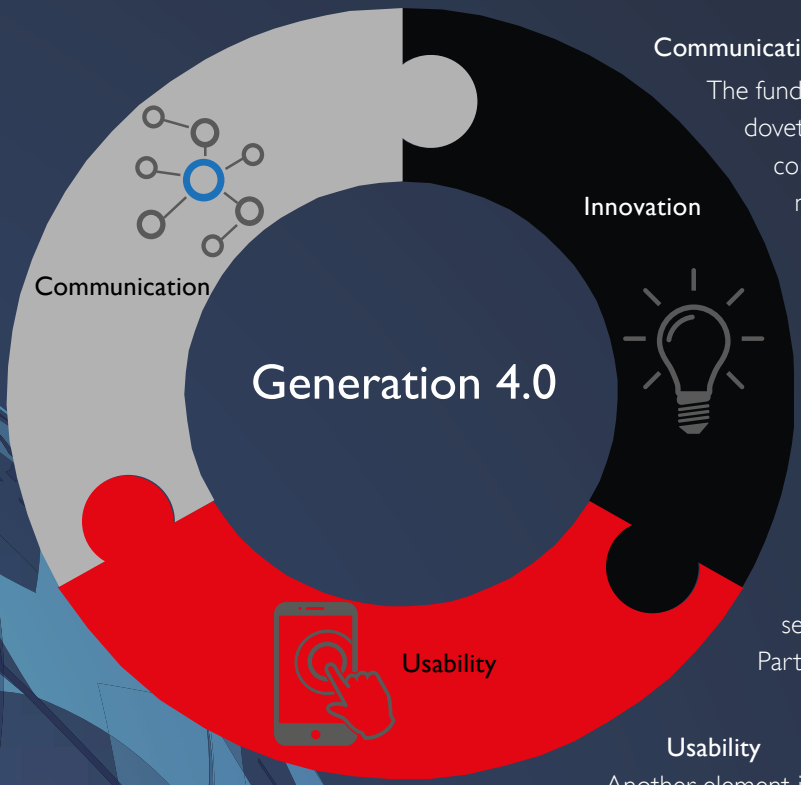
Contents

Generation 4.0 – future-oriented sensors from SensoPart

The basis for interaction with parent IT systems and compatible with Industry 4.0

How will intelligent production look in the future?

The answer is simple: it will be connected, communicative, digital, innovation-friendly as well as easy to install and to operate. And these are just some of its facets. Implementation requires sensors that can deliver information in real-time and monitor themselves. SensoPart groups these specifications under three key words: communication, innovation and usability.



Communication

The fundamental concept of the fourth industrial revolution is the dovetailing of production with state-of-the-art information and communication technology. Sensors allowing two-way communication, i.e. they can send and also receive information, form the technical foundation. This enables access to data and parameters that were previously withheld from the control system, providing a basis for standardised communication.

Innovation

SensoPart's aim is to always be one step ahead, and to be able to offer our customers the most innovative product on the market. These include BlueLight sensors, as well as high-end sensors, such as the FT 55-CM color sensor. The world's smallest distance sensor is also a SensoPart innovation.

Usability

Another element in the implementation of Industry 4.0 concepts is the easy installation and usability of sensors. SensoPart has achieved this by equipping sensors with an extensive range of additional functions. One example is digital color value output, which makes it possible to distinguish any number of different colors. SensoVisualize – the standard software tool – enables parameter settings and the visualisation of process data.

Interconnected system architecture

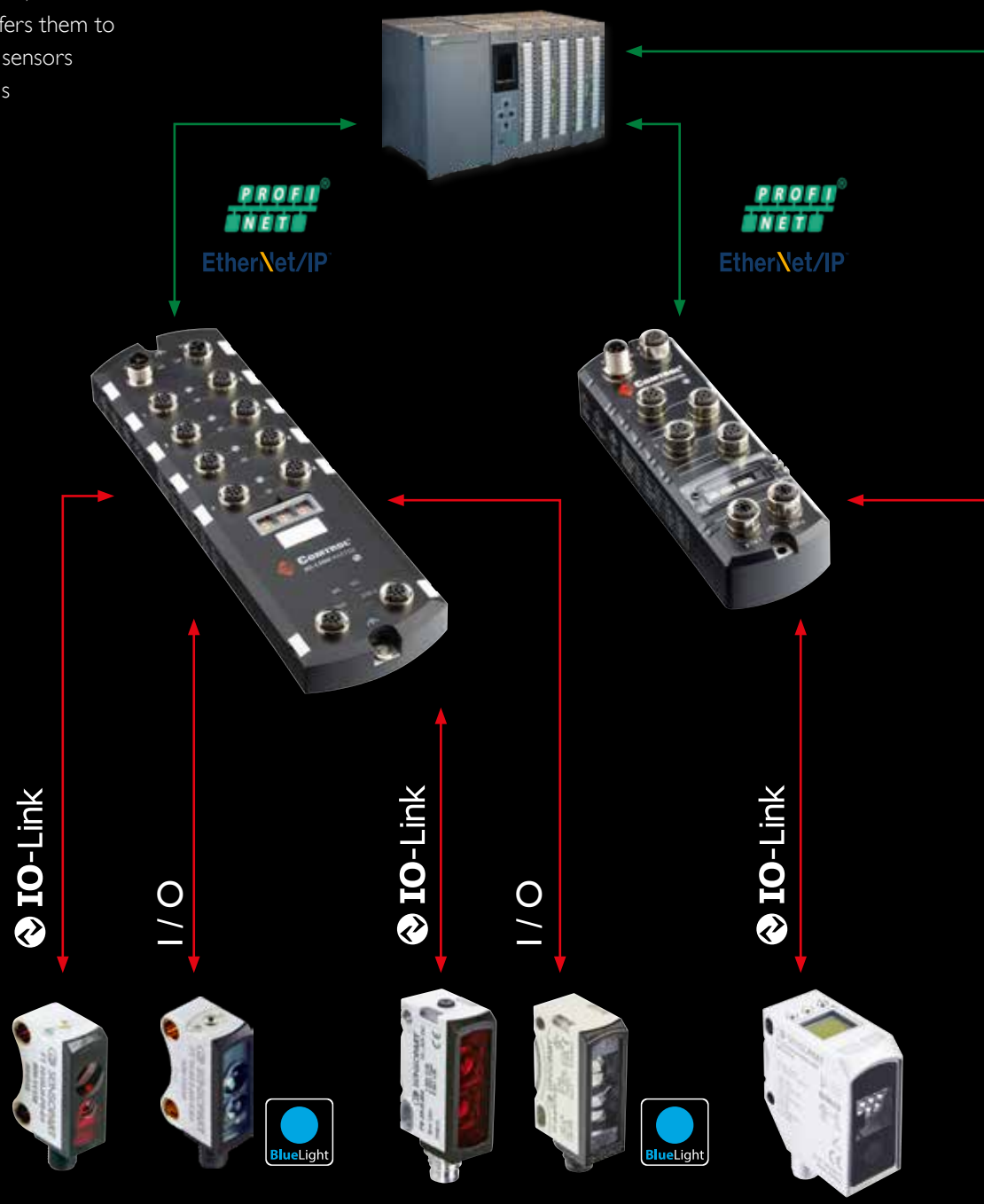
Efficient, communicative, scalable

Automated communication
When data storage is enabled, the master saves the settings and transfers them to the new sensor. All IO-Link sensors from SensoPart support this function.

Simple
Use of existing unshielded IO cables, up to 20 m in length for IO-Link sensors.

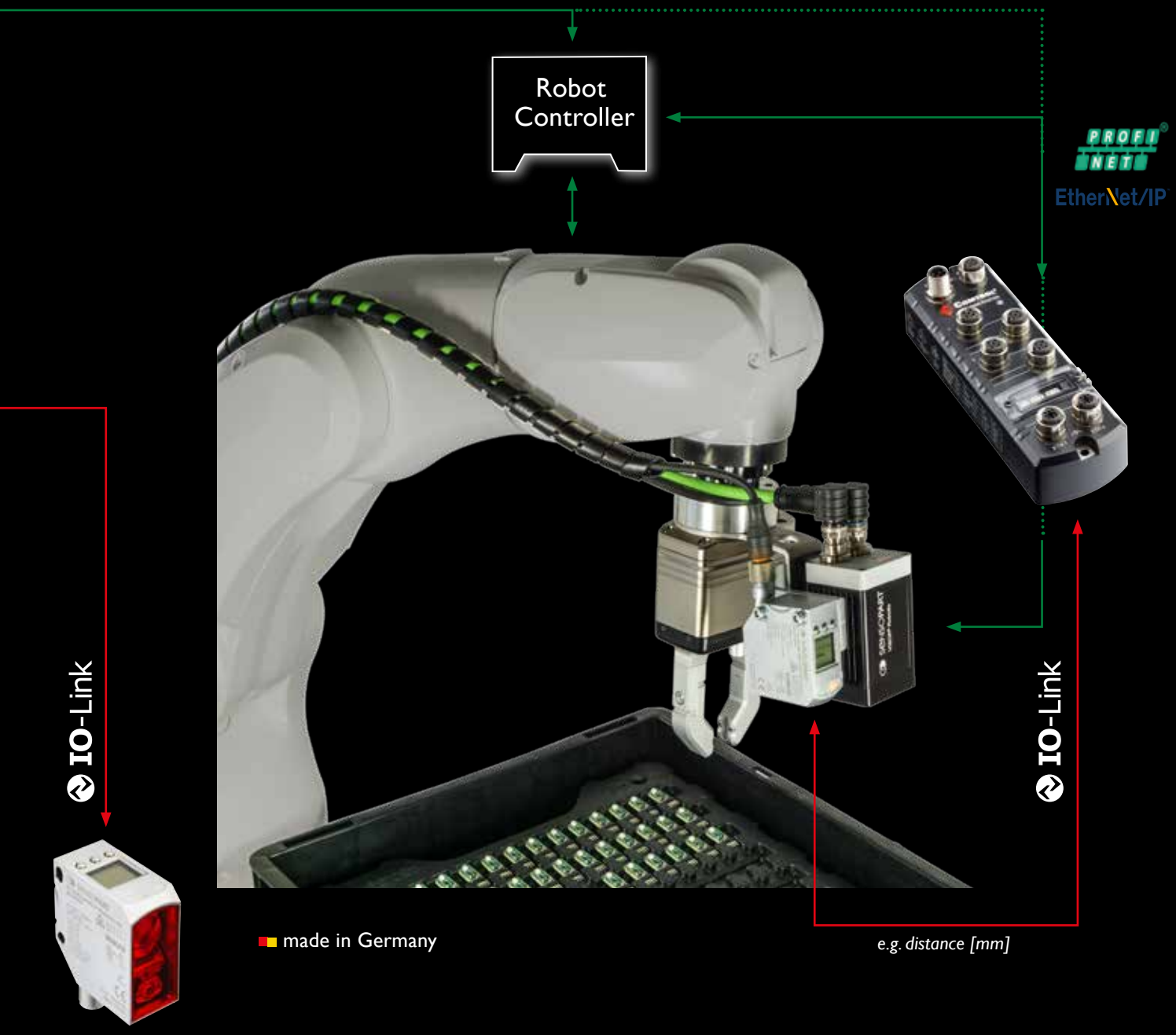
Cost-saving
Fast installation through simple, decentralised cabling. Less cables = less effort.

Transparency
Two-way communication up to the lowest field level, allowing greater transparency. Availability of a large amount of relevant data, e.g. for condition monitoring.



Versatility
Combined use of IO-Link and binary sensors is easily possible on the IO-Link Master. All IO-Link sensors from Senso-Part can also be operated in standard binary mode.

Functionality
Example FT55-CM: output of color values via IO-Link, additional functions (e.g. smart functions) are directly in the sensor.

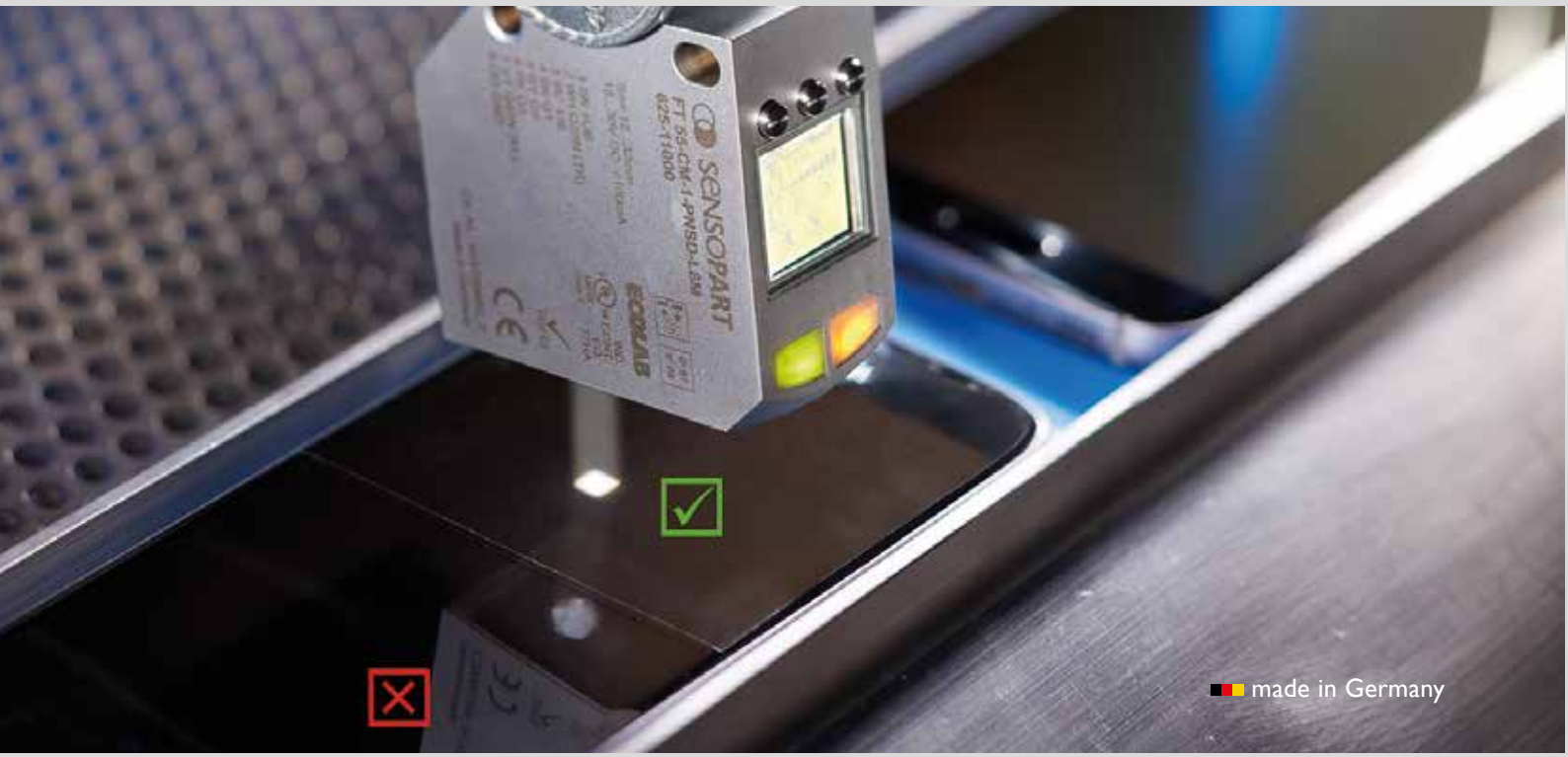


Precision
The digital transfer of previously analogue measurement values avoids cable-related transmission errors and the general limitations of analogue measuring technology. This enables considerably higher transmission accuracy.

Compatibility
The cascadability of the IO-Link Master allows combinations with other Profinet / EthernetIP devices. For example, in robotics applications, the X and Y value and also rotation can be detected with the VISOR® and the Z value with a distance sensor. This architecture also reduces cabling work.

FT 55-CM color sensor – smart performance

Compact sensor family for reliable color detection or assignment



The new compact color sensor from SensoPart is a true allrounder:
The FT 55-CM color sensor offers a scope of functions and level of user-comfort that are unsurpassed in its performance class. The wide operating range – independent of distance – combined with the flexible color detection feature gives a diverse range of applications. The large integrated **LCD display** and **remote** configuration through **IO-Link** or the associated sensor software set new standards in ease of use and connectivity.
This unique combination of characteristics makes the sensor ideally suited for challenging color detection and sorting tasks, for example in machine construction and in the automotive, plastics, pharmaceutical or packaging industries.

TYPICAL FT 55-CM

- Stable processes thanks to intelligent color detection regardless of distance
- Economical solutions through up to twelve storable colors or jobs
- Dependable switching behaviour through reliable glare suppression (depending on model)
- Intuitive sensor setup with integrated LCD display
- Application customisation through digital color value output using IO-Link
- Stable processes with non-flat objects thanks to trigger mode

Inspection of car fuses

Inspection of shiny blister packs

Distinguishing between polished and non-polished metal surfaces; foil detection on shiny surfaces

Inspection of lids or labels

Well-equipped with FT 55-CM:
The number of potential applications for the FT 55-CM is virtually unlimited. This includes precise differentiation of colors on shiny surfaces or the sorting and automatic assignment of colored objects. Due to this wide scope of performance, the sensor demonstrates outstanding ability in many sectors.

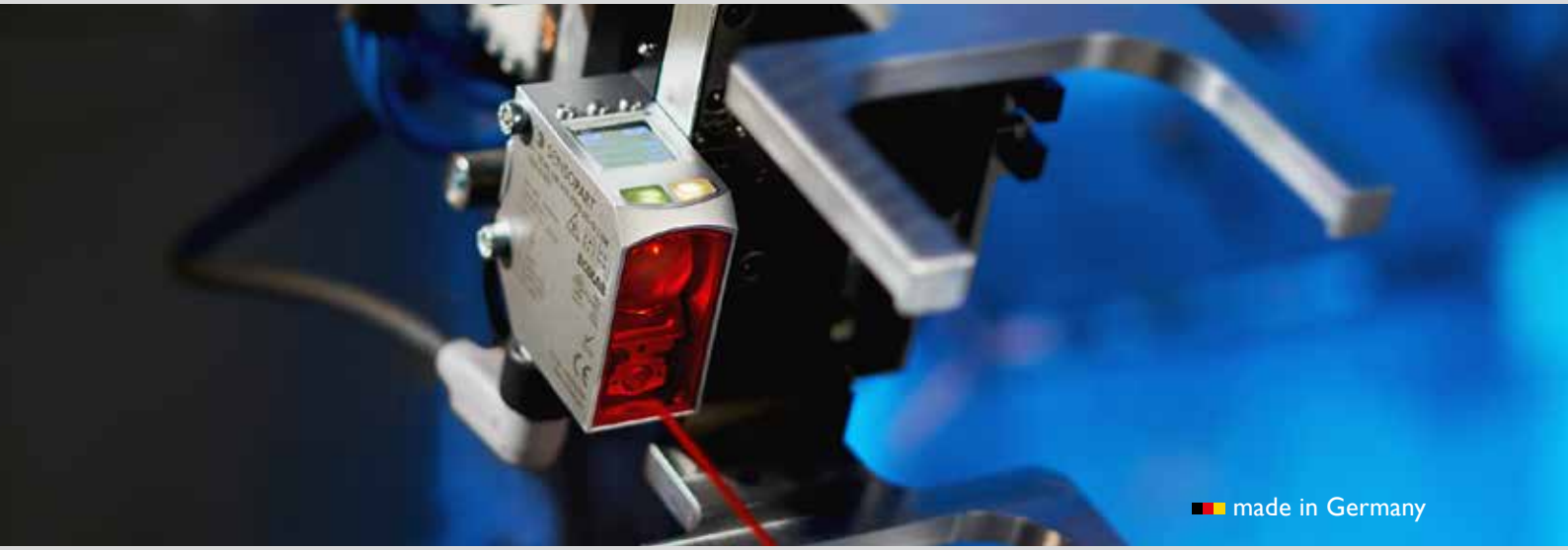
Color detection of packaging elements

Examples of sectors and applications:

- Color differentiation of plastic and leather components (automotive industry)
- Color check of packaging elements, e.g. glue spots (packaging industry)
- Differentiation of contents based on different caps (pharmaceutics industry)
- Sorting of plastic or glass bottles (food and beverage industry)
- Detection of colored markings on metal surfaces (metal processing)

FT 55-RLAM – The allrounder for distance measurement

Compact sensors for precision measuring tasks and reliable object detection



A universal allrounder:
The FT 55-RLAM reliably detects surfaces from black to shiny. Offering extensive connectivity, the triangulation sensor is equipped with an analogue output, two switching outputs, an **IO-Link** interface and an optional RS485 interface. The laser class 1 sensor comes with an innovative and user-friendly operating concept including a large LCD display, unusual in this performance category.

IO-Link ECOLAB IP69 cULus LISTED CE

TYPICAL FT 55-RLAM

- Stable processes thanks to excellent sensor qualities across the entire operating range
  - Operating range up to 600 mm / 1000 mm
  - Repeatability ≤ 40 µm / ≤ 100 µm
  - Linearity ± 0.6 mm / ± 1.5 mm
  - Resolution 30 µm / 50 µm
- IO-Link – a future-proof interface that meets the demands of Industry 4.0
- Laser class 1 – for optimum security
- Simple and fast setup using the intuitive LCD display
- Robust metal housing – sensor durability even in challenging processes
- Thickness or parallel differential measurement in master-slave mode

Utmost precision for diverse applications

This unique combination of characteristics makes the FT 55-RLAM sensor ideally suited for diverse sectors and applications, for example precise positioning in robotics tasks, measuring coil diameters or monitoring the tension of web materials. Thanks to the master-slave function, the sensor can also be used for width or thickness measurements. One sensor – countless applications!

Determining the exact position of parts on an assembly line

Determining the position of a package so that it can be gripped by a robotic arm

Checking if injection moulding tools are empty from a long distance

Master-slave mode for measuring material thickness or detecting a double feed

Examples of sectors and applications:

- Determining the position of car body parts to be mounted (automotive industry)
- Determining the position of parts to be gripped (robotics)
- Monitoring the diameter of web material (packaging industry)
- Determining the diameter of metal coils (metal processing)

BlueLight sensors from the F 10, F 25 and F 55 series.

Reliable identification of objects that are difficult to detect

made in Germany

Developed specifically for recognising objects that are difficult to detect, **BlueLight** sensors are true allrounders. The BlueLight series offers much greater detection efficiency in special applications – even with very dark or highly transparent objects. Reflective surfaces are no longer a problem!

Increased detection efficiency is achieved by the higher intensity of blue light and by the varying interaction of different light colors with the surface of the target object. Short-wave blue light does not penetrate as deeply into the target object as red light and a greater proportion is therefore reflected. This can be a decisive feature when detecting poorly reflective transparent objects.

TYPICAL BLUELIGHT

- Stable process thanks to reliable detection of highly transparent or strongly light-absorbing objects
- Reliable detection even at angles of almost 90° (e.g. with round objects)
- Absolute background suppression using SensoPart BGS technology – critical background situations are no longer an issue
- Adjustable background suppression
- Complete portfolio:
  - BlueLight sensors in three different sizes
  - Subminiature, miniature and compact housing

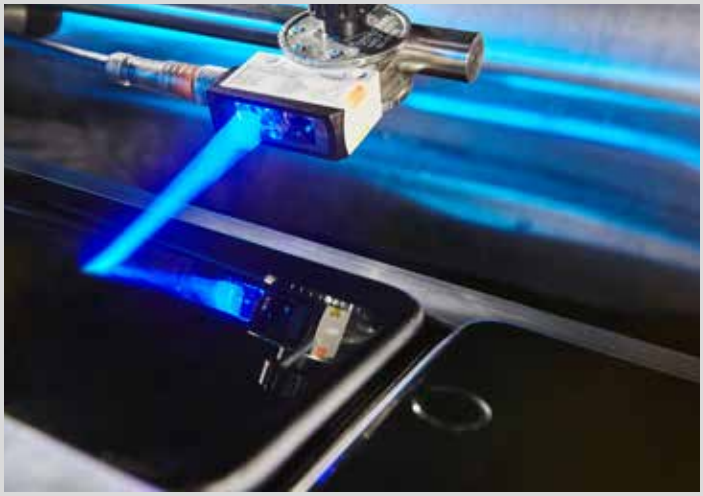
ECOLAB IP69 c UL us LISTED CE

BlueLight

SensoPart BlueLight sensors are also equipped with a high-precision optical concept tailored specifically to blue light, a sophisticated electrical design and SensoPart receiver technology with the best background suppression on the market. A combination of the latest algorithms and SensoPart BlueLight technology opens up completely new possibilities in the detection of 'difficult' objects.

In subminiature housing
Measuring just 21.1 x 14.6 x 8 mm, the F 10 BlueLight is perfect for installation in confined spaces.

Transparent objects become visible
No complex installation of reflectors, no background reflections. Thanks to SensoPart BlueLight technology, transparent objects are reliably detected.



Exceptionally flexible
Even extreme angles of view are no problem for BlueLight sensors.

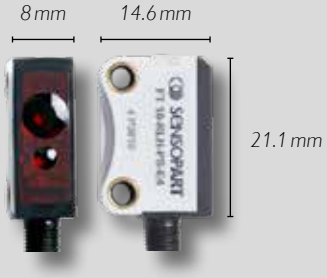
Examples of sectors and applications:

- Detection of metal parts and black plastic components (automotive industry)
- Presence of bottles or dark plastic lids (beverage industry)
- Detection of transparent film / containers / labels / blister packs (packaging industry)
- Presence of transparent test tubes / syringes / pipette tips (medical technology / pharmaceuticals)
- Presence and positioning of wafers (solar industry)

FT 10-RLA – The smallest optical distance sensor in the world

Subminiature distance sensor for precision measurement tasks in confined spaces

When things get too cramped:
The **FT 10-RLA** demonstrates outstanding ability, even in extremely cramped installation conditions. As the smallest optical distance sensor in the world, it is ideally suited to challenging measurement tasks, e.g. during assembly of semi-conductor devices or in robotics applications.



Small but powerful
Measuring just 21.1 x 14.6 x 8 mm in size and only 10 grammes in weight, it is scarcely larger than the tip of your finger – and therefore ideal for cramped conditions.

TYPICAL FT 10-RLA

- Minimum weight, ideal for robotics applications
- Also suited to smallest installation space thanks to minimal dimensions
- Output of measured values via IO-Link
- Excellent sensor characteristics with repeat accuracy and linearity
- Measuring range 10 to 70 mm
- Laser class 1 for optimum eye safety

IO-Link ECOLAB IP67 cULus LISTED CE

Small sensor with big performance

- Excellent repeat accuracy and linearity. Ideal for challenging applications.
- With a blind zone of just 10 mm, nothing escapes the sensor!
- Can also be used in cramped conditions; ideal alternative to fibre-optic cables.
- Digital output of measured values via IO-Link – equipped for the future!

Checking accuracy of installation or presence of components

Detection of double layers on printed-circuit boards, or checking the height and presence of components

Distance measurement in robotics applications directly from the gripper

Examples of sectors and applications:

- Robotics, e.g. distance measurement on gripper
- Electronics production, e.g. double layer control on printed circuit boards or height check of components
- Assembly and handling technology, e.g. for checking accuracy of installation

IO-Link @ SensoPart

Utmost process security thanks to smart sensor technology

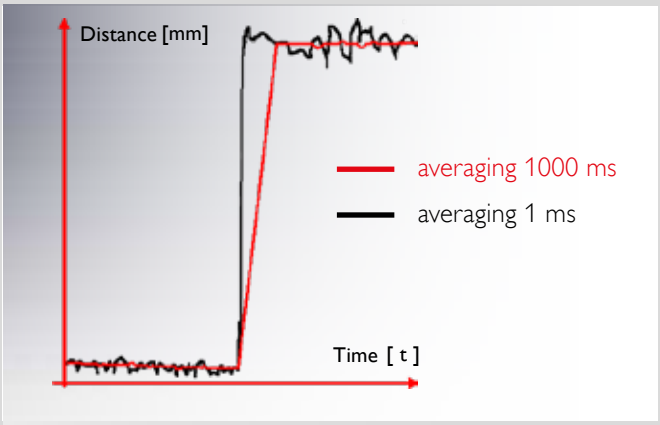
Absolute adjustable switching point

- Precise setting of switching points and measuring areas in mm, directly on the PC
- Fast and easy set-up as sensors can be pre-configured directly with information from the installation diagram
- High precision settings thanks to factory-calibrated switching points
- Applies to all measuring and BGS-IO-Link sensors from SensoPart

Output of RGB color values

- Output of RGB values with color sensors via process data
- Virtually any number of colors can be detected via the control system
- Applies to the color sensor FT 55-CM

Modern sensors are not just distinguished by high-performance hardware but also by a sophisticated software, which can at last exploit the full potential of the sensors' technical characteristics. These functions can solve common tasks with absolute process reliability or open up new fields of application.

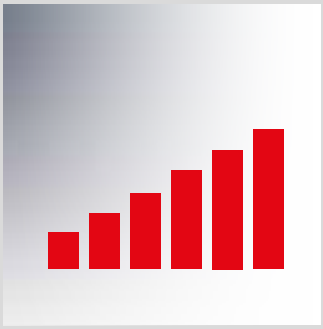


Adjustable mean value filter

- Arithmetic mean value for smoothing signal path
- Reduced signal noise and improved repeatability
- For slow processes with high precision demands, a high mean value filter can be set and repeatability improved
- Applies to all measuring IO-Link sensors from SensoPart

Signal quality

- Cyclic or acyclic output of signal quality
- Immediate feedback for correct sensor alignment
- Detection of contamination on sensor and early information to service team. This reduces downtime and increases productivity
- Applies to all measuring and BGS-IO-Link sensors from SensoPart



SensoVisualize – Software for parameter settings & visualisation

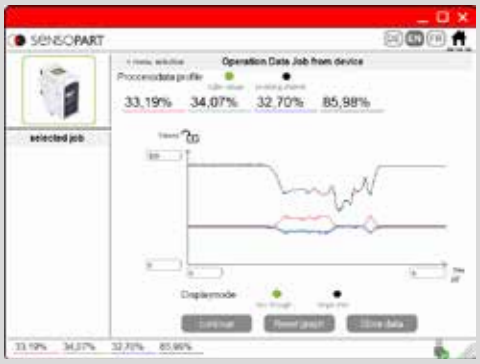
Quick and intuitive to use

SensoVisualize is a software that can be used to set parameters on sensors and visualise process data, and can be utilised with all sensors with an integrated IO-Link interface. The interface is designed so that functions are read from the device description file (IODD). For example, switching points can be set centrally without having to carry out adjustments on the sensor itself.

TYPICAL SENSOVISUALIZE

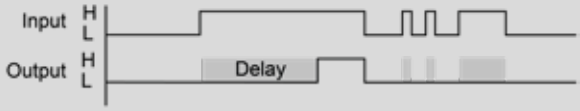
- Software tool for sensor parameter settings and the visualisation of process data over time
- Touch control possible
- Creation and management of jobs, e.g. for batch changes

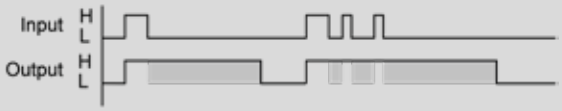
IO-Link



Smart functions

Stable processes through intelligent sensors





Delay functions – stable detection even with difficult objects and external influence

- When detecting objects through scanning, faulty switching can be caused by interfering particles such as sparks, sawdust or dust particles.
- A start-up delay ignores these interferences and only switches when an adjustable time signal X is received.
- A switch-off delay suppresses, for example, the glare from a shiny object – and emits a stable switching signal.

Counter – counting objects

- The counter function is often used with secondary packaging.
- The sensor only switches once all of the parts have been inserted.

Our sensor series F 10, F 25 and F 55

The right sensor for every application.

Optimally equipped

Switching and measuring sensors are the standard solution in industrial automation. At SensoPart you will find the right sensor for virtually every imaginable application: our product portfolio offers a comprehensive choice of different sizes, scanning ranges and operating principles.

The special characteristics and excellent performance data of our products speak for themselves – and you will undoubtedly find the right sensor for your application.

Discover an expansive range

- From the smallest sensors in subminiature format for cramped installation conditions to compact sensors for long scanning ranges
- Outstanding performance data, high reliability and solid workmanship across all form factors
- Special versions available for individual applications

made in Germany

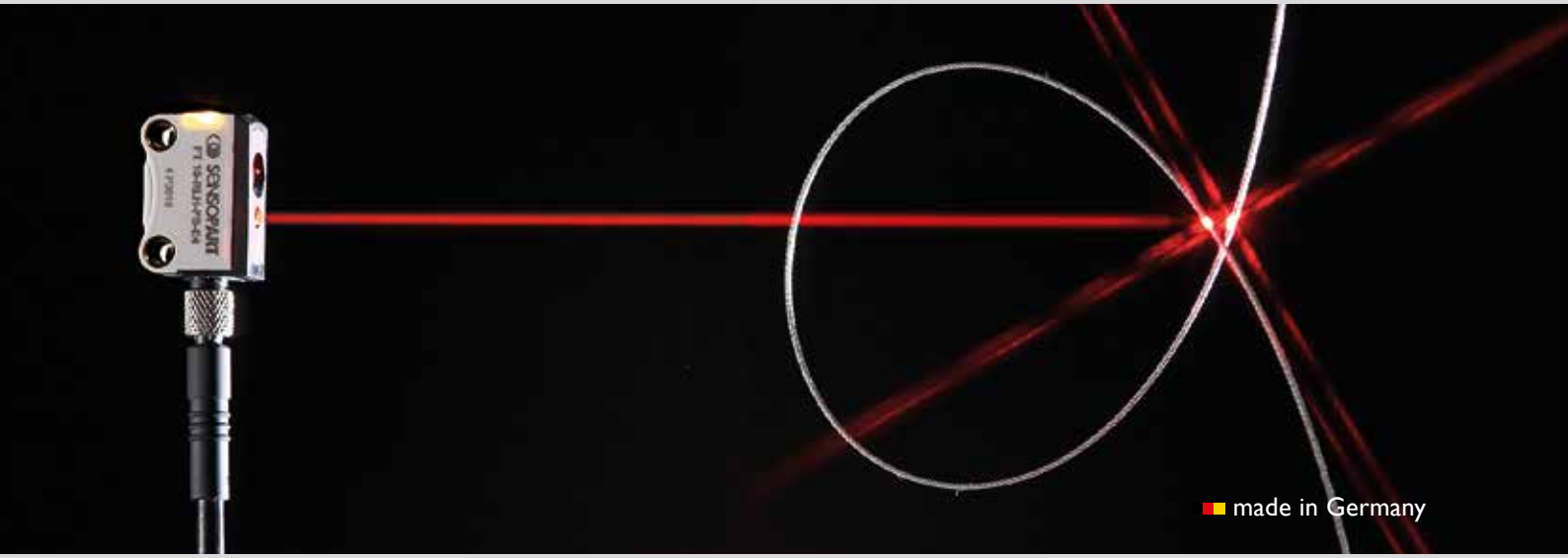
*SensoPart sensors from the **F 10** series in LED and laser versions form one of the most comprehensive series of subminiature sensors on the market. The laser sensors with precise background suppression, adjustable via teach-in, are unparalleled.*

*The **F25** sensor family is extremely diverse – from the LED photoelectric through-beam sensor or the diffuse laser sensor with adjustable background suppression to color and distance sensors, it offers everything a user requires.*

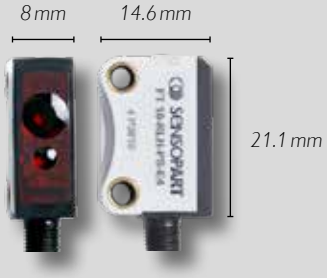
*The products from the **F 55** series combine excellent performance data with a robust housing design and numerous user-friendly details. They guarantee reliable detection using a focused laser light or LEDs, as well as precise background suppression.*

F 10 – family of sub-miniature sensors

Small size, big performance



The right sensor for every application:
In many applications there is simply not enough room for conventional sensors. But there is for F 10: it fits in almost every nook and cranny. Whether used in handling and positioning applications, in the production of solar cells or in the assembly of semi-conductor components - F 10 can achieve top performances even when installed in confined spaces.



A tiny power package
The light-weight photoelectric diffuse sensor with BGS is 21.1 x 14.6 x 8 mm in size and weighs just 3 grammes. It thus even fits on a robotic gripper where it is literally no burden.

TYPICAL F 10

- Sub-miniature sensor for installation in the smallest of spaces and in moving machine parts
- The world's smallest laser sensor with background suppression, adjustable via teach-in
- Sensors as LED or laser versions
- F 10 BlueLight: specially designed for scanning solar wafers and strongly light-absorbing objects
- User-friendly set-up via electronic teach-in key or control line
- Well thought-out mounting accessories for rapid and simple integration

Consistent precision
*The **F 10** sensors with **background suppression** can resolve a change in distance (object displacement) of 0.25 mm in the switching point – a measure enabling utmost positioning accuracy regardless of the object's color or surface properties.*

Blue light in the smallest space
*SensoPart's innovative BlueLight technology is also available in the smallest sensor format, the **F 10**. Thanks to its compact dimensions, the **F 10 BlueLight** is also suited for cramped installation conditions.*

The smart alternative
Instead of using a sender and a receiver as with a fibre-optic system, the photoelectric diffuse sensors of the F 10 family do not require a counterpart – and offer a space-saving solution that is easy to install.

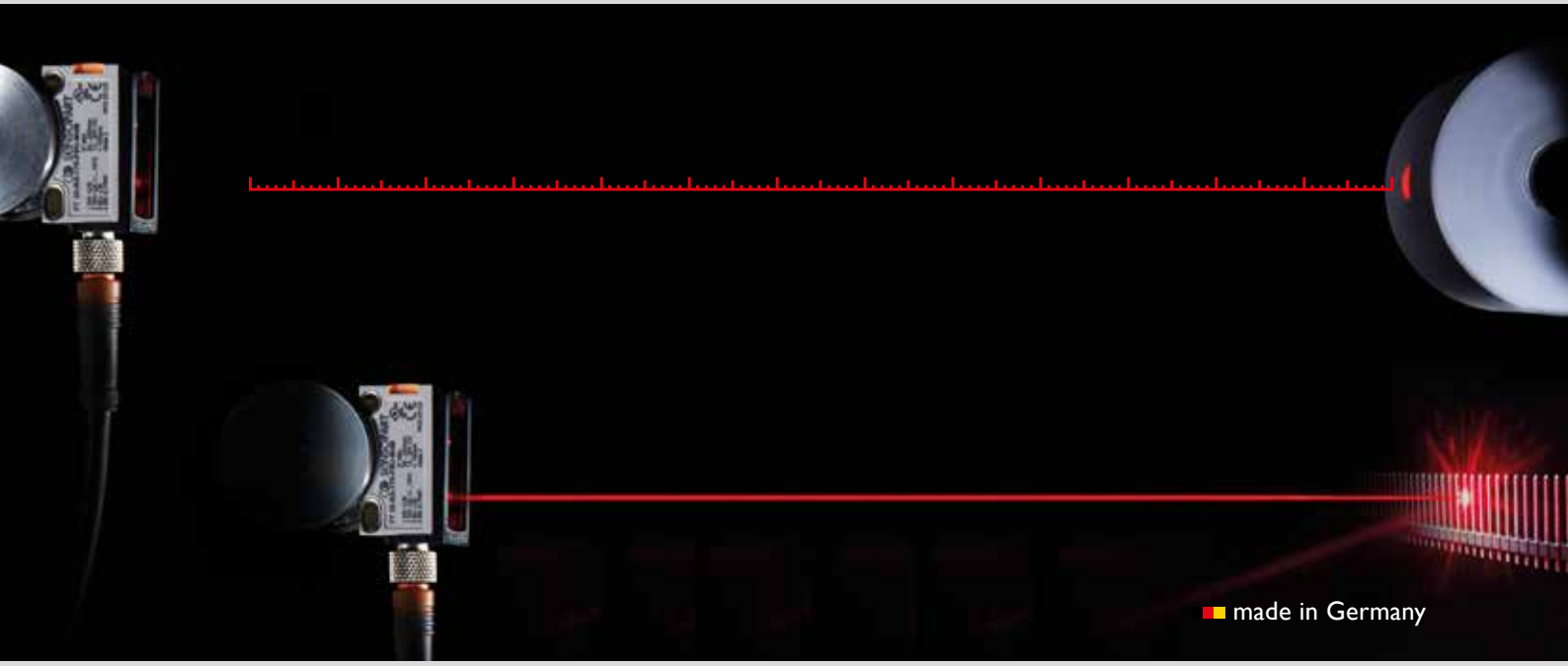
A lightweight miniature
Miniature in size and extremely light in weight, the sensors from the F 10 series are tailor-made for use in extremely confined spaces or even on moving machine parts, for example in seamlessly integrated production machines or handling and assembly systems.

F 10 – Product overview			
Article	Type of light	Adjustment	Scanning distance/ range
Photoelectric diffuse sensors with background suppression			
FT 10-RLH	Laser	Teach-in	70 mm
FT 10-B-RLF	Laser	Fixed focus	15 mm / 30 mm
FT 10-RH	LED	Teach-in	70 mm
FT 10-RF	LED	Fixed focus	15 mm / 30 mm / 50 mm
FT 10-BF	LED, blue	Fixed focus	30 mm / 50 mm

F 10 – Product overview			
Article	Type of light	Adjustment	Scanning distance/ range
Photoelectric retro-reflective sensors			
FR 10-RL	Laser	Teach-in	3 m
FR 10-R	LED	Teach-in	1,6 m
Photoelectric through-beam sensors			
FS/FE 10-RL	Laser	Teach-in	4 m
FS 10-RL/FE 10-RL	Laser	Teach-in	4 m
Distance sensor			
FT 10-RLA	Laser	Teach-in	70 mm

F 25 – A miniature sensor family of a new generation

The best in the category



Countless objects, one sensor family:
The F 25 family from SensoPart offers a diverse range of sensors in identical housing – from the LED photoelectric through-beam sensor or the diffuse laser sensor with adjustable background suppression to color and distances sensors; everything that the user requires.

One hundred percent suitable for industrial applications:
Thanks to a cutting-edge design and outstanding workmanship, F 25 sensors from SensoPart are optimally equipped for harsh operating environments.

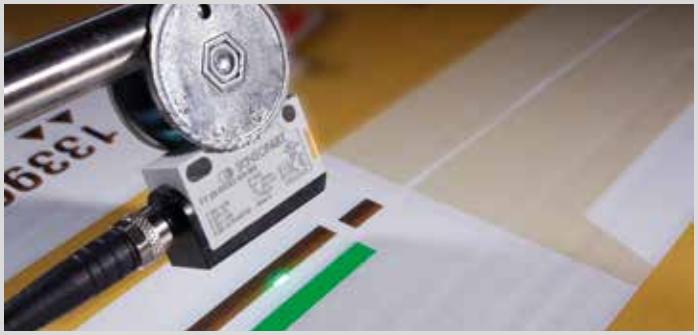
TYPICAL F 25

- Choice of LED or laser light (class 1)
- Most comprehensive sensor family on the market
- User-friendly teach-in key (alternative: fixed focus)
- Best black/white shift on the market in this sensor class
- Precise background suppression thanks to ASIC microchip
- Auto-detect – automatic adjustment of the switching output (PNP/NPN)
- Long ranges with compact miniature housing
- Robust glass-fibre-reinforced plastic housing (IP 69 & IP 67, Ecolab)
- Robust sensor design with metal connector, and mounting holes reinforced with metal inserts
- SensoClip dovetail mount for easy fine alignment

An eye for detail
*The **FR 25-RLO** is the expert for small part detection. Even objects measuring just tenths of a millimetre can be reliably detected.*

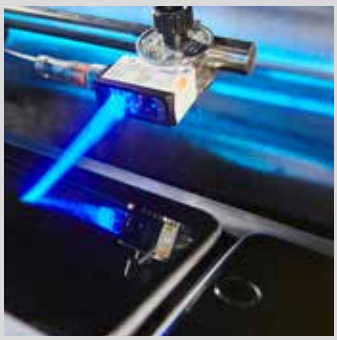
Distance measurement
*The **FT 25-R(L)A** distance sensor with analogue output and high repeat accuracy is primarily used for measurement and control tasks, fill level checks/ measurements or high-precision tasks.*

The specialist for glass detection
*The **FR 25-RGO** photoelectric retro-reflective sensor has been specially designed for detecting transparent objects. It offers absolutely precise and reproducible switching behaviour thanks to its autocollimation principle and automatic adjustment of the switching threshold (the DELTA function).*



Reliable detection of print marks
*The main task of the RGB color sensor **FT 25-C** is detecting a defined color. Thanks to its high switching frequency, the sensor is also suited to very fast applications.*

Impervious to interference
*Whether in handling or assembly applications, whether identifying small or large objects made of paper or metal – the photoelectric diffuse sensors with background suppression **FT 25-RHD** and **FT 25-RLH** reliably detect the most diverse range of objects – even despite background interference.*

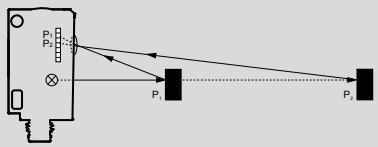
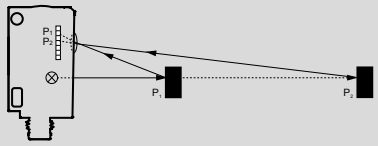
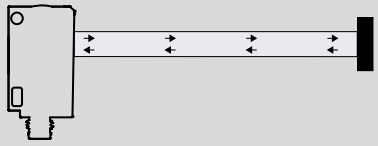


For challenging tasks
*The **F 25 BlueLight** allows the reliable detection of light-absorbing or highly transparent objects, for example, presence detection of carbon-fibre components or matt black interior trim panels.*

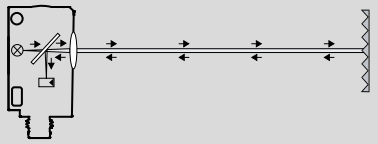
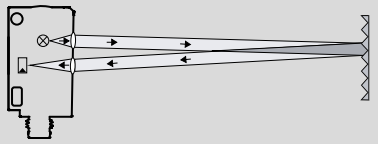
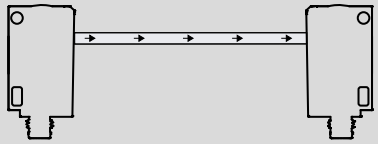
One housing, hundreds of variants

Discover versatility in unity

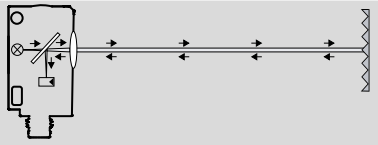
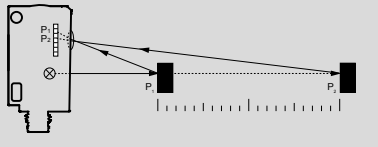
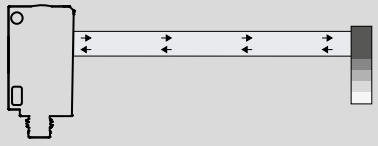
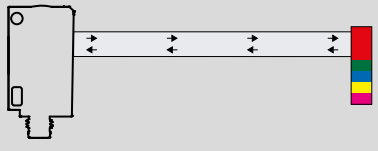
Photoelectric diffuse sensors

Functional principle		Type	Type of light	Adjustment	Scanning distance
Background suppression (photoelectric diffuse sensor)		FT 25-RLH	Laser	Teach-in	120 mm
		FT 25-RHD	LED	Teach-in	400 mm
		FT 25-RH	LED	Teach-in	200 mm
		FT 25-BF2	LED, blue		80 mm
		FT 25-RF1/2	LED		60/80 mm
Foreground suppression (photoelectric diffuse sensor)		FT 25-RV	LED	Teach-in	200 mm
Energetic (photoelectric diffuse sensor)		FT 25-RL	Laser	Teach-in	250 mm
		FT 25-R	LED	Teach-in	800 mm

Light barriers

Functional principle		Type	Type of light	Adjustment	Scanning distance
Photoelectric retro-reflective sensor with autocollimation		FR 25-RLO	Laser	Teach-in	4 m
		FR 25-RGO2	LED	Teach-in	2 m
Photoelectric retro-reflective sensor with double lens		FR 25-RL	Laser	Teach-in	15 m
		FR 25-R	LED	Teach-in	7 m
		FR 25-RF	LED		
Photoelectric through-beam sensor		FS/FE 25-RL	Laser	Teach-in	20 m
		FS/FE 25-R	LED	Teach-in	15 m
		FS/FE 25-RF	LED		6 m

Special sensors

Functional principle		Type	Type of light	Adjustment	Scanning distance
Photoelectric retro-reflective sensor with autocollimation for transparent objects		FR 25-RGO	LED	Teach-in	2 m
Distance sensor		FT 25-RLA 80	Laser	Teach-in	20 ... 100 mm
		FT 25-RA60/170	LED		20 ... 80 mm / 30 ... 200 mm
Contrast sensor		FT 25-W	LED, white	Teach-in	12 ± 2.5 mm
		FT 25-RGB	LED, red/green/blue	Teach-in	12 ± 3 mm
Color sensor		FT 25-C	LED, red/green/blue	Teach-in	12 ± 3 mm

Special features	Application examples
Most accurate small-part detection	Small-part detection against any background
Long scanning distance	Object detection against any background
	Object detection against any background
Background supp. of 100 mm	Object detection against any background
	Object detection against any background
With adjustable window function	Object detection on conveyor belts, selection of objects acc. to height
	Object detection
	Selection of coated and uncoated parts

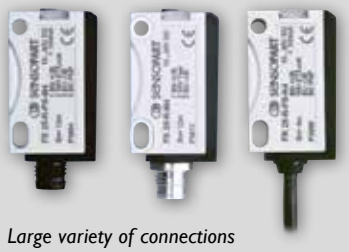
Special features	Application examples
Switching frequency 4 kHz or 10 kHz, small-part detection from 0.2 mm	Detection of objects through narrow openings
	Object detection
Long range	Object detection
	Object detection
	Object detection
Long range	Object detection
	Object detection
	Object detection

Special features	Application examples
With DELTA function (switching threshold adaptation)	Detection of foils, clear glass and plastic
Precise small-part detection, adjustable analogue and switching output	Small-part detection (e.g. O-rings), distance measurement on robot grippers
Long measurement range, adjustable analogue and switching output	Unwinding check, dancer roll regulation, stacking height measurement, double layer detection
Switching frequency 10 kHz or 25 kHz, automatic selection of ideal transmission color "communicating" light spot	Detection of printed marks on endless materials
Switching frequency 2.5 kHz or 10 kHz, "communicating" light spot	Color detection on packaging and labels

Even if all the sensors of the F 25 family look identical externally, they offer an astonishing wealth of variants. You can therefore choose between numerous functional principles – from photoelectric diffuse sensors with background suppression, through autocollimation retro-reflective sensors, to color sensors. And within each of these basic principles there are, in turn, numerous functional variants.

Most of the F 25 sensors are each available in a laser and an LED design. Differing types of connection and switching variants, as well as special designs such as auto-detect (which combines a real PNP and NPN switching function in a single device) expand the total selection to over one hundred different sensors.
And this is just a snapshot, because new functions and variants are always being added.

Whatever the particular function or variant, the excellent performance data of all the F 25 sensors are impressive. For example, the long ranges and scanning distances, the very high switching frequencies, the minimal black-white shift or the particularly precise background suppression. So much quality and variety in a single sensor series – that is really unique!

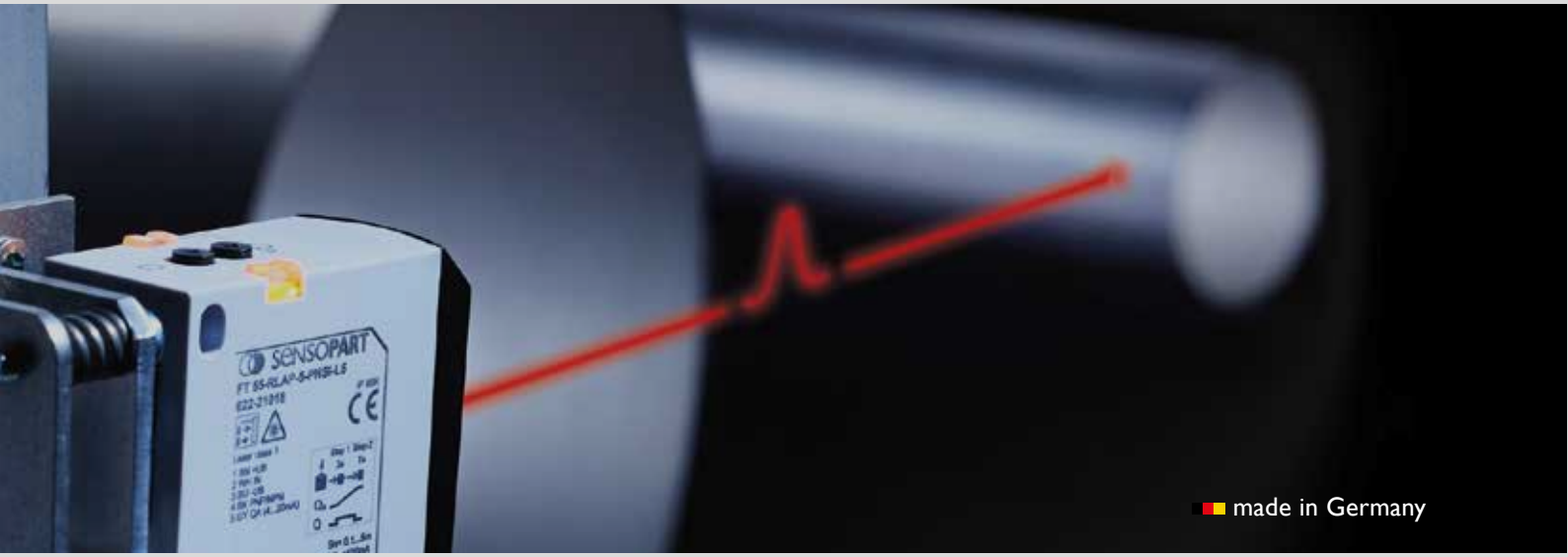


Large variety of connections
- *M8 plastic plug*
- *M8 metal plug*
- *2 m cable*
- *150 mm, M8 or M12 pigtails*

Simple operation
Choice of teach-in or fixed focus

F 55 – New standards in a compact design

The compact class with a long scanning range



SensoPart sets new standards in the compact class with its F 55 series of photoelectric sensors. The products in this family combine excellent performance data with a robust housing design and many user-friendly details. They guarantee
reliable detection by means of a focused laser light or red-light LED as well as precise background suppression.

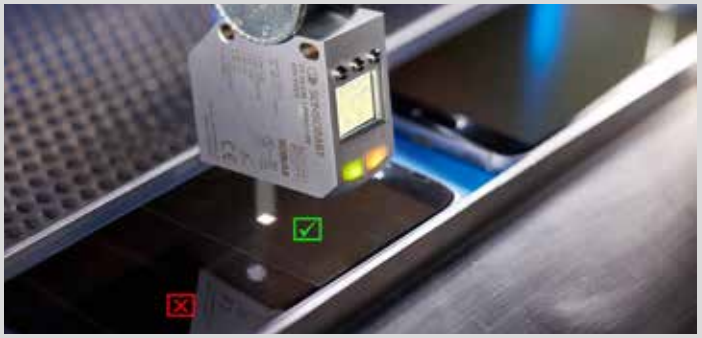
Comprehensive accessories for flexible installation

Housing in either a metal or plastic version

TYPICAL F 55

- Precise laser distance sensors with operating ranges of up to 1 m for diverse applications
- Time-of-flight sensors for distance measurement and reliable object detection in front of any background, with a range of up to 5 m
- High-end color sensor FT 55-CM: high performance and ease of use
- All laser versions are laser class 1 – for optimum safety
- Precise background suppression and minimal black/white-shift
- User-friendly operation of all "energetic" variants via electronic teach-in key or control line

Blue light for challenging tasks
The most powerful blue light sensor, F 55 BlueLight is suited to difficult applications requiring long scanning ranges



Color specialist
*The wide operating range – independent of distance – combined with the flexible color detection feature of **FT 55-CM** enables a diverse range of applications. The large integrated LCD display and remote configuration via SensoVisualize and IO-Link set new standards in ease of use and connectivity.*

F 55 – Product overview			
Article	Type of light	Adjustment	Scanning distance/ range/ operating range
Photoelectric diffuse sensors with background suppression			
FT 55-RLH	Laser	Potentiometer	800 mm
FT 55-RLH2	Laser	Potentiometer	1 m
FT 55-RLHP2	Laser	Teach-in	5 m
FT 55B-RH	LED	Potentiometer	800 mm
FT 55-RH	LED	Potentiometer	1.2 m
FT 55 BH	LED, blue	Potentiometer	1.2 m
Photoelectric diffuse sensors			
FT 55-RL	Laser	Teach-in	1.2 m
FT 55-R	LED	Teach-in	2 m
Photoelectric retro-reflective sensors			
FR 55-RLO (1/2)	Laser	Teach-in	20 m
FR 55-RL	Laser	Teach-in	14 m
FR 55-R	LED	Teach-in	14 m

F 55 – Product overview			
Article	Type of light	Adjustment	Scanning distance/ range/ operating range
Photoelectric through-beam sensors			
FS/FE 55-RL	Laser	Teach-in	30 m
FS/FE 55-R	LED	Teach-in	25 m
Distance sensors			
FT 55-RLAP(2)	Laser	Teach-in	0.1 / 0.06 ... 5 m
FR 55-RLAP	Laser	Teach-in	0.3 ... 70 m
FT 55-RLAM	Laser	Teach-in	up to 1 m
Color sensors			
FT 55-CM-1	LED white	Display	18 ... 32 mm
FT 55-CM-3	LED white	Display	18 ... 60 mm
FT 55-CM-4	LED white	Display	20 ... 150 mm

Distance sensors

On any machine and for any application

0 mm

500 mm

1 m

Under tension

*Thanks to excellent repeatability, the **FT 25-RA** distance sensor determines the exact change in position of dancer rolls. This guarantees precise control of an unwinding process.*

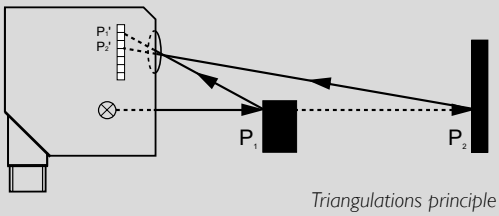
*The sensors can be easily and accurately aligned after installation with the aid of the **SensoClip** mounting component.*

The compact class for measurement and control tasks

*The **FT 25-R(L)A** distance sensor accurately determines the roll diameter of an unwinding machine and therefore supplies early information about an impending roll change. Designed in small housing for easy integration, it offers excellent precision regardless of the surface properties of the object detected.*

Double layers excluded

*One of the typical applications of **FT 50-RLA** is stack height control, e.g. of cardboard boxes, or double layer detection, e.g. printed circuit boards in electronics production. Thanks to excellent repeatability, it is also suited to monitoring coils, e.g. in packaging machines.*



Triangulations principle

5 m

70 m

Allrounder for any surface

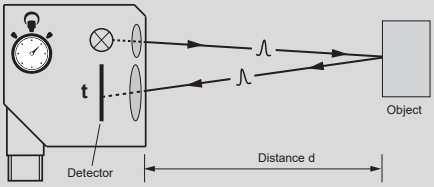
FT 55 time-of-flight *sensors reliably detect objects and measure distances up to 5 m with utmost precision. Using the principle of time-of-flight, the sensors enable measurements on any material and surface. For example, the* ***FT 55-RLAP*** *can accurately determine the position of a robot gripper, e.g. for seizing car body parts.*

A secure grip

The ***FT 55-RLAP*** *allows long scanning ranges up to 5 m, ideal for checking the occupancy of storage bays in high bay warehouses.*

Long scanning range

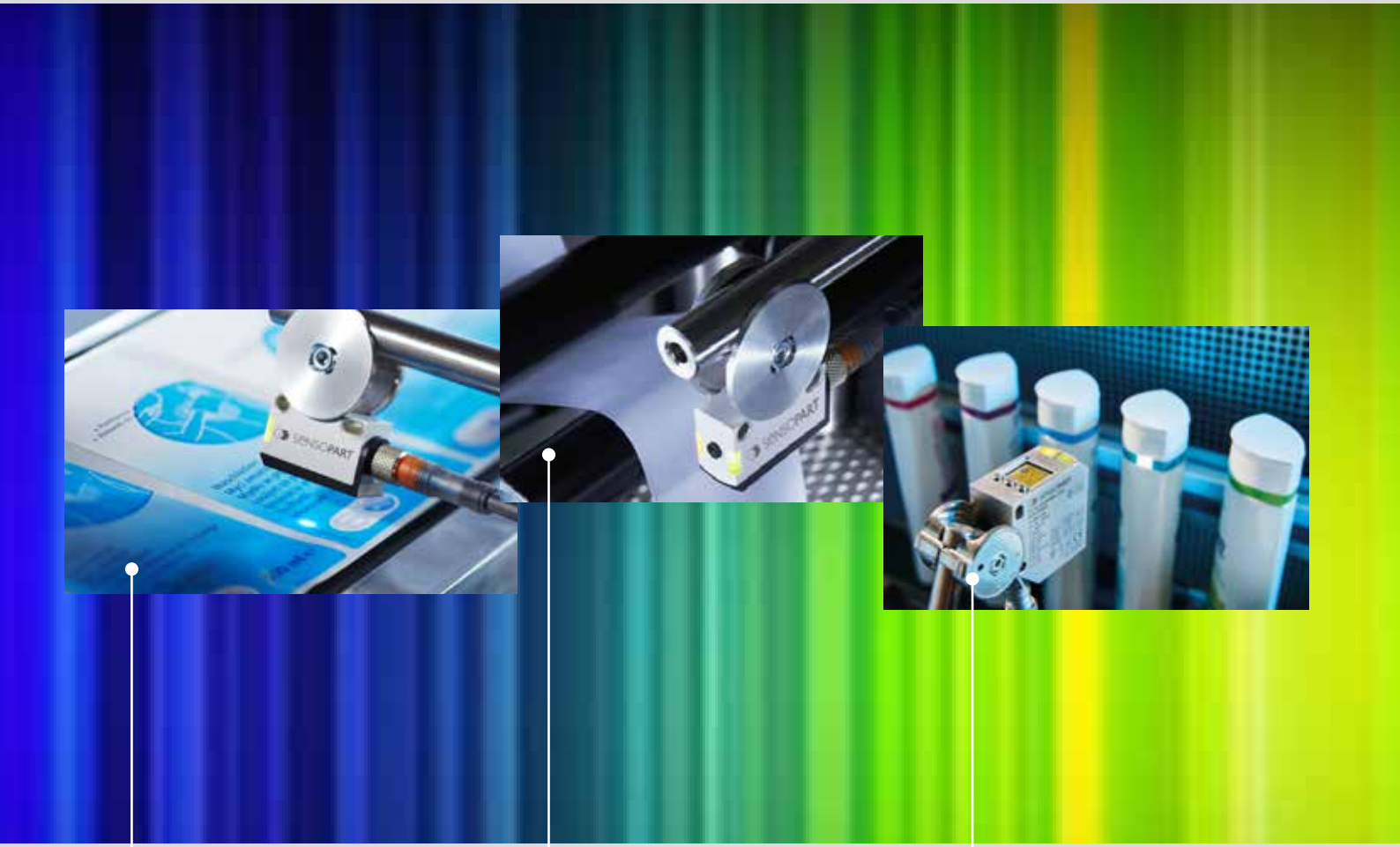
Thanks to its long scanning range of up to 70 m, the reflector device ***FR 55-RLAP*** *is ideal for detecting the exact position of overhead cranes or determining the distance between forklift trucks.*



Time of flight technology

Color sensors

Anything but color-blind



Color contrast marks

Whether in the printing industry or on steel strips: contrast marks must be detected precisely. With a switching frequency of 10 kHz, this is an easy task for the ***FT 25-C****. A color coding often adds additional information to the marks, which can be decrypted by the miniature color sensor* ***FT 25-C****. Even fluttering strips can be detected without difficulty with a depth of field of up to 6 mm.*

The small color expert

The sensors ***FT 25-W/-RGB*** *are considerably smaller than the standard size on the market, while still offering better performance data. With the aid of mounting rod MZ F 25, it is easy to switch from the large standard size to the compact miniature housing – without any additional effort.*

The right lid?

Checking that each bottle has the right lid is an easy task for the ***FT-55 CM****. Equipped with an enormous depth of field and an operating range of up to 150 mm, and able to check up to 12 colors simultaneously, the sensor is the perfect solution for applications of this type.*

The right color?

A faulty mixing ratio of plastic granulates can produce plastic elements with the wrong color. Color is therefore checked in many applications. High color selectivity, extreme ease of use and an adjustable tolerance with 9 levels make ***FT 55-CM*** *ideal for such applications.*

Shining performance

Is the surface polished, coated or has film been applied? This is a quality assurance step in many inspection applications. Thanks to its very precise color differentiation, and an additional version with glare suppression, ***FT 55-CM*** *is optimally suited for shiny objects.*

Sorting colored objects

Has the correct vehicle fuse been supplied? Has the correct toothbrush been seized? This can easily be checked by their color. With Best Fit mode, the ***FT 55-CM*** *provides a powerful function for sorting tasks, ideally suited to such applications.*

Print mark sensors

Precise detection of any print marks

Compatible with standard housing

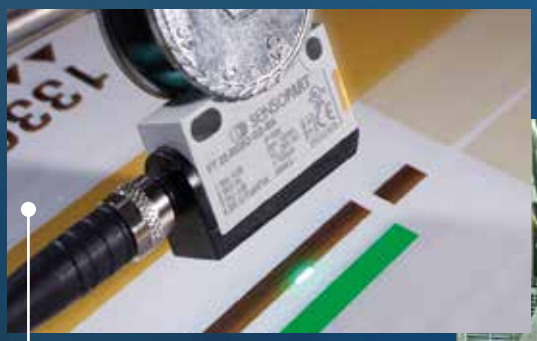
The contrast sensors from the ***F 25*** *series are compatible with standard housing when it comes to installation and connection. The fastening bores are aligned in the same distance from each other. The integrated cable with a M12 connector fits the corresponding female connector.*

Small size – big performance

The sensors ***FT 25-W/-RGB*** *are considerably smaller than the standard size on the market, while still offering better performance data. An easy teach-in method and a very robust housing guarantee a quick set-up and trouble-free operation.*

Subsequent digital printing on labels

With a minimum response time of 20 µs, at jitter of 10 µs and a switching frequency of 25 kHz, the print mark sensors ***FT 25-RGB*** *and* ***FT 25-W are*** *ideal for these applications.*



Color contrast marks

Contrast marks are often color coded to store additional information or to distinguish them from the colors of the label. The ***FT 25-C*** *detects the color coding with a switching frequency of 10 kHz, allowing high positioning accuracy in relation to the colored contrast marks. Different teach modes allow diverse settings in depth of field and color tolerance.*

Smart teach-in process

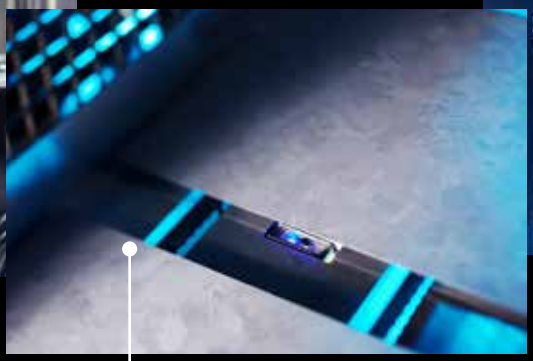
Teaching contrast marks and the background is not always simple in large machines when the sensor is already mounted. The ***contrast mark sensors*** *from SensoPart can therefore be taught dynamically, i.e. in a running process.*

Fluttering strips – no problem

Printing and cutting processes involve high speed, which can result in fluttering carrier strips despite high strip tension. The sensors ***FT 25-C*** *can be taught with a double depth of field for this type of situation.*

Object detection

Whether large or small: always reliably detected.



Technology gives a head start

*The **FT 10-RLH**, the world's first subminiature sensor with laser light and adjustable background suppression, offers precise and consistent switching behaviour even with changing object surfaces and colors. Thanks to SensoPart ASIC technology, it still functions reliably in environments with shiny machine parts in the background, and is perfect for detecting the tiniest objects as well as for installation in the most compact spaces.*

The small blue sensor

*As the world's first blue light sensor, **F 10 BlueLight** enables reliable scanning detection of strongly light-absorbing, reflective and highly-transparent objects – in an ultra-compact subminiature format (21.1 x 14.6 x 8 mm)!*

Maximum transparency

*The **FR 25-RGO** allows optimum detection of transparent objects – partly thanks to the DELTA function. The sensor reliably adapts to changing ambient conditions – dust or contamination has no affect.*

Dot precision

Thanks to the principle of autocollimation and an extremely fine laser light spot, the ***FR 25-RLO*** *is the expert for small part detection. Even objects measuring just tenths of a millimeter can be reliably detected.*

For special angles of vision

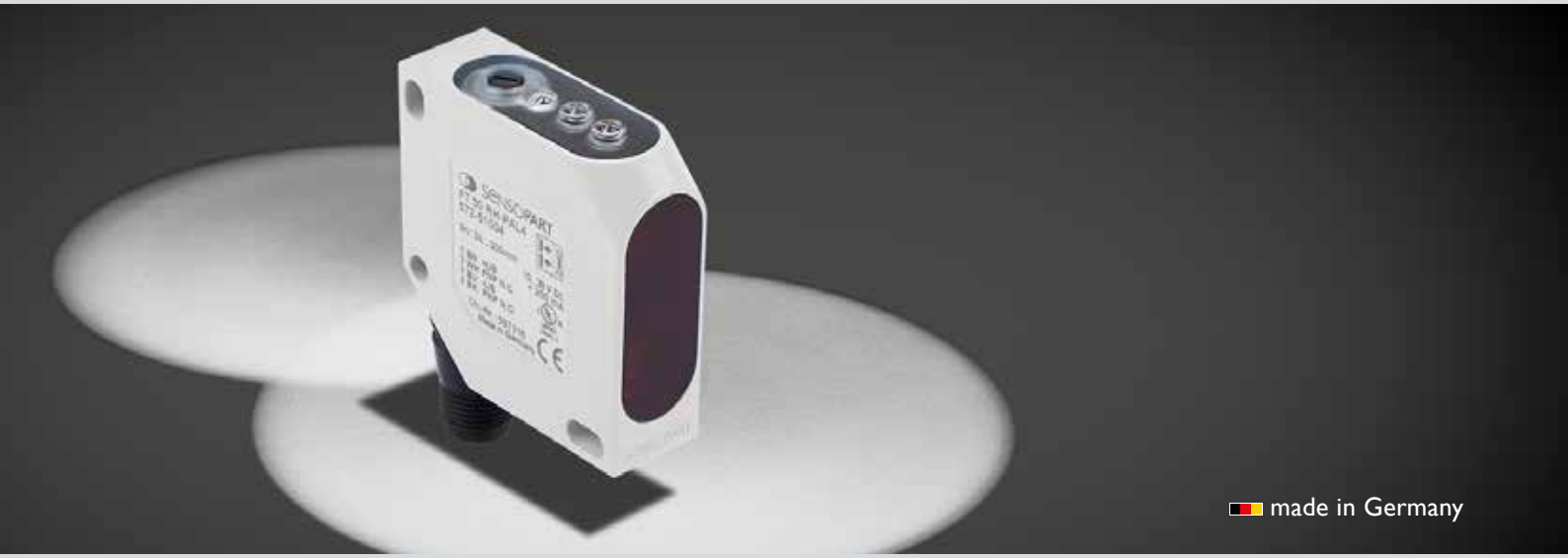
BlueLight technology from SensoPart demonstrates its outstanding ability even at long scanning distances (up to 1.2 m): very dark or transparent objects can be reliably detected at huge scanning angles. The compact version of the ***F 55 BlueLight*** *even offers adjustable background suppression.*

High process stability

With a high-speed scanning rate of up to 500 Hz and a very long range, time-of-flight sensors from the ***FT 55*** *series are experts when it comes to reliable detection and precise measurement of any object at a long distance.*

F 50 – Photoelectric sensors in a compact housing

The reliable standard series



The photoelectric sensors of the F 50 series are virtually synonymous with versatility and utmost reliability. They guarantee user-satisfaction in a wide variety of sectors from the automotive industry, mechanical engineering or wood processing to the packaging and printing industries.
The impressive F 50 sensors offer reliable detection, using either laser light, red light LED or infrared LED, as well as precise background suppression.

TYPICAL F 50

- Universal use in numerous automation applications
- Reliable laser distance sensors with operating ranges up to 300 mm
- Autocollimation variants with high precision and no blind zone
- Photoelectric diffuse sensor with precise background suppression
- Versions with laser, LED or infrared light emitter
- Simple adjustment via potentiometer or keys
- UL-certification

FL 70 – Sensor for use with fibre-optic cables

Functional DIN-rail device

The FL 70 sensor for use with fibre-optic cables comes in three different versions: FL 70 RA-…D with an analogue output, FL 70 R without display and FL 70 R-…D with display. The FL 70 with analogue output offers major benefits for complex applications, such as connecting a so-called cross-section converter. The version FL 70 R without display is a cost-efficient alternative for standard applications.
The FL 70 R-…D with a 4-character display is the high-end version. Its combination of display and teach-in keys offers high ease of use. The sensor is also equipped with numerous additional functions, e.g. fine adjustment of the switching point.
All three versions come with a user-friendly teach-in mode.

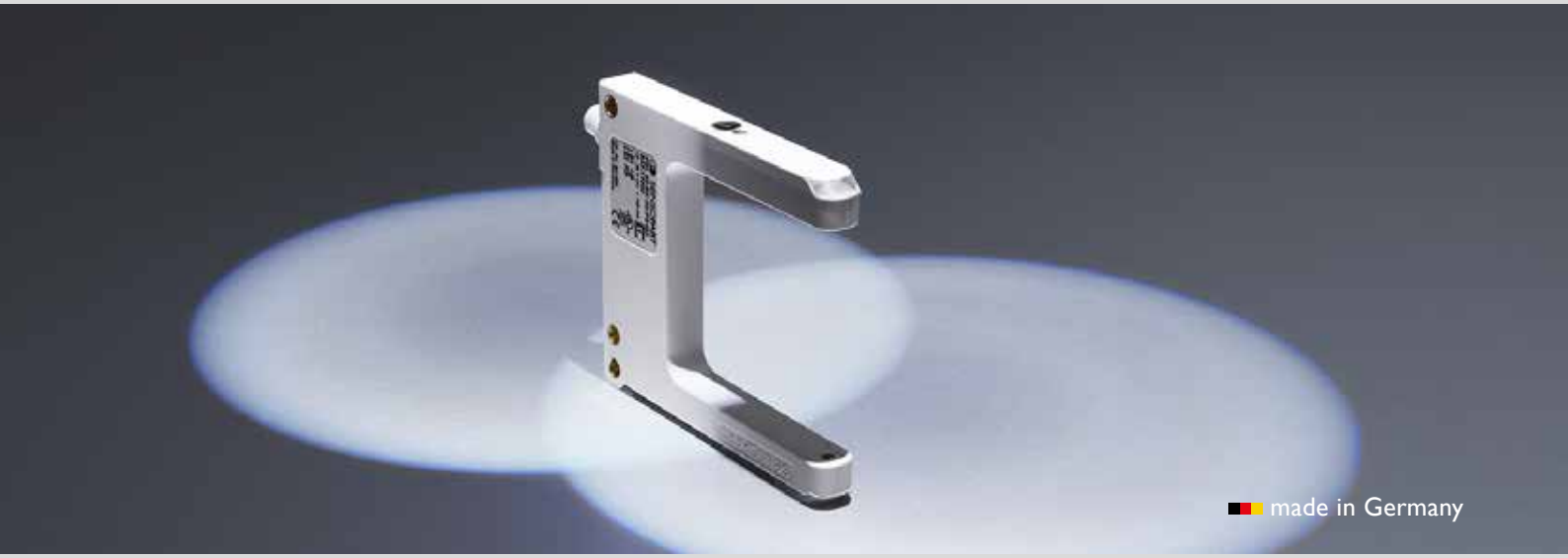
TYPICAL FL 70

- High ease of use – simple teach-in method
- High precision
- High switching frequency
- No mutual interference thanks to automatic communication when mounted side by side
- DIN-rail mounting
- Robust enclosure rating of IP 64
- Wide range of fibre-optic cables
- Little space required for installation at control site

Congestion control with fiber-optic cables
Small plastic plugs are fed in on a vibration conveyor and separated on a conveyor section. Congestion is monitored with an FL 70 R-PSD fiber-optic device in combination with SensoPart's K2L-34 plastic fibre-optic cable.

Fork sensors and optical windows

Experts in small part detection and counting tasks



Fork sensors and optical windows demonstrate characteristic properties as a result of their special housing design: thanks to a precise beam guide they are particularly suited to small part detection. The sensors are also easy to mount as there is no need for time-consuming adjustment.

The fork sensors of the FGL-RK and FGL-IK series detect parts from a diameter of 0.2 mm. They are used, for example, for small part detection on conveyor sections and chutes or for counting bulk goods on vibration conveyors. Rotational speed measurement is another typical application. The optical windows of the FG series are employed, for example, for detecting thread breaks in the textile industry, for part detection in transparent tubes in pneumatic conveyors, or for ejection control. Thanks to their robust housing and fixed light beam, fork sensors and optical windows are frequently the first choice for use in installations subject to strong vibrations.

TYPICAL SENSOPART

- Simple and robust housing
- Quick and easy mounting thanks to dovetail bracket and teach-in function
- Metal or plastic housing
- High resolution for precise small part detection (fork sensors from 0.2 mm, optical windows from 0.8 mm)
- Various fork and window widths available
- Red light or infrared LED options
- High switching frequency of up to 3 kHz
- Dynamic signal evaluation (FG)
- 3- or 4-pin connector depending on variant
- Reliable function even in harsh conditions
- LED-indicators easy to see from all sides

FGL with mounted bracket MBD-S94 and LED-indicators clearly visible on the side of the fork sensor.

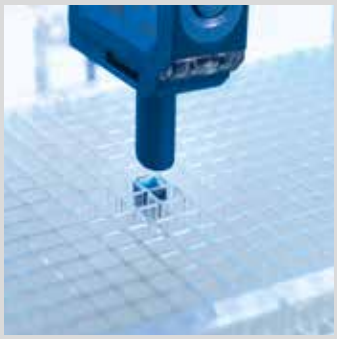
Ultrasonic sensors

Reliable on virtually every surface

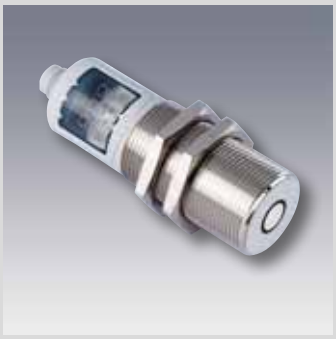
Ultrasonic sensors may be a useful alternative in applications where optical sensors come up against their physical limits. This is the case, for example, when dealing with objects with uneven surfaces or difficult ambient conditions, as well as with highly transparent media as or moving, highly reflective liquid surfaces. Typical uses of ultrasonic sensors are therefore checking the presence of highly transparent film and measuring fill levels in fluid containers. A major advantage is the absolutely reliability of the background suppression function that results from the measurement of the time of flight of sound.

TYPICAL SENSOPART

- Reliable detection of objects with critical surfaces and highly transparent objects
- Available in a cuboid (32 x 20 x 12 mm) or barrel (M12/M18/M30) shape
- Simple adjustment via teach-in, control input or display
- PNP, NPN or analogue output options
- Metal or plastic housings (IP 67 & IP 65)
- Wide range of mounting accessories



The UT 20-S measuring levels in microplate wells.



The ultrasonic sensors of the UMT 30 series are multi-functional experts. Thanks to a three-digit display, sensor settings are always an easy task for users.

Inductive sensors

The metal detectors

Due to their functional principle, inductive sensors are suitable exclusively for the detection of metal objects. But they do this extremely reliably and are also very robust and resistant (e.g. to environmental influences). This makes them an interesting alternative for numerous industrial applications. Inductive sensors are mainly used wherever the detection of uniform movements is involved – for example, as a proximity switch for determining the position of moving machine parts, such as carriages or hydraulic cylinders, as a tachometer on vehicle crankshafts or as a pulse generator for engine ignition.

Inductive sensors are extremely precise due to their high repeatability. Their simple design and uncomplicated initial set-up ensure minimal downtimes. Whether used in robotics, assembly and handling, factory automation or mechanical engineering: inductive sensors from SensoPart are reliable, require no maintenance, and offer versatile use thanks to a wide choice of housings and sizes.

TYPICAL SENSOPART

- Reliable detection of metallic objects
- From 3 mm miniature format to M30 housing
- Product variants for standard or triple switching distances
- Robust barrel or cuboid metal housing
- Simple installation thanks to integrated metric threads
- Different designs for flush, quasi-flush and non-flush mounting
- Available with either switching or analogue output
- NAMUR-compliant design on request

Accessories

A sensor is rarely unaccompanied

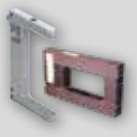
Accessories for mounting, set-up and use are essential for the reliable functioning of an automation solution. The characteristic practical focus of SensoPart products is thus also evident in a particularly versatile and user-friendly range of accessories.

The functionality and robustness of optical sensors often depends on the mounting bracket. Changing applications or product batches also entail realignment of the sensor. All of this is possible with the unique SensoClip concept: the position of sensors can be easily modified along the mounting rod, and the angle can be adjusted as required via two rotation axes.

Optimum connections:
*With the **IO-Link Master**, sensors can be smoothly integrated into systems and processes. The IO-Link interface enables two-way communication between the sensors and the connected components, and data can be easily read out and evaluated.*

Quickly aligned: F 10, F 25 and F 55
sensors can be quickly and precisely aligned with the aid of the robust alumnium dovetail bracket.

Product overview – optical sensors

Product family Dimensions (H x W x D)		Distance sensors	Color (C), contrast (K) and luminescence sensors (UV)	Photoelectric diffuse sensors
F 10 21,1 x 14,6 x 8 mm		FT 10-RLA | **10–70 mm**		
F 25 34 x 20 x 12 mm		FT 25-RLA | **20–100 mm** FT 25-RA | **20–80 mm** FT 25-RA | **30–200 mm**	FT 25-RL | **250 mm** | K FT 25-W | **12 mm** | K FT 25-RGB | **12 mm** | K FT 25-C | **12 mm** | C	FT 25-RL | **250 mm** FT 25-R | **800 mm**
F 55 **Metal** 50 x 50 x 25 mm **Plastic** 50 x 50 x 23 mm		FT 55-RLAP | **5 m** FR 55-RLAP | **70 m** FT 55-RLAP2 | **5 m** FT 55-RLAM | **1 m**	FT 55-CM I **150 mm**	FT 55-RL | **1.2 m** FT 55-R | **2 m**
F 20 32 x 20 x 12 mm				
F 50 50 x 50 x 17 mm		FT 50-RLA-20 | **40–60 mm** FT 50-RLA-40 | **45–85 mm** FT 50-RLA-70 | **30–100 mm** FT 50-RLA-100 | **70–170 mm** FT 50-RLA-220 | **80–300 mm**	FT 50-C | **32 mm** | C FT 50-C-UV | **50 mm** | UV	
Barrel type Ø 4/5 mm Ø 12 mm Ø 18 mm Ø 30 mm				FM 04/05 | **50 mm** FT 12-R | **300 mm** FT 18-2-R | **400 mm** FMS 18-B | **400 mm** FT 18-2-IR | **800 mm** FMS 30-B | **1 m**
FL 70 84 x 35 x 10 mm		FL 70-RA-xD | Fiber-optic sensors Diffuse **310 mm** Through-beam **810 mm**		
F 80 83 x 65 x 25 mm **F 90** 95 x 93 x 42 mm		FT 80-RLA-500 | **250–750 mm** FT 91/92-ILA | **6 m** FT 90-ILA | **10 m** FR 91/92-ILA | **50 m** FR 90-ILA | **250 m**		
FG | FGL				

= Display = Potentiometer = Transparent objects/glass = PC = Teach-in
= BlueLight = Laser Lasernorm IEC 60825-1:2014 = IO-Link

SENSOPART

Photoelectric diffuse sensors with background suppression (BGS) / with foreground suppression (FGS)	Photoelectric retro-reflective sensors	Photoelectric through-beam sensors	Fiber-optic sensors
FT 10-RLH | **70 mm**	FR 10-RL | **2 m**	FS/FE 10-RL | **3 m**	
FT 10-B-RLF | **15/30 mm**	FR 10-R | **1.6 m**		
FT 10-RH | **70 mm**			
FT 10-RF | **15/30/50 mm**			
FT 10-BF | **30/50 mm**			
FT 25-RLH | **120 mm**	FR 25-RL | **13 m**	FS/FE 25-RL | **18 m**	
FT 25-RH | **200 mm**	FR 25-R | **6 m**	FS/FE 25-R | **13 m**	
FT 25-RHD | **400 mm**	FR 25-RF | **3 m**	FS/FE 25-RF | **4 m**	
FT 25-RF | **60/80 mm**	FR 25-RGO | **2 m**		
FT 25-BF | **80 mm**			
FT 25-RV (FGS) | **200 mm**	FR 25-RLO | **4 m**		
FT 55-RLH | **800 mm**	FR 55-RL | **12 m**	FS/FE 55-RL | **25 m**	
FT 55-RLH2 | **1 m**	FR 55-R | **12 m**	FS/FE 55-R | **20 m**	
FT 55-B-RH | **800 mm**	FR 55-RLO | **20 m**		
FT 55-RH | **1.2 m**	FR 55-RLP | **70 m**		
FT 55-BH(2) | **1.2 m**			
FT 55-RLHP2 | **5 m**			
			FL 20-R | Diffuse **100 mm** Through-beam **1 m**
FT 50-RLH | **150 mm**	FR 50-RL | **20 m**	FS/FE 50-I | **15 m**	
FT 50-RLHD | **300 mm**	FR 50-R | **5.5 m**		
FT 50-RH | **300 mm**			
FT 50-IH | **600 mm**			
FT 12-RH | **60 mm**	FR 12-R | **1.5 m**	FS/FE 12-RL | **5 m**	
FT 12-RF | **24 mm**		FS/FE 12-R | **4 m**	
FMH 18 | **120 mm**		FS/FE 18-RL | **50 m**	FMS 18-U | Diffuse **160 mm** Through-beam **700 mm**
	FR 18-2-R | **3 m**	FS/FE 18-R | **20 m**	
	FR 18-2-IR | **3.6 m**	FLS/FLE 18-W | **50 m**	FMS 30-U | Diffuse **800 mm** Through-beam **4.8 m**
		FSE 18-2-I | **10 m**	FAV 30 | **500 mm**
			FL 70-R | Diffuse **310 mm** Through-beam **810 mm**
			FL 70-R-xD | Diffuse **310 mm** Through-beam **810 mm**
FT 92-IL			
		FGL-RK /-IK | **30 – 120 mm**	
		FGL 5-IK | **5 mm**	
		FGL | **5 – 220 mm**	
		FG | **40 – 120 x 80 mm²**	

Product overview – ultrasonic and inductive sensors, SmartPlug and

Ultrasonic sensors

Products		Adjustment	Scanning distances	Special features
UT 20		Teach-in	140 mm / 150 mm / 240 mm / 700 mm	Ultrasonic sensors with soundpipe, PNP, NPN, analogue output
UT 12		Via control input	400 mm	PNP, NPN, analogue output
UT/UM 18		Via control input	250 mm / 300 mm / 800 mm	Variants with stainless steel housings, PNP, NPN, analogue output
UMT 30		Teach-in or display	350 mm / 1.3 m / 3.4 m / 6 m	Display, PNP, 2 x PNP or analogue output

Inductive sensors

Products		Design	Switching distance	Special features
IT 8 / 10 / 12 / 40 **IS 455 / 588**		Cubic	0.8 mm / 1.5 mm / 3mm / 4 mm / 8 mm / 15 mm / 20 mm / 35 mm	Miniature housing, AC/DC variants
IS 33		Barrel type Ø 3 mm	0.6 mm	PNP, NPN
ISN 44-20 **IS 34** **IT 4**		Barrel type Ø 4 mm	0.8 mm	PNP, NPN, NAMUR, stainless steel housing
IMT 5		Barrel type Ø 5 mm	0.8 mm	PNP, NPN, stainless steel housing
ISZ 46 **IS 46 / 56** **IDT 6**		Barrel type Ø 6,5 mm	1.5 mm / 2 mm / 3 mm	PNP, NPN
IS 48 / 58 **IMT 8**		Barrel type Ø 8 mm	1.5 mm / 2 mm / 3 mm / 6 mm	PNP, NPN
IMT 12 **IT 12** **IS 512**		Barrel type Ø 12 mm	2 mm / 4 mm / 6 mm / 10 mm	PNP, NPN
IS 514		Barrel type Ø 14 mm	3 mm	PNP, stainless steel housing
IMT 18 **IS 518** **IT 18**		Barrel type Ø 18 mm	5 mm / 8 mm / 10 mm / 12 mm / 20 mm	PNP, NPN, stainless steel housing
IMT 30 **IS 530** **IT 30**		Barrel type Ø 30 mm	10 mm / 15 mm / 20 mm / 22 mm / 40 mm	PNP, NPN, stainless steel housing
IS 512 / 518		Barrel type Ø 12 mm / 18 mm analogue	6 mm / 10 mm	Analogue output

SmartPlug

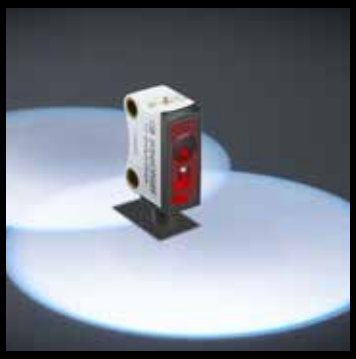
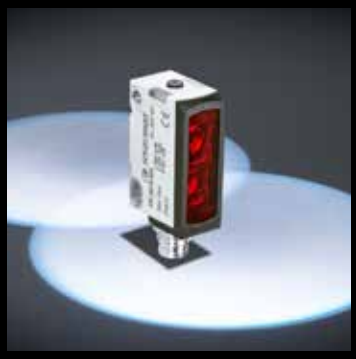
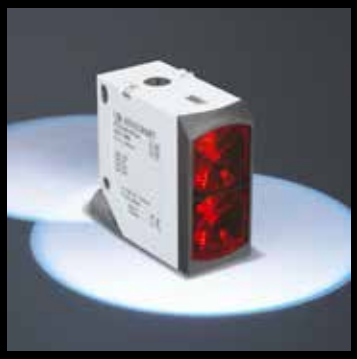
Products		Special features
MFI (Inverter)		Inverts NPN to PNP or PNP to NPN devices, N.C./N.O. also adjustable
MFC (Counter)		Adjustable counter (pulses or intervals) between 1 … 65535
MFT (Timer)		Adjustable on-delay or drop-out delay between 1 … 65535 ms
MFF (Frequency)		Adjustable frequency monitoring between 15 … 1000 Hz
MFW (Wipe Function)		Adjustable wipe function for falling or rising edges; time range 1 … 65535 ms
MFU (Universal)		All-in multifunctional switching device programmable via USB

Accessories

Products		Description
Mechanical accessories		Brackets for sensors
Optical accessories		Reflectors and reflective tape
Electrical accessories		Cables and Converters
IO-Link Master		IO-Link Master for PROFINET, SensoIO, EthernetIP/Modbus TCP, USB

We look ahead

Yesterday, today and in the future


"We gauge ourselves not by what is possible today, but by our vision of what can be achieved" – this has been our motto since the foundation of SensoPart in 1994. Our goal is to always be a step ahead and to be able to offer our customers the most innovative sensor for industrial automation.

True to this motto, we offer easy-to-integrate VISOR® vision sensors and compact laser sensors with outstanding background suppression made in Germany.

We still also have plenty of ideas for the future - watch this space.

SENSOR TECHNOLOGY

- Light barriers
- Diffuse sensors
- Laser sensors
- Miniature sensors
- Distance sensors
- Color sensors
- Contrast sensors
- Anti-collision sensors
- Slot sensors
- Fiber-optic sensors
- Inductive sensors
- Ultrasonic sensors
- Vision sensors
- Smart cameras
- Vision systems
- Object detection
- Object measurement
- Color detection
- Code reading
- Lighting
- Lenses

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11/2018 069-00115