

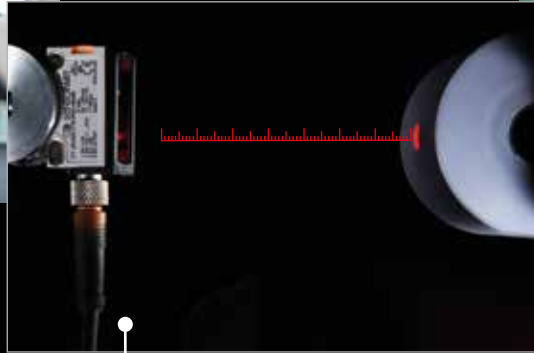
Distance sensors from SensoPart

Accurate and non-contact distance measurement for automation technology



Distance sensors

On any machine and for any application



0 mm

Fits in every gap

Weighing and measuring no more than a sugar cube, the **FT 10-RLA** sensor fits in virtually every space. For example, the sensor controls the distance to textiles in industrial sewing machines, guaranteeing more precise stitching.

300 mm

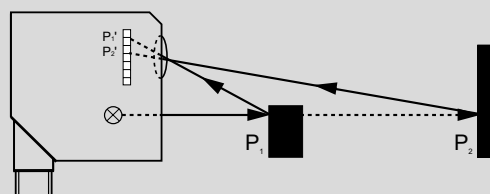
The compact class for measurement and control tasks

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.

500 mm

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



1 m

A secure grip

The smart laser distance sensor **FT 55-RLAM** ensures that e.g. stacked components are gripped with utmost precision. Thanks to high repeatability and linearity, the sensor always reliably grips the part in the correct place, with virtually any type of surface.

5 m

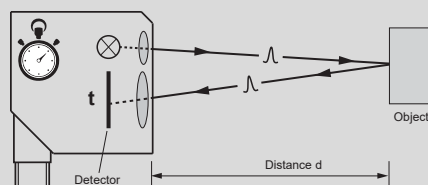
Allrounder for any surface

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

70 m

Long scanning range

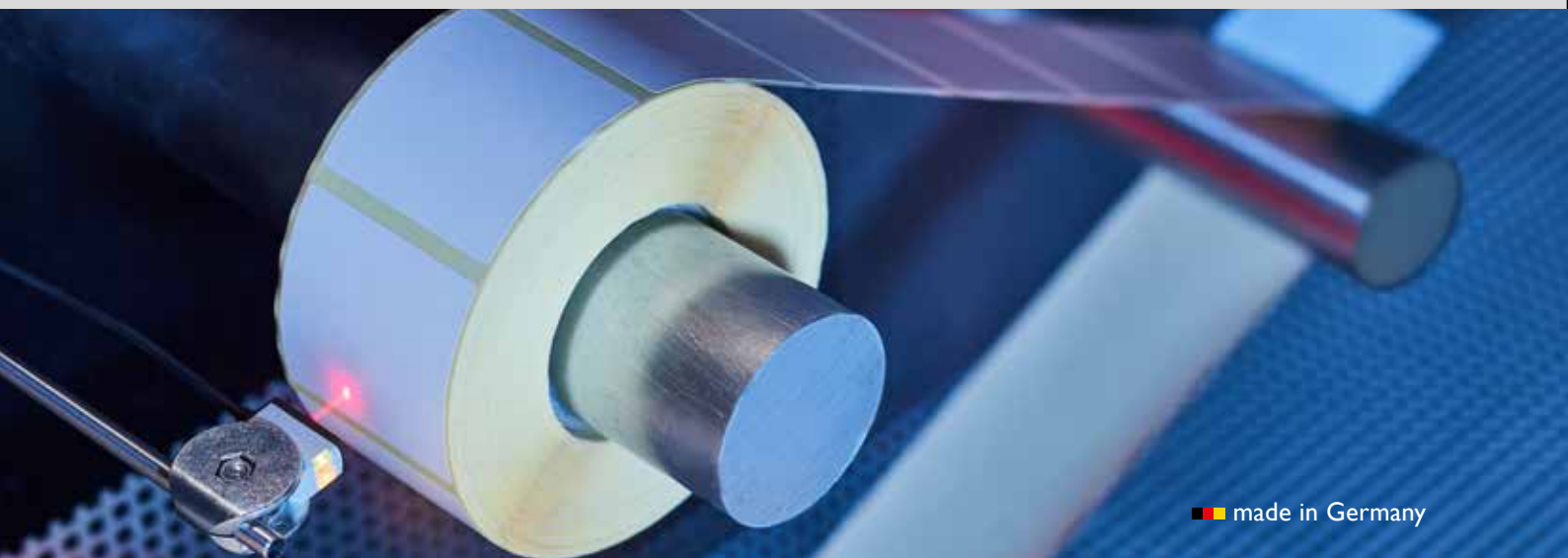
Thanks to its long scanning range of up to 70 m, the reflector device **FR 55-RLAP** is ideal for detecting the exact position of overhead cranes or determining the distance between forklift trucks.



Time of flight technology

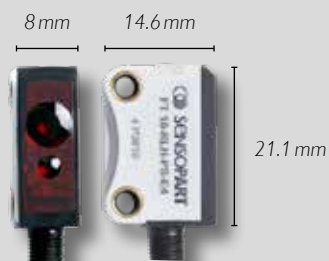
FT 10-RLA – The smallest optical distance sensor in the world

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



ECOLAB



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. monitoring of tilted angle of components
- 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

FT 25 – optical short-range distance sensors

The compact class for measurement and regulatory tasks



made in Germany



FT 25-R(L)A for dancer roll regulation

The precise control of the FT 25-R(L)A ensures a constant tension of the paper roll during unwinding.

TYPICAL FT 25-R(L)A

- Operating range: 20...80 mm / 20...100 mm / 30...200 mm
- Distance sensor with 1 ... 10V analogue output
- Easily integratable ultra-compact ABS housing: 34 x 12 x 20 mm
- High precision and high repeatability – especially for control tasks
- Resolution: from 0.12 mm
- Two adjustable switching points as window mode for 2-point control
- Teach-in operation





In a miniature housing

The FT 25-R(L)A is also suitable for limited installation spaces thanks to its compact dimensions of 34 x 12 x 20 mm.

In addition to its analogue voltage output the small distance sensors also have a switching output and offer the possibility of defining a switching window by means of two switching points. Thanks to their easy operation, these sensors are particularly suitable for simple measurement and regulatory tasks at distances of up to 200 mm. Our laser and LED variants cover a very broad range of applications.

Key applications:

- Dancer roll regulation, sag monitoring (LED / laser)
- Determining the roll diameter of an unwinding machine (LED / laser)
- Stacking height measurement, double layer detection and height measurements in the wood processing, packaging- and handling industry (LED / laser)
- Distance measurement and positioning on robot grippers in „pick & place“ applications (LED / laser)
- Small part measurement, e.g. O-rings and electronic components (laser)
- Measurement on multicoloured and high-contrast objects, e.g. packages (laser)
- Checking fill level of granular material, e.g. plastic pellets

FT 25-R(L)A – Product Overview		
	Operating range	Special features
FT 25-RLA	20 ... 100 mm	Laser, small housing, IO-Link 
FT 25-RA	20 ... 80 mm / 30 ... 200 mm	Small housing with long range, IO-Link 

FT 50 – laser distance sensors

Precise and rapid measurement with many extras



The **FT 50-RLA** is the proven standard series of distance sensors from SensoPart.

These distance sensors are particularly easy to commission thanks to their fixed operating distances. Voltage rises linearly with increasing distance.

Regardless of the reflectivity of the target object, these sensors provide excellent measurement results and their comprehensive range of functions is impressive.

The optional serial interface allows user-friendly configuration via PC, providing visualisation of measurement values.

TYPICAL FT 50

- Laser distance sensors with a variety of measurement ranges
- Shape and color of the target object is largely irrelevant
- High accuracy and resolutions up to 7 μm
- Rapid response time up to 1 kHz
- Intelligent teach-in user concept
- 2 switching outputs
- Analogue output: 4 ... 20 mA / 0 ... 10 V
- Variants with serial interface for measuring differences and thicknesses in master/slave mode
- ABS housing with rotatable plug





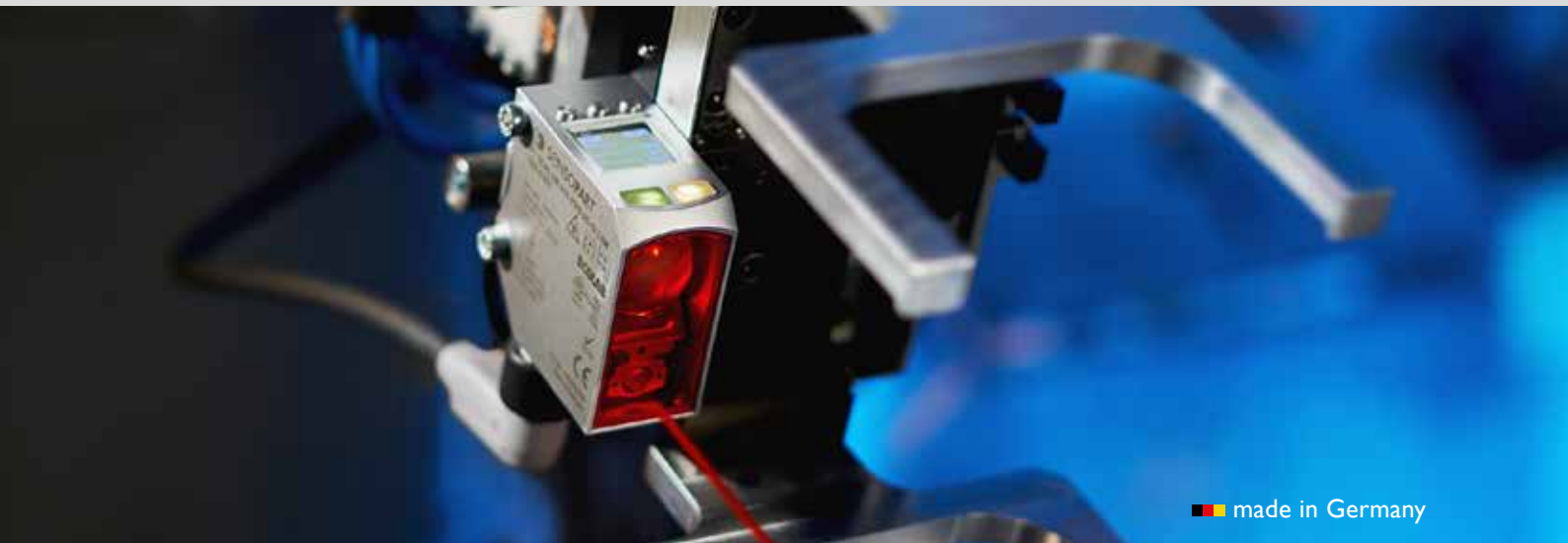
Independent of reflectivity

These highly precise triangulation sensors are predestined for the detection of differing materials thanks to their high contrast-independence.

FT 50 / Product Overview			
	Housing dimensions	Operating range	Special features
FT 50 RLA-20	50 x 17 x 50 mm	40 ... 60 mm	Analogue output
FT 50 RLA-40	50 x 17 x 50 mm	45 ... 85 mm	Analogue output
FT 50 RLA-70 -100 -220	50 x 17 x 50 mm	30 ... 100 mm 70 ... 170 mm 80 ... 300 mm	Analogue output, switching outputs, simple teach-in of measurement ranges; RS485 interface

FT 55-RLAM – The allrounder for distance measurement

Compact sensors for precision measuring tasks and reliable object detection



 made in Germany

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.

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 $\leq 40 \mu\text{m}$ / $\leq 100 \mu\text{m}$
 - Linearity $\pm 0.6 \text{ mm}$ / $\pm 1.5 \text{ mm}$
 - Resolution $30 \mu\text{m}$ / $50 \mu\text{m}$
- 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

 **IO-Link** **ECOLAB**



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)

FT 55 – Time-of-flight sensors with long scanning range

Compact sensors for precision measuring tasks and reliable object detection



 made in Germany



Reliable object detection:

Even objects with highly reflective metal surfaces and at critical measurement angles are reliably detected.



Precise fine adjustment:

The clever mounting and adjustment concept has been specially developed for FT 55 distance sensors. Small changes in angle allow precise alignment of the light spot, even at long distances.

TYPICAL FT 55









- Long ranges and scanning distances (up to 5 m on light objects and 3 m on dark ones)
- Reliable object detection against any backgrounds thanks to light time-of-flight process
- High switching frequency (500/250 Hz) for rapid processes
- High repeatability in the mm range
- Laser class 1 – for optimum security
- Glass-fibre reinforced, hermetically-sealed plastic housing (IP67/IP69K)
- Simple mounting and use (dovetail, teach-in)
- IO-Link with 2 switching outputs, smart functions and measured value output (distance sensors F55-RLAP)

Measuring or switching – the right variant for every application

Measuring distances: laser distance sensors with analogue output

The distance sensors that function according to the time-of-flight principle measure distances ranging from 60 mm to 5 m with utmost precision. They provide a signal that is proportional to the distance via the integrated analogue output (4...20 mA/0...10 V, invertible characteristics) and also have a switching output with switching window function that is adjustable independently of the analogue measurement range.

The measuring distance sensor with analogue output is used, for example, for inspecting the diameter of coils, positioning robots or measuring filling levels and stack heights.

FT 55 – product overview				
	Type of light	Adjustment	Scanning distance/Range ¹	Special features
Laser distance sensors (pointing at object)				
FT 55-RLAP	Laser 	Teach-in  (key and control cable)  IO-Link	0.1 to 5 m	<ul style="list-style-type: none"> • Long-range measurement up to 5 m on white, 3 m on black • Analogue output 4 to 20 mA and 0 to 10 V (changeable via IO-Link), output of measured value via IO-Link • Switching output with automatic detection PNP/NPN with switching point, window and hysteresis function (window taught by teach-in, switching point and hysteresis via IO-Link) • Extensive setting options via IO-Link • Laser class 1
FT 55-RLAP2	Laser 	Teach-in  (key and control cable)  IO-Link	0.06 to 5 m	<ul style="list-style-type: none"> • Long-range measurement • Output of measured value via IO-Link • Switching output with automatic detection PNP/NPN with switching point, window and hysteresis function (switching point taught by teach-in, window and hysteresis via IO-Link) • Extensive setting options via IO-Link • Laser class 1
FR 55-RLAP	Laser 	Teach-in  (key and control cable)	0.3...70 m	<ul style="list-style-type: none"> • Long-range sensor with measurement of up to 70m for collision protection and positioning applications • Analogue output • Switching output with automatic detection PNP/NPN • Laser class 1

¹ Reference material white, 90 % reflectivity

Interconnected system architecture

EtherNet/IP™

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

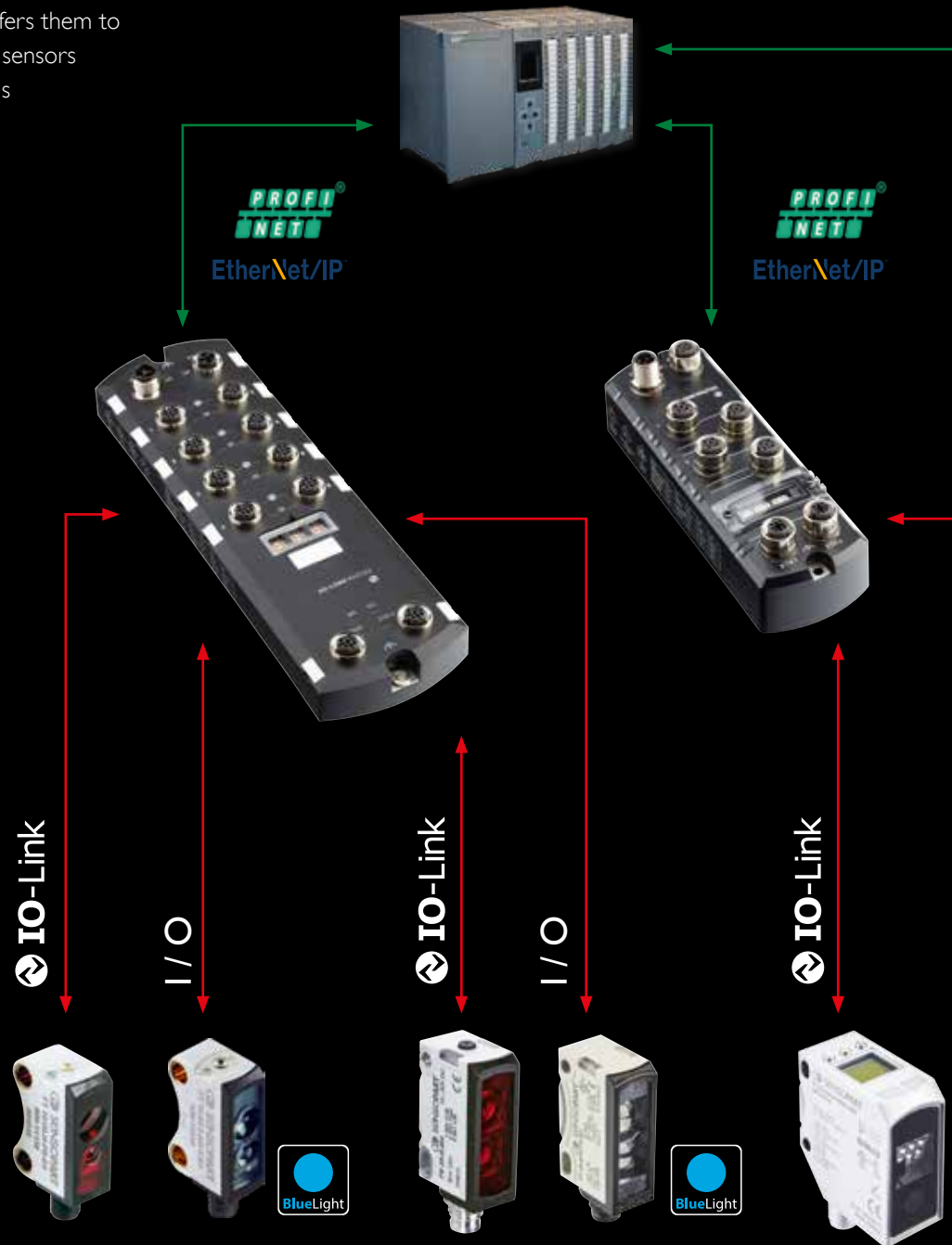
Two-way communication up to the lowest field level, allowing greater transparency. Availability of a large amount of relevant data, e.g. for condition monitoring.

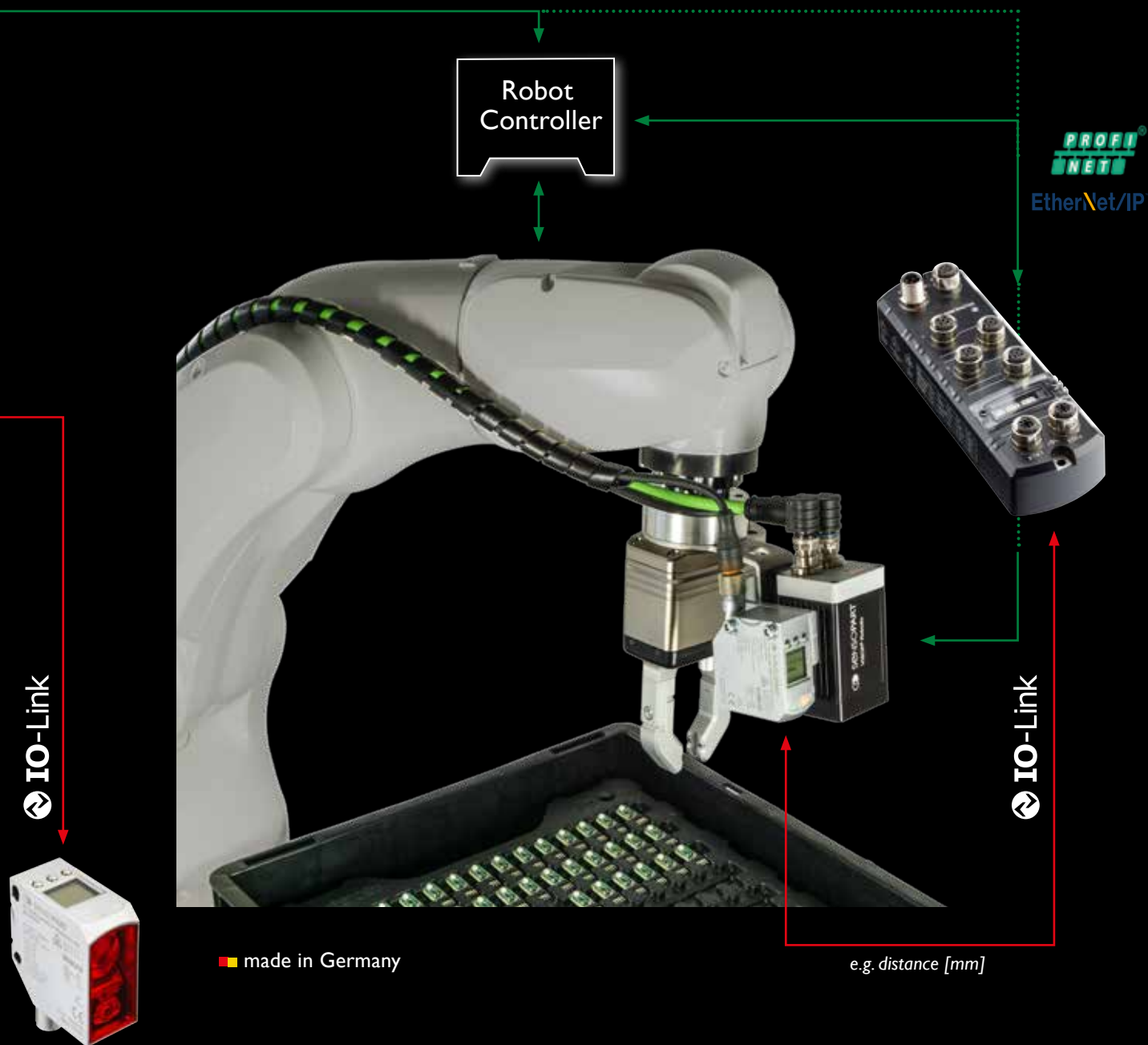
Versatility

Combined use of IO-Link and binary sensors is easily possible on the IO-Link Master. All IO-Link sensors from SensoPart 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 cascability 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.

Technical data distance sensors

Overview of technical characteristics

Sensors for all operating ranges						10	50	100	200	300	400	500	600	700	800	900	1000
		IO-Link	Start of measuring range [mm]	End of measuring range [mm]	Measuring range [mm]												
F10	FT10-RLA-60	✓	10	70	60												
F25	FT 25-RA-60	✓	20	80	60												
	FT 25-RA-170	✓	30	200	170												
	FT 25-RLA-80	✓	20	100	80												
F50	FT 50-RLA-20	–	40	60	20												
	FT 50-RLA-40	–	45	85	40												
	FT 50-RLA-70	–	30	100	70												
	FT 50-RLA-100	–	70	170	100												
	FT 50-RLA-220	–	80	300	220												
F55	FT 55-RLAM-480	✓	120	600	480												
	FT 55-RLAM-800	✓	200	1000	800												
	FT 55-RLAP	✓	100	5,000	4,900												
	FR 55-RLAP-300	–	300	70,000	69,700												
















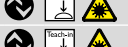
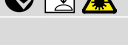









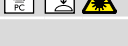












Linearity – precision across the entire measuring range						
			End of measuring range [mm]	Linearity ± [mm]	Linearity [%] at end of measuring range	
F10	FT10-RLA-60		70	0.4	0.25 %	
F25	FT 25-RA-60		80	0.4	0.5 %	
	FT 25-RA-170		200	2	1.0 %	
	FT 25-RLA-80		100	0.25	0.25 %	
F50	FT 50-RLA-20		60	0.6	1.0 %	
	FT 50-RLA-40		85	0.85	1.0 %	
	FT 50-RLA-70		100	0.25	0.25 %	
	FT 50-RLA-100		170	0.425	0.25 %	
	FT 50-RLA-220		300	0.75	0.25 %	
F55	FT 55-RLAM-480		600	0.6	0.1 %	
	FT 55-RLAM-800		1,000	1.5	0.1 %	
	FT 55-RLAP		5,000	15	0.3 %	
	FR 55-RLAP		70,000	350	0.5 %	

Overview technical characteristics

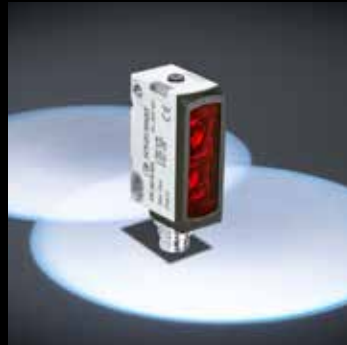
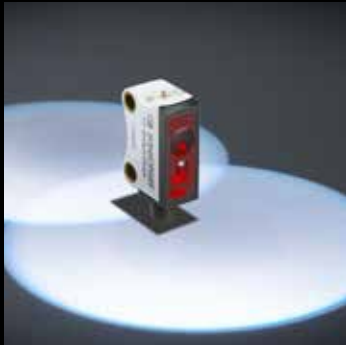
Repeatability - pinpoint precision				
		Response time [ms]*	Repeatability [%] at end of measuring range	
F10	FT10-RLA-60	3	0.14 %	0.14
F25	FT 25-RA-60	0.4	0.50 %	0.50
	FT 25-RA-170	3.4	0.50 %	0.50
	FT 25-RLA-80	3.4	0.25 %	0.25
F50	FT 50-RLA-20	30	0.08 %	0.08
	FT 50-RLA-40	30	0.12 %	0.12
	FT 50-RLA-70	40	0.25 %	0.25
	FT 50-RLA-100	40	0.25 %	0.25
	FT 50-RLA-220	40	0.25 %	0.25
F55	FT 55-RLAM-480	10	0.07 %	0.07
	FT 55-RLAM-800	10	0.10 %	0.10
	FT 55-RLAP	20	0.14 %	0.14
	FR 55-RLAP	10	0.05 %	0.05

* **Factory setting:** Can be set via IO-Link and thus the repeatability can be optimized.

Accuracy in all circumstances		
		Temperature drift [% / K] over measuring range
F10	FT10-RLA-60	0.02
F25	FT 25-RA-60	0.17
	FT 25-RA-170	0.12
	FT 25-RLA-80	0.13
F50	FT 50-RLA-20	0.05
	FT 50-RLA-40	0.05
	FT 50-RLA-70	0.02
	FT 50-RLA-100	0.02
	FT 50-RLA-220	0.02
F55	FT 55-RLAM-480	0.01
	FT 55-RLAM-800	0.01
	FT 55-RLAP-5	0.04
	FR 55-RLAP-70	0.0005

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 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 90 95 x 93 x 42 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				

Photoelectric diffuse sensors with background suppression (BGS)	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			
	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	FMS 30-U Diffuse 800 mm Through-beam 4.8 m
	FR 18-2-IR 3.6 m	FLS/FLE 18-W 50 m	FAV 30 500 mm
		FSE 18-2-I 10 m	
			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 mm ²	



"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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