Distance sensors from SensoPart

Accurate and non-contact distance measurement
for automation technology

Distance sensors

On any machine and for any application

0 mm

300 mm

500 mm

Fits in every gap

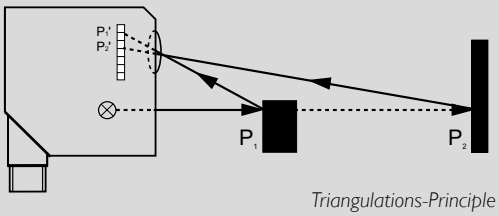
*Weighing and measuring no more than a sugar cube, the **FT 10-RLA** sensor fits in virtually every space. For example, the sensor controls the distance to textiles in industrial sewing machines, guaranteeing more precise stitching.*

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

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

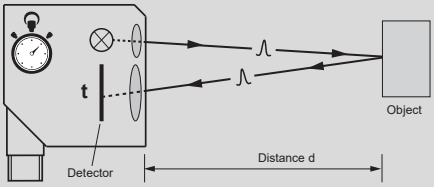
Allrounder for any surface

*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.*

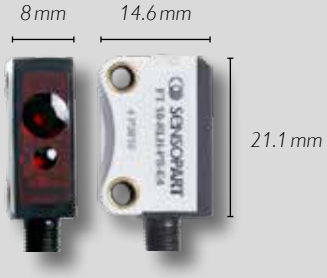


Time of flight technology

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

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. 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

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 … 10 V 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.

IO-Link ECOLAB IP67 IP69 c UL us LISTED CE

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

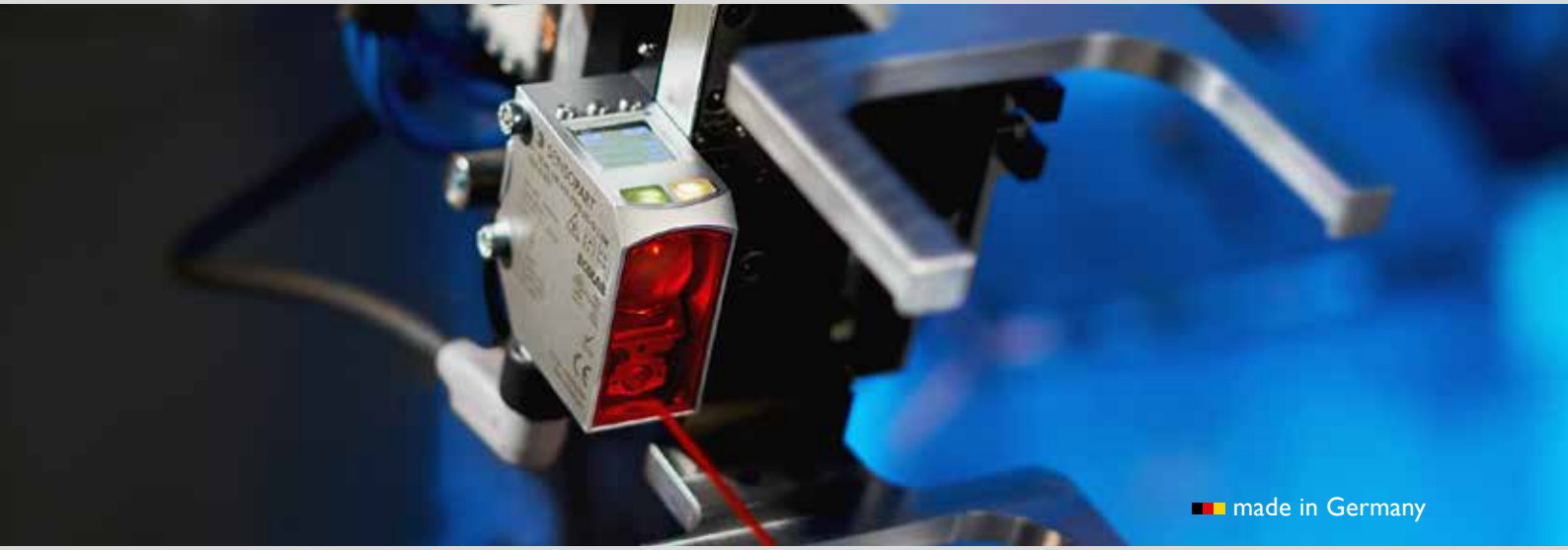
- Laser distance sensors with a variety of measurement ranges
- Shape and color of the target object is largely irrelevant
- High accuracy and resolutions up to 7 µm
- Rapid response time up to 1 kHz
- Intelligent teach-in user concept
- 2 switching outputs
- Analogue output: 4 … 20 mA / 0 … 10 V
- Variants 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



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 IP 69 c UL us 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)

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

Compact sensors for precision measuring tasks and reliable object detection

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)

IO-Link ECOLAB IP67 IP69K c UL us LISTED CE

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	• Long-range measurement up to 5 m on white, 3 m on black • Analogue output 4 to 20 mA and 0 to10 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	• 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	• 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

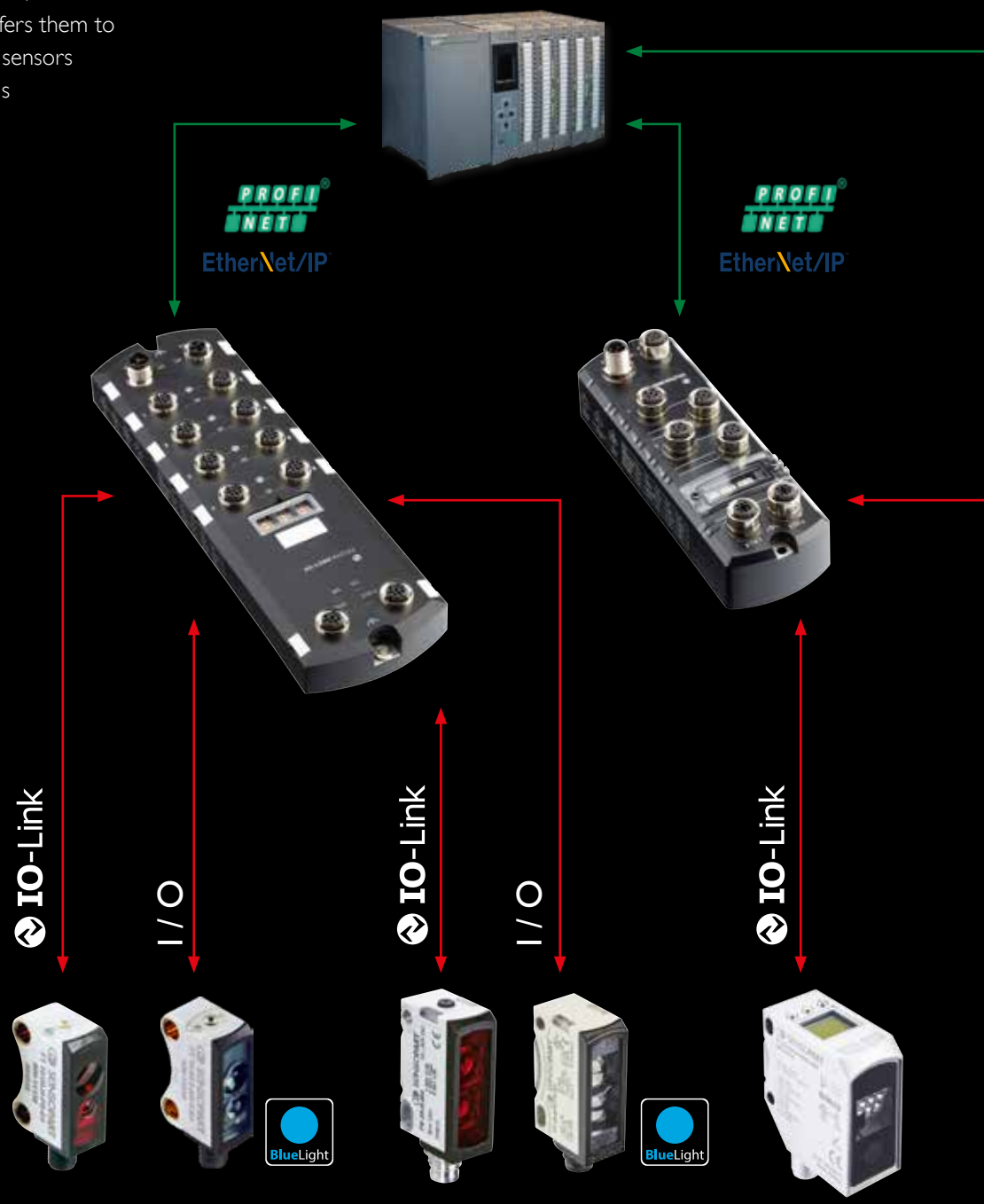
Efficient, communicative, scalable

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.

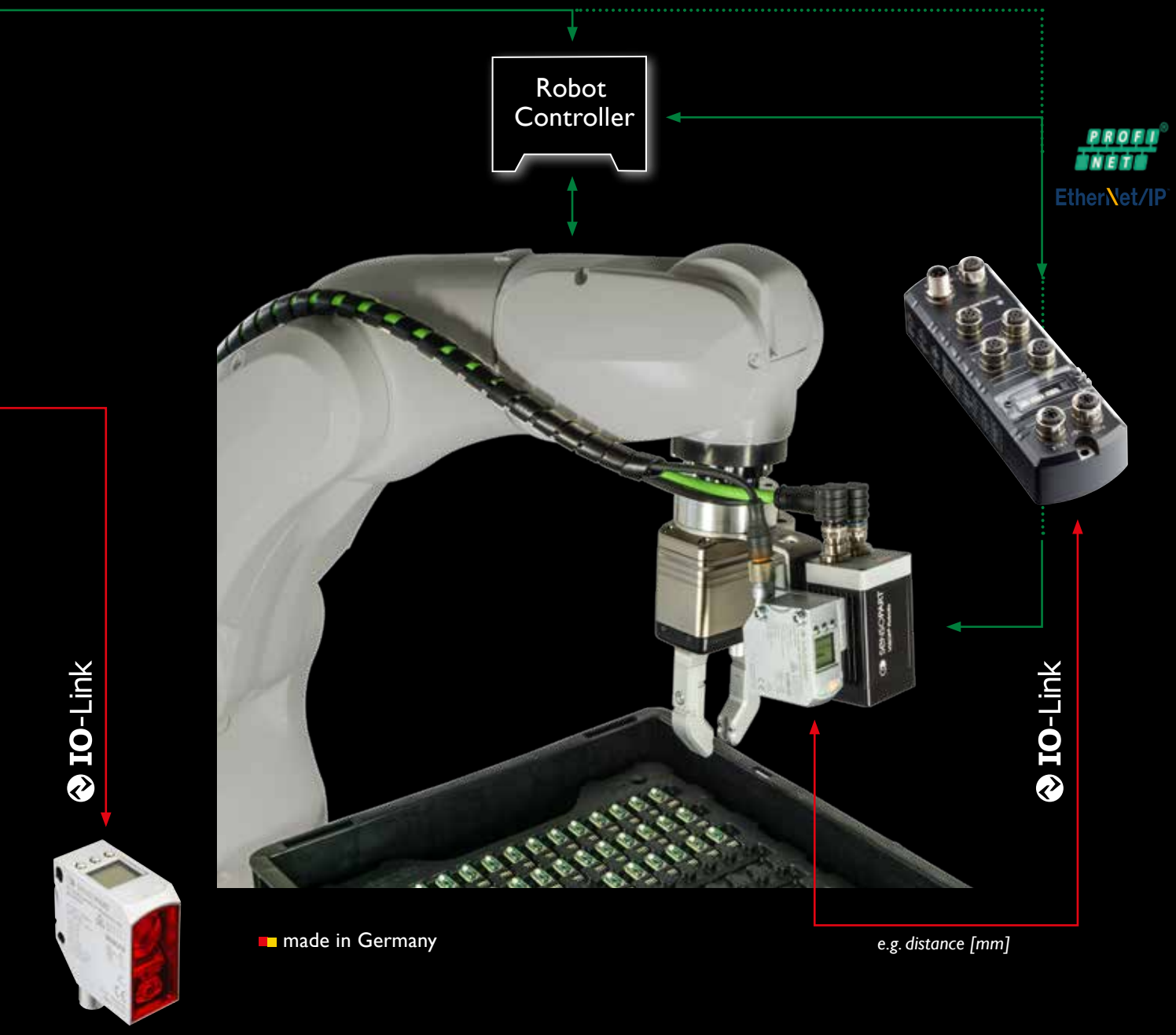
Cost-saving
Fast installation through simple, decentralised cabling. Less cables = less effort.

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.

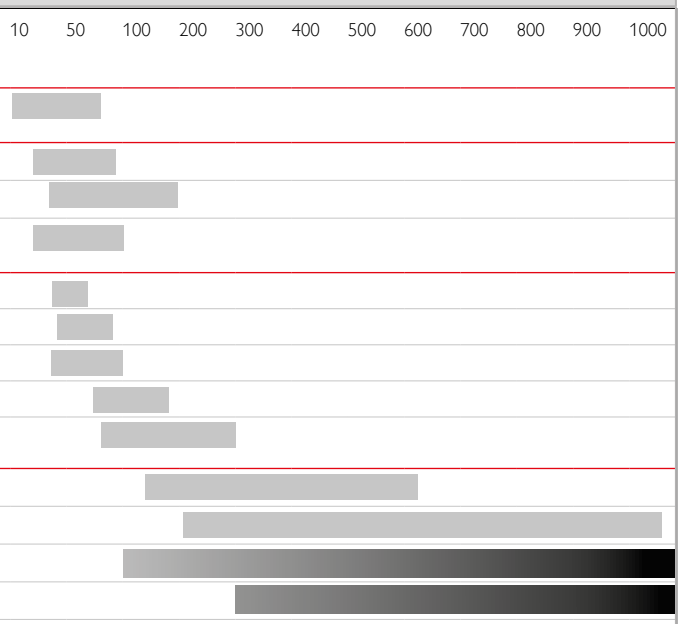
Compatibility
The cascadability of the IO-Link Master allows combinations with other Profinet / EthernetIP devices. For example, in robotics applications, the X and Y value and also rotation can be detected with the VISOR® and the Z value with a distance sensor. This architecture also reduces cabling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

Technical data distance sensors

Overview of technical characteristics

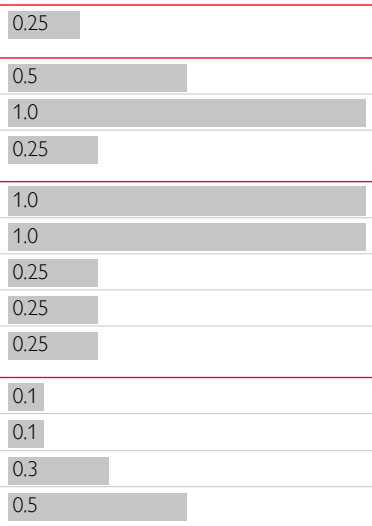
Sensors for all operating ranges

		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 %



Technical data distance sensors

SENSOPART

Overview technical characteristics

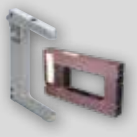
Repeatability - pinpoint precision

		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 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 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				

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

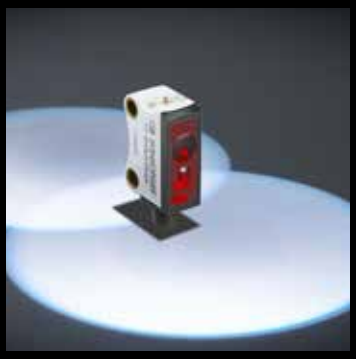
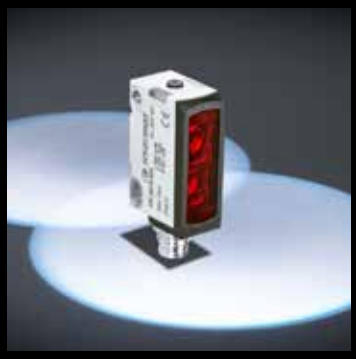
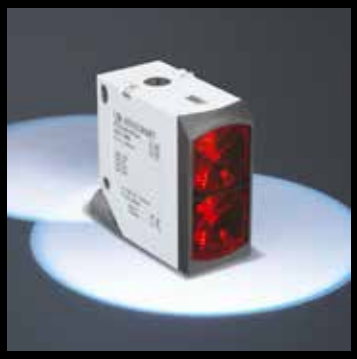
SENSOPART

Photoelectric diffuse sensors with background suppression (BGS)	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**	
	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**	

We look ahead

Yesterday, today and in the future

SENSOPART

"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

Sold & Serviced By:

Canadian and International Sales
ELECTROMATE
877-737-8698
sales@electromate.com
www.electromate.com

U.S. Sales
SERVO2GO.com
877-378-0240
sales@servo2go.com
www.servo2go.com