

FT 55-RLAP

Distance sensor for large distances – Time-of-flight technology



PRODUCT HIGHLIGHTS

- For measurement and control tasks with all object surfaces at long scanning distances
- Stable and precise distance measurement even with tilted objects and with bright, highly reflective backgrounds
- Detection of all objects in front of fixed backgrounds via switching output
- High flexibility thanks to invertible analogue characteristic (Q_A) and window mode (Q)
- Easy installation and operation via external teach-in
- Clearly visible laser light spot (laser class 1) for an easy alignment and full eye safety

Optical data		Functions	
Measurement range	0.1 ... 5 m (see selection table) ¹	Indicator LED 2, green	Operating voltage indicator
Type of light	Laser, red 655 nm	Indicator LED 2, yellow	Status indicator analogue output
Laser class (IEC 60825-1)	1	Indicator LED 1 yellow	Switching output indicator
Resolution	< 5 mm	Measurement range adjustment	Via Teach-in button or control input
Hysteresis	20 mm	Adjustment possibilities	Analogue measurement range Q_A Invertible analogue characteristic Switching output Q (window mode) N.O. / N.C. and Auto-Detect / NPN / PNP via teach-in and control line, wide variety of adjustment possibilities for service and process data via IO-Link
Linearity	± 15 mm (see diagram) ²		
Repeatability	≤ 7 mm (6σ , see diagram) ^{1,3}		
		Default settings	See selection table
Electrical data			
Operating voltage $+U_B$	18 ... 30V DC	Response time Q	2 ms
No-load current I_0	≤ 60 mA	Load	≤ 500 Ohm (4 ... 20 mA) ≥ 4 k Ohm (0 ... 10 V)
Output current I_e Q	≤ 100 mA	Analogue output Q_A	4 ... 20 mA / 0.1 ... 10 V
Protection circuits	Reverse polarity protection U_B / short-circuit protection (Q)	Update time Q_A	2 / 20 ms
Protection class	2	Factor's averaging time ⁸	1 / 10 / 20 / 30 / 40 / 50 / 60 / 70 / 80 / 90 / 100
Power On Delay	< 500 ms	Response time Q_A	2 / 20 ms \times factor averaging time
Switching output Q	Auto-Detect (PNP/NPN) ⁴	Temperature drift	< 1 mm / K
Output function	N.O./N.C.	Warm-up time	20 min.
Switching frequency f (ti/tp 1:1) Q	≤ 250 Hz	Control input IN	$+U_B$ = Teach-in / $-U_B$ = button locked Open = normal operation
Mechanical data		IO-Link	
Dimensions	50 x 50.1 x 23 mm	Communication mode	COM 2
Enclosure rating	IP 67 & IP 69K ⁵	Min. cycle time	2.7 ms
Material, housing	ABS	SIO mode	Compatible
Material, front screen	PMMA	Process bit length	24 Bit
Type of connection	See selection table	Specification	1.1
Ambient temperature: operation	-40 ... +60 °C ^{6,7}		
Ambient temperature: storage	-40 ... +80 °C		
Weight (plug device)	42 g		
Resistance to vibration and impacts	EN 60947-5-2		

¹ Reference material 90 % reflectivity ² 20 ... 90 % ³ At 50 Hz ⁴ Auto-Detect: Automatic selection of PNP or NPN by the sensor; PNP or NPN can be fixed

⁵ With connected IP 67 / IP 69K plug ⁶ Up to +50 °C with current output 4 ... 20 mA ⁷ UL: max. +45 °C ⁸ adjustable via IO-Link, e.g. with SensoIO

Measurement range ¹	Analogue output	Switching output	Type of connection	Part Number	Article number
0.1... 5 m	4 ... 20 mA	Auto-Detect	Plug, M12x1, 5-pin, IO-Link	FT 55-RLAP-5-PNSIL-L5	622-21023
0.1 ... 5 m	0 ... 10V	Auto-Detect	Plug, M12x1, 5-pin, IO-Link	FT 55-RLAP-5-PNSUL-L5	622-21024

<p>Plug connection</p>	<p>Connection, 5-pin, Auto-Detect</p>
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<p>Light spot size</p>	<p>Linearity error (typ.)^{9,10}</p>
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⁹ Output via IO-Link ¹⁰ Deviation linearity error $Q_A < 5$ mm from digital value

<p>Repeatability¹¹ (50 Hz)</p> <p>axial object approach</p>	<p>Repeatability¹¹ (250 Hz¹²)</p> <p>lateral object approach</p>
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¹¹ At constant ambient conditions ¹² Automatic adjustment to 50 Hz at constant distance

<p>Characteristic analogue curve</p>	<table border="1"> <tr> <th>Reference material</th> <th>Measurement range</th> </tr> <tr> <td>White (90 %)</td> <td>0.1 ... 5 m</td> </tr> <tr> <td>Grey (18 %)</td> <td>0.1 ... 5 m</td> </tr> <tr> <td>Black (6 %)</td> <td>0.1 ... 3 m</td> </tr> </table> <p>Default setting¹³</p> <table border="1"> <tr> <td>Analogue output Q_A (4...20 mA / 0.1 ... 10V)</td> <td>0.3 ... 3 m</td> </tr> <tr> <td>Switching output Q (A_1, \dots, A_2), N.O., Auto-Detect</td> <td>0.3 ... 3 m</td> </tr> </table> <p>Accessories</p> <table border="1"> <tr> <td>Connection cables</td> <td>www.sensopart.com/en/accessories</td> </tr> <tr> <td>Brackets</td> <td></td> </tr> <tr> <td>SensIO (901-01001)</td> <td></td> </tr> </table>	Reference material	Measurement range	White (90 %)	0.1 ... 5 m	Grey (18 %)	0.1 ... 5 m	Black (6 %)	0.1 ... 3 m	Analogue output Q_A (4...20 mA / 0.1 ... 10V)	0.3 ... 3 m	Switching output Q (A_1, \dots, A_2), N.O., Auto-Detect	0.3 ... 3 m	Connection cables	www.sensopart.com/en/accessories	Brackets		SensIO (901-01001)	
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¹³The specified precision is achieved by teaching the distances