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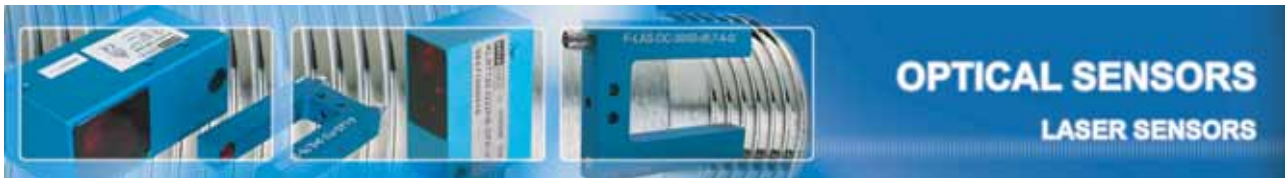
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## A-LAS SERIES ANALOG LASER LIGHT BARRIERS

### Product information

Parallel laser light with homogeneous light distribution in round or rectangular cross-section is used for measuring, positioning and detecting objects starting from a size of 0.01 mm

- Visible laser beam (laser class 2)
- Apertures available from 0.2mm to 30mm
- High reproducibility starting from 0.5µm
- High analog band width (300kHz)
- Optics and optics cover made of glass
- Different control electronics available (parameterisable under Windows® via RS232)



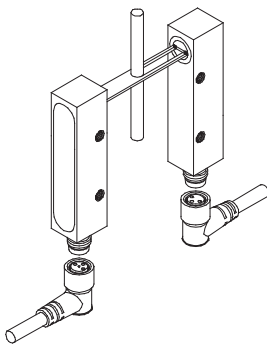
### Characteristics

#### Collimated laser beam

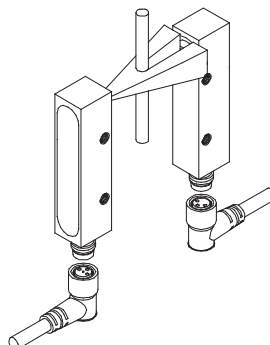
The laser light beam that is emitted by a high-precision optical unit (aspherical surface made of glass) allows the detection of smallest objects (e.g. threads) even in case of a large transmitter/receiver distance (distances up to 100m, depending on the aperture).

#### Advantages

- Telecentric design
- Exact shadow projection onto the receiver
- The distance of the measuring object from the transmitter or receiver has no influence on the measuring signal



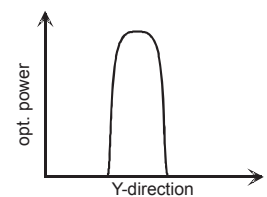
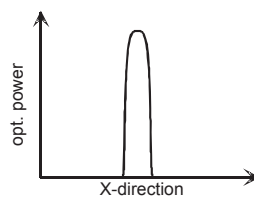
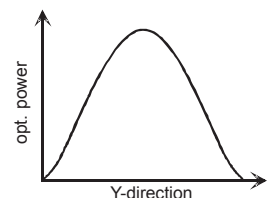
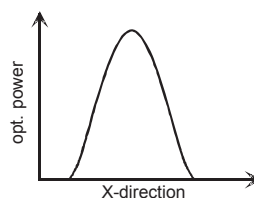
Light barrier A-LAS-Series



Conventional light barrier

#### Homogeneous light distribution

The use of high-precision apertures in the transmitters ensures optimum adaptation to the respective application. Apart from a large variety of standard apertures special apertures can also be realised. The aperture guarantees a homogeneous light distribution on the beam and a sharp beam limitation.

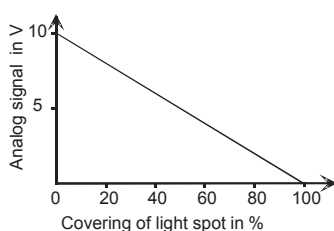


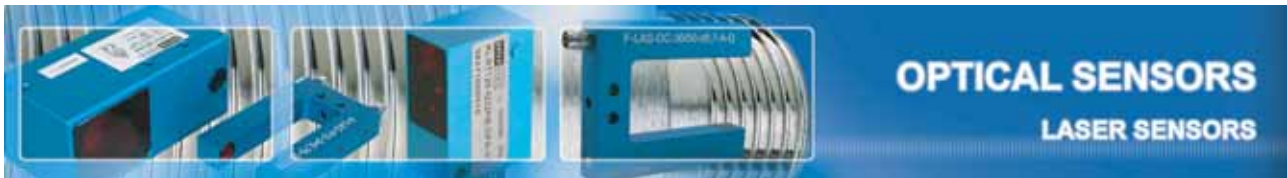
#### Compact and robust metal housing

With their robust metal housing and their high protection class the laser light barriers of series A-LAS are designed for demanding applications in machine construction. With respect to the housing size the A-LAS-90 sensor type with integrated laser driver and pre-amplifier electronics, for example, can be compared with conventional sensor types, and it can be installed and mounted without any problems.

#### Measuring principle

Partial covering of the laser beam leads to a voltage at the analog output that is proportional to the degree of covering.





## A-LAS SERIES ANALOG LASER LIGHT BARRIERS

### Selection chart sensors

Article number	Designation fork design A-LAS-F (Width)-(Aperture)-(Range/Depth)
083764000XX	A-LAS-F08-(Aperture)-10/50
083764001XX	A-LAS-F08-(Aperture)-20/50
083764002XX	A-LAS-F08-(Aperture)-20/60
083764003XX	A-LAS-F08-(Aperture)-20/80
083764004XX	A-LAS-F08-(Aperture)-30/50
083764005XX	A-LAS-F08-(Aperture)-30/60
083764006XX	A-LAS-F08-(Aperture)-30/80
083764015XX	A-LAS-F08-(Aperture)-40/50
083764007XX	A-LAS-F08-(Aperture)-40/60
083764008XX	A-LAS-F08-(Aperture)-40/80
083764009XX	A-LAS-F08-(Aperture)-50/50
083764010XX	A-LAS-F08-(Aperture)-50/60
083764011XX	A-LAS-F08-(Aperture)-50/80
083764012XX	A-LAS-F08-(Aperture)-100/50
083764013XX	A-LAS-F08-(Aperture)-100/80
083764020XX	A-LAS-F10-(Aperture)-10/50
083764021XX	A-LAS-F10-(Aperture)-20/50
083764022XX	A-LAS-F10-(Aperture)-20/60
083764023XX	A-LAS-F10-(Aperture)-20/80
083764024XX	A-LAS-F10-(Aperture)-30/50
083764025XX	A-LAS-F10-(Aperture)-30/60
083764026XX	A-LAS-F10-(Aperture)-30/80
083764035XX	A-LAS-F10-(Aperture)-40/50
083764027XX	A-LAS-F10-(Aperture)-40/60
083764028XX	A-LAS-F10-(Aperture)-40/80
083764029XX	A-LAS-F10-(Aperture)-50/50
083764030XX	A-LAS-F10-(Aperture)-50/60
083764031XX	A-LAS-F10-(Aperture)-50/80
083764032XX	A-LAS-F10-(Aperture)-100/50
083764033XX	A-LAS-F10-(Aperture)-100/80
083764040XX	A-LAS-F12-(Aperture)-10/50
083764041XX	A-LAS-F12-(Aperture)-20/50
083764042XX	A-LAS-F12-(Aperture)-20/60
083764043XX	A-LAS-F12-(Aperture)-20/80
083764044XX	A-LAS-F12-(Aperture)-30/50
083764045XX	A-LAS-F12-(Aperture)-30/60
083764046XX	A-LAS-F12-(Aperture)-30/80
083764039XX	A-LAS-F12-(Aperture)-40/50

Article number	Designation fork design A-LAS-F (Width)-(Aperture)-(Range/Depth)
083764047XX	A-LAS-F12-(Aperture)-40/60
083764048XX	A-LAS-F12-(Aperture)-40/80
083764049XX	A-LAS-F12-(Aperture)-50/50
083764050XX	A-LAS-F12-(Aperture)-50/60
083764051XX	A-LAS-F12-(Aperture)-50/80
083764052XX	A-LAS-F12-(Aperture)-100/50
083764053XX	A-LAS-F12-(Aperture)-100/80
083764060XX	A-LAS-F24-(Aperture)-20/60
083764061XX	A-LAS-F24-(Aperture)-30/60
083764062XX	A-LAS-F24-(Aperture)-40/60
083764063XX	A-LAS-F24-(Aperture)-50/60
083764064XX	A-LAS-F24-(Aperture)-100/60
083764065XX	A-LAS-F24-(Aperture)-100/80
083764066XX	A-LAS-F24-(Aperture)-100/100
083764070XX	A-LAS-F34-(Aperture)-50/80
083764071XX	A-LAS-F34-(Aperture)-100/80
083764072XX	A-LAS-F34-(Aperture)-150/80
083764073XX	A-LAS-F34-(Aperture)-200/80
083764074XX	A-LAS-F34-(Aperture)-250/80
083764075XX	A-LAS-F34-(Aperture)-300/80

Article number	Designation split design A-LAS-F (Range)-(Aperture)
083734073XX	A-LAS-08-(Aperture)
083734074XX	A-LAS-10-(Aperture)
083728472XX	A-LAS-90-(Aperture)
083728471XX	A-LAS-12/90-(Aperture)
083728477XX	A-LAS-24-(Aperture)
083728478XX	A-LAS-24/90-(Aperture)
083728460XX	A-LAS-34-(Aperture)-T
083728461XX	A-LAS-34-(Aperture)-R
083734034XX	A-LAS-34/90-(Aperture)-T
083734035XX	A-LAS-34/90-(Aperture)-R

Selection chart sensors in combination with selection chart apertures.  
Detailed information on [www.pulsotronic.de](http://www.pulsotronic.de).

### Control electronics

Article number	Designation	Dimensions in mm	Output signal	Operating voltage
08369401200	AGL3-2m	60 x 27 x 27	Analog (0-10V), digital (stat./ dyn.)	+12VDC...+32VDC
08369401202	AGL3-5m	60 x 27 x 27	Analog (0-10V), digital (stat./ dyn.)	+12VDC...+32VDC
08369401400	AGL4-Q	65 x 27 x 30	Analog (0-10V), digital (stat./ dyn.), PNP NO/NPN NC	+12VDC...+32VDC
08369401420	AGL4-Qinv	65 x 27 x 30	Analog (0-10V), digital (stat./ dyn.), NPN NO/PNP NC	+12VDC...+32VDC
08369401450	AGL4-Q-HS	65 x 27 x 30	Analog (0-10V), digital (stat./ dyn.), High Speed	+12VDC...+32VDC
08369401470	AGL4-Qinv-HS	65 x 27 x 30	Analog (0-10V), digital (stat./ dyn.), High Speed	+12VDC...+32VDC
08369401300	SI-CON4 (incl. software)	60 x 22 x 40	Analog (0-10V), digital (stat./ dyn.)	+24VDC...+32VDC
08369401510	SI-CON11-0/20	65 x 27 x 30	Analog (0-10V, 0-20mA)	+12VDC...+32VDC
08369401500	SI-CON11-4/20	65 x 27 x 30	Analog (0-10V, 4-20mA)	+12VDC...+32VDC
08369401520	SI-CON11-5/25	65 x 27 x 30	Analog (0-10V, 5-25mA)	+12VDC...+32VDC
08369401600	SI-CON34 (incl. software)	140 x 40 x 75	Digital (programmable)	+24VDC +/-10%
08369401800	SI-CON84 (incl. software)	135 x 31 x 135	Analog (0-5V/ 0-10V), digital (programmable)	+18VDC...+36VDC
08369401901	A-LAS-CON1	80 x 80 x 22,5	Analog (0-10V), digital (programmable)	+12VDC...+32VDC

#### Abbreviations

Q = PNP N.C. / NPN N.O.

Qinv = NPN N.C. / PNP N.O.



# OPTICAL SENSORS

## LASER SENSORS

### A-LAS SERIES ANALOG LASER LIGHT BARRIERS

#### Apertures fork design A-LAS...

Last digits article number	..F08	...F10	...F12	...F24	...F34
01				0,5 x 16	
02		1 x 0,3	1 x 0,3		
03		1 x 0,5	1 x 0,5		
04	1 x 1	1 x 1	1 x 1		
05				1 x 16	
07	2 x 0,75	2 x 0,75	2 x 0,75		
08	2 x 1	2 x 1	2 x 1		
10				2 x 16	
13	3 x 0,75	3 x 0,75	3 x 0,75		
14		4 x 1	4 x 1		
15			6 x 0,8		
16			6,5 x 0,5		
17			6,5 x 0,8		
18		3 x 1	3 x 1		
19		6,5 x 0,3	6,5 x 0,3		
20				16 x 0,5	
21				16 x 1	
22				16 x 2	
23	d 0,3	d 0,3	d 0,3	0,2 x 9,5	
24	d 0,5	d 0,5	d 0,5	0,3 x 10	
26	d 0,7	d 0,7	d 0,7		
28	d 1,0	d 1,0	d 1,0		
31	d 2,0	d 2,0	d 2,0	1,5 x 9,5	
33				9,5 x 0,2	
34				9,5 x 1,5	
36				10 x 0,3	
42	1 x 0,3				
43	1 x 0,5				
45	3 x 0,1				
50	0,2 x 0,5	0,2 x 0,5	0,2 x 0,5		
51	0,2 x 1	0,2 x 1	0,2 x 1		
52	0,3 x 0,5	0,3 x 0,5	0,3 x 0,5		
53	0,3 x 0,8	0,3 x 0,8	0,3 x 0,8		
54	0,3 x 1	0,3 x 1	0,3 x 1		
55	0,3 x 1,5	0,3 x 1,5	0,3 x 1,5		
56		0,3 x 3	0,3 x 3		
57	0,5 x 0,2	0,5 x 0,2	0,5 x 0,2		
58	0,5 x 0,3	0,5 x 0,3	0,5 x 0,3		
59	0,5 x 1	0,5 x 1	0,5 x 1		
60	0,5 x 2				
61	0,5 x 3				
62		0,5 x 4	0,5 x 4		
63	0,75 x 2	0,75 x 2	0,75 x 2		
64	0,75 x 3	0,75 x 3	0,75 x 3		
65	0,8 x 0,3	0,8 x 0,3			
66	1 x 0,2	1 x 0,2	1 x 0,2		
67	1 x 2	1 x 2	1 x 2		10 x 0,3
68	1 x 3				10 x 2
69	1,5 x 0,3				20 x 0,3
70	2 x 0,5				20 x 2
71	3 x 0,5				25 x 2
72	3 x 1				25 x 0,3
73		1,2 x 2	1,2 x 2		30 x 0,5
74		1,5 x 0,3	1,5 x 0,3		30 x 2
75		2 x 1,2	2 x 1,2		
76		3 x 0,3	3 x 0,3		5 x 2
77			0,5 x 6,5		5 x 0,3
78			0,8 x 6		
79			0,8 x 6,5		
81		4 x 0,5	4 x 0,5		
90		1 x 4	1 x 4		

#### Apertures split design A-LAS...

Last digits article number	...08	...10	...90 ...12/90	...24 ...24/90	...34 ...34/90
02	1 x 0,3	1 x 0,3	1 x 0,3	2 x 16	
03	1 x 0,5	1 x 0,5	1 x 0,5		
04	1 x 1	1 x 1	1 x 1		
06					
07	2 x 0,75	2 x 0,75	2 x 0,75		
08	2 x 1	2 x 1	2 x 1		
11					
12				16 x 2	
13	3 x 0,75	3 x 0,75	3 x 0,75		
14	4 x 1	4 x 1	4 x 1		
15			6 x 0,8*		
16			6,5 x 0,5*		
17			6,5 x 0,8*		
18			4 x 0,5		
23	d 0,3	d 0,3	d 0,3	0,2 x 9,5	
24	d 0,5	d 0,5	d 0,5	0,3 x 10	
26	d 0,7	d 0,7	d 0,7	0,5 x 16	
28	d 1,0	d 1,0	d 1,0	1 x 16	
31	d 2,0	d 2,0	d 2,0	1,5 x 9,5	
33			d 3,0	9,5 x 0,2	
34				9,5 x 1,5	
36				10 x 0,3	
38				16 x 0,5	
41				16 x 1	
43					
50	0,2 x 0,5	0,2 x 0,5	0,2 x 0,5		
51	0,2 x 1	0,2 x 1	0,2 x 1		
52		0,3 x 0,5	0,3 x 0,5		
53	0,3 x 0,8		0,3 x 0,8		
54			0,3 x 1		
55	0,3 x 1,5	0,3 x 1,5	0,3 x 1,5		
56	0,3 x 3	0,3 x 3	0,3 x 3		
57			0,5 x 0,2		
58			0,5 x 0,3		
59			0,5 x 1		
62		0,5 x 4	0,5 x 4		
63			0,75 x 2		
64			0,75 x 3		
65			0,8 x 0,3		
66			1 x 0,2		
67			1 x 2		
74			1,5 x 0,3		
75	2 x 1,2	2 x 1,2			
76			3 x 0,3		
80		2 x 3			
81			4 x 0,5		
83					10 x 0,3
84					10 x 2
85					20 x 0,3
86					20 x 2
87					25 x 2
88					25 x 0,3
89					30 x 0,5
90			1 x 4		30 x 2
91			5 x 1*		
92					5 x 2
93					5 x 0,3

\*only for ... 12/90



# OPTICAL SENSORS

## LASER SENSORS

### A-LAS SERIES ANALOG LASER LIGHT BARRIERS

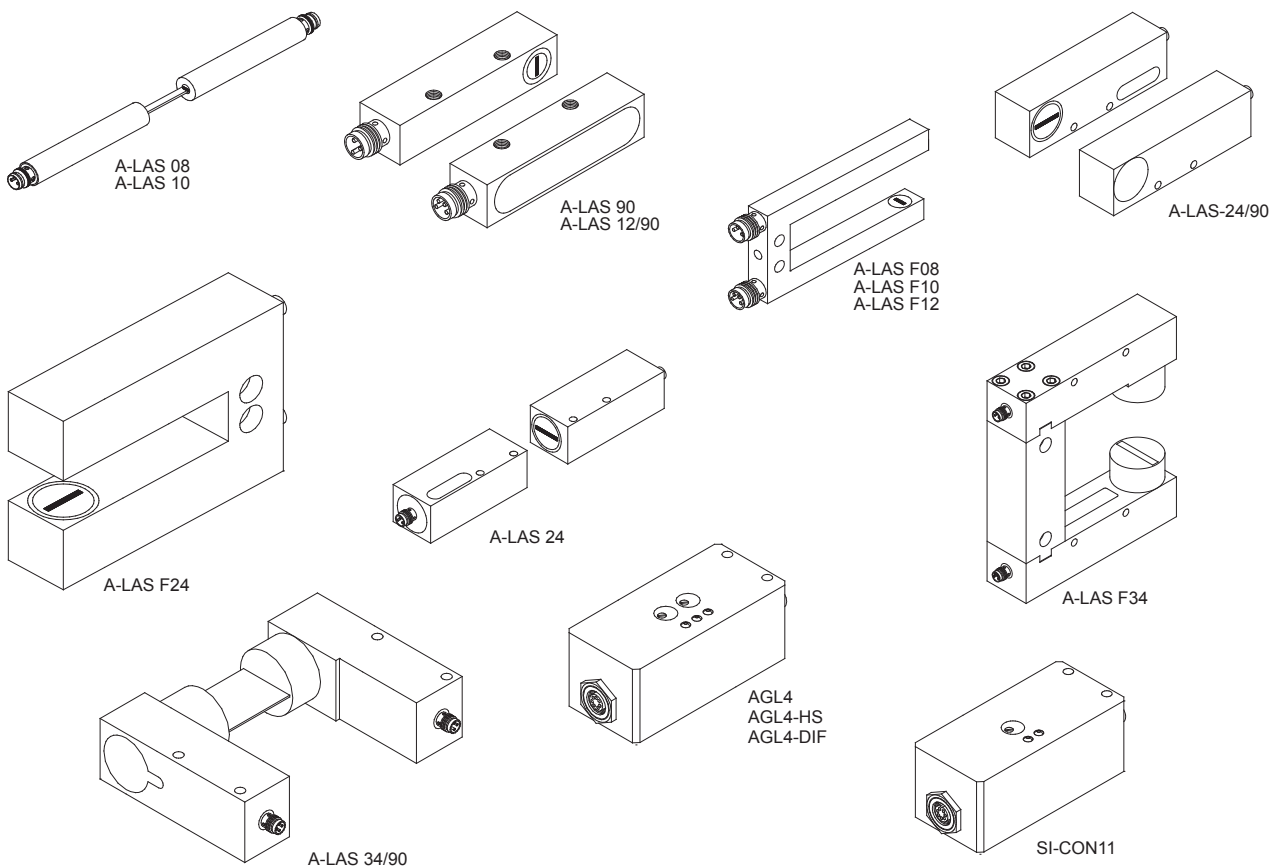
#### Accessories

Article number	Designation	Application
08379481100	MOUNT-LS90/1	mounting device (straight) for A-LAS-90-...
08379480700	MOUNT-LS90/2	mounting device (angled) for A-LAS-90-...
08379480300	MOUNT-LS08	mounting device for A-LAS-08-...
08379480200	MOUNT-LS10	mounting device for A-LAS-10-...
08369401130	ZS-8	target for A-LAS-08
08369401120	ZS-10	target for A-LAS-10

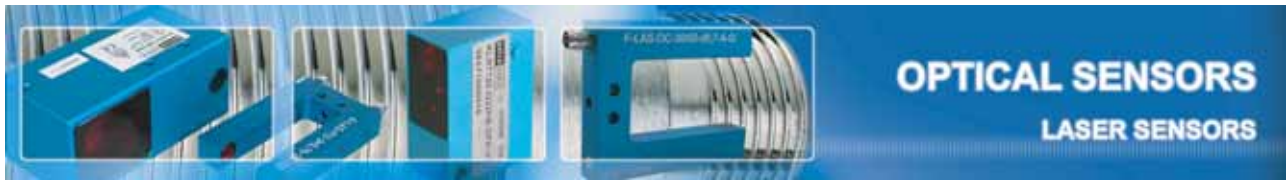
#### Cables

Article number	Designation	Application
08379450800	cab-las-agl7 (l=2m)	connection AGL3 with PLC and voltage supply
08379450400	cab-las3-2 (l=2m)	connection A-LAS-transmitter with control electronics SI-CON4
08379450300	cab-las4-2 (l=2m)	connection A-LAS-receiver with control electronics SI-CON4
08379450100	cab-las5/PC (l=2m)	connection SI-CON4/ SI-CON34 with PC
08379452600	cab-las8/702-fem (l=2m)	connection SI-CON11/ AGL4 with PLC and voltage supply
08379451600	cab-las8/SPS (l=2m)	connection SI-CON34 with PLC and voltage supply
44505451100	cab-M8/4-g-2 (l=2m)	connection SI-CON4 with PLC and voltage supply
08379452500	cab-las-y-2m (l=2m)	connection A-LAS with control electronics SI-CON4/ SI-CON11/ SI-CON34
08379453000	cab-las9/PC (l=2m)	connection SI-CON84 with PC
08379453100	cab-power25-i/o (l=2m)	connection SI-CON84 with PLC and voltage supply
08379453200	cab-sens9 (l=2m, open)	connection SI-CON84 with external sensors
08379453300	cab-code9 (l=2m, open)	connection SI-CON84 with incremental encoder
08379453400	cab-las-y-con84	connection A-LAS with control electronics SI-CON84

#### Type overview

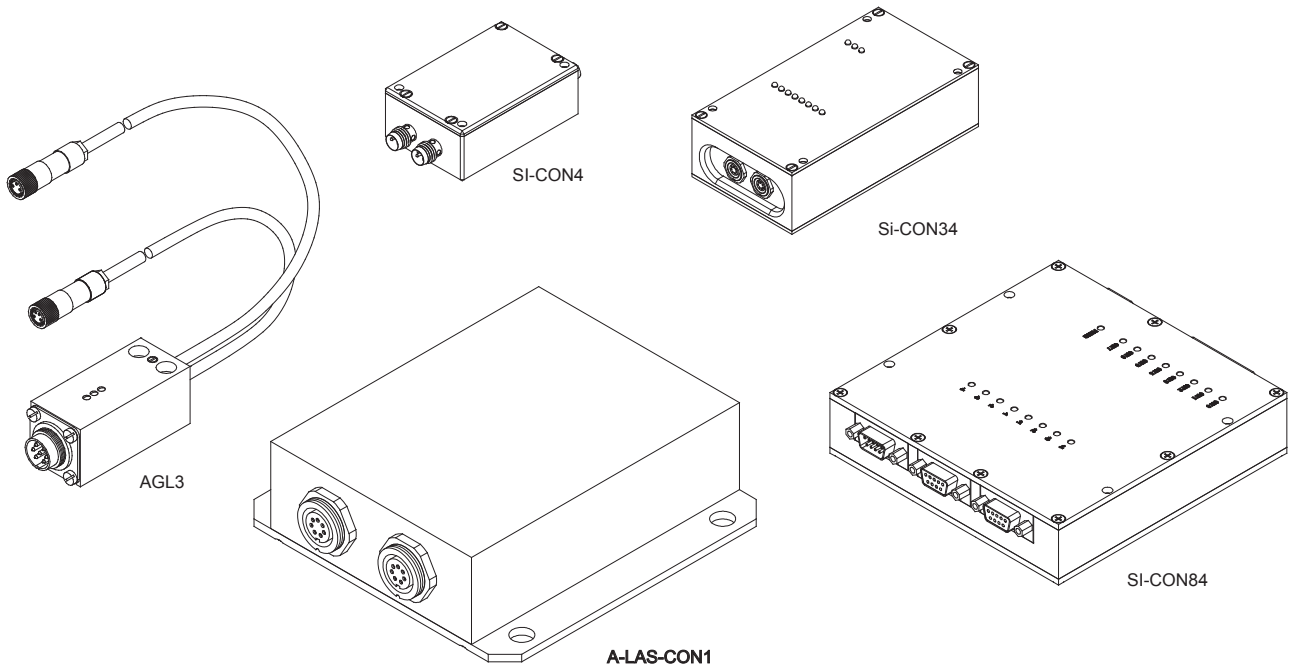


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# A-LAS SERIES ANALOG LASER LIGHT BARRIERS

## Type overview





## D-LAS SERIES DIGITAL LASER LIGHT BARRIERS

### Product information

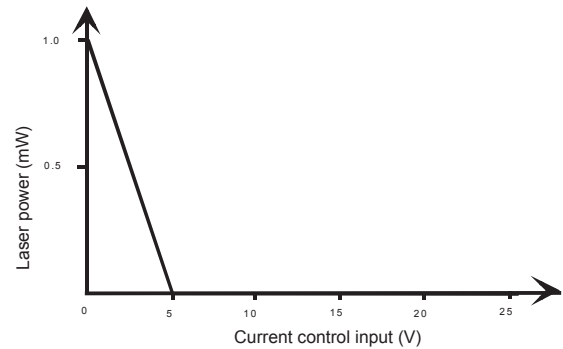
The laser digital light barriers of D-LAS Series work with visible parallel laser light. The use of round or rectangular apertures ensures a homogeneous light distribution in the laser beam. Smallest objects are detected even in case of a large transmitter/receiver distance. Dynamic correction of the switching threshold compensates the effect of dirt accumulation (with D-LAS1, D-LAS2, D-LAS34, D-LAS-34/90). These light barriers are ideal for positioning tasks.



### Characteristics

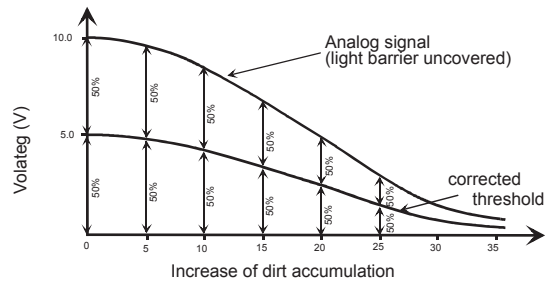
#### Adjustable laser power

The adjustment of the laser power of transmitters type D-LAS1, D-LAS2 and D-LAS90 is realised via the current control input (I-Control). This input can also be used as a test input for switching the laser light barrier ON or OFF.



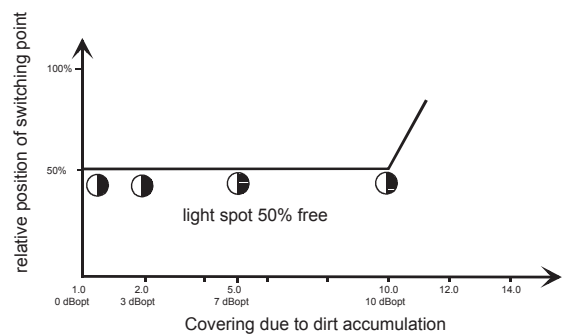
#### Dynamic threshold

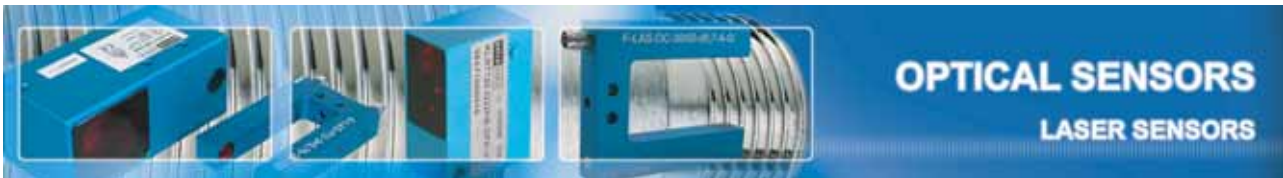
By way of continuous monitoring of the maximum value at the receiver a dynamic correction of the switching threshold compensates the effect of dirt accumulation. This means that increased dirt accumulation does not lead to a shift of the switching point.



#### Example:

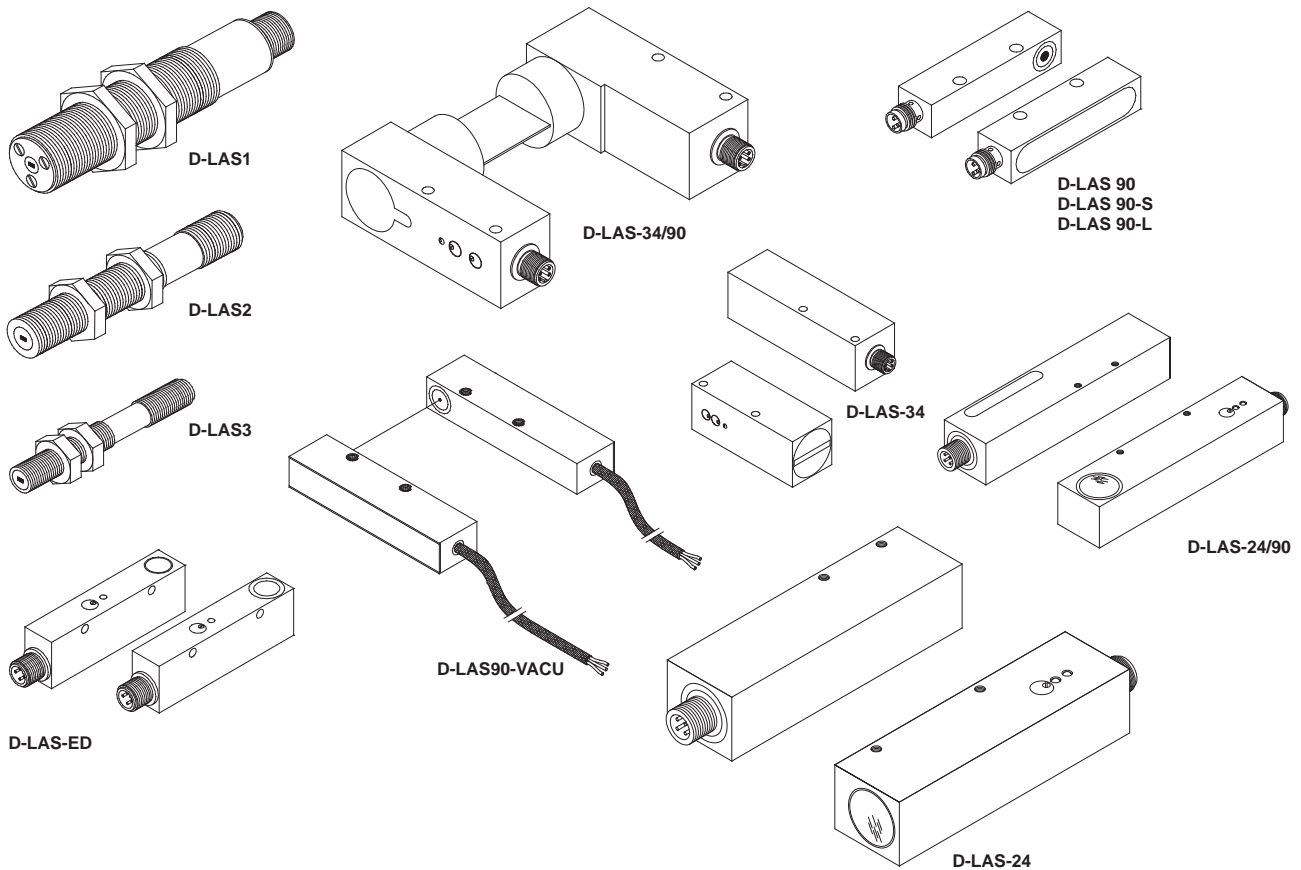
In clean condition the laser light barriers of D-LAS Series indicates a value of 10 V at the analog output, the switching threshold adjusts itself to 50% of the analog signal, i.e. the switching state changes at 50% covering of the light spot. In case of increasing dirt accumulation the value of the analog signal decreases, but the 50% distance to the switching threshold is maintained.





## D-LAS SERIES DIGITAL LASER LIGHT BARRIERS

### Type overview



#### Monitor signal

In addition to the switching signal the laser light barriers D-LAS1 and D-LAS2, D-LAS 24, D-LAS 24/90 as well as D-LAS 34 also provide an analog signal. This "monitoring" of the analog voltage allows improved evaluation of the switching signal. The output also is suitable for measuring tasks.

#### Dynamic measurement

When a measuring object passes through the laser light beam of a D-LAS1-D light barrier it triggers a voltage pulse. The pulse duration of the voltage impulse is independent of the time the measuring object stays in the laser beam. The pulse duration is set to a fixed value of 10 ms.

#### Pulsating light operation

If intensive external light sources must be expected in a laser light barrier application, it is recommendable for safety reasons to use a pulsed system (D-LAS1, D-LAS3, D-LAS90, D-LAS90-VACU). Due to the use of narrow-band electronic filters only the modulated light of the transmitter is detected. Even pulsed light sources such as fluorescent lamps have no influence on the switching reliability.

#### Constant light operation

In case of high switching frequency requirements a non-pulsed system can be used. Here external light suppression is ensured by means of narrowband optical filtering. Therefore constant-light light barriers are suitable for fast processes or for measuring objects moving at high speed. With the help of the analog output constant-light light barriers of series D-LAS2, D-LAS-34, D-LAS-34/90, D-LAS-GD1 can also be used for measuring tasks.





# OPTICAL SENSORS

## LASER SENSORS

## D-LAS SERIES DIGITAL LASER LIGHT BARRIERS

### Selection chart sensors

Article number	Designation square housing	Connection
083724210XX	D-LAS90-Q-(Aperture)	M8, 3 pole
083724211XX	D-LAS90-Qinv-(Aperture)	M8, 3 pole
08378421550	D-LAS90-S-T (Type "short": Apert. 0.7mm)	M8, 3 pole
08378421500	D-LAS90-S-Q-R	M8, 3 pole
08378421600	D-LAS90-S-Qinv-R	M8, 3 pole
08378422550	D-LAS90-L-T (Type "long": Apert. 3.0mm)	M8, 3 pole
08378422500	D-LAS90-L-Q-R	M8, 3 pole
08378422600	D-LAS90-L-Qinv-R	M8, 3 pole
083734203XX	D-LAS90-VACU-T-2m	Capton-cable
083734204XX	D-LAS90-VACU-R-2m	Capton-cable
083724220XX	D-LAS-24-Q-(Aperture)	M12, 4 pole
083724221XX	D-LAS-24-Qinv-(Aperture)	M12, 4 pole
083724230XX	D-LAS-24/90-Q-(Aperture)	M12, 4 pole
083724231XX	D-LAS-24/90-Qinv-(Aperture)	M12, 4 pole
083734205XX	D-LAS-34-(Aperture)-T	M12, 4 pole
083734206XX	D-LAS-34-Q-(Aperture)-R	M12, 4 pole
083734207XX	D-LAS-34-Qinv-(Aperture)-R	M12, 4 pole
083734226XX	D-LAS-34-TC-Q-(Aperture)-R	M12, 4 pole
083734227XX	D-LAS-34-TC-Qinv-(Aperture)-R	M12, 4 pole
083734235XX	D-LAS-34/90-(Aperture)-T	M12, 4 pole
083734236XX	D-LAS-34/90-Q-(Aperture)-R	M12, 4 pole
083734237XX	D-LAS-34/90-Qinv-(Aperture)-R	M12, 4 pole
083734246XX	D-LAS-34/90-TC-Q-(Aperture)-R	M12, 4 pole
083734247XX	D-LAS-34/90-TC-Qinv-(Aperture)-R	M12, 4 pole
083784201XX	D-LAS-ED1-T (Glass detection)	M12, 4 pole
08378420200	D-LAS-ED1-R (Glass detection)	M12, 5 pole
08373000063	CD-LAS-63 (CD height measurement)	cable, 4 pole

Article number	Designation cylinder housing 1=M18, 2=M12, 3=M8	Connection
083734100XX	D-LAS1-Q-(Aperture)	M12, 4 pole
083734101XX	D-LAS1-Qinv-(Aperture)	M12, 4 pole
083734102XX	D-LAS1-TC-Q-(Aperture)	M12, 4 pole
083734103XX	D-LAS1-TC-Qinv-(Aperture)	M12, 4 pole
083734104XX	D-LAS1-D-Q-(Aperture)	M12, 4 pole
083734105XX	D-LAS1-D-Qinv-(Aperture)	M12, 4 pole
083734106XX	D-LAS1-DTC-Q-(Aperture)	M12, 4 pole
083734107XX	D-LAS1-DTC-Qinv-(Aperture)	M12, 4 pole
083734108XX	D-LAS1-P-Q-(Aperture)	M12, 4 pole
083734109XX	D-LAS1-P-Qinv-(Aperture)	M12, 4 pole
083734110XX	D-LAS1-PTC-Q-(Aperture)	M12, 4 pole
083734111XX	D-LAS1-PTC-Qinv-(Aperture)	M12, 4 pole
083734112XX	D-LAS1-PD-Q-(Aperture)	M12, 4 pole
083734113XX	D-LAS1-PD-Qinv-(Aperture)	M12, 4 pole
083734114XX	D-LAS1-PDTC-Q-(Aperture)	M12, 4 pole
083734115XX	D-LAS1-PDTC-Qinv-(Aperture)	M12, 4 pole
08373418000	D-LAS1-LC-Q	M12, 4 pole
08373418100	D-LAS1-LC-Qinv	M12, 4 pole
083714200XX	D-LAS2-Q-(Aperture)	M12, 4 pole
083714201XX	D-LAS2-Qinv-(Aperture)	M12, 4 pole
083714202XX	D-LAS2-TC-Q-(Aperture)	M12, 4 pole
083714203XX	D-LAS2-TC-Qinv-(Aperture)	M12, 4 pole
08373428028	D-LAS2-LC-Q	M12, 4 pole
08379428128	D-LAS2-LC-Qinv	M12, 4 pole
083714230XX	D-LAS3-Q-(Aperture)	M8, 3 pole
083714231XX	D-LAS3-Qinv-(Aperture)	M8, 3 pole

Selection chart sensors in combination with selection chart apertures.  
Detailed information on [www.pulsotronic.de](http://www.pulsotronic.de).

### Mounting devices

Article number	Designation
08379480800	FL-18 (mounting flange flat, f. D-LAS1)
08379480900	FL-12 (mounting flange flat, f. D-LAS2)
08379481000	FL-8 (mounting flange flat, f. D-LAS3)
08379481100	FL-90 (mounting flange flat, f. D-LAS90)
08379480400	WFL-18 (mounting flange angled / D-LAS1)
08379480500	WFL-12 (mounting flange angled / D-LAS2)
08379480600	WFL-8 (mounting flange angled / D-LAS3)
08379480700	WFL-90 (mounting flange angled / D-LAS90)

### Accessories

Article number	Designation
08369174700	EO-18 (Attachment optics receiver D-LAS1)
08369401000	SF-12 (Ray trap)
08369401100	ZS-18 (Target, f. D-LAS1 receiver)
08369401115	ZS-12 (Target, f. D-LAS2 receiver)
08369401130	ZS-8 (Target, f. D-LAS3 receiver)

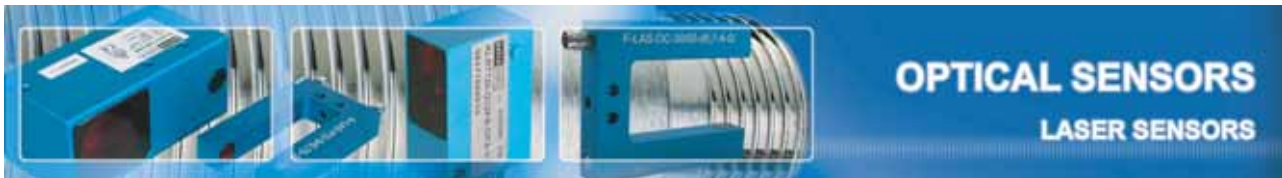
### Abbreviations

D = Dynamic output  
ED = Glass detection  
EO = Attachment optics  
FL = Flange

Article number	Designation high temperature through beam S=0,3Hz, M=20Hz, L=1kHz	Connection
08373411698	D-LAS-CERO-T	M12, 4 pole
08373411650	D-LAS-CERO-Q-S-R	M12, 4 pole
08373411660	D-LAS-CERO-Q-M-R	M12, 4 pole
08373411670	D-LAS-CERO-Q-L-R	M12, 4 pole
08373411610	D-LAS-CERO-Qinv-S-R	M12, 4 pole
08373411620	D-LAS-CERO-Qinv-M-R	M12, 4 pole
08373411630	D-LAS-CERO-Qinv-L-R	M12, 4 pole
08373411950	D-LAS-CERO90-Q-S-R	M8, 3-pole
08373411960	D-LAS-CERO90-Q-M-R	M8, 3-pole
08373411970	D-LAS-CERO90-Q-L-R	M8, 3-pole
08373411750	D-LAS-CERO90-Qinv-S-R	M8, 3-pole
08373411760	D-LAS-CERO90-Qinv-M-R	M8, 3-pole
08373411770	D-LAS-CERO90-Qinv-L-R	M8, 3-pole

### Abbreviations

Q = PNP N.C. / NPN N.O.  
L = Type long, Aperture d 0,3  
LC = Low cost (plastic optics)  
P = Potentiometer  
R = Receiver  
Qinv = PNP N.O / NPN N.C.  
S = Type short, Aperture d 0,7  
SF = Ray trap  
T = Transmitter  
TC = Threshold Correction  
VACU = Application in vacuum possible  
WFL = Angled flange  
ZS = Target



## D-LAS SERIES ANALOG LASER LIGHT BARRIERS

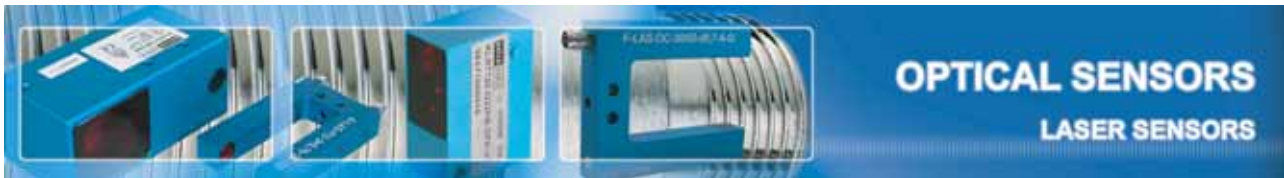
### Selection chart apertures

Last digits article number	D-LAS1	D-LAS2	D-LAS3	D-LAS 90 D-LAS 12/90	D-LAS-24 D-LAS-24/90	D-LAS-34 D-LAS-34/90	D-LAS-ED
02				1 x 0,3	2 x 16		
03	1 x 0,3	1 x 0,3	1 x 0,3	1 x 0,5			
07	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75			
08	2 x 1	2 x 1	2 x 1	2 x 1			
12				3 x 0,5	16 x 2		
13	3 x 0,75	3 x 0,75	3 x 0,75	3 x 0,75			
14	4 x 1			4 x 1			
18				4 x 0,5			
23	d 0,3	d 0,3	d 0,3	d 0,3			
24	d 0,5	d 0,5	d 0,5	d 0,5	2 (0,3) x 10		
26	d 0,7	d 0,7	d 0,7	d 0,7			
28	d 1,0	d 1,0	d 1,0	d 1,0	1 (0,5) x 16		
30							9,5 x 4
31	d 2,0	d 3,0	d 2,0	d 2,0	1,5 (0,2) x 9,5		
32							4 x 9,5
34	d 3,0	d 2,0			9,5 x 1,5 (0,2)		
36					10 x 2 (0,3)		
41					16 x 1 (0,5)		
43		1 x 0,5					
54				0,3 x 1			
55	0,3 x 1,5		0,3 x 1,5	0,3 x 1,5			
56	0,3 x 3		0,3 x 3	0,3 x 3			
59	0,5 x 1			0,5 x 1			
62	0,5 x 4	0,5 x 4		0,5 x 4			
63				0,75 x 2			
64				0,75 x 3			
74		1,5 x 0,3		1,5 x 0,3			
76		3 x 0,3		3 x 0,3		10 x 0,3	
83						10 x 2	
84						20 x 0,3	
85						20 x 2	
86						25 x 2	
87						25 x 0,3	
88						30 x 0,5	
89						30 x 2	
90						5 x 2	
92						5 x 0,3	
93							
99	7 x 3						

At rectangular apertures (A x B) the measure "A" stands for the side of the aperture, that is parallel to the longest side of the sensor.

### Cables

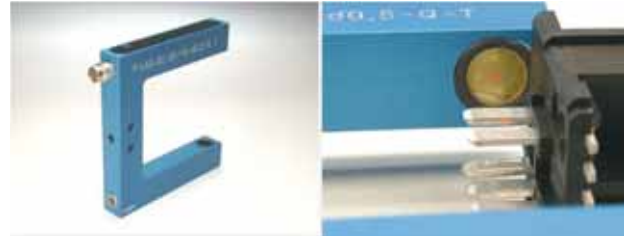
Article number	Designation	Application
44505123810	V1-3/P/2m	cab-M8/3-g-2 (straight, l=2m)
44505123812	V1-3/P/5m	cab-M8/3-g-5 (straight, l=5m)
44505125610	V1-3/W/P/2m	cab-M8/3-w-2 (angled, l=2m)
44505125612	V1-3/W/P/5m	cab-M8/3-w-5 (angled, l=5m)
44505125910	V1-3/W/P/PNP/2L/2m	cab-M8/3-w-pnp-2 (angled, LED, l=2m)
44505125912	V1-3/W/P/PNP/2L/5m	cab-M8/3-w-pnp-5 (angled, LED, l=5m)
44505126010	V1-3/W/P/NPN/2L/2m	cab-M8/3-w-npn-2 (angled, LED, l=2m)
44505126012	V1-3/W/P/NPN/2L/5m	cab-M8/3-w-npn-5 (angled, LED, l=5m)
44505170210	V1-4/P/2m	cab-M8/4-g-2
44503833544	V1-4/P/5m	cab-M8/4-g-5
44505125310	V2-4/P/2m	cab-M12/4-g-2 (straight, l=2m)
44505125312	V2-4/P/5m	cab-M12/4-g-5 (straight, l=5m)
44505123910	V2-4/W/P/2m	cab-M12/4-w-2 (l=2m)
44505123912	V2-4/W/P/5m	cab-M12/4-w-5 (angled, l=5m)
08379452800	cab-M12/4-g-2-shd (straight, l=2m, screened)	cab-M12/4-g-2-shd (straight, l=2m, screened)
08379452802	cab-M12/4-g-5-shd (straight, l=5m, screened)	cab-M12/4-g-5-shd (straight, l=5m, screened)
44505125410	V2-4/W/P/PNP/2L/2m	cab-M12/4-w-pnp-2 (angled, LED, l=2m)
44505125412	V2-4/W/P/PNP/2L/5m	cab-M12/4-w-pnp-5 (angled, LED, l=5m)
44505124010	V2-4/W/P/NPN/2L/2m	cab-M12/4-w-npn-2 (angled, LED, l=2m)
44505124012	V2-4/W/P/NPN/2L/5m	cab-M12/4-w-npn-5 (angled, LED, l=5m)
44505129000	V2-5/P/2m	cab-M12/5-g-2 (straight, l=2m)



## F-LAS SERIES LASER FORK LIGHT BARRIERS

### Product information

Parallel laser light with homogeneous light distribution in round or rectangular cross-section detects smallest objects. The sensitivity is set by means of a potentiometer. These laser light barriers are ideal for positioning tasks.



### Characteristics

#### Collimated laser beam

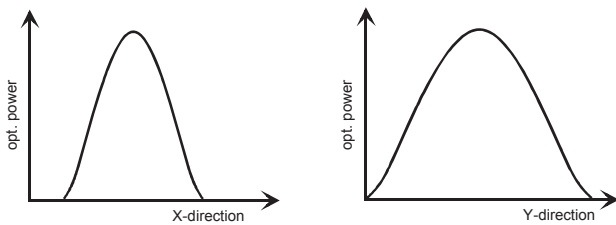
The laser light beam that is emitted by a high-precision optical unit allows a very precise detection of smallest objects. The low divergence of the light beam almost completely reduces the measuring error that is caused by moving the measuring object from the transmitter in the direction of the receiver.

#### Advantages:

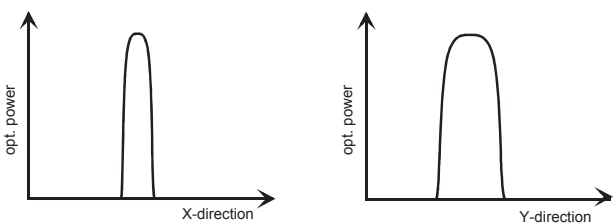
- Visible light beam
- Telecentric design
- Exact shadow projection onto the receiver
- The distance of measuring object from the transmitter or receiver has no influence on the measuring signal in a wide range

#### Homogenous light distribution

The use of high-precision apertures in the transmitter ensures optimum adaptation to the application. Apart from a large variety of standard apertures special apertures can be realised. The aperture ensures an homogeneous light distribution in the beam and a sharp beam limitation.



Beam profile in the two main axes without aperture



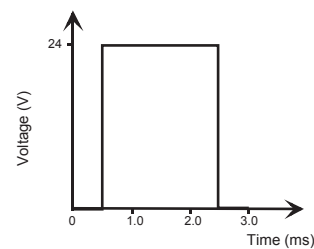
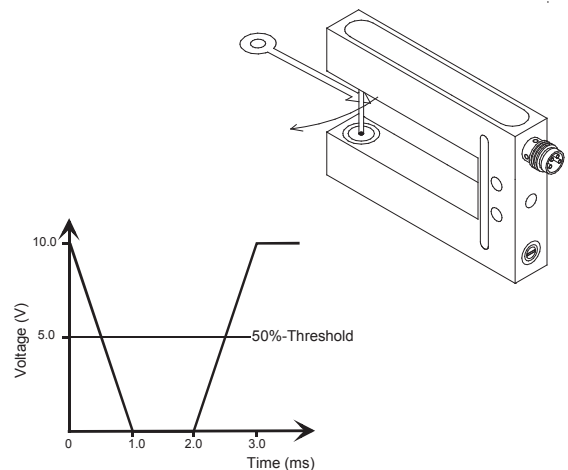
Beam profile in the two main axes with aperture

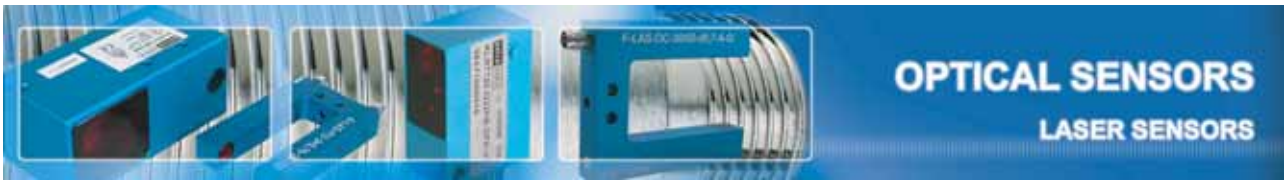
#### Monitor signal

In addition to the switching signal the fork light barriers of the F-LAS series also provide an analog signal. Monitoring the analog voltage allows a better evaluation of the switching signal. The output can also be used for measuring tasks.

#### Functional principle

The signal at the analog output decreases proportionally with increasing laser beam covering.





# F-LAS SERIES LASER FORK LIGHT BARRIERS

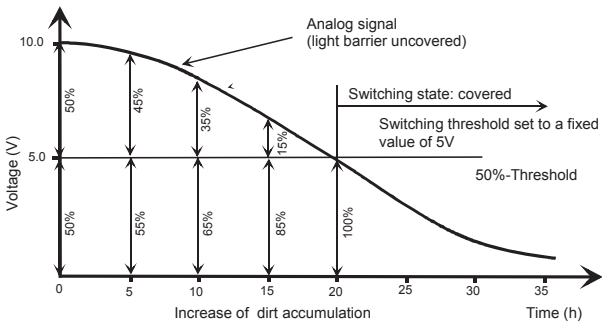
## Characteristics

### Adjustable switching threshold (Version T)

The comparator threshold is adjusted via the integrated potentiometer. The switching state is indicated by an integrated LED.

### High positioning accuracy

In conventional light barriers the switching threshold, which depends on a fixed voltage (absolute value), is set by a potentiometer. As a consequence the switching point shifts with increasing dirt accumulation.



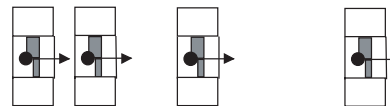
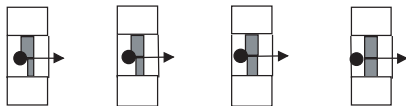
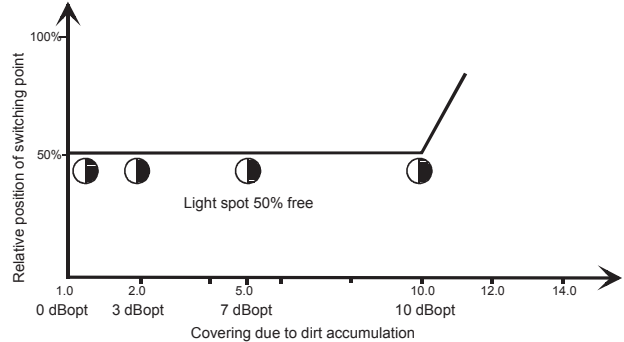
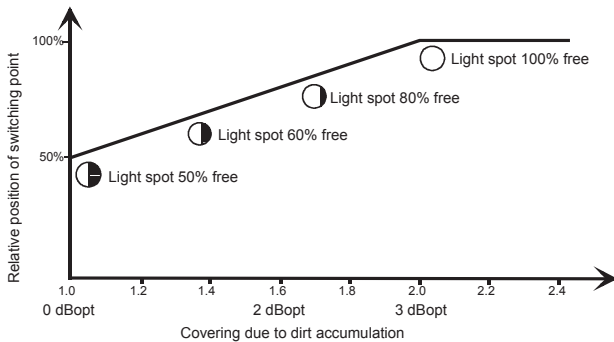
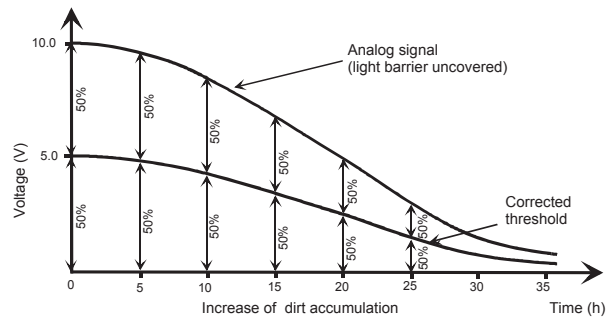
### Constant light operation (F-LAS-DC)

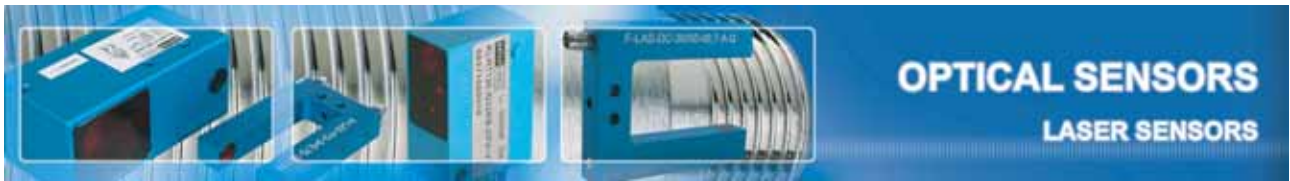
In case of high switching frequency requirements a non-pulsed system can be used. Here external light suppression is ensured by means of narrow-band optical filtering. Therefore constant-light light barriers are suitable for fast processes or for measuring objects moving at high speed. The analog output can also be used for measuring tasks.

### Adjustable amplification (Version A)

With version A the amplification factor can be adjusted via the integrated potentiometer. The switching threshold is fixed.

A dynamic correction of the switching threshold compensates the effect of dirt accumulation by continuous monitoring of the maximum value at the receiver. Thus increased dirt accumulation does not lead to a shift of the switching point.





## F-LAS SERIES LASER FORK LIGHT BARRIERS

### Selection chart sensors

Article number	Designation 12mm housing Constant light operation F-LAS-DC-(Width/depth)-(Aperture)
083764200XX	F-LAS-DC-10/50-(Aperture)-A-Q
083764210XX	F-LAS-DC-10/50-(Aperture)-A-Qinv
083764240XX	F-LAS-DC-10/50-(Aperture)-T-Q
083764250XX	F-LAS-DC-10/50-(Aperture)-T-Qinv
083764280XX	F-LAS-DC-10/50-(Aperture)-A-Q-TC
083764270XX	F-LAS-DC-10/50-(Aperture)-A-Qinv-TC
083764220XX	F-LAS-DC-10/50-(Aperture)-T-Q-TC
083764230XX	F-LAS-DC-10/50-(Aperture)-T-Qinv-TC
083764201XX	F-LAS-DC-20/50-(Aperture)-A-Q
083764211XX	F-LAS-DC-20/50-(Aperture)-A-Qinv
083764241XX	F-LAS-DC-20/50-(Aperture)-T-Q
083764251XX	F-LAS-DC-20/50-(Aperture)-T-Qinv
083764281XX	F-LAS-DC-20/50-(Aperture)-A-Q-TC
083764271XX	F-LAS-DC-20/50-(Aperture)-A-Qinv-TC
083764221XX	F-LAS-DC-20/50-(Aperture)-T-Q-TC
083764231XX	F-LAS-DC-20/50-(Aperture)-T-Qinv-TC
083764202XX	F-LAS-DC-30/50-(Aperture)-A-Q
083764212XX	F-LAS-DC-30/50-(Aperture)-A-Qinv
083764242XX	F-LAS-DC-30/50-(Aperture)-T-Q
083764252XX	F-LAS-DC-30/50-(Aperture)-T-Qinv
083764282XX	F-LAS-DC-30/50-(Aperture)-A-Q-TC
083764272XX	F-LAS-DC-30/50-(Aperture)-A-Qinv-TC
083764222XX	F-LAS-DC-30/50-(Aperture)-T-Q-TC
083764232XX	F-LAS-DC-30/50-(Aperture)-T-Qinv-TC
083764203XX	F-LAS-DC-40/50-(Aperture)-A-Q
083764213XX	F-LAS-DC-40/50-(Aperture)-A-Qinv
083764243XX	F-LAS-DC-40/50-(Aperture)-T-Q
083764253XX	F-LAS-DC-40/50-(Aperture)-T-Qinv
083764283XX	F-LAS-DC-40/50-(Aperture)-A-Q-TC
083764273XX	F-LAS-DC-40/50-(Aperture)-A-Qinv-TC
083764223XX	F-LAS-DC-40/50-(Aperture)-T-Q-TC
083764233XX	F-LAS-DC-40/50-(Aperture)-T-Qinv-TC
083764204XX	F-LAS-DC-50/50-(Aperture)-A-Q
083764214XX	F-LAS-DC-50/50-(Aperture)-A-Qinv
083764244XX	F-LAS-DC-50/50-(Aperture)-T-Q
083764254XX	F-LAS-DC-50/50-(Aperture)-T-Qinv
083764284XX	F-LAS-DC-50/50-(Aperture)-A-Q-TC
083764274XX	F-LAS-DC-50/50-(Aperture)-A-Qinv-TC
083764224XX	F-LAS-DC-50/50-(Aperture)-T-Q-TC
083764234XX	F-LAS-DC-50/50-(Aperture)-T-Qinv-TC
083764205XX	F-LAS-DC-100/50-(Aperture)-A-Q
083764215XX	F-LAS-DC-100/50-(Aperture)-A-Qinv
083764245XX	F-LAS-DC-100/50-(Aperture)-T-Q
083764255XX	F-LAS-DC-100/50-(Aperture)-T-Qinv
083764285XX	F-LAS-DC-100/50-(Aperture)-A-Q-TC
083764275XX	F-LAS-DC-100/50-(Aperture)-A-Qinv-TC
083764225XX	F-LAS-DC-100/50-(Aperture)-T-Q-TC
083764235XX	F-LAS-DC-100/50-(Aperture)-T-Qinv-TC
083764207XX	F-LAS-DC-100/100-(Aperture)-A-Q
083764217XX	F-LAS-DC-100/100-(Aperture)-A-Qinv
083764247XX	F-LAS-DC-100/100-(Aperture)-T-Q
083764257XX	F-LAS-DC-100/100-(Aperture)-T-Qinv
083764287XX	F-LAS-DC-100/100-(Aperture)-A-Q-TC
083764277XX	F-LAS-DC-100/100-(Aperture)-A-Qinv-TC
083764227XX	F-LAS-DC-100/100-(Aperture)-T-Q-TC
083764237XX	F-LAS-DC-100/100-(Aperture)-T-Qinv-TC

Connection 12mm housing: connector M8 4-pole

Article number	Designation 16mm housing Pulsating light operation
083764258XX	F-LAS-16-AC-80/40-(Aperture)-A-Q
083764278XX	F-LAS-16-AC-80/40-(Aperture)-A-Qinv
083764268XX	F-LAS-16-AC-80/40-(Aperture)-T-Q
083764288XX	F-LAS-16-AC-80/40-(Aperture)-T-Qinv
083764218XX	F-LAS-16-AC-80/65-(Aperture)-A-Q
083764238XX	F-LAS-16-AC-80/65-(Aperture)-A-Qinv
083764228XX	F-LAS-16-AC-80/65-(Aperture)-T-Q
083764248XX	F-LAS-16-AC-80/65-(Aperture)-T-Qinv

Article number	Designation 16mm housing Constant light operation
083764209XX	F-LAS-16-DC-80/40-(Aperture)-A-Q
083764219XX	F-LAS-16-DC-80/40-(Aperture)-A-Qinv
083764249XX	F-LAS-16-DC-80/40-(Aperture)-T-Q
083764259XX	F-LAS-16-DC-80/40-(Aperture)-T-Qinv
083764289XX	F-LAS-16-DC-80/65-(Aperture)-A-Q
083764279XX	F-LAS-16-DC-80/65-(Aperture)-A-Qinv
083764229XX	F-LAS-16-DC-80/65-(Aperture)-T-Q
083764239XX	F-LAS-16-DC-80/65-(Aperture)-T-Qinv

Connection 16mm housing: connector M12 4-pole

Article number	Designation Laser fork light barriers for label detection
0837342600X	F-LAS-LBL-(Aperture)-Q
0837342601X	F-LAS-LBL-(Aperture)-Qinv
0837342604X	F-LAS-LBL-(Aperture)-Q-HAMP
0837342605X	F-LAS-LBL-(Aperture)-Qinv-HAMP

Connection label detection: connector M12 4-pole

Selection chart sensors in combination with selection chart apertures.  
Detailed information on [www.pulsotronic.de](http://www.pulsotronic.de).

#### Abbreviations

A = Potentiometer for adjustment of amplification  
AC = Pulsating light operation  
DC = Constant light operation  
HAMP = High amplification  
Q = NPN N.O. / PNP N.C.  
Qinv = PNP N.O. / NPN N.C.  
T = Potentiometer for adjustment of comparator threshold  
TC = Threshold Correction



# OPTICAL SENSORS

## LASER SENSORS

### F-LAS SERIES LASER FORK LIGHT BARRIERS

#### Selection chart apertures

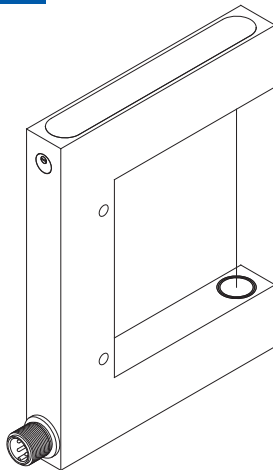
Last digits article number	F-LAS	F-LAS-LBL
02	1 x 0,3	
03	1 x 0,5	
07	2 x 0,75	
08	2 x 1	
09	3 x 0,75	
18	d 0,2	
22	3 x 1	
23	d 0,3	
25	d 0,5	
27	d 0,7	
28	d 1,0	
29	d 2,0	
30	0,8 x 9,5	
33	9,5 x 0,2	
34	9,5 x 0,3	
35	9,5 x 0,8	
36	9,5 x 1,5	
37	9,5 x 4	
49	0,2 x 2	
50	0,2 x 5	
51	0,2 x 9,5	
54	0,3 x 1	
55	0,3 x 1,5	
56	0,3 x 3	
57	0,3 x 9,5	
59	0,5 x 1	
61	0,5 x 3	
63	0,75 x 2	
64	0,75 x 3	
67	1 x 2	
73	1,5 x 9,5	
74	1,5 x 0,3	
75	1,5 x 5	
76	3 x 0,3	
77	3 x 0,5	
80	4 x 9,5	
85	5 x 0,2	d 0,5
86	5 x 1,5	d 1,0
X0		3 x 0,3
X1		3 x 0,5
X2		3 x 0,75
X8		
X9		

#### Cables

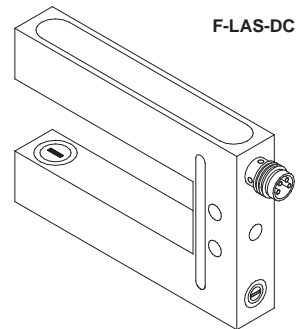
Article number	Designation	Application
44505123810	V1-3/P/2m	cab M8/3-g-2 (straight, l = 2m)
44505123812	V1-3/P/5m	cab M8/3-g-5 (straight, l = 5m)
44505125610	V1-3/W/P/2m	cab M8/3-w-2 (angled, l = 2m)
44505125612	V1-3/W/P/5m	cab M8/3-w-5 (angled, l = 5m)
44505451100	cab M8/4-g-2 (straight, l = 2m)	
08379125512	cab M8/4-g-5 (straight, l = 2m)	
44505451150	V1-4/W/P/2m	cab M8/4-w-2 (angled, l = 2m)

#### Type overview

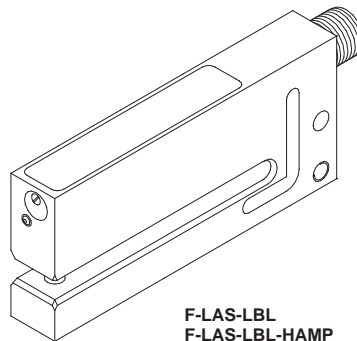
F-LAS-AC-16-80/65  
F-LAS-DC-16-80/65

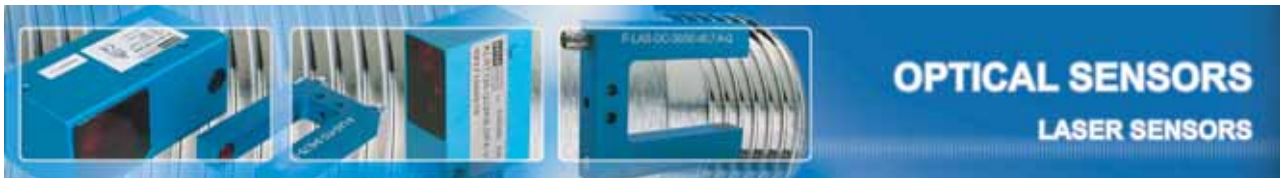


F-LAS-DC



F-LAS-LBL  
F-LAS-LBL-HAMP



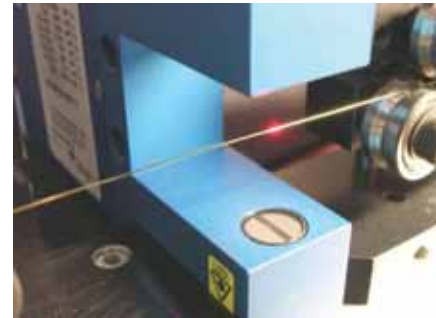


## L-LAS SERIES LASER LINE SENSORS

### Product information

Line sensors are applied where precise positioning is required or where the dimensions of an object have to be determined with high accuracy, e.g. the diameter of a wire.

The laser line sensors of L-LAS series offer various operating widths with a resolution of maximum 1024 pixels. An analog output (voltage or current output) informs about the position and the dimensions of an object. The digital output switches when the adjustable threshold values are exceeded or gone below. The serial interface RS232 allows communication via PC (or PLC + RS232 module).



### Characteristics

#### Functional principle of the sensor

L-LAS-TB laser line sensors are one-way light barriers. A laser collimator that generates a gap-shaped laser light curtain is used as a transmitter, that means parallel laser light is available. The object is positioned between the transmitter and receiver unit of the sensor system. When the laser light curtain impinges on the object, this creates a shadow of this object. Subsequently the laser light curtain (incl. shadow) impinges on the optical receiver and is projected on a line sensor.

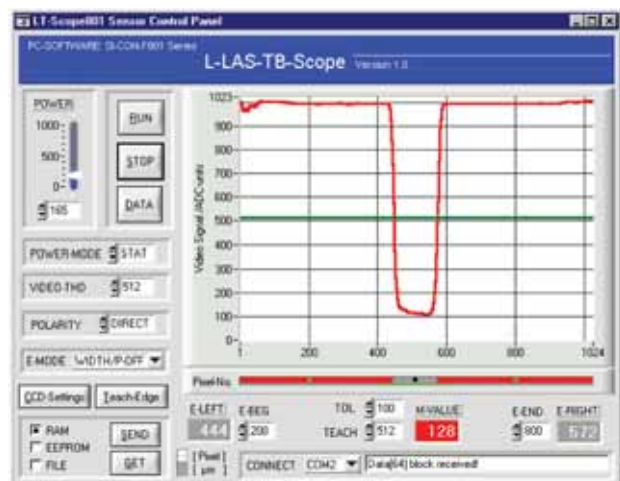
The L-LAS-LT laser line sensors operate according to the principle of triangulation, laser transmitter and receiver are arranged in a certain angle to each other. In the so-called reference distance the two optical axes of transmitter and receiver meet. A part of the laser light that is reflected from the measuring object is projected from the receiver optics onto the line detector. The integrated controller calculates the distance between measuring object and sensor.

- Telecentric beam path
- Various models available (in fork shape or split shape)
- Various operating widths available
- Resolution up to 1024 pixels
- Insensitive to outside light due to interference filter, polarisation filter and mechanical covers
- External Teach-function
- Sturdy metal housing
- Parameterisable under Windows®, RS232 interface (USB adaptor available)
- Laser class 2 (visible laser light, 670 nm)
- Thickness measurement of objects respectively measurement of the distance between two objects
- Object counting in the lens coverage

#### Parametrisation under Windows® with Software L-LAS-TB Scope, L-LAS-LT-Scope, L-LAS-MS-Scope, L-LAS-GD-Scope, LINE-Scope

The sensors can easily be set with the help of a Windows® user interface in which the sensor signals are displayed in numerical and graphical form.

- Threshold (video threshold)
- Laser power
- Averaging
- Polarity of output signal
- Display in mm, inch or pixel
- Exposure time of laser line
- Evaluation algorithm (thickness measurement, „gap-size“ measurement, edge detection, etc.)
- Laser power correction
- (Video-) Threshold correction





# OPTICAL SENSORS

## LASER SENSORS

### L-LAS SERIES LASER LINE SENSORS

#### Selection chart sensors

Article number	Designation Through beam version, split
08377063600	L-LAS-TB-12-T
08377063601	L-LAS-TB-12-R (incl. software)
08378000020	L-LAS-TB-25-T
08378000021	L-LAS-TB-25-R (incl. software)
08377063500	L-LAS-TB-35-T
08377063501	L-LAS-TB-35-R (incl. software)
08377063800	L-LAS-TB-50-T
08377063801	L-LAS-TB-50-R (incl. software)
08377063810	L-LAS-TB-75-T
08377063811	L-LAS-TB-75-R (incl. software)
08377063820	L-LAS-TB-100-T
08377063821	L-LAS-TB-100-R (incl. software)

Article number	Designation Through beam version, split with separate control electronics
08377064002	L-LAS-TB-8-CON1 (incl. software)
08377064000	L-LAS-TB/90-8x1-T
08377064001	L-LAS-TB/90-8x1-R
08377064003	L-LAS-TB/90-1x8-T
08377064004	L-LAS-TB/90-1x8-R
08377064012	L-LAS-TB-12-CON1 (incl. software)
08377064010	L-LAS-TB/90-12x1-T
08377064011	L-LAS-TB/90-12x1-R
08377064013	L-LAS-TB/90-1x12-T
08377064014	L-LAS-TB/90-1x12-R
08377064002	L-LAS-TB-8-CON2 (incl. software)
08377064100	L-LAS-TB-T08
08377064101	L-LAS-TB-R18
08377064205	L-LAS-TB-8-CON1-MS (incl. software)
08377064002	L-LAS-TB-8-CON1-SL
08377064000	L-LAS-TB/90-8x1-T
08377064001	L-LAS-TB/90-8x1-R
08377064003	L-LAS-TB/90-1x8-T
08377064004	L-LAS-TB/90-1x8-R

Article number	Designation Through beam version / fork mounting Master/Slave-Systems
08377064400	L-LAS-TB-F-8x1-40/40-MA (incl. software)
08377064450	L-LAS-TB-F-8x1-40/40-SL
08377064403	L-LAS-TB-F-1x8-40/40-MA (incl. software)
08377064453	L-LAS-TB-F-1x8-40/40-SL
08377064500	L-LAS-TB-F-16x1-40/40-MA (incl. software)
08377064550	L-LAS-TB-F-16x1-40/40-SL
08377064503	L-LAS-TB-F-1x16-40/40-MA (incl. software)
08377064553	L-LAS-TB-F-1x16-40/40-SL
08377064600	L-LAS-TB-F-8x1-200/40-MA-BL (incl. software)
08377064650	L-LAS-TB-F-8x1-200/40-SL-BL
08377064603	L-LAS-TB-F-1x8-200/40-MA-BL (incl. software)
08377064653	L-LAS-TB-F-1x8-200/40-SL-BL
08377064610	L-LAS-TB-F-8x1-200/65-MA-BL
08377064660	L-LAS-TB-F-8x1-200/65-SL-BL
08377064613	L-LAS-TB-F-1x8-200/65-MA-BL
08377064663	L-LAS-TB-F-1x-200/65-SL-BL
08377064310	L-LAS-TB-F-8x1-200/65-MA-BL
08377064360	L-LAS-TB-F-8x1-200/65-SL-BL
08377064313	L-LAS-TB-F-1x8-200/65-MA-BL
08377064363	L-LAS-TB-F-1x8-200/65-SL-BL

Article number	Designation Principle of triangulation
08377065037	L-LAS-LT-37 (incl. software)
08377065055	L-LAS-LT-55 (incl. software)
08377065058	L-LAS-LT-55-HS (incl. software)
08377065080	L-LAS-LT-80 (incl. software)
08377065110	L-LAS-LT-110 (incl. software)
08377065135	L-LAS-LT-135 (incl. software)
08377065160	L-LAS-LT-160 (incl. software)
08377065200	L-LAS-LT-200 (incl. software)
08377065275	L-LAS-LT-275 (incl. software)
08377065450	L-LAS-LT-450 (incl. Software)
08377065038	L-LAS-LT-37-MA (incl. software)
08377065039	L-LAS-LT-37-SL

Article number	Designation Reflex light Elektronics and frontend in separate housings
08377065900	L-LAS-RL-15-FE (frontend)
08377065901	L-LAS-RL-CON1 (incl. software)
	<b>Elektronics and frontend in one housing</b>
08377065930	L-LAS-RL-150-UV-256 (incl. software)
08377065931	L-LAS-RL-150-UV-256-SL (incl. software)
08377065932	L-LAS-RL-150-UV-512 (incl. software)
08377065933	L-LAS-RL-150-UV-512-SL (incl. software)
08377065934	L-LAS-RL-150-UV-1024 (incl. software)
08377065935	L-LAS-RL-150-UV-1024-SL (incl. software)
08377065960	L-LAS-RL-150-VIS-256 (incl. software)
08377065961	L-LAS-RL-150-VIS-256-SL (incl. software)
08377065962	L-LAS-RL-150-VIS-512 (incl. software)
08377065963	L-LAS-RL-150-VIS-512-SL (incl. software)
08377065964	L-LAS-RL-150-VIS-1024 (incl. software)
08377065965	L-LAS-RL-150-VIS-1024-SL (incl. software)
08377065980	L-LAS-RL-150-IR-256 (incl. software)
08377065981	L-LAS-RL-150-IR-256-SL (incl. software)
08377065982	L-LAS-RL-150-IR-512 (incl. software)
08377065983	L-LAS-RL-150-IR-512-SL (incl. software)
08377065984	L-LAS-RL-150-IR-1024 (incl. software)
08377065985	L-LAS-RL-150-IR-1024-SL (incl. software)

Article number	Designation Special versions
08377065000	L-LAS-GD10 (incl. software)
08377065001	L-LAS-GTM-256/16 (incl. software)

Detailed information on [www.pulsotronic.de](http://www.pulsotronic.de).

#### Abbreviations

BL = Blow air  
 ED = Edge detection  
 GD = Gloss detection  
 GTM = Glass thickness measuring  
 IR = Infrared  
 LT = Laser Triangulation  
 MA = Master  
 R = Receiver  
 RL = Reflex laser  
 SL = Slave  
 T = Transmitter  
 TB = Through beam  
 UV = Ultraviolet  
 VIS = Visible





# OPTICAL SENSORS

## LASER SENSORS

## L-LAS SERIES LASER LINE SENSORS

### Accessories

Article number	Designation blast air attachment
0837800027	ABL-12-T (for L-LAS-TB-12-T)
0837800028	ABL-12-R (for L-LAS-TB-12-R)
0837800024	ABL-25-T (for L-LAS-TB-25-T)
0837800025	ABL-25-R (for L-LAS-TB-25-R)
0837800050	ABL-50-T (for L-LAS-TB-50-T)
0837800051	ABL-50-R (for L-LAS-TB-50-R)
0837800053	ABL-75-T (for L-LAS-TB-75-T)
0837800054	ABL-75-R (for L-LAS-TB-75-R)
0837800056	ABL-100-T (for L-LAS-TB-100-T)
0837800057	ABL-100-R (for L-LAS-TB-100-R)

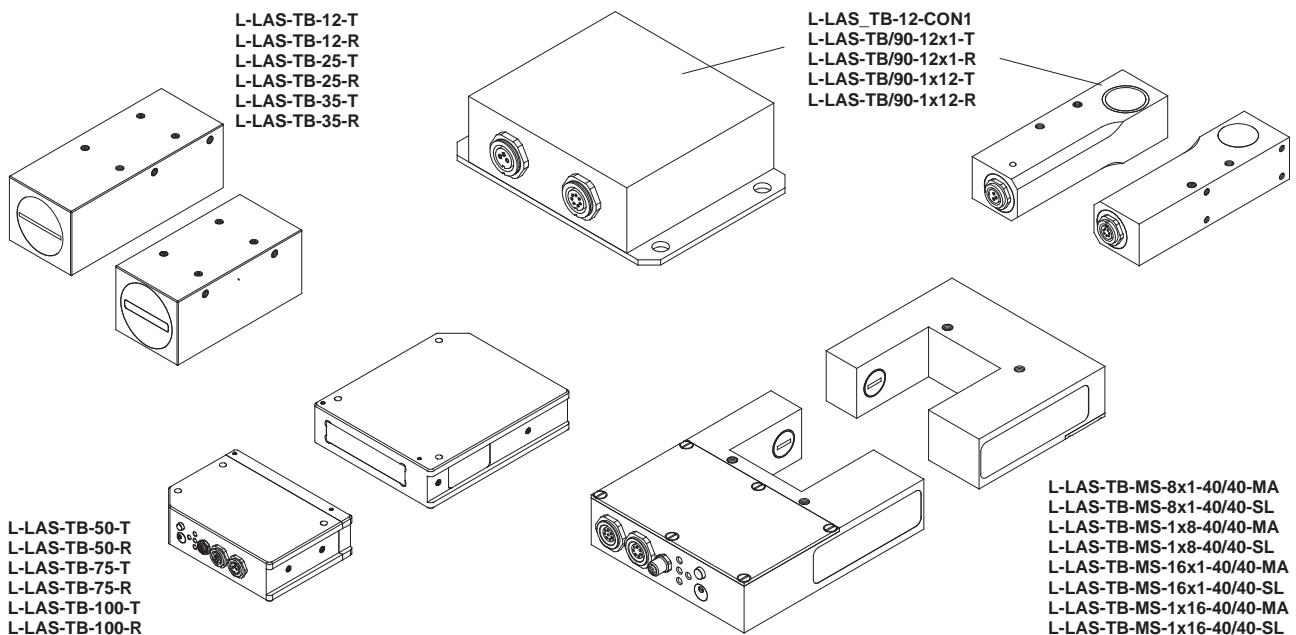
Article number	Designation fastening rail
08379063002	TRA-L-LAS-TB-25-100 (for L-LAS-TB-25)
08379063003	TRA-L-LAS-TB-35-200 (for L-LAS-TB-35)
08379063010	TRA-L-LAS-TB-L100 (for L-LAS-TB-50, -75, -100)
08379063020	TRA-L-LAS-TB-L200 (for L-LAS-TB-50, -75, -100)
08379063030	TRA-L-LAS-TB-L300 (for L-LAS-TB-50, -75, -100)
08379063040	TRA-L-LAS-TB-L400 (for L-LAS-TB-50, -75, -100)
08379063050	TRA-L-LAS-TB-L500 (for L-LAS-TB-50, -75, -100)
08379063100	TRA-L-LAS-TB-L1000 (for L-LAS-TB-50, -75, -100)
08379063150	TRA-L-LAS-TB-L1500 (for L-LAS-TB-50, -75, -100)

Article number	Designation mounting devices
0837800026	MOUNT-L-LAS-TB/90-12 (mounting plate for L-LAS-TB-12 T + R)

### Cables

Article number	Designation	Connection	with
08379450050	cab-las4/PC (l = 2m)	PC	L-LAS-CON, L-LAS-R, L-LAS-F, L-LAS-MA, L-LAS-LT, L-LAS-ED, L-LAS-GTM
08379451600	cab-las8/SPS (l = 2m)	SPS	L-LAS-CON, L-LAS-R, L-LAS-F, L-LAS-MA, L-LAS-LT, L-LAS-ED, L-LAS-GTM
08379450450	cab-las3-male-2m (l = 2m)	L-LAS-T	L-LAS-CON1, L-LAS-R
08379450460	cab-las7-male-2m (l = 2m)	L-LAS-R	L-LAS-CON1
		L-LAS-MA	L-LAS-SL
08379450470	cab-las3-m/f	L-LAS-T	L-LAS-CON2
08379455000	ca-col5	L-LAS-R	L-LAS-CON2

### Type overview



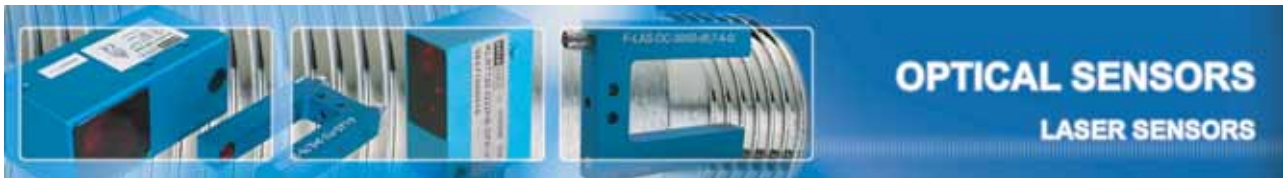
**p-u-l-s-o-t-r-o-n-i-c**  
Pulsotronic GmbH & Co. KG

Neue Schichtstraße 14b  
D-09366 Niederdorf

& +49 (0) 37296 / 930 - 200  
☎ +49 (0) 37296 / 930 - 280

info@pulsotronic.de  
www.pulsotronic.de

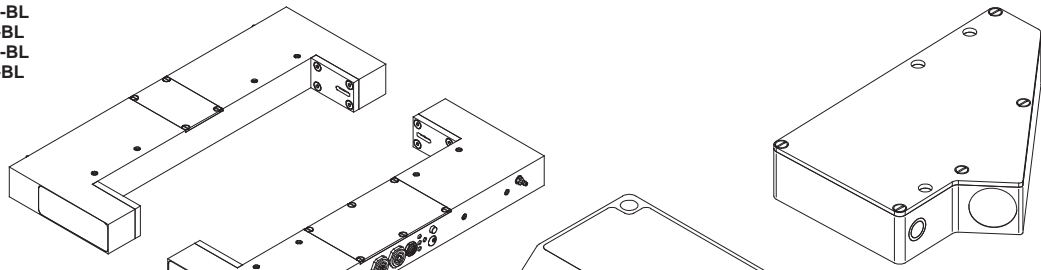
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modifications!



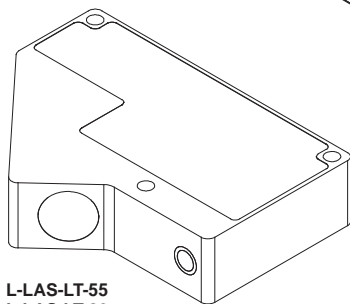
# L-LAS SERIES LASER LINE SENSORS

## Type overview

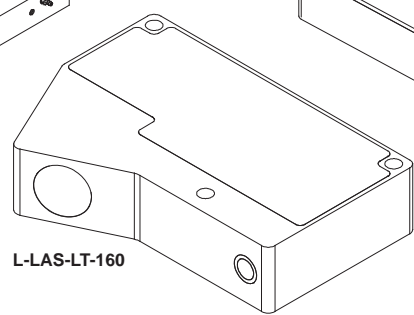
- L-LAS-TB-MS-8x1-200/40-MA-BL
- L-LAS-TB-MS-8x1-200/40-SL-BL
- L-LAS-TB-MS-1x8-200/40-MA-BL
- L-LAS-TB-MS-1x8-200/40-SL-BL
- L-LAS-TB-MS-8x1-200/40-MA
- L-LAS-TB-MS-8x1-200/40-SL
- L-LAS-TB-MS-1x8-200/40-MA
- L-LAS-TB-MS-1x8-200/40-SL



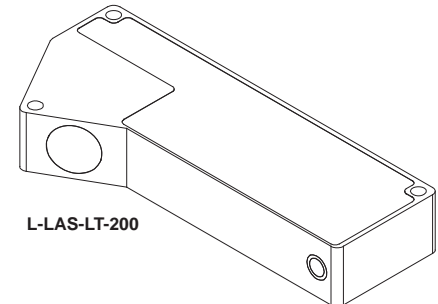
L-LAS-LT-37



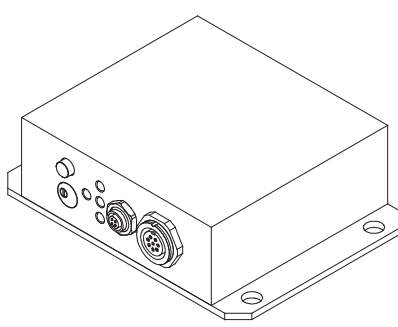
L-LAS-LT-55  
L-LAS-LT-80



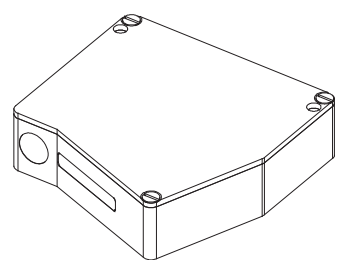
L-LAS-LT-160



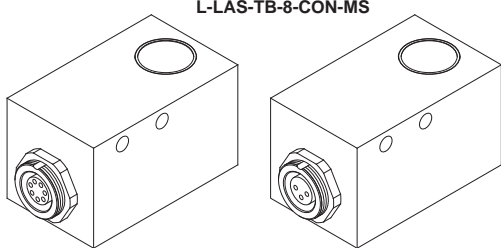
L-LAS-LT-200



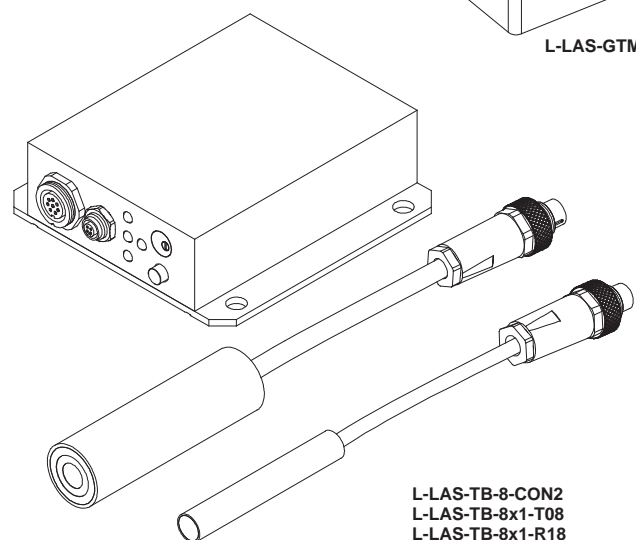
L-LAS-TB-8-CON-MS

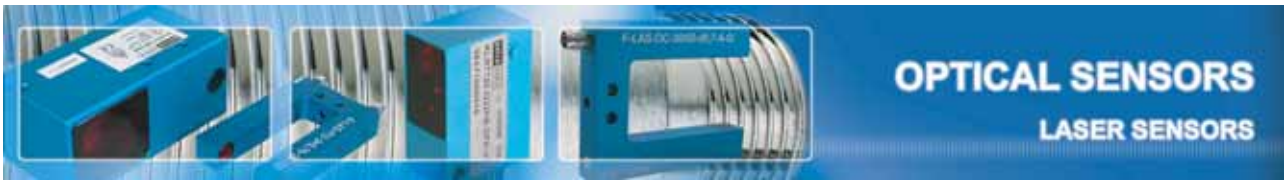


L-LAS-GTM-256/16



L-LAS-TB-8-CON2  
L-LAS-TB-8x1-T08  
L-LAS-TB-8x1-R18





## LCC SERIES LASER COPY COUNTERS

### Product information

LCC laser copy counters primarily are designed for detecting and counting magazines or single sheets in imbricated arrangement. In the optimal operating range they detect sheet edges of a thickness of typ. 50 µm. The sensors of LCC Series are characterised by their reliable function, their ease of operation and their sturdy mechanical construction. The LCC series provides high scanning frequencies of max. 1,5kHz and is able to adapt to bright and dark, slow and fast moving parts.



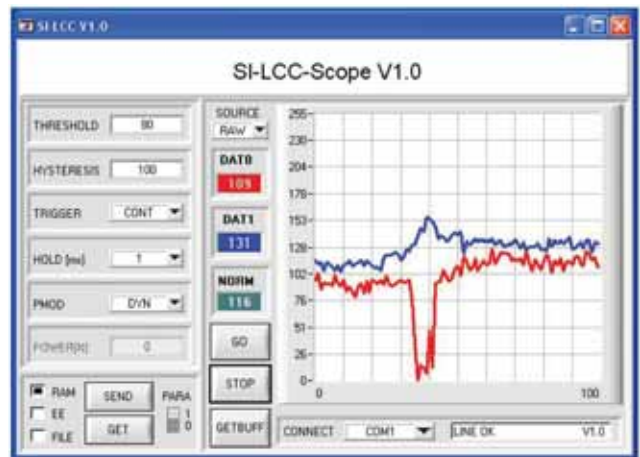
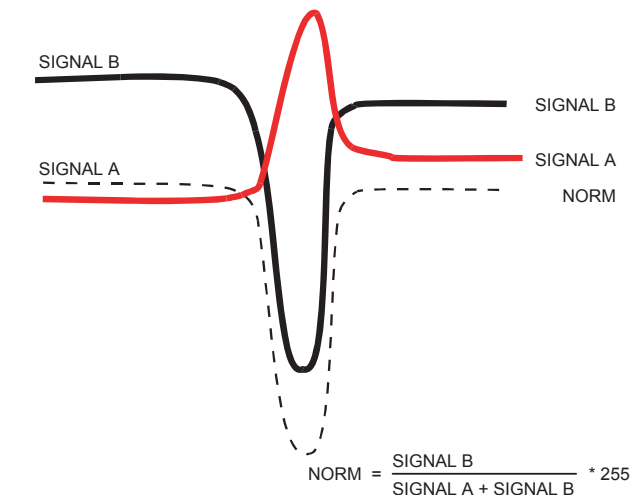
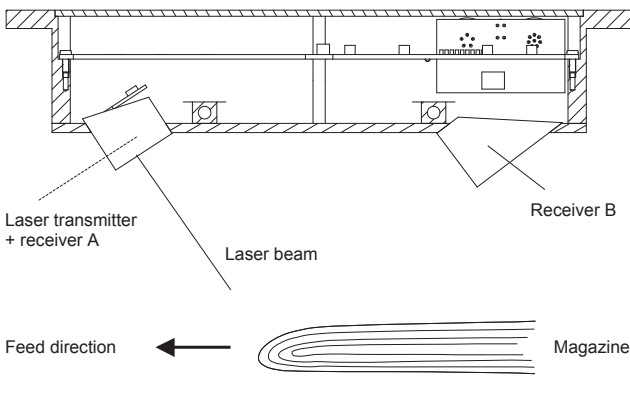
### Characteristics

#### Functional principle of the sensor

The LCC laser copy counters comprehend a laser transmitter (laser diode, λ=670nm) and two receivers. The laser beam is focussed at an angle onto the magazine or sheet opposite to the direction of feed. When an edge arrives, it blocks the beam path to receiver 2, whereas the signal at receiver 1 slightly increases due to the more favourable angle of impingement. The standardised (NORM) value of SIGNALS A and B is used as the starting signal for all further algorithms of the laser copy counter.

#### Parametrisation under Windows® with Software SI-LCC-Scope V1.0 resp. SI-LCC-MA-Scope V1.0

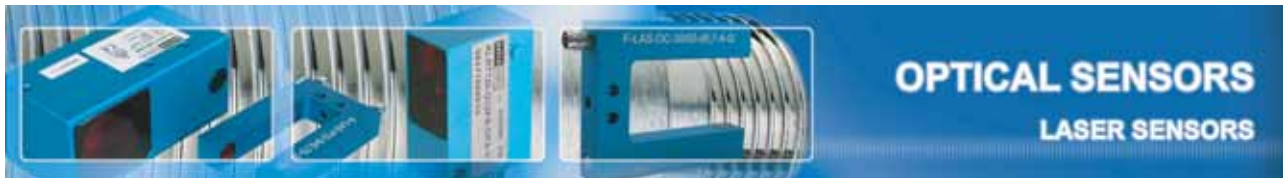
The sensors can easily be set with the help of a Windows® user interface in which the sensor signals are displayed in numerical and graphical form. The user interface also provides various software algorithms and setting parameters. With software version SI-LCC-MA V1.0 several parameters can also be set via DIP and HEX switches.



Parameters such as

- Threshold (sensitivity)
- Hysteresis
- Laser power mode (static or dynamic)
- Output pulse lengthening
- Dead time (static or dynamic)

can be adjusted via software resp. via HEX- and DIP-switches on LCC-...-MA types.



## LCC SERIES LASER COPY COUNTERS

### Selection chart sensors

Article number	Designation
<b>LCC-Sensing range</b>	
08398409150	LCC-30 (incl. SI-LCC V1.0 software*)
08398409140	LCC-40 (incl. SI-LCC V1.0 software*)
08398409170	LCC-60 (incl. SI-LCC V1.0 software*)
08398409180	LCC-80 (incl. SI-LCC V1.0 software*)
08398409190	LCC-90 (incl. SI-LCC V1.0 software*)
08398409160	LCC-130 (incl. SI-LCC V1.0 software*)
<b>LCC-MA</b>	
08398409152	LCC-30-MA (incl. SI-LCC-MA V1.0 software*)
08398409101	LCC-40-MA (incl. SI-LCC-MA V1.0 software*)
08398409171	LCC-60-MA (incl. SI-LCC-MA V1.0 software*)
08398409181	LCC-80-MA (incl. SI-LCC-MA V1.0 software*)
08398409191	LCC-90-MA (incl. SI-LCC-MA V1.0 software*)
08398409161	LCC-130-MA (incl. SI-LCC-MA V1.0 software*)
<b>LCC-CON</b>	
08398409300	LCC-CON1 (incl. SI-LCC V1.0 software*)
08398409320	LCC-FE-TR (transmitter and receiver unit)
08398409301	LCC-FE-R (receiver unit)
<b>LCC-CYL</b>	
08398409142	LCC-40-CYL (incl. SI-LCC V1.0 software*)
08398409182	LCC-80-CYL (incl. SI-LCC V1.0 software*)
<b>LCC-LT</b>	
08398409195	LCC-LT-110 (incl. SI-LCC V1.0 software*)

#### Abbreviations

CON = Control electronics  
 CYL = Cylinder optics  
 FE = Frontend  
 LCC = Laser Copy Counter  
 LT = Laser Triangulation  
 MA = Master  
 R = Receiver  
 TB = Through beam

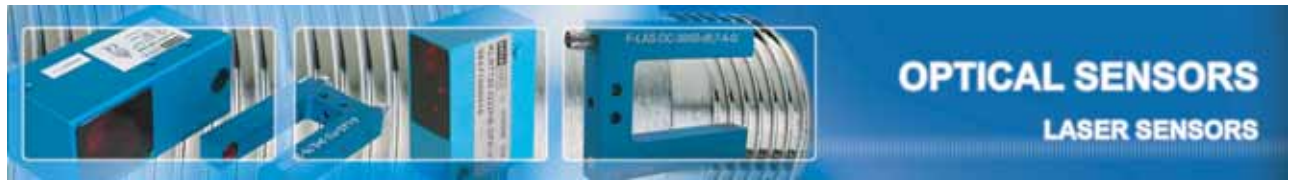
Detailed information on [www.pulsotronic.de](http://www.pulsotronic.de).

### Accessories

Article number	Designation
08398409151	LCC-TB-30 attachment optics
08398409184	LCC-TB-80 attachment optics
08379451630	counting adaptor

### Cables

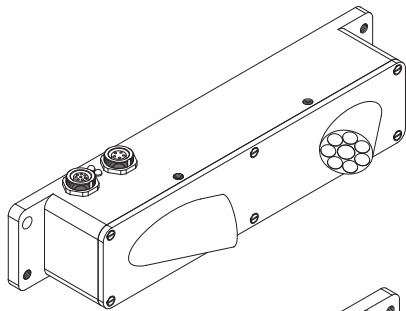
Article number	Designation	Application
08379450100	cab-las5/PC (l = 2m)	connection LCC - PC
08379451600	cab-las8/SPS (l = 2m)	connection LCC - SPS
08405163100	cab-lcc-5 (l = 2m)	connection LCC-CON1 - LCC-R
08405163103	cab-lcc-5 (l = 6m)	connection LCC-CON1 - LCC-R
08405163000	cab-lcc-8 (l = 2m)	connection LCC-CON1 - LCC-TR
08405163003	cab-lcc-8 (l = 6m)	connection LCC-CON1 - LCC-TR



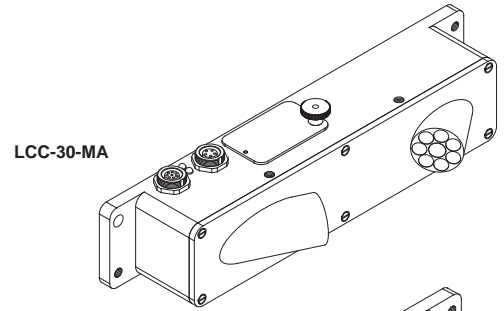
**OPTICAL SENSORS**  
LASER SENSORS

**LCC SERIES** LASER COPY COUNTERS

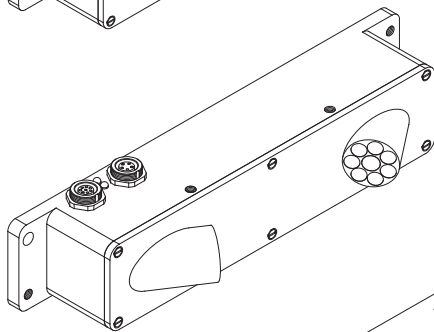
**Type overview**



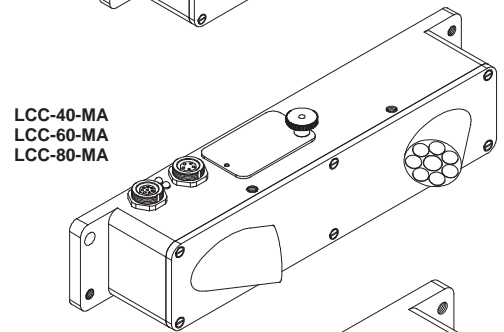
LCC-30



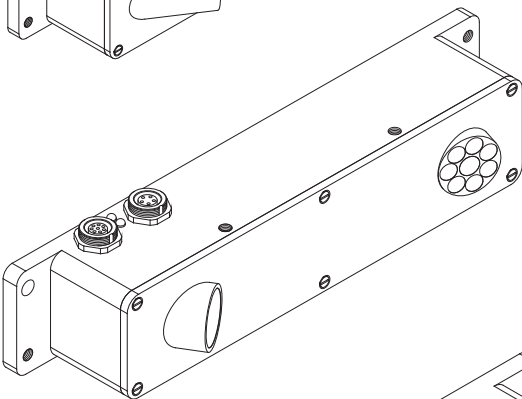
LCC-30-MA



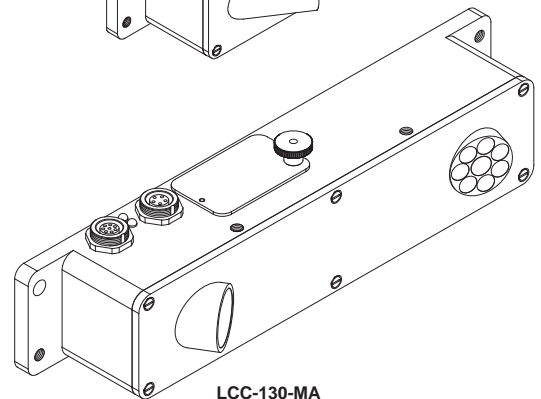
LCC-40  
LCC-60  
LCC-80



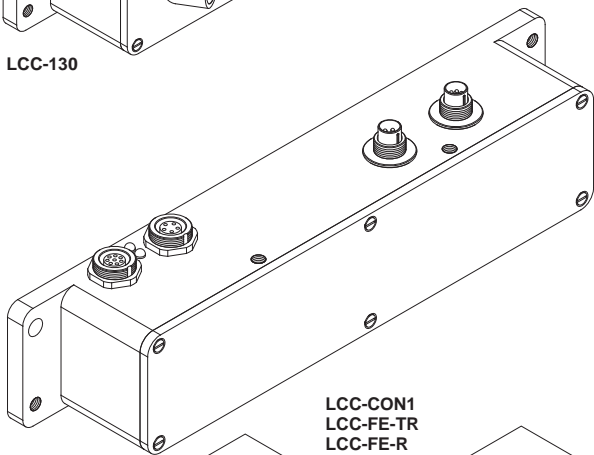
LCC-40-MA  
LCC-60-MA  
LCC-80-MA



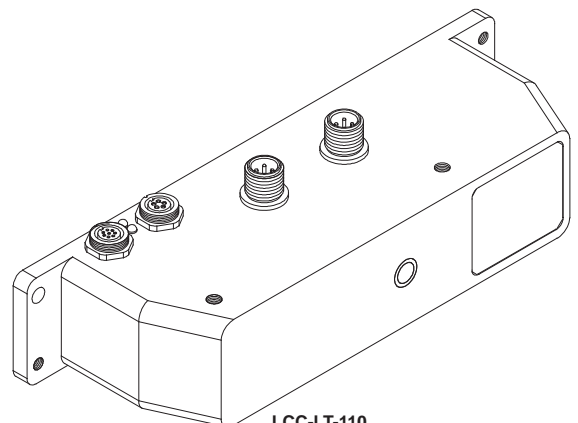
LCC-130



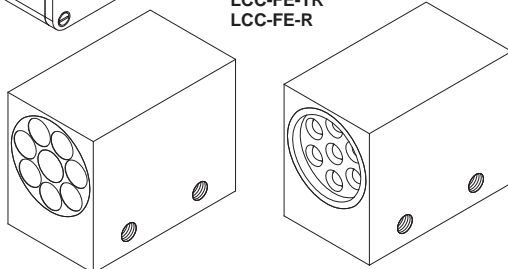
LCC-130-MA

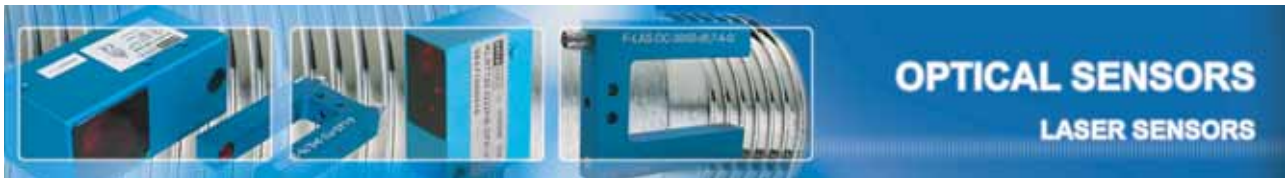


LCC-CON1  
LCC-FE-TR  
LCC-FE-R



LCC-LT-110





## M-LAS SERIES MINIATURE LASER SENSORS

### Product information

With an external diameter starting from 3mm or thread M4 these laser light barriers are among the smallest throughout the world. Due to their compact design sensors of the M-LAS series are used for applications with little installation space and applications that require a small light spot (parallel or focused). Various control units are available:

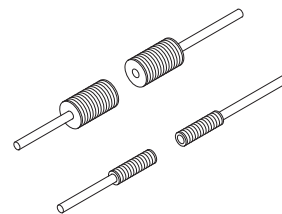
- RS232 version, parametrisable under Windows®
- Analog version with 4...20 mA output
- Digital version with automatically corrected switching threshold

Sensors of the M-LAS Series are ideal for detecting extremely small parts and for positioning objects.



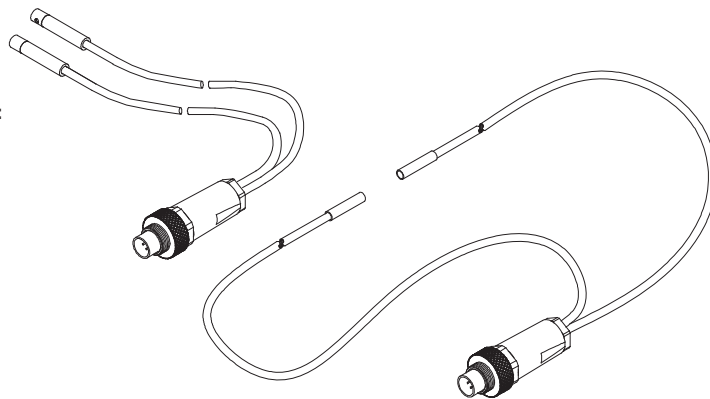
### Characteristics

- Big transmitter/receiver distance
- Low beam divergency
- Insensitive to outside light due to modulated IR-light
- Laser class 1 (PO < 0,4 mW)
- High switching frequency
- Sturdy metal housing
- Scratch-resistant optics cover made of glass

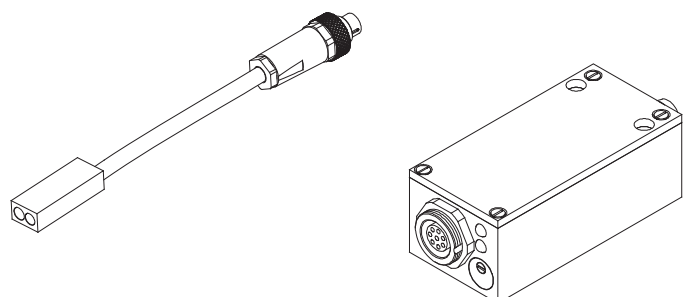


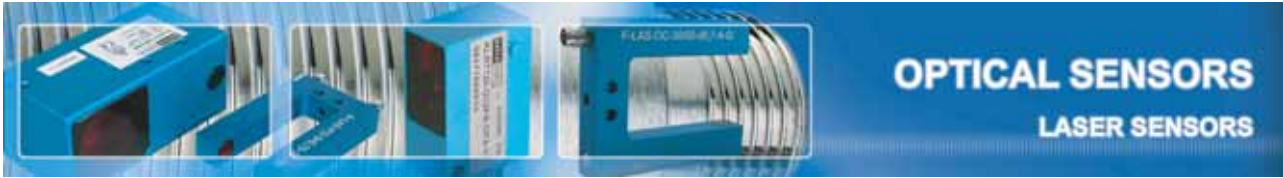
#### Versions with 8-pole circular connector:

- M-LAS-3-P
- M-LAS-M4-P
- M-LAS-M8-P
- M-LAS-4/90-P
- M-LAS-Q5/90-P
- M-LAS-F05-30130
- M-LAS-F05-80/50
- M-LAS-10-RFX-IR
- M-LAS-10-RFX-VIS



Depending on the users' requirements, the M-LAS laser light barriers can be combined with different control units.





## M-LAS SERIES MINIATURE LASER SENSORS

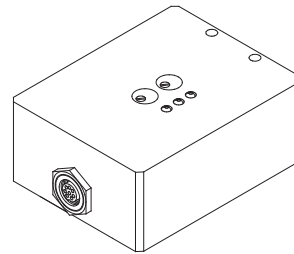
### Selection chart sensors

Article number	Designation sensors with connector
08363604230	M-LAS-M4-P (connector 712 8-pole)
08363604330	M-LAS-M8-P (connector 712 8-pole)
08363604430	M-LAS-M8-VIS-P (connector 712 8-pole)
08363604239	M-LAS-4/90-P (connector 712 8-pole)
08363604539	M-LAS-Q5/90-P (connector 712 8-pole)
08363604530	M-LAS-F05-30/30 (cable length 1m)
08363604580	M-LAS-F05-80/50 (cable length 3m)

### Control electronics

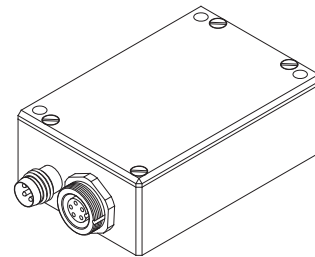
Article number	Designation
08369402010	M-CON2-0/20
08369402020	M-CON2-4/20

- Digital signals static and dynamic
- Analog voltage output (0 ... 10V)
- Analog current output (4 ... 20mA)
- Amplification factor and sensitivity adjustable via potentiometer

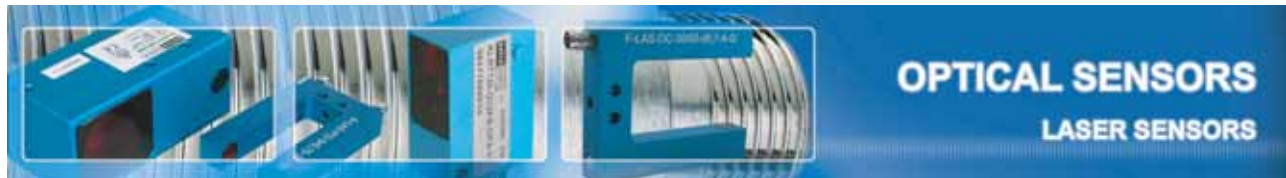


Article number	Designation
08369402030	M-CON3 (incl. software LR-Scope)

- Windows®-Parametrisation
- Analog signal (0 ... 10V) and digital signal (0V/+24V)



Continuation on the following page

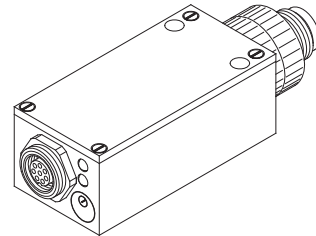


## M-LAS SERIES MINIATURE LASER SENSORS

### Control electronics

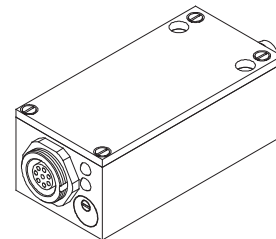
Article number	Designation
08369402060	M-CON4 Kontrollelektronik

- Connector M12 4-pole
- Two switching signals (static Q, Qinv)
- Adjustment of sensitivity via potentiometer



Article number	Designation
08369402050	M-CON8

- Two digital signals (static Q, Qinv)
- Connector M8 4-pole
- Adjustment of sensitivity via potentiometer



### Reflex light barriers with special control electronics

Article number	Designation light barrier
08363604500	M-LAS-10-RFX-IR (1m cable)
08363604600	M-LAS-10-RFX-VIS (1m cable)

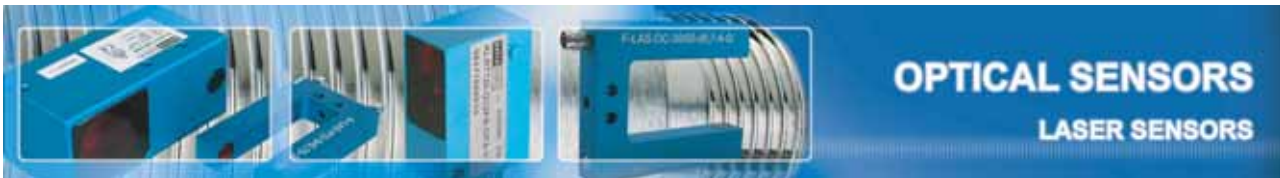
Article number	Designation control electronics
08369402090	M-CON4-10-RFX-IR
08369402080	M-CON4-10-RFX-VIS

Detailed information on [www.pulsotronic.de](http://www.pulsotronic.de).

#### Abbreviations

- IR = Infrared
- P = Potentiometer
- Q = PNP N.C. / NPN N.O.
- Qinv = PNP N.O. / NPN N.C.
- R = Receiver
- RFX = Reflex light barrier
- T = Transmitter
- VIS = Visible

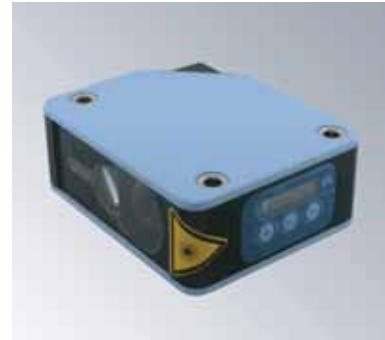




## KLDS SERIES LASER DISTANCE SENSORS

### Product information

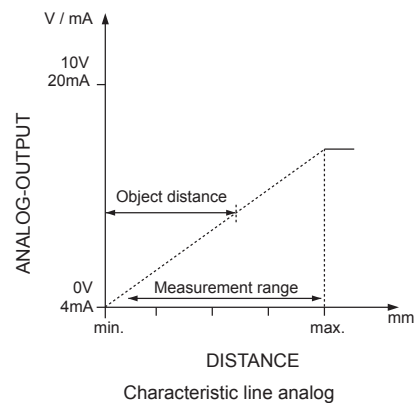
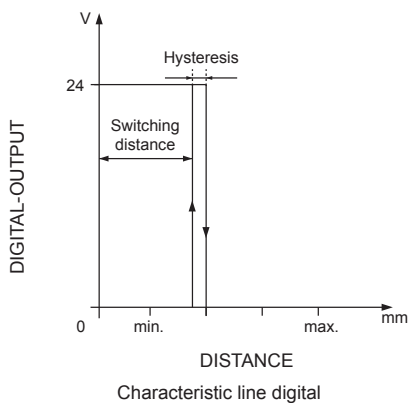
With laser distance sensors of the KLDS series the user realises precise measuring on large distances. The functional principle of the sensors is based on the detection of the time of flight. For distances of up to 7m the reflection characteristics of natural surfaces are sufficient. Using special reflectors the user realises distances of max. 100m. Additionally to two separately adjustable switching outputs analog or alarm outputs and serial interfaces are available.

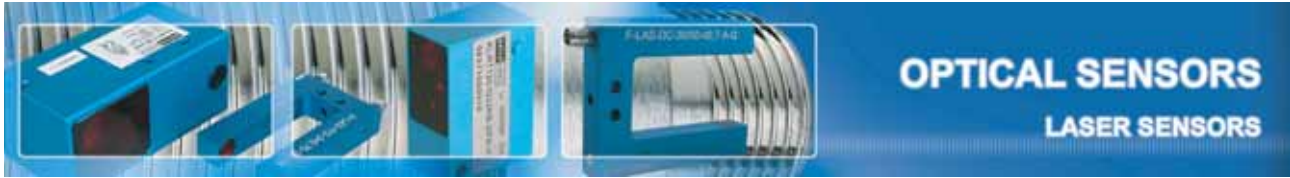


### Characteristics

Distance sensors with time of flight measurement are appropriate for applications demanding a constant performance on the entire measurement range. The maximum measurement and detection error mainly depends on the application and the factors given in the following. The linearity is of great importance. It indicates the maximum deviation of the analog output compared to the ideal value which is proportional to the distance. The linearity is indicated as percental value of the full scale value. The temperature drift indicates the maximum deviation of the measurement value in comparison to a thermal fluctuation of the sensor. It is given in mm/°C. The repeat accuracy is a measure for measuring variations on a target in the same distance in different measuring times.

### Output signal





## KLDS SERIES LASER DISTANCE SENSORS

### Selection chart sensors

Article number	Designation
0837100040	KLDS4M-Q53KB-DNSS-V2
0837100041	KLDS4M-Q53KB-DPSS-V2
0837100042	KLDS4M-Q53KB-DNSS-ANU-V2
0837100043	KLDS4M-Q53KB-DPSS-ANU-V2
0837100044	KLDS4M-Q53KB-DPSS-ANU-V2/S
0837100010	KLDS4M-Q90AB-DNSS-ANI-V2
0837100011	KLDS4M-Q90AB-DPSS-ANI-V2
0837100015	KLDS7M-Q90AB-DNSS-ANI-V2
0837100016	KLDS7M-Q90AB-DPSS-ANI-V2
0837100020	KLDS20M-Q90AB-DNSS-ANI-V2
0837100021	KLDS20M-Q90AB-DPSS-ANI-V2
0837100030	KLDS100M-Q90AB-DNSS-ANI-V2
0837100031	KLDS100M-Q90AB-DPSS-ANI-V2

### Accessories

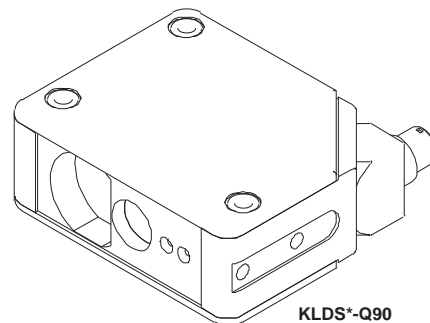
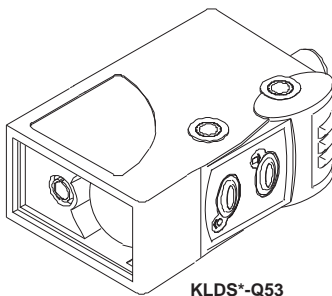
Article number	Designation
0837900001	ST-5037 Fastening angle for KLDS*-Q90...
0837900002	RFL-340/200 reflector

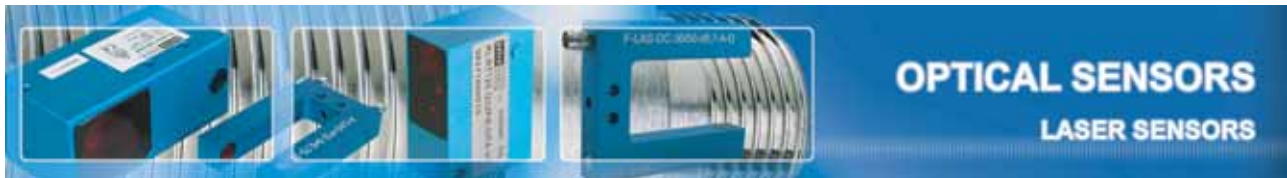
### Cables

Article number	Designation
44500001910	V2-8/P/2m
44500001912	V2-8/P/5m
44500001917	V2-8/P/10m
44505129000	V2-5/P/2m
44500033556	V2-5/P/5m

Detailed information on [www.pulsotronic.de](http://www.pulsotronic.de).

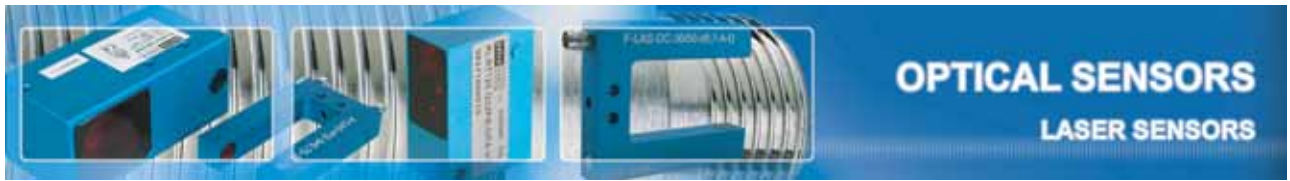
### Type overview





## NOTES

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## NOTES

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